HP-67 / 97 program

CATALOG

Hewlett-Packard Company

HEWLETT hp PACKARD

We welcome you as a member of the HP-67/97 USERS' CLUB – EUROPE, a collection and distribution center for user contributed programs and for those developed by Hewlett-Packard.

Through this system you can obtain programs from a wide variety of application areas for a nominal handling charge. Active participation on your part, as a contributor, is the key to providing needed and useful programs. In appreciation for each submitted program, once included in the catalog, we will send you two programs of your choice or one program and ten blank magnetic cards.

For your convenience, this catalog is divided into the following two parts :

PART I – ***Catalog of contributed programs*** *:*

A reference guide to all programs currently available from the European users' club.

PART II – ***Contributor's Guide*** *:*

A reference document with guidelines for correct documentation of your program submittals.

We are confident that your active participation in the Users' Club will help you to attain the full potential of your HP-67 or HP-97 and we invite you therefore to frequently take advantage of the services it provides.

HP-67/97 USERS' CLUB – EUROPE

PART I

HP-67/97 Users' Club-Europe Catalog of Contributed Programs

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INTRODUCTION

This program catalog is a reference guide to programs currently available from the HP-67/97 Users' Club. All HP-67 and HP-97 Users will find this catalog a convenient source for selecting programs from a wide variety of fields and application areas. Both user contributed and individual Hewlett-Packard developed programs are listed.

USING THE CATALOG

The catalog is divided into two sections to aid in selecting programs. It will help you to find program descriptions in the Program Abstract Section, which serves as the focal point of the catalog.

Following is a list of the two catalog sections and a description of their usage :

a. Application Section

b. Abstracts Section

Application Section

The Application Section includes both an Application Category Table and an Application Index. Use this section if you know the general area of application into which your problem falls. First refer to the Application Category Table to find the category number as a key. Here you will find the names and library program numbers of programs that may solve your particular problem. To make certain these programs *will* serve your needs, turn to the Abstracts Section and review the abstract for each of these programs.

Abstracts Section

The Abstracts Section includes a short abstract of each program residing in the program library*. Once you have obtained a library program number, turn to this section and review the program abstract. The abstract provides information to enable you to determine whether the program will meet your needs. This section will usually provide you with enough information to compare programs against each other when selecting between two or more alternatives.

PROGRAM SUPPORT

The programs described in this catalog are either Hewlett-Packard developed or user-contributed. Programs developed by Hewlett-Packard are maintained by the company's staff of Application Engineers. User-contributed programs are reviewed by specialists prior to acceptance. At that time a check for completeness, proper documentation, and the ability to perform the accompanying sample problem(s) is performed. After acceptance to the program library, the responsability for revising these programs rests with the contributor.

Users may directly report to us any logic or documentation errors, suggest possible program modifications, or otherwise remark on a program's general performance. In the event an error is reported, the program is temporarily placed on "unavailable" status. If the program concerned is

* Program Abstracts for application pac programs are identified by an @ before the program number.

Hewlett-Packard developed, we will correct the problem. On contributed programs we will notify the contributor of the error and request his assistance in resolving it; no response to a program error notification may result in the program's removal from the program library. If a user suggests possible changes to a program that might clarify documentation, add more versatility to it, improve its efficiency, or otherwise enhance its ability to perform without altering its intended function, we will review and then forward these suggestions to the contributor. Suggestions may be made by any user, but the contributor must agree to and submit the official change to us.

ORDERING PROGRAMS

Each program may be purchased for a handling charge (equivalent to US $ 4.00) with a required minimum order of 4 programs. A Program Order Form has been attached to this catalogue for your ordering convenience. The price per program in different currencies and the payment methods are shown on the same form. Complete it in full and mail to :

HP - 67/97 USERS' CLUB - EUROPE
HEWLETT-PACKARD S.A.
P.O. BOX
1217 MEYRIN 2 – GENEVA/SWITZERLAND

All such programs are purchased on a non-return non-exchange basis.

N.B. Due to legal requirements an invoice will be issued for French and Spanish customers.

PROGRAM DOCUMENTATION

We fill program requests by photocopying the following standard documentation submitted by the contributor :

a. **Program Description I**–gives a thorough description to the program and explains any special operating procedures, warnings, and limits.
b. **Program Description II**–provides a sketch of the problem (if applicable), shows sample problem(s) with solution(s), and directs the user to the reference material used in originating the program.
c. **User Instructions**–gives step-by-step instructions to the user on how to run the program.s,
d. **Program Listing Form I and II**–gives step-by-step listing of the program keystrokes required to record the program on a magnetic card. Pre-recorded magnetic cards are not furnished. In addition, keystroke codes and comments (as applicable) associated with each keystroke are shown.

PROGRAM CONTRIBUTIONS

The HP-67/97 Users' Club was established to provide a source of readily available and useful programs written for the HP-67 and HP-97 Programmable Calculators. Your programs are a necessary ingredient for insuring the Club's success. Please submit any program you feel will be of value to other owners. Refer to the Contributor's Guide Section for program submittal instructions. The forms necessary to complete program documentation are included.

Important : All program documentation and club publications are in English. Program contributions will be considered for acceptance only if in English.

CHANGE OF ADDRESS

To insure receipt of the next catalogue issues, please report a change of address to us as soon as possible. Make sure that the old address label and your new address is given.

Application Section

APPLICATION CATEGORY TABLE

01 BUSINESS

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- 01.02 LOANS
- 01.03 SAVINGS AND ANNUITIES
- 01.04 INVESTMENT ANALYSIS
- 01.05 REAL ESTATE
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02 ENGINEERING

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- 02.07 DYNAMICS
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- 03.05 INTEGRATION
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Abstracts Section

PROGRAM ABSTRACTS

00001D 97-BEER'S LAW

THIS SPECTROPHOTOMETRY PROGRAM SOLVES BEER'S LAW TO FIND EITHER ABSORBANCE OR PERCENT TRANSMITTANCE. IT ALSO CALCULATES THE CONCENTRATION OF AN UNKNOWN, GIVEN THE CONCENTRATION OF A STANDARD AND THE ABSORBANCE OR PERCENT TRANSMITTANCE OF THE STANDARD AND UNKNOWN.

144 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

a 00002D 97-PROTEIN ELECTROPHORESIS

THIS PROGRAM AIDS IN THE CALCULATIONS OF PROTEIN FRACTIONATION. REQUIRED DATA ARE THE INTEGRATION COUNTS FOR EACH PROTEIN FRACTION AND, OPTIONALLY, THE GRAMS OF TOTAL PROTEIN. THS PROGRAM CALCULATES THE PERCENTAGE OF THE TOTAL FOR EACH FRACTION AND, IF TOTAL PROTEIN HAS BEEN INPUT, THE NUMBER OF GRAMS FOR EACH PROTEIN FRACTION. AN OPTIONAL OUTPUT IS THE ALBUMIN/GLOBULIN RATIO.

148 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00003D 97-LDH ISOENZYMES

THIS PROGRAM ANALYZES THE RESULTS OF THE FRACTIONATION OF THE FIVE LACTIC DEHYDROGENOSE ISOENZYMES AND COMPUTES THE PERCENTAGE EACH ISOENZYME REPRESENTS OF THE WHOLE. IT ALSO CHECKS THE COMPUTED PERCENTAGE OF EACH ISOENZYME AGAINST ITS ACCEPTED NORMAL VALUE.

114 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00004D 97-BODY SURFACE AREA

THIS PROGRAM CALCULATES BODY SURFACE AREA BY EITHER THE DUBOIS OR BOYD METHOD. REQUIRED DATA ARE HEIGHT AND WEIGHT, WHICH MAY BE INPUT IN EITHER METRIC OR ENGLISH UNITS.

147 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00005D 97-UREA CLEARANCE

THIS PROGRAM CALCULATES UREA CLEARANCE, GIVEN THE URINE FLOW RATE AND THE CONCENTRATION OF UREA IN URINE AND BLOOD. THE URINE FLOW RATE MAY BE CORRECTED FOR THE PATIENT'S BODY SURFACE AREA. THE PROGRAM CALCULATES STANDARD OR MAXIMUM CLEARANCE DEPENDING ON WHETHER THE CORRECTED URINE FLOW RATE IS ABOVE OR BELOW 2 ML/MIN. THE PERCENT OF MEAN NORMAL MAY ALSO BE FOUND.

131 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00006D 97-CREATININE CLEARANCE

THIS PROGRAM CALCULATES CREATININE CLEARANCE, GIVEN THE URINE FLOW RATE AND THE CONCENTRATION OF CREATININE IN URINE AND PLASMA. THE URINE FLOW RATE MAY BE CORRECTED FOR THE PATIENT'S BODY SURFACE AREA.

98 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00007D 97-AMNIOTIC FLUID ASSAY

THIS PROGRAM CALCULATES SPECTROPHOTOMETRIC ESTIMATION OF BILE PIGMENTS IN AMNIOTIC FLUID. MEASUREMENTS OF ABSORBANCE CHARGES IN THE FLUID IS USEFUL IN

00007D (CONT'D)

RH-SENSITIZED PREGNANCIES AND ALLOWS CALCULATION OF THE DIFFERENCE BETWEEN THE ACTUAL AND THE INTERPOLATED ABSORBANCES. GIVEN THE WEEKS OF GESTATION, THE 'B' FACTOR AND, OPTIONALLY, THE LILEY ZONE NUMBER MAY BE FOUND.

146 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00008D 97-BLOOD ACID-BASE STATUS

THIS PROGRAM COMPUTES TOTAL PLASMA CO2(TCO2) AND BASE EXCESS FROM THE PARTIAL PRESSURE OF C(2PCO2), PH, AND HEMOGLOBIN CONCENTRATION. IF THE PCO2 AND PH VALUES USED ARE FOUND AT OTHER THAN 37 DEGREES CENTIGRADE, THE PROGRAM WILL CORRECT THEM TO 37 DEGREES CENTIGRADE VALUES IF BODY TEMPERATURE IS ALSO INPUT. AN OPTIONAL OUTPUT OF THE PROGRAM IS THE CONCENTRATION OF PLASMA BICARBONATE.

186 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00009D 97-OXYGEN SATURATION AND CONTENT

THIS PROGRAM ESTIMATES OXYGEN SATURATION OF BLOOD FROM VARIOUS BODY PARAMETERS AND COMPUTES OXYGEN CONTENT. IF THE ACTUAL OXYGEN SATURATION IS KNOWN, OXYGEN CONTENT CAN BE FOUND DIRECTLY.

214 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
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a 00010D 97-RED CELL INDICES

THIS PROGRAM COMPUTES RED CELL INDICES BASED ON THREE MEASURED VALUES: RED CELL COUNT, HEMATOCRIT, AND HEMOGLOBIN. THE INDICES COMPUTED ARE MEAN CORPUSCULAR VOLUME, MEAN CORPUSCULAR HEMOGLOBIN, AND MEAN CORPUSCULAR HEMOGLOBIN CONCENTRATION.

95 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00011D 97-TOTAL BLOOD VOLUME

THIS PROGRAM COMPUTES TOTAL BLOOD VOLUME BY THE RADIOISOTOPE DILUTION TECHNIQUE. THE INPUTS TO THE PROGRAM ARE BACKGROUND COUNTS PER MINUTE, VOLUME OF RADIOACTIVE SOLUTION INJECTED, DILUTION OF THE STANDARD SOLUTION, COUNTS PER MINUTE OF THE STANDARD, AND THE COUNTS PER MINUTE OF THE SAMPLE OF WHOLE BLOOD.

91 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
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a 00012D 97-SCHILLING TEST

THIS PROGRAM PERFORMS THE CALCULATIONS INVOLVED WITH THE SCHILLING TEST FOR THE DETERMINATION OF VITAMIN B12 ABSORPTION. THE INPUTS TO THE PROGRAM ARE THE BACKGROUND COUNTS PER MINUTE, THE DILUTION AND COUNTS PER MINUTE OF THE STANDARD, THE VOLUME OF URINE EXCRETED, AND THE COUNTS PER MINUTE OF THE URINE. THE OUTPUT IS THE PERCENT OF DOSE EXCRETED.

99 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
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a 00013D 97-THYROID UPTAKE

THIS PROGRAM COMPUTES THYROID UPTAKE AS A PERCENTAGE OF AN ADMINISTERED DOSE OF RADIOIODINE. INPUTS TO THE PROGRAM ARE THE COUNTS PER MINUTE FOR THE STANDARD, THE STANDARD BACKGROUND, THE PATIENT COUNTS (AFTER INGESTION OF THE DOSE), AND THE PATIENT BACKGROUND. CORRECTIONS MAY BE MADE TO THE COMPUTED VALUE TO ACCOUNT FOR RECENT PRIOR RADIOACTIVITY AND FOR SIGNIFICANT DIFFERENCES IN THE ACTIVITIES OF THE STANDARD AND THE DOSE.

125 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00014D 97-RADIOACTIVE DECAY CORRECTIONS

THIS PROGRAM CALCULATES THE DECAY IN RADIOACTIVITY OF AN ISOTOPE OVER A SPECIFIED TIME INTERVAL. THE HALF-LIVES OF 15 DIFFERENT RADIOISOTOPES ARE STORED BY THE PROGRAM AND MAY BE USED IN CALCULATING THE DECAY. THREE VARIABLES ARE NEEDED TO ENTIRELY DEFINE THE PROBLEM: ACTIVITY OF THE SELECTED ISOTOPE AT THE INITIAL TIME, ELAPSED TIME AND PRESENT ACTIVITY.

183 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00015D 97-RADIOMMUNOASSAY

THIS PROGRAM PERFORMS THE CALCULATIONS FOR PLOT OF RADIOIMMUNOASSAY DATA. IT ALLOWS FOR ANY NUMBER OF REPLICATES IN THE COUNTS INPUT AND FOR ANY NUMBER OF STANDARDS. OUTPUTS INCLUDE CORRELATION COEFFICIENT, SLOPE, AND INTERCEPT OF THE LEAST-SQUARES REGRESSION LINE COMPUTED. THEN, GIVEN COUNTS FOR THE UNKNOWN, THE CORRESPONDING CONCENTRATION IS COMPUTED.

208 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
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a 00016D 97-BASIC STATISTICS

THIS PROGRAM COMPUTES THE BASIC STATISTICS OF ONE VARIABLE: MEAN, STANDARD DEVIATION, STANDARD ERROR, AND COEFFICIENT OF VARIATION. INPUT DATA MAY BE GROUPED OR UNGROUPED.

112 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00017D 97-CHI-SQUARE EVALUATION AND DISTRIBUTION

THIS PROGRAM CALCULATES THE CHI-SQUARE STATISTIC FOR THE GOODNESS OF FIT TEST. IT ALSO EVALUATES THE CHI-SQUARE DENSITY AND THE CUMULATIVE DISTRIBUTION.

224 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00018D 97-T STATISTICS

THIS PROGRAM WILL COMPUTE EITHER OF TWO TEST STATISTICS WHICH ARE USED TO COMPARE POPULATION MEANS: THE PAIRED T STATISTIC OR THE T STATISTIC FOR TWO MEANS.

171 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00019D 97-T DISTRIBUTION

THIS PROGRAM CALCULATES THREE PARAMETERS OF THE T DISTRIBUTION GIVEN X AND THE DEGREES OF FREEDOM. THE DENSITY FUNCTION IS COMPUTED AS WELL AS TWO MEASURES OF THE AREA UNDER THE DISTRIBUTION CURVE.

223 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

PROGRAM ABSTRACTS

00020D 97-NETWORK TRANSFER FUNCTIONS

THIS PROGRAM COMPUTES VARIOUS TRANSFER FUNCTIONS OF A LADDER NETWORK COMPOSED OF ANY NUMBER OF STANDARD ELEMENTS. THE LADDER IS BUILT UP ONE ELEMENT AT A TIME BY SELECTING SHUNT OR SERIES ELEMENTS FROM A MENU OF CIRCUIT ELEMENTS.

312 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00021D 97-REACTIVE L-NETWORK IMPEDANCE MATCHING

THIS PROGRAM COMPUTES NETWORKS WHICH WILL MATCH ANY TWO COMPLEX IMPEDANCES. IT ACCEPTS COMPLEX LOAD AND SOURCE IMPEDANCES IN RECTANGULAR FORM AND OUTPUTS ALL POSSIBLE SOLUTIONS, DISPLAYING AN ERROR MESSAGE IF A GIVEN TOPOLOGY IS NOT SUITABLE.

111 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00022D 97-CLASS A TRANSISTOR AMPLIFIER BIAS OPTIMIZATION

THIS PROGRAM SIMPLIFIES THE DESIGN OF A CLASS A TRANSISTOR AMPLIFIER. THE USER SPECIFIES A NUMBER OF ITEMS FROM WHICH THE PROGRAM DETERMINES THE OPTIMUM VALUES FOR R(1), R(2), R(E), AND R(L). THE MINIMUM POWER GAIN IS ALSO COMPUTED.

221 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00023D 97-TRANSISTOR AMPLIFIER PERFORMANCE

THIS PROGRAM COMPUTES CERTAIN SMALL-SIGNAL PROPERTIES OF A TRANSISTOR AMPLIFIER GIVEN THE H-PARAMETER MATRIX AND THE SOURCE AND LOAD IMPEDANCES. PROPERTIES COMPUTED ARE CURRENT AND VOLTAGE GAINS AND INPUT AND OUTPUT IMPEDANCES.

174 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
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00024D 97-TRANSISTOR CONFIGURATION COMVERSION

THIS PROGRAM CONVERTS AMONG H-PARAMETER MATRICES FOR COMMON-BASE, COMMON-EMITTER, AND COMMON-COLLECTOR TRANSISTOR CONFIGURATIONS.

217 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00025D 97-PARAMETER CONVERSION

THIS PROGRAM ALLOWS CONVERSION AMONG VARIOUS COMMONLY USED PARAMETER SETS. APPROPRIATE PRE- AND POST- CONDITIONING OPERATIONS MUST BE PERFORMED DEPENDING ON WHICH CONVERSION IS DESIRED.

224 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00026D 97-FOURIER SERIES

THIS PROGRAM COMPUTES FOURIER COEFFICIENTS FROM SAMPLES OF A PERIODIC FUNCTION. UP TO TEN CONSECUTIVE PAIRS OF COEFFICIENTS MAY BE COMPUTED AT ONE TIME FROM N EQUALLY SPACED POINTS. THE COEFFICIENTS MAY BE DISPLAYED IN

00026D (CONT'D)

EITHER RECTANGULAR OR POLAR FORM.

173 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00027D 97-ACTIVE FILTER DESIGN

THIS PROGRAM COMPUTES ELEMENT VALUES FOR A STANDARD FILTER CIRCUIT. THE USER SELECTS CORNER OR CENTER FREQUENCY, MIDBAND GAIN, PEAKING FACTOR, AND A CAPACITOR. THE PROGRAM THEN PRINTS OUT A LIST OF ELEMENTS WHICH FORM THE DESIRED FILTER.

136 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00028D 97-BUTTERWORTH OR CHEBYSHEV FILTER DESIGN

THIS PROGRAM COMPUTES COMPONENT VALUES FOR BUTTERWORTH OR CHEBYSHEV FILTERS BETWEEN EQUAL TERMINATIONS. INPUTS ARE TERMINATION RESISTANCE, BANDPASS CHARACTERISTICS, ATTENUATION AT SOME OUT-OF-BAND FREQUENCY, AND, FOR THE CHEBYSHEV FILTER, ALLOWABLE PASSBAND RIPPLE.

328 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00029D 97-BODE PLOT OF BUTTERWORTH AND CHEBYSHEV FILTERS

THIS PROGRAM PROVIDES GAIN, PHASE AND GROUP DELAY INFORMATION FOR BODE PLOTS OF N-POLE BUTTERWORTH OR CHEBYSHEV FILTERS. A FREQUENCY TRANSFORMATION FEATURE ALLOWS FOUR TYPES OF FILTER CHARACTERISTICS: LOW PASS, HIGH PASS, BAND PASS, AND BAND ELIMINATION. FREQUENCY STEPS MAY BE EITHER LINEAR OR LOGARITHMIC.

216 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00030D 97-RESISTIVE ATTENUATOR DESIGN

THIS PROGRAM COMPUTES VALUES FOR THE RESISTORS WHICH YIELD AN ATTENUATOR HAVING ANY DESIRED LOSS.

145 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00031D 97-SMITH CHART CONVERSIONS

THIS PROGRAM CONVERTS AMONG COMMONLY USED RADIALLY SCALED PARAMETERS: STANDING WAVE RATIO, REFLECTION COEFFICIENT, AND RETURN LOSS. IT ALSO INTERCONVERTS IMPEDANCE AND REFLECTION COEFFICIENT.

81 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00032D 97-TRANSMISSION LINE IMPEDANCE

THIS PROGRAM COMPUTES HIGH FREQUENCY CHARACTERISTIC IMPEDANCE FOR FIVE TYPES OF TRANSMISSION LINE OPEN TWO-WIRE LINE, SINGLE WIRE NEAR GROUND, BALANCED WIRES NEAR GROUND, WIRES IN PARALLEL NEAR GROUND, AND COAXIAL LINE.

109 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00033D 97-MICROSTRIP CALCULATIONS

THIS PROGRAM ACCEPTS CONDUCTOR WIDTH, DIELECTRIC THICKNESS AND RELATIVE PERMITTIVITY, AND COMPUTES RELATIVE PHASE VELOCITY AND CHARACTERISTIC IMPEDANCE FOR LOSSLESS LINE. IT ALSO COMPUTES COPPER LOSS AND RESISTANCE PER UNIT LENGTH.

224 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00034D 97-TRANSMISSION LINE CALCULATIONS

THIS PROGRAM COMPUTES THE INPUT IMPEDANCE OF LOSSY TRANSMISSION LINE WITH ARBITRARY TERMINATION IMPEDANCE.

215 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00035D 97-UNILAT DES; FIG OF MERIT,MAX UNILAT GAIN, GAIN CIRCLES

THIS PROGRAM,FROM A TRANSISTOR'S S-PARAMETERS,COMPUTES UNILATERAL FIGURE OF MERIT, TRANSDUCER POWER GAIN, TRANSDUCER GAIN FOR SPECIFIED INPUT AND OUTPUT IMPEDANCES, AND GAIN CONTRIBUTION FROM CHANGE OF EITHER SOURCE OR LOAD. IT ALSO COMPUTES THE CENTER AND RADIUS OF A CONSTANT GAIN CIRCLE.

134 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00036D 97-BILATERAL DESIGN: STABILITY FACTOR, MAXIMUM GAIN,OPTIMUM MATCHING

THIS PROGRAM COMPUTES THE MAXIMUM GAIN AVAILABLE AND THE LOAD AND SOURCE REFLECTION COEFFICIENTS WHICH YIELD THE MAXIMUM GAIN WHEN THE STABILITY FACTOR IS GREATER THAN 1

202 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00037D BILATERAL DESIGN: GAIN AND STABILITY CIRCLES LOAD AND SOURCE MAP

THIS PROGRAM COMPUTES THE LOCATION AND RADIUS OF STABILITY CIRCLES. IT ALSO COMPUTES THE SOURCE OR LOAD REFLECTION COEFFICIENT CORRESPONDING TO A GIVEN LOAD OR SOURCE TERMINATION

192 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00038D 97-VECTOR STATICS

THIS PROGRAM PERFORMS THE BASIC TWO DIMENSIONAL VECTOR OPERATIONS OF OF ADDITION, CROSS PRODUCT AND DOT, SCALAR, OR INNER PRODUCT. IN ADDITION, THE ANGLE BETWEEN VECTORS MAY BE FOUND. IT ALSO CALCULATES THE TWO REACTION FORCES NECESSARY TO BALANCE A GIVEN TWO-DIMENSIONAL FORCE VECTOR. THE DIRECTION OF THE REACTION FORCES MAY BE SPECIFIED AS A VECTOR OF ARBITRARY LENGTH OR BY CARTESIAN COORDINATES USING THE POINT OF FORCE APPLICATION AS THE ORIGIN

129 PROGRAM STEPS
USERS LIBRARY HEWLETT PACKARD CO
CUPERTINO, CA

00039D 97-SECTION PROPERTIES

THIS PROGRAM CALCULATES THE PROPERTIES OF POLYGONAL SECTIONS

00039D (CONT'D)

COORDINATES OF THE VERTICES OF THE POLYGON ARE INPUT SEQUENTIALLY FOR A COMPLETE,CLOCKWISE PATH AROUND THE POLYGON.HOLES IN THE CROSS SECTION, WHICH DO NOT INTERSECT THE BOUNDARY, MAY BE DELETED BY FOLLOWING A COUNTER-CLOCKWISE PATH. A SPECIAL FEATURE ALLOWS ADDITION OR DELETION OF CIRCULAR AREAS.

346 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00040D 97-STRESS ON AN ELEMENT

THIS PROGRAM REDUCES DATA FROM RECTANGULAR AND EQUIANGULAR ROSETTE STRAIN GAGES. IT ALSO PERFORMS MOHR CIRCLE STRESS ANALYSIS BY CONVERTING AN ARBITRARY STRESS CONFIGURATION TO PRINCIPAL STRESSES, MAXIMUM SHEAR STRESS AND ROTATION ANGLE, FROM WHICH THE STATE OF STRESS FOR AN ARBITRARY ORIENTATION MAY BE CALCULATED.

164 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00041D 97-SODERBERG'S EQUATION FOR FATIGUE

THIS PROGRAM WILL CALCULATE THE SEVENTH VARIABLE FROM THE OTHER SIX VALUES IN SODERBERG'S EQUATION. THE SEVEN VARIABLES ARE: YIELD POINT STRESS OF THE MATERIAL, MATERIAL ENDURANCE STRESS FROM REVERSE BENDING TESTS, STRESS CONCENTRATION FACTOR FOR THE PART, FACTOR OF SAFETY, MAXIMUM LOAD, MINIMUM LOAD, AND CROSS SECTIONAL AREA OF THE PART. THIS IMPLEMENTATION OF SODERBERG'S EQUATION IS FOR DUCTILE MATERIALS ONLY.

185 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00042D CANTILEVER BEAMS

THIS PROGRAM CALCULATES DEFLECTION,SLOPE,MOMENT AND SHEAR AT ANY SPECIFIED POINT ALONG A RIGIDLY FIXED, CANTILEVER BEAM OF UNIFORM CROSS SECTION. DISTRIBUTED LOADS, POINT LOADS, APPLIED MOMENTS OR COMBINATIONS OF ALL THREE MAY BE MODELED. BY USING THE PRINCIPLE OF SUPERPOSITION, COMPLICATED BEAMS WITH MULTIPLE POINT LOADS, APPLIED MOMENTS AND COMBINED DISTRIBUTED LOADS MAY BE ANALYZED.

211 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00043D SIMPLY SUPPORTED BEAMS

THIS PROGRAM CALCULATES DEFLECTION, SLOPE, MOMENT AND SHEAR AT ANY SPECIFIED POINT ALONG A SIMPLE SUPPORTED BEAM OF UNIFORM CROSS SECTION. DISTRIBUTED LOADS, POINT LOADS, APPLIED MOMENTS OR COMBINATION OF ALL THREE MAY BE MODELED. BY USING THE PRINCIPLE OF SUPERPOSITION, COMPLICATED BEAMS WITH MULTIPLE POINT LOADS AND MULTIPLE APPLIED MOMENTS CAN BE ANALYZED

193 PROGRAM STEPS
USERS LIBRARY HEWLETT PACKARD CO
CUPERTINO, CA

00044D BEAMS FIXED AT BOTH ENDS

THIS PROGRAM CALCULATES DEFLECTION,SLOPE,MOMENT AND SHEAR AT ANY SPECIFIED POINT ALONG A BEAM OF UNIFORM CROSS SECTION,FIXED AT BOTH

00044D (CONT'D)

ENDS. DISTRIBUTED LOADS,POINT LOADS, APPLIED MOMENTS OR COMBINATION OF ALL THREE MAY BE MODELED. BY USING THE PRINCIPLE OF SUPERPOSITION, COMPLICATED BEAMS WITH MULTIPLE POINT LOADS AND MULTIPLE APPLIED MOMENTS CAN BE ANALYZED.

223 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00045D PROPPED CANTILEVER BEAMS

THIS PROGRAM CALCULATES DEFLECTION,SLOPE,MOMENT AND SHEAR AT ANY SPECIFIED POINT ALONG A BEAM OF UNIFORM CROSS SECTION. DISTRIBUTION LOADS,POINT LOADS, APPLIED MOMENTS OR COMBINATIONS OF ALL THREE MAY BE MODELED. BY USING THE PRINCIPLE OF SUPERPOSITION, COMPLICATED BEAMS WITH MULTIPLE POINT LOADS AND MULTIPLE APPLIED MOMENTS CAN BE ANALYZED.

222 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00046D COLUMNS

THIS PROGRAM PERFORMS AN INTERCHANGEABLE SOLUTION FOR THE FOUR PROPERTIES OF SLENDER COMPRESSION MEMBERS OR COLUMNS: CRITICAL BUCKLING LOAD, MODULUS OF ELASTICITY, MINIMUM MOMENT OF INERTIA AND LENGTH OF THE MEMBER. IT ALSO CALCULATES THE MAXIMUM DEFLECTION, THE MAXIMUM MOMENT, AND THE MAXIMUM STRESS IN AN ECCENTRICALLY LOADED COLUMN UNDER COMPRESSIVE STRESS.

150 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00047D HELICAL SPRING DESIGN

THIS PROGRAM PERFORMS ONE OR TWO POINT DESIGN FOR HELICAL COMPRESSION SPRINGS OF ROUND WIRE, WITH ENDS SPARE AND GROUND. AFTER A TENTATIVE SPRING DESIGN HAS BEEN FOUND, A CHECK CAN BE RUN TO DETERMINE WHETHER STRESSES ARE ACCEPTABLE, AND WHETHER SUFFICIENT CLEARANCE BETWEEN COILS IS AVAILABLE AT THE POINT OF HIGHEST OPERATING LOAD.

223 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00048D FLAT SPRING DESIGN

THIS PROGRAM SOLVES THE VALUES INVOLVED IN FLAT SPRING DESIGN THERE ARE A TOTAL OF EIGHT CASES, INCLUDING MULTIPLE LEAF AND TRIANGULAR PLATE SPRINGS. ONE OF EIGHT SPRING GEOMETRIES MAY BE SPECIFIED

302 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00049D 97-FOUR BAR FUNCTION GENERATOR

THIS PROGRAM MAY BE USED TO DESIGN A FOUR BAR LINKAGE WHICH WILL APPROXIMATE AN ARBITRARY FUNCTION OF ONE VARIABLE. FREUDENSTEIN'S APPROACH IS USED IN THE SOLUTION CRAMER'S RULE IS USED TO SOLVE THE 3X3 SYSTEM OF LINEAR EQUATIONS

280 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00050D 97-PROGRESSION OF FOUR BAR SYSTEM

THIS PROGRAM CALCULATES ANGULAR DISPLACEMENT, VELOCITY AND ACCELERATION FOR THE OUTPUT LINK OF A FOUR BAR SYSTEM. EITHER THE "CONNECTING LINK" OR THE "OUTPUT LINK" MAY BE SELECTED AS THE PROGRAM'S OUTPUT LINK.

166 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00051D 97-PROGRESSION OF SLIDER CRANK

THIS PROGRAM CALCULATES THE DISPLACEMENT, VELOCITY AND ACCELERATION OF THE CONNECTING ROD IN A SLIDER CRANK MECHANISM REQUIRED INPUT VARIABLES ARE CRANK RADIUS, CONNECTING ROD LENGTH, SLIDER OFFSET, CRANKSHAFT SPEED AND CRANK POSITION.

192 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00052D CIRCULAR CAMS

THIS PROGRAM COMPUTES THE PARAMETERS NECESSARY FOR THE DESIGN OF A HARMONIC OR CYCLOIDAL CIRCULAR CAM WITH A ROLLER, POINT OR FLAT FOLLOWER.

214 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00053D LINEAR CAMS

THIS PROGRAM COMPUTES PARAMETERS NECESSARY FOR THE DESIGN OF HARMONIC, CYCLOIDAL OR PARABOLIC PROFILES FOR LINEAR CAMS WITH ROLLER FOLLOWERS

191 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00054D GEAR FORCES

THIS PROGRAM COMPUTES THREE MUTUALLY PERPENDICULAR FORCES, RESULTING FROM INPUT TORQUE, ON HELICAL, LEVEL OR WORM GEARS

107 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00055D STANDARD EXTERNAL INVOLUTE SPUR GEARS

THIS PROGRAM CALCULATES PITCH DIAMETER, TOOTH THICKNESS, THE INVOLUTE AND CORRESPONDING FLANK ANGLE INVOLUTE FOR STANDARD EXTERNAL INVOLUTE SPUR GEARS. REQUIRED INPUT VARIABLES ARE DIAMETRAL PITCH, NUMBER OF TEETH, PRESSURE ANGLE AND PIN DIAMETER. FLANK ANGLE IS CALCULATED BY NEWTON'S METHOD. THE PROGRAM ALSO CALCULATES THE THEORETICAL VALUES OF THE MEASUREMENT OVER PINS, THE RADIUS TO THE CENTER OF THE PIN, AND THE MEASUREMENT OVER ONE PIN. GIVEN THE VALUE OF THE TOOTH THINNING, THE PROGRAM WILL RETURN THE MEASUREMENT OVER PINS WITH TOOTH THINNING

147 PROGRAM STEPS
USERS LIBRARY HEWLETT PACKARD CO
CUPERTINO, CA

00056D BELT LENGTH

THIS PROGRAM COMPUTES THE BELT LENGTH AROUND AN ARBITRARY SET OF PULLEYS. IT MAY ALSO BE USED TO COMPUTE THE TOTAL LENGTH BETWEEN ANY

00056D (CONT'D)

SET OF COORDINATES.

169 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00057D 97-FREE VIBRATIONS

THIS PROGRAM PROVIDES AN EXACT SOLUTION TO THE DIFFERENTIAL EQUATION FOR A DAMPED OSCILATOR VIBRATING FREELY. REQUIRED INPUT VARIABLES ARE MASS, SPRING CONSTANT, AND DAMPING CONSTANT. THE INITIAL CONDITIONS ARE THE DISPLACEMENT AND VELOCITY AT TIME ZERO.

215 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00058D 97-VIBRATION FORCED BY COSINE FUNCTION

THIS PROGRAM FINDS THE STEADY-STATE SOLUTION FOR AN OBJECT UNDERGOING DAMPED, FORCED OSCILLATIONS DRIVEN BY A PERIODIC EXTERNAL FORCE. IT ALSO CALCULATES THE NATURAL FREQUENCY OF AN UNDAMPED SYSTEM, THE DAMPED NATURAL FREQUENCY, THE DAMPING RATIO AND RESONANT FREQUENCY.

172 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00059D EQUATIONS OF STATE

THIS CARD PROVIDES BOTH IDEAL GAS AND REDLICH-KWONG EQUATIONS OF STATE. GIVEN FOUR OF THE FIVE STATE VARIABLES (ABSOLUTE PRESSURE, VOLUME, NUMBER OF MOLES PRESENT, UNIVERSAL GAS CONSTANT, AND ABSOLUTE TEMPERATURE), THE FIFTH IS CALCULATED. FOR THE REDLICK-KWONG SOLUTION, THE CRITICAL PRESSURE AND TEMPERATURE OF THE GAS MUST BE KNOWN.

213 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00060D ISENTROPIC FLOW FOR IDEAL GASES

THIS PROGRAM REPLACES INSENTROPIC FLOW TABLES FOR IDEAL GASES IN CONVERGING-DIVERGING PASSAGES.

159 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00061D CONDUIT FLOW

THIS PROGRAM SOLVES FOR THE AVERAGE VELOCITY, OR THE PRESSURE DROP FOR VISCOUS, INCOMPRESSIBLE FLOW IN CONDUITS

193 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00062D 97-HEAT EXCHANGERS

THIS PROGRAM ALLOWS ANALYSIS OF COUNTER-FLOW,PARALLEL-FLOW, PARALLEL-COUNTER FLOW CONFIGURATION (WITH AN EVEN NUMBER OF TUBE PASSES), AND CROSS FLOW (BOTH FLUIDS UNMIXED) HEAT EXCHANGES.

319 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00063D FACTORS AND PRIMES

THIS PROGRAM WILL FIND ALL PRIME FACTORS OF A POSITIVE INTEGER, AND LIST ALL PRIME NUMBERS BETWEEN LOWER AND UPPER BOUNDS SPECIFIED BY THE USER.

223 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00064D 97-GREATEST COMMON DIVISOR, LEAST COMMON MULTIPLE, DECIMAL TO FRACTION

THIS PROGRAM FINDS THE GREATEST COMMON DIVISOR AND THE LEAST COMMON MULTIPLE OF TWO INTEGERS. IT ALSO FINDS THE NEAREST FRACTIONAL APPROXIMATION FOR A DECIMAL NUMBER.

199 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00065D 97-BASE CONVERSIONS

THIS PROGRAM CONVERTS POSITIVE NUMBERS FROM ONE BASE TO ANOTHER WHERE THE BASES ARE INTEGER VALUES FROM 2 TO 99 INCLUSIVE.

153 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00066D 97-OPTIMUM SCALE FOR A GRAPH; PLOTTING

THIS PROGRAM (1) FINDS THE OPTIMAL SCALE FOR A GRAPH, GIVEN CERTAIN PARAMETERS OF THE GRAPH, AND (2) ASSISTS IN PLOTTING FUNCTIONS OF ONE VARIABLE BY GENERATING ORDERED PAIRS FOR A RANGE OF VALUES SPECIFIED BY THE USER.

128 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00067D 97-COMPLEX OPERATIONS

THIS PROGRAM ALLOWS FOR CHAINED CALCULATIONS INVOLVING COMPLEX NUMBERS. THE FOUR OPERATIONS OF COMPLEX ARITHMETIC (ADD, SUBTRACT, MULTIPLY, DIVIDE) ARE PROVIDED, AS WELL AS SEVERAL OF THE MOST USED FUNCTIONS OF A COMPLEX VARIABLE.

145 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00068D 97-POLYNOMIAL SOLUTIONS

THIS PROGRAM SOLVES POLYNOMIAL EQUATIONS WITH REAL COEFFICIENTS OF DEGREE 5 AND BELOW, PROVIDED THE HIGH-ORDER COEFFICIENT IS 1.

224 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00069D 97-4 X 4 MATRIX OPERATIONS

THIS PROGRAM CALCULATES THE DETERMINANT AND INVERSE OF A 4 X 4 MATRIX AND SOLVES A SYSTEM OF 4 SIMULTANEOUS EQUATIONS IN 4 UNKNOWNS,BY GAUSSIAN ELIMINATION

421 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00070D 97-SOLUTION TO F (X)=0 ON AN INTERVAL

THIS PROGRAM USES A COMBINATION OF BISECTION AND THE SECANT METHOD TO GUARANTEE RAPID CONVERGENCE TO A

00070D (CONT'D)

REAL ROOT OF THE EQUATION F (X) = 0 IN A FINITE INTERVAL. (AN ACCURACY TOLERANCE, THE GREATEST ALLOWABLE ERROR IN THE FINAL APPROXIMATION FOR THE ROOT, MUST ALSO BE SPECIFIED).

139 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00071D 97-NUMERICAL INTEGRATION

THIS PROGRAM FINDS THE INTEGRALS OF FUNCTIONS KNOWN EXPLICITLY USING SIMPSON'S RULE; INTEGRALS FOR FUNCTIONS KNOWN AT DISCRETE POINTS MAY BE APPROXIMATED BY EITHER THE TRAPEZOIDAL RULE OR SIMPSON'S RULE

112 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00072D 97-GAUSSIAN QUADRATURE

THIS PROGRAM USES THE SIX-POINT GAUSS-LEGENDRE QUADRATURE METHOD TO FIND INTEGRALS OVER FINITE OR INFINITE INTERVALS.

178 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00073D 97-DIFFERENTIAL EQUATIONS

THIS PROGRAM SOLVES FIRST AND SECOND ORDER DIFFERENTIAL EQUATIONS BY THE FOURTH ORDER RUNGE-KUTTA METHOD.

163 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00074D 97-INTERPOLATIONS

THIS PROGRAM ALLOWS SELECTION OF ONE OF THREE DIFFERENT INTERPOLATION ROUTINES LINEAR,LAGRANGIAN,AND FINITE DIFFERENCE

163 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00075D 97-COORDINATE TRANSFORMATIONS

THIS PROGRAM PROVIDES 2 AND 3 -DIMENSIONAL COORDINATE TRANSLATION AND/OR ROTATION OF AXES

285 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00076D 97-INTERSECTIONS OF LINES, LINES AND CIRCLE AND CIRCLES.

THIS PROGRAM CALCULATES THE POINT OF INTERSECTION OF (1) TWO COPLANAR LINES, (2) A COPLANAR CIRCLE AND LINE, OR (3) TWO COPLANAR CIRCLES

211 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00077D 97-CIRCLE COMPUTATIONS

THIS PROGRAM CALCULATES (1) THE CENTER AND RADIUS OF A CIRCLE GIVEN THREE-NONCOLLINEAR POINTS, AND (2) THE COORDINATES OF POINTS ON A CIRCLE GIVEN THE CENTER AND RADIUS OF A CIRCLE

216 PROGRAM STEPS
USERS LIBRARY HEWLETT PACKARD CO
CUPERTINO, CA

PROGRAM ABSTRACTS

00078D 97-SPHERICAL TRIANGLES

THIS PROGRAM SOLVES ALL SIX CASES OF SPHERICAL TRIANGLES: THREE SIDES (SSS),THREE ANGLES (AAA),TWO SIDES AND THE INCLUDED ANGLE (SAS),TWO ANGLES AND THE INCLUDED SIDE(ASA),TWO SIDES AND AN OPPOSITE ANGLE (SSA),AND TWO ANGLES AND AN OPPOSITE SIDE (AAS).

175 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00079D 97-GAMMA FUNCTION

THIS PROGRAM APPROXIMATES THE GAMMA FUNCTION FOR VALUES RANGING FROM 1 THROUGH 70.

156 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00080D 97-BESSEL FUNCTIONS, ERROR FUNCTION

THIS PROGRAM COMPUTES THE BESSEL FUNCTIONS JN(X) AND IN(X) WHERE N IS A POSITIVE INTEGER AND X IS POSITIVE. IT ALSO FINDS THE ERROR FUNCTION AND COMPLEMENTARY ERROR FUNCTION FOR POSITIVE ARGUMENTS.

221 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00081D 97-HYPERBOLICS

THIS PROGRAM COMPUTES THE HYPERBOLIC FUNCTIONS AND THEIR INVERSES.

132 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00082D 97-TRAVERSE,INVERSE AND SIDESHOTS

THIS PROGRAM REDUCES FIELD DATA AND SOLVES FOR (1) BEARING/AZIMUTH TRAVERSE, (2) FIELD ANGLE TRAVERSE, (3) INVERSE AND (4) SIDESHOTS. IT ALSO INCLUDES ROUTINES FOR (5) SLOPE DISTANCE REDUCTION, (6) CLOSURE FOR TRAVERSES, AND (7) CURVED SIDES FOR TRAVERSES.

221 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00083D 97-TRAVERSE ADJUSTMENT

THIS PROGRAM ADJUSTS TRAVERSES USING ONE OF TWO METHODS: (1) THE COMPASS OR BOWDITCH RULE, (2) CRANDALL'S RULE. DATA CAN CONSIST OF EITHER COORDINATES OF POINTS OR LATITUDES AND DEPARTURES FOR EACH LEG.

224 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00084D 97-INTERSECTIONS

THIS PROGRAM COMPUTES THE COORDINATES OF THE POINT OF INTERSECTION OF TWO LINES USING THE COORDINATES OF A POINT ON EACH LINE AND A BEARING (OR AZIMUTH) OR DISTANCE FOR EACH LINE. IT ALSO COMPUTES THE REMAINING BEARINGS AND DISTANCES. GIVEN A POINT AND BEARING OF ONE LINE AND A SECOND POINT, THE OFFSET FROM THE SECOND POINT TO THE LINE CAN BE COMPUTED

194 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00085D 97-CURVE SOLUTIONS

THIS PROGRAM COMPUTES PARAMETERS FOR CIRCULAR CURVES. TWO PARAMETERS MUST BE KNOWN; (1) RADIUS AND CENTRAL ANGLE OR (2) RADIUS OR CENTRAL ANGLE AND EITHER ARC LENGTH, CHORD, TANGENT, MID ORDINATE OR EXTERNAL. ALL EIGHT PARAMETERS CAN BE OUTPUT AS WELL AS THE AREAS OF THE FILLET, SEGMENT AND SECTOR.

178 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00086D 97-HORIZONTAL CURVE LAYOUT

THIS PROGRAM CALCULATES THE LAYOUT OF A HORIZONTAL CIRCULAR CURVE BY EITHER (1) PC DEFLECTIONS AND CHORD LENGTHS, (2) PI DEFLECTIONS AND DISTANCES, (3) TANGENT DISTANCES OR (4) CHORD DISTANCES AND OFFSETS. THE REQUIRED INFORMATION ON THE CURVE IS THE PC OR PI STATION, RADIUS OR DEGREE OF CURVE, AND CENTRAL ANGLE

206 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00087D 97-SPIRAL CURVE LAYOUT

THIS PROGRAM CALCULATES THE LAYOUT OF SPIRAL CURVES BY EITHER (1) DEFLECTION ANGLES AND CHORD DISTANCES FROM THE BEGINNING STATION OF THE SPIRAL (PS), OR (2) TANGENT DISTANCES AND OFFSETS TO THE SPIRAL REQUIRED INPUT VARIABLES ARE THE PS STATION, RADIUS OF THE CENTRAL CIRCULAR CURVE, AND THE LENGTH OF THE SPIRAL. PROGRAM IS DEPENDENT ON PROGRAM #00086D, HORIZONTAL CURVE LAYOUT TO LOAD A SET OF CONSTANTS INTO THE SECONDARY REGISTERS

224 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00088D 97-VERTICAL CURVES AND GRADES

THIS PROGRAM COMPUTES STATION AND ELEVATION DATA FOR VERTICAL CURVES AND STRAIGHT GRADES REQUIRED INPUT VARIABLES ARE BEGINNING STATION, ELEVATION, BEGINNING GRADE, ENDING GRADE, AND EITHER (1) LENGTH OF THE CURVE, (2) ELEVATION AT HIGH OR LOW POINT, OR (3) STATION AND ELEVATION THROUGH WHICH THE CURVE PASSES

223 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00089D 97-RESECTION

THIS PROGRAM SOLVES THE 'THREE POINT PROBLEM' OR RESECTION BY LOCATING A POINT FROM THREE KNOWN POINTS. REQUIRED DATA ARE THE DISTANCES BETWEEN POINTS 1 AND 2 AND POINTS 2 AND 3 AND THE INCLUDED ANGLE. ALTERNATIVELY, THE COORDINATES OF THE THREE POINTS MAY BE USED.

199 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00090D 97-TWO INSTRUMENT RADIAL SURVEY

THIS PROGRAM USES A TWO INSTRUMENT RADIAL SURVEY TECHNIQUE TO DETERMINE THE COORDINATES OF A POINT. REQUIRED DATA ARE THE COORDINATES OF THE THEODOLITE, ELEVATION AND HEIGHT OF INSTRUMENT FOR THE THEODOLITE, REFERENCE AZIMUTH, ANGLE RIGHT AT THE THEODOLITE FROM REFERENCE AZIMUTH BOTH TO DISTANCE METER, AND TO UNKNOWN POINT SLOPE DISTANCE AND

00090D (CONT'D)

VERTICAL ANGLE FROM THEODOLITE TO DISTANCE METER, SLOPE DISTANCE FROM DISTANCE METER TO POINT, VERTICAL ANGLE FROM THEODOLITE TO POINT AND HEIGHT OF INSTRUMENT FOR THE PRISM AT THE POINT. THE HORIZONTAL DISTANCE AND AZIMUTH FROM THE THEODOLITE TO THE POINT ARE COMPUTED AS WELL AS THE COORDINATES AND ELEVATION OF THE POINT

189 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00091D 97-EDM SLOPE REDUCTION

THIS PROGRAM REDUCES SLOPE DISTANCES MEASURED WITH AN ELECTRONIC DISTANCE METER TO A HORIZONTAL DISTANCE AT SEA LEVEL AND AT THE INSTRUMENT STATION ELEVATION. CORRECTIONS ARE MADE FOR CURVATURE OF THE EARTH AND FOR REFRACTION OF LIGHT (COEFFICIENT OF REFRACTION 0.071). A RADIUS OF 20,906,000 FEET IS USED FOR THE EARTH

186 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00092D 97-STADIA REDUCTION/THREE WIRE LEVELING

THE STADIA REDUCTION PROGRAM COMPUTES THE ELEVATION AND HORIZONTAL DISTANCE FOR POINTS LOCATED BY STADIA OBSERVATIONS REQUIRED DATA ARE STATION ELEVATION, HEIGHT OF INSTRUMENT, ROD READING IF DIFFERENT FROM HEIGHT, VERTICAL OR ZENITH ANGLE, AND ROD INTERVAL THREE WIRE LEVELING COMPUTES ELEVATIONS FOR A LINE OF WIRE LEVELS. REQUIRED DATA ARE UPPER, CENTER, AND LOWER STADIA HAIR READINGS FOR THE BACKSIGHT AND FORESIGHT. STADIA CONSTANTS ARE CONTAINED IN THE PROGRAMS AND MAY BE CHANGED AS DESIRED

145 PROGRAM STEPS
USERS LIBRARY HEWLETT PACKARD CO
CUPERTINO, CA

00093D 97-TAPING REDUCTION/FIELD ANGLE CHECK

THE REDUCTION PROGRAM CORRECTS TAPED DISTANCES FOR TEMPERATURE, PULL TENSION, SAG AND INDEX. A SERIES OF CONSTANTS IN THE PROGRAM MAY BE CHANGED AS DESIRED. THE FIELD ANGLE CHECK PROGRAM IS DESIGNED TO REDUCE FIELD ANGLE DATA. ONE DIRECT AND ONE REVERSE POINTING TO THE BACKSIGHT AND ONE DIRECT AND ONE REVERSE POINTING TO THE FORESIGHT ARE INPUT FOR EACH POSITION. THE AVERAGE ANGLE FOR EACH POSITION IS COMPUTED. DATA FOR ANY NUMBER OF POSITIONS CAN BE AVERAGED TO GET A FINAL ANGLE.

213 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00094D 97-AZIMUTH OF THE SUN

THIS PROGRAM COMPUTES THE AZIMUTH OF THE SUN AND REFERENCE MARK FROM A SOLAR OBSERVATION. REQUIRED DATA ARE OBSERVER'S LATITUDE, TIME ZONE, WATCH CORRECTION, TEMPERATURE, PRESSURE, TIME OF MARK TO SUN, AND VERTICAL OF ZENITH ANGLE. DECLINATION AND HOUR DIFFERENCE IN DECLINATION ARE ALSO REQUIRED AND MAY BE OBTAINED FROM AN EPHEMERIS

205 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

a 00095D 97-PREDETERMINED AREA

THIS PROGRAM SOLVES FOR THE LOCATION OF ONE SIDE OF A LAND PARCEL TO ENCLOSE A SPECIFIED AREA BY TWO CASES: (1) BY HINGING ONE SIDE OF A TRIANGLE, AND (2) BY SLIDING ONE SIDE OF A TRAPEZOID PARALLEL TO ANOTHER.

224 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00096D 97-EARTHWORK

THIS PROGRAM CALCULATES (1) VOLUME BY AVERAGE END AREA AND (2) VOLUME OF A BORROW PIT. FOR VOLUME BY AVERAGE END AREA, REQUIRED DATA ARE THE ELEVATION AND OFFSET DISTANCE FOR EACH POINT ON THE CROSS-SECTION AND THE INTERVAL BETWEEN CROSS-SECTIONS. FOR VOLUME OF A BORROW PIT, WIDTH AND LENGTH OF A RECTANGULAR SECTION AND THE ELEVATION AT EACH CORNER OF THE SECTION ARE REQUIRED KNOWNS.

131 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00097D 97-COORDINATE TRANSFORMATION

THIS PROGRAM TRANSFORMS COORDINATES FROM ONE SYSTEM TO A SECOND SYSTEM THAT HAS BEEN SCALED, ROTATED AND TRANSLATED WITH RESPECT TO THE FIRST. THE TRANSFORMATION PARAMETERS CAN BE INPUT IF THEY ARE KNOWN. IF COORDINATES OF AT LEAST TWO POINTS ARE KNOWN IN BOTH SYSTEMS, THE TRANSFORMATION PARAMETERS CAN BE COMPUTED BY A LEAST SQUARES METHOD ONCE THE PARAMETERS ARE KNOWN, IT IS POSSIBLE TO CONVERT FROM EITHER SYSTEM TO THE OTHER.

224 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

a 00098D 97-STATE PLANE COORDINATES-LAMBERT

THIS PROGRAM CONVERTS GEOGRAPHIC COORDINATES (LATITUDE AND LONGITUDE) TO AND FROM STATE PLANE COORDINATES FOR REGIONS USING LAMBERT CONFORMAL CONIC PROJECTIONS.

294 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

a 00099D 97-STATE PLANE COORDINATES-TRANSVERSE MERCATOR

THIS PROGRAM CONVERTS GEOGRAPHIC COORDINATES (LATITUDE AND LONGITUDE) TO AND FROM STATE PLANE COORDINATES FOR REGIONS USING TRANSVERSE MERCATOR PROJECTIONS

433 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

a 00100D 97-STATE PLANE COORDINATES-ALASKA ZONES 2-9

THIS PROGRAM CONVERTS GEOGRAPHIC COORDINATES (LATITUDE AND LONGITUDE) TO AND FROM STATE PLANE COORDINATES FOR ZONES 2-9 IN ALASKA

441 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

a 00101D 97-BASIC STATISTICS FOR TWO VARIABLES

THIS PROGRAM CALCULATES MEANS, STANDARD DEVIATIONS, COVARIANCE,

00101D (CONT'D)

CORRELATION COEFFICIENT, COEFFICIENTS OF VARIATION, SUMS OF DATA POINTS, SUM OF MULTIPLICATION OF DATA POINTS, AND SUMS OF SQUARES OF DATA POINTS DERIVED FROM A SET OF GROUPED OR UNGROUPED DATA POINTS

217 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00102D 97-FACTORIAL, PERMUTATION AND COMBINATION

THIS PROGRAM FINDS THE EXTENDED RANGE FACTORIAL (N CAN BE GREATER THAN 69), PERMUTATION AND COMBINATION. ALTHOUGH PERMUTATION AND COMBINATION ARE FUNCTIONS OF THE FACTORIAL, THIS PROGRAM DOES NOT USE THE FACTORIAL KEY, AND THUS ALLOWS GREATER ACCURACY AND A LARGER RANGE

162 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

a 00103D 97-MOMENTS, SKEWNESS AND KURTOSIS (FOR GROUPED OR UNGROUPED DATA).

IN THIS PROGRAM, MOMENTS ARE USED TO DESCRIBE SETS OF DATA, SKEWNESS IS USED TO MEASURE THE LACK OF SYMMETRY IN A DISTRIBUTION, AND KURTOSIS IS THE RELATIVE PEAKNESS OR FLATNESS OF A DISTRIBUTION. THE PROGRAM ALSO PROVIDES THE OPTION FOR CALCULATING THOSE STATISTICS FOR GROUPED DATA (USING SIMILAR FORMULAS AS FOR UNGROUPED DATA)

171 PROGRAM STEPS
USERS LIBRARY HEWLETT PACKARD CO
CUPERTINO, CA

a 00104D 97-RANDOM NUMBER GENERATOR

THIS PROGRAM CALCULATES (1) UNIFORMLY DISTRIBUTED NUMBERS, (2) RANDOM INTEGERS, (3) NORMALLY DISTRIBUTED NUMBERS, (4) EXPONENTIALLY DISTRIBUTED NUMBERS, (5) MEAN, STANDARD DEVIATION AND COUNTER OF THE NUMBERS GENERATED THE MULTIPLICATIVE LINEAR CONGRUENTIAL METHOD IS USED. THIS GENERATOR PASSES THE CHI SQUARE FREQUENCY TEST FOR UNIFORMITY, SERIAL TEST AND RUN TESTS FOR RANDOMNESS

193 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

a 00105D 97-HISTOGRAM

THIS PROGRAM SORTS INPUT DATA INTO 24 INTERVALS OR BINS OF EQUAL WIDTH BETWEEN SPECIFIED UPPER AND LOWER LIMITS. THE 24 INTERVALS ARE STORED 3 AT A TIME IN REGISTERS 1-8

208 PROGRAM STEPS
USERS LIBRARY HEWLETT PACKARD CO
CUPERTINO, CA

a 00106D 97-ONE WAY ANALYSIS OF VARIANCE

THIS PROGRAM DETERMINES WHETHER OBSERVED DIFFERENCES AMONG A SAMPLE MEANS CAN BE ATTRIBUTED TO CHANCE OR WHETHER THEY ARE INDICATIVE OF ACTUAL DIFFERENCES AMONG THE CORRESPONDING POPULATION MEANS. THE COMPLETE ANOVA TABLE IS GENERATED

138 PROGRAM STEPS
USERS LIBRARY HEWLETT PACKARD CO
CUPERTINO, CA

a 00107D 97-TWO WAY ANALYSIS OF VARIANCE (NO REPLICATIONS)

THIS PROGRAM ANALYZES THE TOTAL VARIABILITY OF A SET OF DATA INTO COMPONENTS WHICH CAN BE ATTRIBUTED TO DIFFERENT SOURCES OF VARIATION IT TESTS THE ROW AND COLUMN EFFECTS INDEPENDENTLY AND GENERATES THE ANOVA TABLE FOR THE CASE SUCH THAT (1) EACH CELL HAS ONLY ONE OBSERVATION AND (2) THE ROW AND COLUMN EFFECTS DO NOT INTERACT.

159 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00108D 97-ANALYSIS OF COVARIANCE (ONE WAY)

THIS PROGRAM TESTS THE EFFECT OF ONE VARIABLE SEPARATELY FROM THE EFFECT OF A SECOND VARIABLE. IF THE SECOND REPRESENTS AN ACTUAL MEASUREMENT FOR EACH INDIVIDUAL (RATHER THAN A CATEGORY). IT ALSO TESTS FOR A DIFFERENCE IN MEANS OF RESIDUALS AND GENERATES THE COMPLETE ANOCOV TABLE.

207 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00109D 97-NORMAL AND INVERSE NORMAL DISTRIBUTIONS

THIS PROGRAM EVALUATES THE STANDARD NORMAL DENSITY FUNCTION F(X) AND THE NORMAL INTEGRAL Q(X) FOR GIVEN X. IF Q IS GIVEN, X CAN ALSO BE FOUND. THE STANDARD NORMAL DISTRIBUTION HAS MEAN 0 AND STANDARD DEVIATION 1

298 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

a 00110D 97-CHI-SQUARE DISTRIBUTION

THIS PROGRAM EVALUATES CHI-SQUARE DENSITY AND SERIES APPROXIMATION IS USED TO EVALUATE CUMULATIVE DISTRIBUTION

114 PROGRAM STEPS
USERS LIBRARY HEWLETT PACKARD CO
CUPERTINO, CA

a 00111D 97-T DISTRIBUTION

THIS PROGRAM EVALUATES THE T DENSITY FUNCTION (X) AND THE CUMULATIVE DISTRIBUTION P(X) FOR A GIVEN X AND DEGREES OF FREEDOM

214 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00112D 97-F DISTRIBUTION

THIS PROGRAM EVALUATES THE INTEGRAL OF THE F DISTRIBUTION FOR GIVEN VALUES OF X (GREATER THAN ZERO), AND ONE OF THE DEGREES OF FREEDOM IS EVEN. THE INTEGRAL IS EVALUATED BY MEANS OF APPROXIMATED SERIES

125 PROGRAM STEPS
USERS LIBRARY HEWLETT PACKARD CO
CUPERTINO, CA

a 00113D 97-MULTIPLE LINEAR REGRESSION

THIS PROGRAM FITS A LINEAR EQUATION OF THE FORM Z=A+BX+CY BY THE LEAST SQUARES METHOD

224 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00114D 97-POLYNOMIAL APPROXIMATION

THIS PROGRAM APPROXIMATES IN THE LEAST SQUARES SENSE THE FUNCTION F(X) BY A POLYNOMIAL OF DEGREE M, WHERE M IS GREATER THAN OR EQUAL TO 2 AND LESS THAN OR EQUAL TO 4. A SET OF EQUALLY SPACED POINTS ARE REQUIRED. THE SPECIAL CHEBYSHEV POLYNOMIALS FOR DISCRETE INTERVALS ARE USED.

424 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00115D 97-T STATISTICS

THIS PROGRAM INCLUDES (1) PAIRED T STATISTICS, (2) T STATISTICS FOR TWO MEANS. DIFFERENT TEST STATISTICS ARE USED TO TEST THE CORRESPONDING NULL HYPOTHESIS.

172 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00116D 97-CHI-SQUARE EVALUATION

THIS PROGRAM CALCULATES THE VALUE OF THE CHI-SQUARED STATISTIC FOR THE GOODNESS OF FIT TEST.

113 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00117D 97-CONTINGENCY TABLE

THIS PROGRAM COMPUTES THE CHI-SQUARED STATISTIC (WITH 2 (K-1) DEGREES OF FREEDOM) FOR TESTING THE INDEPENDENCE OF THE TWO VARIABLES. PEARSON'S COEFFICIENT OF CONTINGENCY, WHICH MEASURES THE DEGREE OF ASSOCIATION BETWEEN THE TWO VARIABLES, IS ALSO CALCULATED.

193 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00118D 97-SPEARMAN'S RANK CORRELATION COEFFICIENT

THIS PROGRAM MEASURES RANK CORRELATION WHEN N INDIVIDUALS ARE RANKED FROM 1 TO N ACCORDING TO SOME SPECIFIED CHARACTERISTIC BY 2 OBSERVERS, AND DETERMINES IF THE RANKINGS ARE SUBSTANTIALLY IN AGREEMENT WITH ONE ANOTHER.

69 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00119D 97-MEAN AND RANGE CONTROL CHARTS

THIS PROGRAM COMPUTES (1) THE SAMPLE MEAN AND THE SAMPLE RANGE, (2) THE OVER-ALL MEAN AND THE AVERAGE RANGE, (3) THE UPPER AND LOWER CONTROL LIMIT FOR THE MEAN, AND (4) THE UPPER AND LOWER CONTROL LIMIT FOR THE RANGE.

157 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00120D 97-OPERATING CHARACTERISTICS CURVES

THIS PROGRAM EVALUATES THE PROBABILITY OF ACCEPTANCE FOR A SINGLE SAMPLING PLAN WITH FINITE OR INFINITE LOT SIZE.

205 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00121D 97-SINGLE- AND MULTI-SERVER QUEUES

THIS PROGRAM COMPUTES THE ARRIVAL RATE OF CUSTOMERS AND THE SERVICE RATE OF EACH SERVER WHERE THERE ARE N IDENTICAL STATIONS AVAILABLE TO SERVICE CALLS FROM AN INFINITE NUMBER OF CUSTOMERS. IT ALSO HANDLES THE CASE IN WHICH DEMAND ARISES FROM A FINITE POPULATION.

214 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00122D 97-INTERNAL RATE OF RETURN

THIS PROGRAM CALCULATES THE INTERNAL RATE OF RETURN (DISCOUNTED RATE OF RETURN OR YIELD) GIVEN A NON-ZERO INITIAL INVESTMENT AND UP TO 44 POSITIVE CASH FLOWS. IF THERE ARE NEGATIVE AS WELL AS POSITIVE CASH FLOWS, UP TO 22 CASH FLOWS CAN BE ENTERED. IF THE NUMBER OF CASH FLOWS ENTERED EXCEEDS PROGRAM CAPABILITY, ERRONEOUS RESULTS WILL OCCUR.

196 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00123D 07-INTERNAL RATE OF RETURN-GROUPS OF CASH FLOWS

THIS PROGRAM SOLVES FOR THE INTERNAL RATE OF RETURN (IRR) WHEN GROUPS OF UNEVEN CASH FLOWS ARE INVOLVED. GIVEN A NON-ZERO INVESTMENT, THE CASH FLOWS AND THE CORRESPONDING NUMBER OF TIMES EACH CASH FLOW OCCURS, THE PROGRAM CALCULATES PERIODIC YIELD (IRR). UP TO 20 GROUPS OF POSITIVE OR NEGATIVE CASH FLOWS, WITH EACH GROUP CONTAINING A MAXIMUM OF 99 CASH FLOWS, MAY BE ENTERED

212 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00124D 97-DISCOUNTED CASH FLOW ANALYSIS-NET PRESENT VALUE

ASSUMING A MINIMUM DESIRED YIELD (COST OF CAPITAL, DISCOUNT RATE), THIS PROGRAM FINDS THE PRESENT VALUE OF THE FUTURE CASH FLOWS GENERATED BY THE INVESTMENT AND SUBTRACTS THE INITIAL INVESTMENT FROM THIS AMOUNT. IF THE FINAL NET PRESENT VALUE (NPV) IS POSITIVE, THE INVESTMENT EXCEEDS THE PROFIT OBJECTIVES ASSUMED. IF NPV IS NEGATIVE, THE INVESTMENT IS NOT PROFITABLE TO THE EXTENT OF THE DESIRED YIELD. IF NPV IS ZERO, THE INVESTMENT MEETS THE PROFIT OBJECTIVES

74 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00125D 97-DIRECT REDUCTION LOANS SINKING FUND

THIS PROGRAM SOLVES PROBLEMS WHEN PAYMENTS ARE MADE AT THE END OF THE COMPOUNDING PERIOD (ORDINARY ANNUITY). DIRECT REDUCTION LOANS AND MORTGAGES ARE TYPICAL EXAMPLES

180 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00126D 97-ACCUMULATED INTEREST/REMAINING BALANCE

THIS PROGRAM FINDS BOTH THE TOTAL INTEREST PAID OVER A SPECIFIED NUMBER OF PAYMENT PERIODS AND THE REMAINING BALANCE AT THE END OF THE LAST SPECIFIED PERIOD. REQUIRED DATA

00126D (CONT'D)

ARE THE PERIODIC INTEREST RATE, PERIODIC PAYMENT AMOUNT, LOAN AMOUNT, AND THE BEGINNING AND ENDING PAYMENT NUMBERS FOR THE TIME SPAN BEING CONSIDERED. IT CAN BE USED FOR LOANS WITH BALLOON PAYMENTS PROVIDED THAT THE BALLOON PAYMENTS ARE CONCURRENT WITH, AND IN ADDITION TO, THE FINAL PAYMENT. IT ALSO GENERATES A PERIOD BY PERIOD AMORTIZATION SCHEDULE.

132 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00127D 97-WRAP-AROUND MORTGAGE

THIS PROGRAM CALCULATES THE PERIODIC YIELD TO THE LENDER OF A WRAP-AROUND (REFINANCING) MORTGAGE, WITH OR WITHOUT A BALLOON PAYMENT. IT ALSO SOLVES FOR THE PERIODIC PAYMENT NECESSARY TO AMORTIZE A MORTGAGE.

134 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00128D 97-CONSTANT PAYMENT TO PRINCIPAL LOAN AMORTIZATION SCHEDULE

FOR A LOAN WHERE THE PRINCIPAL IS REPAID IN EQUAL INSTALLMENTS, THIS PROGRAM DISPLAYS THE PAYMENT NUMBER AND CALCULATES THE PAYMENT TO INTEREST, TOTAL PAYMENT, REMAINING BALANCE, AND TOTAL INTEREST. THE PROGRAM ALSO CALCULATES THE INTEREST ACCUMULATED BETWEEN ANY TWO PAYMENTS

107 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00129D 97-ADD-ON RATE INSTALLMENT LOAN/INTEREST REBATE--RULE OF 78'S

THIS PROGRAM CALCULATES THE MONTHLY PAYMENT AMOUNT, TOTAL FINANCE CHARGE, AND THE ANNUAL PERCENTAGE RATE FOR AN ADD-ON RATE LOAN. IT ALSO CALCULATES THE UNEARNED INTEREST (REBATE) AS WELL AS THE REMAINING PRINCIPAL DUE FOR A PREPAID CONSUMER LOAN USING THE RULE OF 78'S

165 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00130D 97-SAVINGS PLAN-LEASES

THIS PROGRAM SOLVES PROBLEMS WHEN PAYMENTS ARE MADE AT THE BEGINNING OF THE COMPOUNDING PERIOD (ANNUITY DUE). IT ALSO CALCULATES ALL VARIABLES IN COMPOUND INTEREST SITUATIONS.

197 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00131D 97-ADVANCE PAYMENTS

THIS PROGRAM SOLVES FOR THE PERIODIC PAYMENT AMOUNT NECESSARY TO ACHIEVE A DESIRED YIELD WHEN A NUMBER OF PAYMENTS ARE MADE IN ADVANCE AND, GIVEN THE PERIODIC PAYMENT, THE PROGRAM FINDS THE YIELD. EITHER AMOUNT MAY BE CALCULATED WHEN A RESIDUAL VALUE EXISTS

135 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

a 00132D COMPOUNDING PERIODS DIFFERENT FROM PAYMENT PERIODS

THIS PROGRAM CALCULATES THE NUMbER OF PAYMENTS, THE PERIODIC PAYMENT AMOUNT, AND FUTURE VALUE WHEN THE FREQUENCY OF PAYMENTS (DEPOSITS) DIFFERS FROM THE FREQUENCY OF COMPOUNDING PERIODS. THE PROGRAM ASSUMES THAT PAYMENTS OCCUR AT THE BEGINNING OF THE PAYMENT PERIOD, AND THAT PAYMENTS DEPOSITED FOR A PARTIAL COMPOUNDING PERIOD WILL ACCRUE SIMPLE INTEREST FOR THE REMAINDER OF THAT PERIOD.

167 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00133D 97-SIMPLE INTEREST/INTEREST CONVERSIONS

THIS PROGRAM SOLVES FOR ANY VARIABLE OF AN ACCRUED SIMPLE INTEREST CALCULATION ON A 360 OR 365-DAY BASIS. GIVEN THREE OF THE FOUR VARIABLES (NUMBER OF DAYS, ANNUAL INTEREST RATE, BEGINNING AMOUNT, OR ACCRUED INTEREST) THE FOURTH IS CALCULATED. THE PROGRAM ALSO EVALUATES NOMINAL TO EFFECTIVE INTEREST RATE CONVERSIONS, AND VICEVERSA, FOR BOTH FINITE AND CONTINUOUS COMPOUNDING.

191 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00134D 97-DEPRECIATION SCHEDULES

THIS PROGRAM EVALUATES THE DEPRECIATION SCHEDULES FOR THREE METHODS OF DEPRECIATION: STRAIGHT-LINE, SUM-OF-THE-YEAR'S-DIGITS, AND DECLINING BALANCE. IT ALSO CALCULATES THE CROSSOVER POINT BETWEEN STRAIGHT LINE AND DECLINING BALANCE DEPRECIATION.

220 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00135D 97-DAYS BETWEEN DATES

THIS PROGRAM CALCULATES THE NUMBER OF DAYS BETWEEN TWO DATES ON AN ACTUAL OR 30/360 BASIS (30 DAY MONTH, 360 DAY YEAR). WHEN THE ACTUAL NUMBER OF DAYS IS DESIRED, THE TWO DATES MUST OCCUR BETWEEN JANUARY 1, 1901, AND DECEMBER 31, 2099. THERE IS NO LIMIT FOR THE 30/360 BASIS. PROGRAM DESIGNED FOR USE WITH BOND PRICE AND YIELD (#00136D).

148 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00136D 97-BOND PRICE AND YIELD

THIS PROGRAM CALCULATES THE 'FLAT' PRICE (I.E., NOT INCLUDING ACCRUED INTEREST) OR ANNUAL YIELD OF A SEMIANNUAL COUPON BOND. REQUIRED INPUT DATA ARE THE NUMBER OF COUPON PERIODS BETWEEN SETTLEMENT DATE AND REDEMPTION (MATURITY) DATE, THE ANNUAL COUPON RATE EXPRESSED AS A PERCENT, THE REDEMPTION VALUE IF OTHER THAN 100, AND EITHER THE ANNUAL YIELD EXPRESSED AS A PERCENT OR THE BOND PRICE. DAYS BETWEEN DATES (PROGRAM #00135D), MAY BE USED WITH THIS PROGRAM.

190 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00137D 97-INTEREST AT MATURITY/DISCOUNTED SECURITIES

THE FIRST PART OF THIS PROGRAM CALCULATES THE PRICE OR YIELD OF INTEREST AT MATURITY SECURITIES. THE SECOND PART CALCULATES THE PRICE OR YIELD OF DISCOUNTED SECURITIES SUCH AS US TREASURY BILLS.

163 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00138D 97-LINEAR REGRESSION-EXPONENTIAL CURVE FIT

THIS PROGRAM PERFORMS A LEAST SQUARES REGRESSION TO DETERMINE BOTH A LINEAR AND EXPONENTIAL FIT FOR THE GIVEN SET OF DATA PAIRS (X,Y). THE COEFFICIENT OF DETERMINATION IS ALSO CALCULATED. A TREND LINE OPTION, FOR EVENLY SPACED X-VALUES IS AVAILABLE.

206 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00139D 97-MULTIPLE LINEAR REGRESSION

THIS PROGRAM PERFORMS A LEAST SQUARES MULTIPLE LINEAR REGRESSION FOR A SERIES OF DATA POINTS (X,Y,Z). IT ALSO CALCULATES THE COEFFICIENT OF DETERMINATION, 'GOODNESS OF FIT' FOR THE CALCULATED STRAIGHT LINE.

213 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00140D 97-BREAK-EVEN ANALYSIS

THIS PROGRAM PROVIDES A TECHNIQUE FOR ANALYZING THE RELATIONSHIPS AMONG FIXED COSTS, VARIABLE COSTS, AND INCOME. GIVEN FOUR OF THE FOLLOWING VARIABLES: FIXED COSTS, SALES PRICE PER UNIT, VARIABLE COSTS PER UNIT, NUMBER OF UNITS SOLD, AND GROSS PROFIT, THE REMAINING VARIABLE IS CALCULATED. THE DEGREE OF OPERATING AVERAGE MAY ALSO BE FOUND.

77 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00141D 97-INVOICING

GIVEN A DISCOUNT RATE, NUMBER OF UNITS, AND PRICE PER UNIT FOR EACH LINE ITEM, THIS PROGRAM CALCULATES THE NET LINE TOTAL, MAINTAINS A RUNNING SUBTOTAL AND GRAND TOTAL, AND DETERMINES EACH LINE TOTAL'S PERCENT OF THE GRAND TOTAL. A MAXIMUM OF 20 LINE ITEMS MAY BE INPUT.

108 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00142D 97-PAYROLL

THIS PROGRAM IS A SAMPLE OF A PAYROLL PLAN FOR A SMALL BUSINESS, WHICH MAY BE MODIFIED TO SUIT AN EMPLOYER'S PARTICULAR NEEDS. THE BASIS IS ONE MAIN PROGRAM WITH A SEPARATE DATA CARD FOR EACH EMPLOYEE. AFTER THE NET PAY FOR AN INDIVIDUAL IS CALCULATED (BASED ON THE DATA CARD INFORMATION) HIS DATA CARD IS RE-ENTERED TO RECORD THE NEW DATA ONTO THE CARD.

156 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

a 00143D 97-INVENTORY

THIS PROGRAM IS A SAMPLE OF HOW AN INVENTORY PROGRAM MIGHT BE WRITTEN. IT MAY BE MODIFIED TO SUIT THE PARTICULAR NEEDS OF AN INDIVIDUAL BUSINESS.

96 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00144D 67-SOLUTIONS TO GEOMETRIC PROBLEMS PART #1

CALCULATES ANGLES AND LOCATES INCLINED HOLES AND POINTS FROM MEASUREMENTS MADE WITH DOWEL PINS, HEIGHT BLOCKS AND/OR SINE RATE.

116 PROGRAM STEPS
D STEDMAN
MORGAN HILL, CA

00145D 67-INERTIA OF ROLLER OR BALL BEARINGS

THIS PROGRAM CALCULATES THE POLAR INERTIA OF THE ROTATING RACE AND THE BALLS OR ROLLERS OF A BEARING. THE CONTRIBUTION OF THE INERTIA OF THESE ELEMENTS CAN BE EXTREMELY IMPORTANT IN HIGH PERFORMANCE PRECISION MACHINES.

168 PROGRAM STEPS
D STEDMAN
MORGAN HILL, CA

00146D 67-3 X 3 DETERMINANT WITH AUTO DATA ENTRY

THIS PROGRAM SOLVES FOR THE VALUE OF A 3 X 3 DETERMINANT. THE CALCULATOR QUEUES THE USER AS TO WHICH DATA VALUE TO ENTER, BY DISPLAYING A BLINKING POSITION NUMBER (1 THROUGH 9) UNTIL NINE VALUES HAVE BEEN ENTERED. THE ANSWER WILL THEN BE DISPLAYED.

112 PROGRAM STEPS
D G STRUCKMAN
FREMONT, CA

00147D 67-SOLUTIONS TO GEOMETRIC PROBLEMS PART #2

CALCULATES THE POSITION AND ANGLES OF V GROOVES OR NOTCHES, OR ACCURATELY DETERMINES LONG RADII FROM MEASUREMENTS OBTAINED USING DOWEL PINS, AND HEIGHT GAGES.

172 PROGRAM STEPS
D STEDMAN
MORGAN HILL, CA

00148D 67-BLACK BODY THERMAL RADIATION

CALCULATES WAVE LENGTH OF MAXIMUM EMISSIVE POWER, TOTAL EMISSIVE POWER, MONOCHROMATIC EMISSIVE POWER, EMISSIVE POWER FROM ZERO TO A SPECIFIED WAVE LENGTH, FOR BLACK RADIATING SURFACES.

196 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00149D 67-SOLUTIONS TO GEOMETRIC PROBLEMS #3

CALCULATES ANGLES OF BOTH INTERNAL AND EXTERNAL TAPERS USING DOWEL PINS, HEIGHT GAGES AND BALLS.

149 PROGRAM STEPS
D Y STEDMAN
MORGAN HILL, CA

00150D 67-SOLUTIONS TO GEOMETRIC PROBLEMS PART #4

PROGRAM ACCURATELY LOCATES POINTS OF TANGENCY BETWEEN STRAIGHT LINES, AND ARCS OR BETWEEN STRAIGHT LINE AND TWO SEPARATE CIRCLES.

159 PROGRAM STEPS
D Y STEDMAN
MORGAN HILL, CA

00151D 97-LEASE VS PURCHASE ANALYSIS WITH INTEREST

THIS PROGRAM CALCULATES THE RELATIVE ADVANTAGE OF PURCHASING WITH RESPECT TO LEASING AT A GIVEN APPORTUNITY COST TAKING INTO ACCOUNT PURCHASE PRICE, PROJECTED SALVAGE VALUE, MAINTENANCE COST AND LEASE PAYMENTS. AS AN OPTIONAL STEP, THE PROGRAM WILL CONSIDER THE RELATIVE MERITS OF LEASING WITH RENTAL CREDITS APPLIED TO THE PURCHASE PRICE.

70 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00152D 97-CALL OPTIONS CALLED

GIVEN THE OPPORTUNITY TO BUY 100 SHARES OF A STOCK AND SELL A CALL OPTION THEREON, THIS PROGRAM CALCULATES THE PROFIT AND RATE OF RETURN FROM SO DOING IF THE CALL IS EXERCISED, AND CHOOSES AMONG THE BEST COMBINATION OF CALLS AND UNDERLYING STOCK, IF DESIRED.

76 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00153D 97-WARRANT AND OPTION HEDGING

A WARRANT (A DETACHABLE RIGHT TO BUY A SHARE OF STOCK AT A FIXED PRICE) SELLS AT A LOWER PRICE THAN THE CORRESPONDING STOCK. HENCE ANY INCREASE IN THE PRICE OF THE STOCK IS REPRESENTED BY AN EVEN HIGHER PERCENTAGE INCREASE IN THE WARRANT AND THEREFORE THE WARRANT GENERALLY SELLS AT A PREMIUM. THIS PROGRAM EVALUATES THE INVESTMENT VALUE OF THIS PREMIUM CAPTURED BY SELLING THE WARRANTS SHORT AND BUYING THE STOCK.

144 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00154D 97-SAVINGS ACCOUNT COMPOUNDED DAILY

USES A CALENDAR PROGRAM TO CALCULATE PRECISE INTEREST. DATA IS ENTERED JUST AS IT APPEARS IN A SAVINGS PASSBOOK.

88 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00155D 97-ECONOMIC ORDER QUANTITY AND LIMIT ORDER QUANTITY

ONE PROGRAM COMPUTES ALL FACTORS NECESSARY TO OBTAIN LIMIT ORDER QUANTITIES (LOQ) FOR A GROUP OF PARTS USING THE TRIAL ECONOMIC ORDER QUANTITY (EOQ) METHOD (LOQ MAY BE DEFINED AS THE MOST ECONOMICAL ORDER QUANTITY POSSIBLE WITHOUT CHANGING PRESENT SETUP COSTS.) SECOND PROGRAM COMPUTES EOQ USING A MODIFIED FORMULA WHICH COMPENSATES FOR DAILY PARTIAL DELIVERIES OF THE ORDERED PART AS DETERMINED BY THE PRODUCTION RATE.

142 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00156D 97-ELLWOOD INCOME VALUATION FOR INCOME PROPERTY APPRAISAL

COMPUTES THE VALUE OF AN INCOME STREAM FROM AN INVESTMENT WHICH IS PARTIALLY MORTGAGED. THIS PROGRAM IS A SUBSTITUTE FOR THE TABLES COMMONLY USED IN APPRAISING REAL ESTATE INCOME STREAMS TO DERIVE A VALUE FOR A PROPERTY GIVEN A REQUIRED RETURN ON EQUITY.

94 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00157D 97-REAL ESTATE RENTAL INVESTMENT ANALYSIS

THIS PROGRAM CALCULATES THE RENT, CASH FLOW IN PERCENT, GROWTH RETURN, AND TAXABLE INCOME (TAX SHELTER) FOR A SUBJECT PROPERTY

90 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00158D 97-EULER FUNCTION

COMPUTES THE VALUE OF THE EULER FUNCTION FOR A NON-NEGATIVE INTEGER.

51 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00159D 97-AREAS

COMPUTES THE AREA OF A CIRCLE, AN ELLIPSE, A REGULAR POLYGON, A POLYGON GIVEN THE COORDINATES OF THE VERTICES, A CIRCULAR SEGMENT, AN ELLIPTICAL SEGMENT, AND AN INSCRIBED REGULAR POLYGON.

142 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00160D 97-OPERATIONAL STACK OF FOUR COMPLEX NUMBERS

THIS PROGRAM CREATES AN OPERATIONAL STACK OF FOUR COMPLEX NUMBERS, SO THAT RPN CAN BE USED TO EVALUATE COMPLEX EXPRESSIONS. FUNCTIONS ARE: (A) LIFT STACK PRIOR TO ENTERING A COMPLEX NUMBER, (B) ADD, (C) SUBTRACT, (D) MULTIPLY, (E) DIVIDE, AND (RTN) RAISE A COMPLEX NUMBER TO A COMPLEX POWER. THE OPERATION STACK AUTOMATICALLY DROPS AFTER ANY TWO-NUMBER OPERATION.

75 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00161D 97-COMPLEX POLYNOMIAL EVALUATION-COMPLEX QUADRATIC EQUATION

THE FIRST PROGRAM EVALUATES POLYNOMIALS WHICH HAVE COMPLEX COEFFICIENTS. THE POLYNOMIAL CAN BE OF ANY DEGREE. THE SECOND PROGRAM FINDS THE TWO GENERALLY COMPLEX ROOTS OF A QUADRATIC EQUATION WITH COMPLEX COEFFICIENTS.

121 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00162D 97-MULTIPLE LINEAR REGRESSION FOR 3 INDEPENDENT VARIABLES

FOR A SET OF N DATA POINTS (3 INDEPENDENT VARIABLES), THIS PROGRAM FITS A LINEAR EQUATION OF THE FORM T=A+BX+CY+DZ BY THE LEAST SQUARE METHOD. GAUSS'S ELIMINATION METHOD IS APPLIED TO SOLVE THE SYSTEM OF

00162D (CONT'D)

LINEAR EQUATIONS.

407 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00163D 97-CHEBYSHEV LEGENDRE HERMITE AND LAGUERRE POLYNOMIALS

COMPUTE THE VALUE OF CHEBYSHEV, LEGENDRE, HERMITE OR LAGUERRE POLYNOMIAL BY USING A RECURRENCE RELATION.

171 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00164D 97-SINE COSINE AND EXPONENTIAL INTEGRALS

EVALUATES THE SINE, COSINE AND EXPONENTIAL INTEGRALS BY USING A SERVUS APPROXIMATION.

72 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00165D 97-KELVIN FUNCTIONS

EVALUATES THE KELVIN FUNCTIONS BER(X) AND BEI(X).

59 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00166D 97-STABILITY OF 2ND-ORDER CONTINUOUS TIME SYSTEM

THIS PROGRAM TESTS THE STABILITY AT A 2ND ORDER CONTINUOUS TIME SYSTEM BY APPLYING LYAPUNOU THEOREM

192 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00167D 97-ESTIMATING INVENTORY AT COST USING RETAIL METHOD

THIS PROGRAM COMPUTES THE ESTIMATED COST OF INVENTORY AT THE END OF A PERIOD USING THE RETAIL INVENTORY METHOD

60 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00168D 97-ESTIMATING INVENTORY USING GROSS PROFIT METHOD

THIS PROGRAM ESTIMATES THE COST OF ENDING INVENTORY USING THE GROSS PROFIT METHOD

60 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00169D 97-AMOUNT OF EQUITY AT ANY TIME

GIVEN THE PURCHASE PRICES, MORTGAGE AMOUNT, THE INTEREST RATE AND PAYMENT THIS PROGRAM SOLVES FOR THE EQUITY AND REMAINING BALANCE AT ANY GIVEN PAYMENT

175 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00170D 97-STOCK PORTFOLIO ANALYSIS

GIVEN THE NUMBER OF SHARE ORIGINAL PRICE, CURRENT PRICE, AND DIVIDEND, THIS PROGRAM CALCULATES THE CURRENT VALUE, PROFIT OR LOSS, EARNINGS PER

00170D (CONT'D)

SHARE AND THE PERCENT YIELD.

175 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00171D 97-SYSTEM AND INPUT MATRICES OF DTS BY APPROXIMATION METHOD

THIS PROGRAM CONVERTS THE SYSTEM AND INPUT MATRICES OF CONTINUOUS TIME SYSTEM INTO THOSE OF DISCRETE TIME SYSTEM. APPROXIMATION BY SERIES EXPANSION IS APPLIED.

203 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00172D 97-HISTOGRAM WITH PRINTER PLOT

PROGRAM NUMBER 5 FROM HP-67/97 STAT PAC 1 IS MODIFIED TO OUTPUT THE HISTOGRAM OF THE HP-97 PRINTER.

221 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00173D HEX-OCTAL ARITHMETIC

CONVERTS NUMBER FROM HEX OR OCTAL TO BASE TEN AND FROM BASE 10 TO HEX OR OCTAL. ALSO ADDS HEX NUMBERS AND ADDS OCTAL NUMBERS.

201 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00174D 97-THE GAME OF 21 (BLACKJACK)

PLACE YOUR BET AND GET TWO CARDS FACE UP. YOUR CALCULATOR IS THEN DEALT TWO CARDS, ONE UP-ONE DOWN. YOUR OBJECTIVE IS TO DRAW CARDS THAT TOTAL 21 OR COME CLOSER TO 21 THAN THE HAND HELD BY YOUR CALCULATOR.

220 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00175D 97-DICE

PLAYERS USE THE CALCULATOR TO ROLL A PAIR OF DICE. TO PLAY "CRAPS", A BET IS PLACED AND THE FIRST "SHOOTER" THROWS THE DICE. A 7 OR 11 IS A "NATURAL" WIN. 2,3,OR 12, IS "CRAPS" AND ALL THAT IS BET IS LOST. ANY OTHER NUMBER IS A "POINT" TO BE MATCHED FOR A WIN.

109 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00176D 97-SLOT MACHINE

YOUR CALCULATOR BECOMES AN ELECTRONIC SLOT MACHINE WHICH DEDUCTS $1 FROM YOUR BANK ACCOUNT WITH EACH SPIN AND PAYS UP TO $100 FOR A JACKPOT. THE AMOUNT IN YOUR ACCOUNT CAN BE DISPLAYED AT ANY TIME

89 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00177D 97-SUBMARINE HUNT

THE CALCULATOR POSITIONS A SUBMARINE IN A 10X10 GRID. YOUR OBJECT IS TO LOCATE IT BY TAKING SONAR READINGS AND DESTROY IT WITH DEPTH CHARGES. IF YOU MISS, THE SUBMARINE MOVES TO A NEW POSITION FOR EXTRA CHALLENGE. THE SUB CAN

00177D (CONT'D)

ALSO MOVE ON SONAR READINGS.

148 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00178D 97-ARTILLERY GAME

YOU ARE THE GUNNER FIRING A ROUND OF ARTILLERY AT A MOVING TARGET WHOSE INITIAL POSITION HAS BEEN RANDOMLY SELECTED. A SPOTTER PLANE WEAVING IN AND OUT OF CLOUDS OVER THE BATTLE AREA TELLS YOU THE RESULT OF EACH FIRING.

219 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00179D 97-SPACE WAR

AS THE COMMANDER OF THE STARSHIP KITTYHAWK IN A 10X10 GRID GALAXY, YOU HAVE 18 STARDAYS (MOVES) TO SEARCH OUT AND DESTROY THE VILLAINOUS ALGLOGS. YOUR WEAPONS ARE TORPEDOS AND PHASERS. IN ADDITION, YOUR SENSORS CAN DETECT THE PRESENCE OF THE ENEMY OR YOUR HOME BASE, LOCATED SOMEPLACE IN THE GALAXY, WHERE YOU MAY REFUEL. WARNING: A MOVE OFF THE GRID AND YOU ARE LOST IN SPACE.

448 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00180D 97-SUPER BAGELS

YOUR OBJECTIVE IS TO GUESS AN INTEGER NUMBER CHOSEN BY YOUR CALCULATOR. CLUES TELL YOU HOW CLOSE EACH GUESS IS AND, WHEN THE PROPER NUMBER IS FINALLY ENTERED, THE NUMBER OF GUESSES IS DISPLAYED. FOR A MORE CHALLENGING GAME, YOU MAY SPECIFY THE NUMBER AND RANGE OF DIGITS IN THE HIDDEN NUMBER

223 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00181D 97-NIM(K)

BEFORE PLAY BEGINS, YOU SPECIFY THE NUMBER OF PILES, K (1 TO 9), AND THE NUMBER OF COUNTERS IN EACH PILE (1 TO 9). THEN, YOU AND YOUR CALCULATOR TAKE TURNS REMOVING ANY NUMBER OF COUNTERS (AT LEAST 1) FROM UP TO K-1 PILES. THE WINNER IS THE PLAYER WHO REMOVES THE LAST COUNTER

224 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00182D 97-QUEEN BOARD

SIMILAR TO CHESS MOVES. IN THIS GAME THE QUEEN MOVES ONLY TO THE LEFT, DOWN, OR DIAGONALLY TO THE LEFT. YOU AND YOUR CALCULATOR COMPETE TO BE THE FIRST PLAYER TO MOVE THE QUEEN TO THE WINNING SQUARE

87 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00183D 97-HEXAPAWN

AS THE POOR HUMAN PLAYER, YOU MAY WISH TO USE A PLAYING BOARD TO KEEP TRACK OF THIS SIMPLE GAME. YOUR CALCULATOR WILL MAKE RANDOM MOVES AT FIRST, BUT WILL NOT REPEAT A LOSING MOVE, AND SOON PLAYS VERY WELL. THE GAME IS WON BY ADVANCING A PAWN TO THE THIRD ROW, CAPTURING ALL OF THE

00183D (CONT'D)

OPPONENT'S PAWNS, OR CREATING A POSITION IN WHICH THE OPPONENT CANNOT MOVE.

125 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00184D 97-TIC-TAC-TOE

THE CALCULATOR MOVES FIRST, THEREBY INCREASING YOUR CHANCES TO WIN. IF YOU MAKE ANY BAD MOVES, THE CALCULATOR WILL WIN. OTHERWISE, THE GAME WILL END IN A TIE.

169 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00185D 97-WARI

THIS CENTURIES-OLD GAME IS PLAYED ON A BOARD CONTAINING 12 SMALL BINS AND 2 LARGE PITS. 48 SEEDS (COUNTERS) ARE METHODICALLY DISTRIBUTED INTO AND CAPTURED FROM THE BINS. YOUR OBJECTIVE IS TO CAPTURE ALL YOUR OPPONENT'S SEEDS.

220 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00186D 97-RACETRACK

UP TO 5 VEHICLES RACE ON A SUPER-ELLIPTICAL TRACK. PLAYERS INPUT ACCELERATION AND THE MACHINE UPDATES FOR VELOCITY AND POSITION AND CHECKS FOR COLLISION. ALL VEHICLES INVOLVED IN A COLLISION ARE PENALIZED BY HAVING THEIR VELOCITIES REDUCED TO ZERO. A VEHICLE LEAVING THE TRACK IS SIMILARLY PENALIZED AND, AT A HIGH VELOCITY, MAY REQUIRE SEVERAL MOVES TO GET BACK ON-WATCH OUT

221 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00187D 97-TEASER

TEASER DEFIES YOU TO CHANGE A 3X3 ARRAY OF 1'S AND 0'S FROM ITS INITIAL FORM OF 8 ZEROES AND 1 ONE TO THE WINNING FORM OF 8 ONES AND 1 ZERO

159 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00188D 97-THE DEALER

THE DEALER WILL DEAL CARDS FROM A DECK OF 52 CARDS WITHOUT EVER DUPLICATING ANY OF THE CARDS DEALT. THE DEALER WILL ALSO DRAW NUMBERS FROM 1 TO 75 FOR BINGO OR FROM 1 TO A MAXIMUM OF 99 FOR OTHER GAMES REQUIRING A DEAL WITHOUT REPLACEMENT.

214 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO
CUPERTINO, CA

00189D 97-GOLF

CHOOSE YOUR HANDICAP, DESIGN YOUR COURSE,SELECT AND SWING YOUR CLUB, AND HOPE YOUR BALL ESCAPES THE WOODS. HOLE NUMBER, YARDAGE, PAR, AND DISTANCE TO THE WOODS ARE OUTPUT FOR ONE OR TWO GOLFERS

224 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00190D 97-BOWLING SCORE KEEPER

THIS PROGRAM KEEPS SCORE FOR UP TO 10 BOWLERS. PLAYERS NEED NOT BOWL IN ORDER. TWO LANES MAY BE SCORED SIMULTANEOUSLY.

217 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00191D 97-BIORHYTHMS

GIVEN YOUR BIRTHDATE, THE PROGRAM CALCULATES YOUR PHYSICAL (23-DAY), SENSITIVITY (28-DAY), AND COGNITIVE (33-DAY) CYCLES FOR ANY BIO DATE BETWEEN JANUARY 1, 1901, AND DECEMBER 31, 2099.

221 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00192D 97-TIMER

THIS PROGRAM CONTAINS FIVE DIFFERENT TIMERS: 5-SECOND INTERNAL VISIBLE TIMER; MINIMUM INTERVAL VISIBLE TIMER; COUNT-UP TIMER; COUNT-DOWN TIMER; SPLITS (UP TO 16). CALIBRATION ROUTINES ARE INCLUDED TO ACCOMODATE DIFFERENCES BETWEEN CALCULATORS AND DIFFERENT ENVIRONMENTS.

224 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

00193D 67-SOLUTIONS OF GEOMETRIC PROBLEMS PART # 5

THIS CARD WILL CALCULATE THE POINT OF INTERSECTION OF TWO LINES AND THE CARTESIAN COORDINATES OF POINTS IN OTHER COORDINATE SYSTEMS (GRID POINTS).

180 PROGRAM STEPS
D STEDMAN
MORGAN HILL, CA

00194D 97-EIGENVALUES FOR 3RD-ORDER SYSTEM

THIS PROGRAM CALCULATES THE EIGENVALUES OF A 3RD-ORDER SYSTEM DESCRIBED BY AX=XX

222 PROGRAM STEPS
USERS LIBRARY HEWLETT-PACKARD CO.
CUPERTINO, CA

PROGRAM ABSTRACTS

00195D 67-CONCENTRATION.

PLAYER TRIES TO MEMORIZE A RANDOM NUMBER DISPLAYED FOR TWO AND A HALF SECONDS. IF SUCCESSFUL, A LARGER NUMBER WILL BE DISPLAYED; IF NOT, A SMALLER NUMBER WILL BE DISPLAYED. CREDIT IS GIVEN FOR EACH CORRECT DIGIT. GAME ENDS AFTER THREE MISSES. SCORE IS THE TOTAL NUMBER OF CORRECT DIGITS. A DIFFICULTY FACTOR CAN BE ENTERED AT THE START OF ANY GAME.

111PROGRAM STEPS
W.M. KOLB
USA - UPPER MARLBORO.

00196D 67-PRECESSION OF RIGHT-ASCENSION AND DECLINATION.

GIVEN THE EQUATORIAL COORDINATES (RIGHT-ASCENSION AND DECLINATION) OF A BODY FOR ONE EPOCH, THIS PROGRAM WILL CALCULATE THE PRECESSED COORDINATES FOR ANY OTHER EPOCH.

176PROGRAM STEPS
R.H. SHUDDE
USA - CARMEL, CALIF.

00197D 67-LOCAL SIDEREAL TIME & OBLIQUITY FROM LOCAL STANDARD TIME.

COMPUTE OBLIQUITY & LOCAL SIDEREAL TIME FROM LONGITUDE, LOCAL STANDARD TIME (AND TIME ZONE), AND ANY VALID GREGORIAN DATE. USEFUL FOR PREPARING A TABLE OF LOCAL SEDEREAL TIME AS A FUNCTION OF LOCAL STANDARD TIME FOR EVENING VIEWING OF AN OBJECT. CAN ALSO BE USED AS A COMPANION PROGRAM FOR PROGRAM 00198D, ASTRONOMICAL SPHERICAL COORDINATE XFRM'S.

188PROGRAM STEPS
R.H. SHUDDE
USA - CARMEL, CALIF.

00198D 67-ASTRONOMICAL SPHERICAL COORDINATE XFRM'S (4 SYSTEMS).

CONVERT FROM ONE AZIMUTH/ALTITUDE, HOUR ANGLE/DECLINATION. EQUATORIAL RIGHT ASCENSION/DECLINATION, OR ECLIPTIC LONGITUDE/LATITUDE COORDINATE SYSTEM TO ANY OF THE OTHER COORDINATE SYSTEMS.

219PROGRAM STEPS
R.H. SHUDDE
USA - CARMEL, CALIF.

00199D 67-LAME'S EQUATIONS.

PROGRAM SOLVES BOTH LAME'S EQUATIONS FOR THICK-WALLED CYLINDRICAL PRESSURE VESSELS. IN EACH SET OF 4 EQUATIONS FOR CIRCUMFERENTIAL STRESS, OR FOR RADIAL STRESS, THE USER MAY SOLVE FOR ANY ONE OF FOUR ARBITRARY VARIABLES IN TERMS OF THE REMAINING THREE. SOLUTION ORDER IS COMPLETELY ARBITRARY. PROGRAM IS INITIALIZED FOR INTERNAL AND EXTERNAL RADII.

198PROGRAM STEPS
H.G. HEARD
USA - WOODSIDE, CALIF.

00200D 67-BLACKJACK GAME.

THIS IS THE GAME OF BLACKJACK AS PLAYED BY MOST NEVADA CASINOS. ALL NEEDED INFORMATION ON CARD TOTALS IS SHOWN IN ONE DISPLAY. A HALT WITH DISPLAY OCCURS ONLY WHEN A DECISION BY THE PLAYER IS REQUIRED. DOUBLING DOWN IS ALLOWED ON 2-CARD TOTALS OF 10 OR 11. A PAUSE TO DISPLAY TOTALS OCCURS FOR EVERY CARD TAKEN BY THE DEALER. CARDS ARE DEALT FROM AN INFINITE DECK. A PLAYER BLACKJACK PAYS 3:2.

224PROGRAM STEPS
D.B. ANDERSON

00200D (CONTD)

USA - SAN JOSE, CALIF.

00201D 67-SHOOTING GALLERY.

STEP RIGHT UP TO THE ARCADE, DROP A QUARTER IN THE OL' SHOOTING GALLERY MACHINE AND TRY AND HIT THE MOVING DECIMAL POINT. YOU'VE GOT 12 SHOTS (TWO 6-GUNS), BUT THE MACHINE CAN SHOOT BACK. TRY AND BEAT THE 200 POINT LIMIT FOR A FREE GAME, BUT DON'T LET THE MACHINE GET 6 OR MORE SHOTS OFF AT YOU OR YOU LOSE.

140PROGRAM STEPS
C.A. PEARCE
USA - BERWYN.

00202D 67-INTEGRALS.

COMPUTES SINE, COSINE, EXPONENTIAL INTEGRALS. COMPUTES FRESNEL COSINE AND SINE INTEGRALS. COMPUTES COMPLETE ELLIPTIC INTEGRALS OF THE FIRST AND SECOND KINDS.

211PROGRAM STEPS
G. KIDD
USA - BERKELEY, CALIF.

00203D 97-FLAG TEST ROUTINE.

THIS ROUTINE MAY BE USED IN THE PROCESS OF PROGRAM EDITING AND DEBUGGING TO INDICATE THE STATUS OF THE FOUR FLAGS IN THE CALCULATOR. IT USES ONLY ONE LABEL AND THE Z AND T REGISTERS OF THE STACK. USE OF THE LABEL MAY EVEN BE AVOIDED BY PLACING THE ROUTINE AT THE TOP OF THE PROGRAM AND INITIATING IT BY PRESSING RTN-R/S. X, Y AND ALL STORAGE REGISTERS AS WELL AS FLAG STATUS ARE UNDISTURBED BY THE TEST.

027PROGRAM STEPS
HOWARD B. KUTNER, CPA
USA - NEW YORK/NY

00204D 97-PINBALL-WIZZARD.

FOR EITHER 67 OR 97 USE, THIS PRG SIMULATES AN ACTUAL PINBALL MACHINE, INCLUDING TWO FLIPPERS, OUT HOLE BONUS, THUMPER BUMPERS, SLINGSHOT KICKERS, SPECIAL STAR ROLLOVERS, BONUS ADVANCE STAR ROLL OVERS, TOP ROLL-OVERS, KICK OUT HOLES, FREE BALL DROP TARGETS, FREE GAME SCORING, SPINNER GATE, OPTIONAL TILTING POSSIBILITY AND EITHER CONSERVATIVE (STANDARD) OR LIBERAL (EASY SCORING OPTIONS. MACHINE KEEPS TRACK OF GAMES, AMOUNT SPENT, NUMBER OF BALLS TO PLAY, TOTAL SCORE, ETC.

222PROGRAM STEPS
CRAIG A. PEARCE
USA - BERWYN/ILLINOIS.

00205D 67-STAR TREK - ADVANCED.

HERE ARE 1113 STEPS OF DECISION-MAKING THAT PUT THE PRESSURE ON YOU THE CAPTAIN. YOU FLY THE U.S.S. ENTERPRISE ON A TRIAXIAL COORDINATE SYSTEM TRACKING DOWN KLINGON, ROMULAN, AND VALLICIAN WAR VESSELS IN ADDITION TO A STRANDED NUBIAN FREIGHTER. FUNCTIONS INCLUDE ADVANCED SENSOR SYSTEM, COURSE CONTROLS, SHIELDS, PHASERS, PHOTON TORPEDOES, TRANSPORTER, TRACTOR BEAM, ROMULAN CLOAKING DEVICE, SELF-DESTRUCT, AND EVEN A PRACTICE "FIRING RANGE".

999PROGRAM STEPS
LARRY SCHNEIDER
USA - WILKES-BARRE PA.

00206D 67-DOG RACES.

GIVES ALL 36 WIN AND QUINIELLA ODDS ON 8 DOGS THEN STOPS ON HANDICAPPING' TIPS. SHOWS RACE IN PROGRESS

00206D (CONTD)

IN MAXIMUM OF SEVEN STEPS THEN STOPS ON FINISH ORDER. GIVES ALL WIN, PLACE, SHOW, QUINIELLA, PERFECTA AND TRIFECTA PAYOFFS PLUS DAILY DOUBLE AND BIG Q IF PREVIOUS RACE HAS BEEN RUN. ALL PAYOFFS VARY WITH POPULARITY OF DOGS. PAYOFFS CAN BE WITH OR WITHOUT PERCENT TAKEN OUT. RANDOM NUMBER SEED IS ONLY ENTRY MADE BEFORE FIRST RACE.

335PROGRAM STEPS
DONALD L. MILLER
USA - TAMPA/FLA.

00207D 97-BALLISTICS TRAJECTORY COMPUTATIONS.

THE PROGRAM COMPUTES REMAINING VELOCITIES, ENERGIES, FLIGHT TIMES, MAXIMUM RISE AND DROPS OF BULLETS AT USER SPECIFIED INTERVALS.

210PROGRAM STEPS
DAVID M. IVEY
USA - MACON.

00208D 67-TELEPHONE DIRECTORY.

THIS PROGRAM WILL STORE 19 NAME CODES AND PHONE NUMBERS, ALLOWING YOU TO CHANGE THEM, DELETE THEM OR REVIEW THEM. THE CAPACITY IS LIMITED BY THE NUMBER OF DATA CARDS. THE PROGRAM WILL CHECK AND LET YOU KNOW IF ANOTHER DATA CARD IS NEEDED.

185PROGRAM STEPS
RUBEN J. CARRIL
USA - GLENDORA/CALIF.

00209D 97-LINEAR LIFE.

LINEAR LIFE IMPLEMENTS TWO DISTINCT TRANSFORMATION PRINCIPLES, "STATIC" AND "DYNAMIC", WHICH ACT UPON LINEAR DIGITAL ARRAYS OF VARIABLE LENGTH TO EVOLVE PATTERNS OF GREAT DEPTH AND BEAUTY. THE GENERATIVE PRINCIPLES ARE LOGICALLY SIMPLE BUT OPERATIONALLY DEEP, AND OFFER MANY CHALLENGES TO THE USER.

224PROGRAM STEPS
MORDECAI SCHWARTZ, M.D.
USA - WOODMERE,L.I./N.Y.

00210D 97-GAME OF LIFE (9 X 9).

THE GAME OF LIFE WAS ORIGINALLY DESCRIBED IN SCIENTIFIC AMERICAN, OCTOBER 1970, IN AN ARTICLE BY MARTIN GARDNER. THE GAME WAS ORITINATED BY JOHN CONWAY. IN THE GAME, ORGANISMS EXIST AS CELLS ON A GRID (9 X 9 IN THIS VERSION) AND DIE OR REPRODUCE ACCORDING TO A SIMPLE GENETIC RULE. THE SYMMETRY GENERATED IS VERY INTERESTING. A GENERATION TAKES LESS THAN 3 MINUTES TO RUN COMPARED TO 50 FOR A PREVIOUS LIFE PROGRAM.

210PROGRAM STEPS
JOHN R. RAUSCH
USA - FRANKLIN/OHIO.

00211D 97-COLINEAR ANTENNA GAIN AND PATTERN.

PROGRAM CALCULATES GAIN OF CENTER FED DIPOLE ANTENNAS AND COLINEAR ARRAYS OF CENTER FED DIPOLES. PROGRAM ALSO CALCULATES RELATIVE GAIN AT SELECTABLE ANGLES (ELEVATION ANGLE FOR VERTICAL ANTENNA), OR USES THE HP-97 PRINTER TO PLOT RELATIVE GAIN IN SELECTABLE DB STEPS. PROVISION FOR PROGRESSIVE PHASE SHIFT TO EVALUATE BEAM TILT IS INCLUDED.

220PROGRAM STEPS
KENNETH R. WETZEL
USA - RIDGECREST/CA.

00212D 67-DISCOUNTED-CASH-FLOW / PRESENT VALUE ANALYSIS.

00212D (CONTD)

PROGRAM TO SOLVE THE GENERAL EQUATION FOR INVESTMENT ANALYSIS: PV = FO+F1/(1+I)+F2/(1+I)**2+...+ FN/(1+I)**N WHEN THE INTERNAL RATE OF RETURN (I) OR THE PRESENT VALUE (PV) IS THE UNKNOWN VARIABLE UP TO 22 CASH FLOWS (FO, F1,..,F21) CAN BE GIVEN. WHEN N OR F1=F2=..=FN= PMT IS THE UNKNOWN, VALUES OF FO, I AND THE THIRD VARIABLE KNOWN (PMT OR N) MUST BE GIVEN. AFTER THE UNKNOWN VALUE IS CALCULATED THE PROGRAM CAN FLASH, YEAR BY YEAR, THE DISCCUNTED AND ACCUMULATED CASH FLOW.

224PROGRAM STEPS
HERNAN C. ANZOLA
USA - STANFORD/CALIF.

00213D 97-BIORHYTHM CRITICAL DAYS (COMPLETE).

BIORHYTHMIC CRITICAL DAYS ARE DAYS WHEN A PERSON IS MOST SUSCEPTABLE TO BE ACCIDENT PRONE, ERROR PRONE, OR EMOTIONALLY UNSTABLE. THIS PROG. ALLOWS A LOOK INTO THE FUTURE TO IDENTIFY THESE CRITICAL DAYS IN ANY OF THREE MODES: THE NEXT 30 CALENDAR DAYS, THE NEXT 10 CRITICAL DAYS OR THE NEXT 3 MULTIPLE CRITICAL DAYS. SUBSEQUENT GROUPS FOR EACH MODES ARE AVAILABLE, HOWEVER THE MODES CANNOT BE MIXED AND THE ABILITY OF SPECIFY A DIFFERENT NUMBER OF DAYS IS NOT AVAILABLE. PROG.LIMITED TO 200 YEAR-CALENDAR.

221PROGRAM STEPS
FRED A LUMMUS, P.E.
USA - GREENVILLE, TEXAS.

00214D 97-BIORHYTHM-BIOLOGICAL CYCLES WITH 31 DAYS PRINTOUT.

THIS PROGRAM IS THE COMPANION PRINTING VERSION OF PROGRAM 00195D. A GIVEN BIRTHDATE AND A STARTING DATE ARE CONVERTED TO JULIAN DAY NUMBER DISPLAY. A 31-DAY PRINTED TAPE WITH THE 23-DAY, 28 DAY, AND 33-DAY CYCLES IS OUTPUT FROM THE STARTING DATE. ANY JULIAN OR GREGORIAN DATE FROM 1 JANUARY 4713 B.C. MAY BE INPUT.

209PROGRAM STEPS
REX H. SHUDILE
USA - CARMEL CALIF.

00215D 97-SYNCHRONOUS (BELT) INDEXER, 2 PULLEYS.

THIS PROGRAM COMPUTES GEOMETRIC PARAMETERS FOR INCREMENTAL MOTION SYSTEMS WHICH USE A CONSTANT ANGLE DRIVER SUCH AS A STEPPER MOTOR AT GENEVA, AND SYNCHRONOUS(TOOTHED) BELT AND PULLEYS, CHAIN AND SPROCKETS, OR GREAT AND RACK. COMMON EXAMPLES ARE PRODUCTION LINE WORK POSITIONERS AND PUNCHED CARD/TAPE INDEXERS. PROGRAM YIELDS STEP ANGLE/PULLEY SIZE COMBINATIONS HAVING LINEAR CUMULATIVE ERROR WITHIN USER DEFINED LIMITS; BELT LENGTH; CENTER DISTANCE; AND NO. OF BELT TEETH ENGAGED. (ON THE SMALLER PULLEY).

224PROGRAM STEPS
THOMAS A. HENDER
USA - CORVALLIS/OREGON.

00216D 67-FIXED TIME TRAFFIC SIGNALS 1.

PROGRAM CALCULATES THE OPTIMUM SETTING OF FIXED TIME TRAFFIC CONTROL SIGNALS AND THE CHARACTERISTICS OF ANY FLOW, AT ANY CYCLE LENGTH, ON ANY PHASE.

224PROGRAM STEPS
PAUL O. ROER
CANADA - VANCOUVER,BC.

00217D 97-WIND CHILL INDEX AND EQUIVALENT TEMPERATURE.

HOW COLD IS COLD? TEMPERATURE AND WIND BOTH AFFECT THE HEAT LOSS FROM THE SURFACE OF THE BODY. THE EFFECT OF THESE 2 FACTORS IS EXPRESSED AS AN "EQUIVALENT TEMPERATURE", WHICH APPROX. THE STILL AIR TEMPERATURE WHICH WOULD HAVE THE SAME COOLING EFFECT. THIS PROGRAM ACCEPTS INPUTS OF EITHER MPH OR METTERS PER SECOND DEGREES IN FAHRENHEIT OR CENTIGRADE AND CALCULATES THE EQUIVALENT TEMP. IN EITHER DEGREES FAHRENTHEIT OR CENTIGRADE. THE WIND CHILL INDEX (WCI) IS EXPRESSED IN KCAL/M**2HR.

111PROGRAM STEPS
FRED LUMUS, P.E.
USA - GREENVILLE, TEXAS.

00218D 97-CHICAGO BRIDGE SCOREKEEPER.

PROGRAM ACCEPTS POINTS SCORED ABOVE AND BELOW THE LINE FOR EACH OF 4 HANDS OF SO CALLED CHICAGO BRIDGE. GAME AND PART SCORE BONUSES ARE AUTOMATICALLY AWARDED. AUTOMATICALLY TOTALS NET SCORES FOR 4 OR 5 INDIVIDUAL PLAYERS IN CHANGING PARTNERSHIPS.

188PROGRAM STEPS
JACK E. KAHOUN
USA - MILLBRAE/CA.

00219D 67-BUBBLE SORT ROUTINE.

THIS PROGRAM SORTS DATA IN ANY COMBINATION OF REGISTERS 0-20 (AT LEAST 2) IN ASCENDING OR DESCENDING ORDER USING A BUBBLE SORT.

069PROGRAM STEPS
LEE M. LAMUNYON
USA - PICAYUNE/MS.

00220D 67-DUPLICATE BACKGAMMON.

GENERATES 25,000 BACKGAMMON DICE THROWS FROM EACH SEED AND COMPILES MATCH SCORE. STORES ANY NUMBER OF GAMES TO 21 PER CARD, INCLUDING EACH GAME SCORE. THEN DUPLICATES THROWS FOR EACH GAME WITH PLAYERS EXCHANGED AND GAMES IN RANDOM ORDER. COMPARES EACH REPLAYED GAME SCORE WITH ORIGINAL SCORE AND COMPILES OVERALL SCORE. ALLOWS UNLIMITED INTERRUPTIONS. REVIEWS COMBINED SCORE OF EACH GAME AFTER COMPLETION OF REMATCH. PRINTS SCORES WITH HP-97. INCLUDED FLOWCHART.

224PROGRAM STEPS
DONOVAN E. SMITH
USA - EL CERRITO/CALIF.

00221D 97-PHASE OF MOON DATES.

GIVEN A MONTH AND YEAR DURING THE 200 YEAR PERIOD FROM MARCH 1900 THROUGH FEBRUARY 2100, THIS PROGRAM WILL DETERMINE THE DATE FOR EACH PHASE OF THE MOON WITHIN PLUS OR MINUS ONE DAY. ALSO A CORRECTIN FACTOR MAY BE OPTIONED FOR DIFFERENT TIME ZONES.

214PROGRAM STEPS
FRED A. LUMMUS, P.E.
USA - GREENVILLE/TEXAS.

00222D 67-JACK OF EAGLES.

A GUESSING GAME. ON EACH MOVE THE HUMAN ENTERS A POSITIVE OR NEGATIVE NUMBER: THE MACHINE HAS ALREADY ANALYZED THE HUMAN'S PREVIOUS MOVES AND ANTICIPATES HIS CHOICE. IF CORRECT, MACHINE SCORE GOES UP, IF WRONG, HUMAN SCORE GOES UP. HUMAN CAN CHEAT IF SO DESIRED.

208PROGRAM STEPS
DICK JENSSEN
USA - PARKVILLE/VICTORIA.

00223D 97-CURVE PLOTTING ROUTINE.

GIVEN (1) THE FUNCTION TO BE PLOTTED, (2) THE PLOTTING INTERVAL, AND (3) THE NUMBER OF POINTS TO BE PLOTTED, THIS ROUTINE PLOTS THE FUNCTION USING THE HP-97 PRINTER. TWO UNIQUE FEATURES WERE INCORPORATED: (1) THE VALUES ARE PRESCANNED FOR MAXIMUM AND MINIMUM (AND PRINTED) (2) IF THE OUTPUT INTERVAL CONTAINS ZEROS, THE ZERO LEVEL IS INDICATED AND POINTS ARE PLOTTED WITH RESPECT TO IT. TEN PRINT POSITIONS (ACROSS) ARE USED.

184PROGRAM STEPS
ARTHUR E. ANDERSON III
USA - MOUNTAIN VIEW, CALIF.

00224D 67-GRAPH OF A FUNCTION.

THIS PROGRAM HAS BEEN PRIMARELY WRITTEN FOR HP-97 OWNERS. GIVEN A FUNCTION F(X) (AND YOU HAVE 112 STEPS AVAILABLE TO DEFINE F) THE COMPUTER WILL DRAW THE GRAPH OF F FROM TWO GIVEN ENDPOINTS. VERY ACCURATE GRAPHS CAN BE OBTAINED SIMPLY BY GLUING TOGETHER MORE STRIPS.

112PROGRAM STEPS
MOSHE M. BREINER
USA - CAMBRIDGE/MA.

00225D 97-WEAK ACID/BASE TITRATION CURVE.

FOR WEAK ACID OR BASE, PROGRAM ACCEPTS UP TO 4 DISSOCIATION CONSTANTS, VOLUME AND MOLARITY; FOR STRONG BASE OR ACID TITRANT IT ACCEPTS NORMALITY. THEN FOR EACH TITRANT VOLUME ENTERED, PROGRAM COMPUTES PH. 3-,4-,5- OR 6-DEGREE EQUATION IN H OR OH (AS NEEDED) IS SOLVED BY ITERATION TO OBTAIN PH, SO METHOD IS QUITE GENERAL AND WILL WORK FOR VERY WIDE RANGE OF CONCENTRATIONS.

223PROGRAM STEPS
KARL MARHENKE
USA - APTOS/CA.

00226D 67-ESTIMATING OBESITY, BODY FAT SURFACE AREA, TOTAL BODY WATER.

OBESITY MAY BE DIFINED AS EXCESSIVE AMOUNT OF BODY FAT. A SIMPLE METHOD OF ESTIMATING FAT CONTENT IN THE LIVING SUBJECT IS BASED ON MEASUREMENTS OF BODY WEIGHT AND HEIGHT CORRECTED FOR SEX, AND FRAME SIZE. THIS PROGRAM CALCULATES THE W/H**2 INDEX, A CRUDE MEASURE OF OBESITY. BODY FAT, BODY SURFACE AREA AND TOTAL BODY WATER FOR MEN AND WOMEN CAN ALSO BE CALCULATED USING EITHER ENGLISH OR METRIC UNITS OF WEIGHT AND HEIGHT.

200PROGRAM STEPS
ANDREW C.M. COILE
USA - BETHESDA, MARYLAND.

00227D 97-TRAVERSE, INVERSE AND SIDE SHOTS WITH BEARING/QUAD OUTPUT.

THIS PROGRAM PROVIDES ROUTINES FOR: 1) BEARING/AZIMUTH TRAVERSE, 2) FIELD ANGLE TRAVERSE, 3) INVERSE, 4) SIDE SHOTS, 5) SLOPE DISTANCE REDUCTION AND 6) CURVED SIDES FOR TRAVERSES, FOR REDUCTION OF FIELD DATA. IT IS A REVISED VERSION OF SURVEY PAC SUI-01A WHICH PROVIDES OUTPUTS IN BEARINGS/QUADRANTS RATHER THAN AZIMUTHS. NO CLOSURE ROUTINE IS INCLUDED.

217PROGRAM STEPS
HEWLETT PACKARD
USA - CORVALLIS/OREGON.

00228D 97-PLOT SUBROUTINE.

00228D (CONTD)

PROGRAM PLOTS THE VALUE IN THE DISPLAY BETWEEN SPECIFIED LIMITS.

048PROGRAM STEPS
JAMES A. WEBER
USA - RENTON/WA.

00233D 97-ESTIMATED TIME OF ARRIVAL.

THIS PROGRAM IS AN INTERCHANGEABLE SOLUTION FOR THE SPEED, TIME, AND DISTANCE PROBLEM. THE PROGRAM DOES NOT CONTAIN A CALENDAR SO A TEN-DAY TRIP BEGUN ON THE 27TH OF A MONTH WILL END ON THE 37TH DAY OF THAT SAME MONTH.SIMPLY SUBTRACT 28,29,30 OR 31 AS APPROPRIATE TO GET THE CORRECT DAY OF THE NEXT MONTH.

195PROGRAM STEPS
HEWLETT PACKARD
USA - CORVALLIS.

00234D 97-GREAT CIRCLE AND RHUMBLINE NAVIGATION.

THIS PROGRAM COMPUTES THE GREAT-CIRCLE DISTANCE BETWEEN TWO POINTS. IT ALSO MAY BE USED TO PRODUCE A LIST OF POINTS ON THAT GREAT CIRCLE WHICH ARE SEPARATED BY A SPECIFIED LONGITUDE DIFFERENCE. THE LIST OF GREAT-CIRCLE POINTS IS PRINTED ALONG WITH THE RHUMBLINE COURSES AND DISTANCES BETWEEN SUCCESSIVE POINTS.

224PROGRAM STEPS
HEWLETT PACKARD
USA - CORVALLIS.

00235D 97-DEAD RECKONING.

THIS PROGRAM IS FUNDAMENTALLY A PROGRAM TO COMPUTE LATITUDE AND LONGITUDE ALONG A RHUMB LINE COURSE. INPUTS ARE INITIAL POSITION, COURSE, SPEED, AND INITIAL TIME. WHEN ANOTHER TIME IS SPECIFIED, THE PROGRAM UPDATES THE LATITUDE AND LONGITUDE AND PRINTS OR DISPLAYS THE RESULTS DEPENDING ON WHETHER THE PRINT OPTION IS SELECTED OR NOT.

167PROGRAM STEPS
HEWLETT PACKARD
USA - CORVALLIS.

00236D 97-VELOCITY TRIANGLE AND COURSE TO STEER.

THE FIRST PROGRAM IS AN INTERCHANGEABLE SOLUTION FOR THE VECTOR ADDITION PROBLEM. GIFEN ANY TWO OF THE VECTORS, THE PROGRAM COMPUTES THE THIRD. COMPASS COURSE IS CORRECTED ON INPUT FOR MAGNETIC VARIATION AND DEVIATION. TRUE COURSE IS DECORRECTED ON OUTPUT TO YIELD COMPASS COURSE. THE SECOND PROGRAM CALCULTATES A COURSE TO STEER GIVEN YOUR LOCATION, THE LOCATION WHERE YOU WANT TO GO, YOUR BOAT'S SPEED THROUGH THE WATER, AND THE SET AND DRIFT OF THE CURRENT.

174PROGRAM STEPS
HEWLETT PACKARD
USA - CORVALLIS.

00237D 97-STAR SIGHT PLANNING.

THIS PROGRAM PRODUCES A LIST OF SELECTED STARS THAT ARE ABOVE THE HORIZON AT ANY PLACE AND TIME. THE STARS ARE THOSE USED IN VOLUME 1 TO H.O.249. FROM THE LIST PRODUCED BY THIS PROGRAM, A NAVIGATOR CAN EASILY SELECT STARS WHICH ARE WELL-DISTRIBUTED IN AZIMUTH. ALTITUDES ARE ACCURATE TO THE NEAREST DEGREE. IN POLAR LATITUDES DURING CERTAIN SEASONS, THIS FEATURE WILL NOT WORK BECAUSE TWILIGHT IS NOT DEFINED.

224PROGRAM STEPS
HEWLETT PACKARD

00237D (CONTD)

USA - CORVALLIS.

00238D 97-ALMANAC INTERPOLATOR.

A SEXTANT, THIS PROGRAM, AND THE NAUTICAL ALMANAC ARE ALL THE ITEMS NECESSARY TO DETERMINE THE INFORMATION NEEDED TO PLOT A LINE OF POSITION FROM ANY CELESTIAL SIGHT. THE PROGRAM CAN ALSO BE USED TO COMPUTE THE SEXTANT SETTING FOR LOCATING A DIFFICULT-TO-SEE OBJECT.

189PROGRAM STEPS
HEWLETT PACKARD
USA - CORVALLIS.

00239D 97-SUN LINE OF POSITION.

THE SUN ALMANAC PROGRAM COMPUTES ALTITUDE INTERCEPTS FROM SUN SIGHTS. SEXTANT READINGS ARE CORRECTED FOR DIP OF THE HORIZON, MEAN REFRACTION, AND SEMIDIAMETER OF THE SUN. THE ALMANAC EQUATIONS USED AGREE TO ACCEPTABLE TOLERANCES (LESS THAN 5 MI.ERROR) WITH AVAILABLE ALMANACS FROM 1933 TO 1978.

220PROGRAM STEPS
HEWLETT PACKARD
USA - CORVALLIS.

00240D 97-STAR LINE OF POSITION.

THE STAR ALMANAC PRG COMPUTES ALTITUDE INTERCEPTS FROM STAR SIGHTS. SEXTANT READINGS ARE CORRECTED FOR DIP OF THE HORIZON AND MEAN REFRACTION. THE ALMANAC EQUATIONS USED ACCOUNT FOR ABBERATION, PRECESSION AND NUTATION OF THE EQUINOXES, AND PARTIALLY FOR PROPER MOTION OF THE STARS THEMSELVES. THE PROGRAM COVERS ALL 57 NAVIGATIONAL STARS PLUS POLARIS. THIS 7 CARD PROGRAM CONTAINS 1282 STEPS.

999PROGRAM STEPS
HEWLETT PACKARD
USA - CORVALLIS.

00241D 97-BEARING LINE OF POSITION.

THIS PROGRAM COMPUTES YOUR LOCATION GIVEN BEARINGS TO TWO KNOWN OBJECTS. THE FIX MAY BE A STATIONARY FIX OR A RUNNING FIX. IF ONLY ONE OBJECT IS AVAILABLE FOR SIGHTING, IT MAY BE USED AS BOTH THE FIRST AND SECOND OBJECTS.

169PROGRAM STEPS
HEWLETT PACKARD
USA - CORVALLIS.

00242D 97-TWO ANGLE LINE OF POSITION.

THE COORDINATES OF THREE STATIONS ARE INPUT ALONG WITH THE APPROX. BEARING OF THE 2ND STATION AND THE HORIZONTAL SEXTANT ANGLES BETWEEN THE 1ST AND 2ND STATIONS AND 2ND 3RD STATIONS.FROM EACH HORIZONTAL SEXTANT ANGLE AN LOP AND AN APPROX. FIX ARE COMPUTED.THIS PROGRAM MAY ALSO BE USED TO STORE AN LOP FROM 2 STATIONS FOR USE BY ENTERING ONLY 2 STATIONS, THE APPROXIMATE BEARING OF THE 2ND STATION, AND THE HORIZONTAL SEXTANT ANGLE BETWEEN THE 2 STATIONS.

206PROGRAM STEPS
HEWLETT PACKARD
USA - CORVALLIS.

00243D 97-FIX FROM TWO LINES OF POSITION.

THIS PRG USES THE DATA STORED BY THE LOP PRGS TO COMPUTE THE LAT.AND LONG.OF THE INTERSECTION OF 2 LINES OF POSITION (ACTUALLY CIRCLES).EITHER A RUNNING OR A STATIONARY FIX MAY BE OBTAINED WITH THIS PRG. ERRORS IN SEXTANT HEIGHT WILL SHOW UP AS LATERAL MOVEMENT OF THE LINES

00243D (CONTD)

OF POSITION.A TRAPEZOIDAL FIGURE RESULTS FROM PERTURBING BOTH LINES OF POSITION.THE DIAGONALS OF THIS ERROR TRAPEZOID,THE WORST-CASE DISTANCE ERRORS, ARE ALSO COMPUTED BY THIS PRG ASSUMING A ONE MINUTE SEXTANT ERROR.

220PROGRAM STEPS
HEWLETT PACKARD
USA - CORVALLIS.

00244D 97-RADAR PLOTTING CLOSEST POINT OF APPROACH.

GIVEN TWO BEARINGS AND RANGES ON ANOTHER VESSEL, THIS PROGRAM COMPUTES THE CHANGE OF HEADING REQUIRED TO PASS AT A SPECIFIED MINIMUM DISTANCE. A CLOSEST POINT OF APPROACH SMALLER THAN THE MINIMUM DISTANCE IS FLASHED IN THE DISPLAY.
TWO TARGETS MAY BE TRACKED SIMULTANEOUSLY USING THIS PROGRAM. IF YOU CHANGE COURSE TO AVOID ONE TARGET, BE SURE TO PAY PARTICULAR ATTENTION TO THE OTHER ONE TO AVOID IT ALSO.

212PROGRAM STEPS
HEWLETT PACKARD
USA - CORVALLIS.

00245D 97-DISTANCE BY HORIZON ANGLE.

THIS PROGRAM COMPUTES THE DISTANCE TO AN OBJECT OF KNOWN HEIGHT WHOSE BASE IS OBSCURED BY THE HORIZON AND WHOSE TOP SUBTENDS A SEXTANT ALTITUDE HS WITH THE HORIZON.THE SEXTANT ALTITUDE IS CORRECTED FROM HEIGHT OF EYE.ADDITIONAL FEATURES ARE THE CALCULATION OF THE DISTANCE TO THE HORIZON FOR A GIVEN HEIGHT OF EYE AND DISTANCE OF VISIBILITY OF AN OBJECT OF HEIGH H ABOVE SEA LEVEL.
NOTE: A SEXTANT ALTITUDE LESS THAN 10 FEET MAY MAKE THE COMPUTED DISTANCE.

108PROGRAM STEPS
HEWLETT PACKARD
USA - CORVALLIS.

00246D 97-BEATING TO WINDWARD.

AFTER SAILING SOME DISTANCE ON A GIVEN TACK, IT IS POSSIBLE TO SAIL DIRECTLY TO THE UPWIND MARK ON THE OPPOSITE TACK ALONG WHAT IS CALLED THE "LAY LINE". THIS PROGRAM PROVIDES A SIMPLE SOLUTION TO THE PROBLEM OF DETERMINING THE DIRECTION OF THE LAY LINE.FROM MEASUREMENTS MADE ABOARD A PROPERLY INSTURMENTED SAILBOAT, THE PROGRAM COMPUTES THE COURSE AND SPEED MADE GOOD ON BOTH TACKS, THE HEADING OF THE LAY LINE, AND THE TIME AT WHICH THE LAY LINE WILL BE REACHED.

223PROGRAM STEPS
HEWLETT PACKARD
USA - CORVALLIS.

50001D 67-ELEMENTS OF A CLOTHOIDE.

COMPUTES THE FOUR ELEMENTS OF A CLOTHOIDE: A;R;L; AND T (PARAMETER; RADIUS OF CONNECTION; LENGTH AND DEFLECTION); GIVEN TWO OF THEM.

111PROGRAM STEPS
CHRISTIAN LANDOLT
CH-BECKENRIED

50002D 67-COMPLETE GREGORIAN CALENDAR 15 OCT 1582 TO CIRCA AD 5000.

ALLOWING FOR ALL LEAP YEARS, PROGRAM ACCEPTS DATE IN TWO FORMS(YEARS MONTH DAY OR JULIAN DAY);INTERCONVERTING;INCREMENTING OR DECREMENTING BY A SPECIFIED NUMBER OF DAYS; FINDING YEARDAY AND WEEKDAY OF A DATE AND WHETHER A GIVEN YEAR IS A LEAPYEAR; AND COMPUTING DIFFERENCE BETWEEN TWO DATES IN DAYS OR WEEKS-

PROGRAM ABSTRACTS

50002D (CONTD)

AND-DAYS. ALSO INTERCONVERTS DAYS AND WEEKS-AND-DAYS. HIGH DEGREE OF FUNCTION INDEPENDENCE. ENTERED DATES ARE SAVED IN Y-REGISTER. DATA CARD REQUIRED.

224PROGRAM STEPS
ANDREW STEPHENSON
UK-HIGH WYCOMBE.

50003D 67-LOGIC CIRCUIT SIMULATOR.

INTENDED TO ALLOW SIMULATION OF SEQUENTIAL AND COMBINATIONAL LOGIC IN A 4-LEVEL RPN STACK, THE PROGRAM PROVIDES "RECALL LOGIC" ON ALL OF 10 DATA STORES AND "STORE LOGIC" ON TWO, WITH PROGRAM CAPACITY OF BETWEEN 50 AND 105 STEPS, DEPENDING ON HOW MANY DATA STORES ARE USED. COMPREHENSIVE SUITE OF FUNCTIONS (STACK & LOGIC); MOST MERGE SEVERAL STEPS. WARNING: VERY SLOW PROGRAM (ALMOST 4 SEC. PER STEP).

224PROGRAM STEPS
ANDREW MICHAEL STEPHENSON
UK-HIGH WYCOMBE.

50004D 67-INTERCEPT-AZIMUTH (SIGHT REDUCTION TABLE).

COMPUTES CALCULATED ALTITUDE AND AZIMUTH OF A CELESTIAL BODY, FROM LOCAL HOUR ANGLE, LATITUDE AND DECLINATION. IF SEXTANT ALTITUDE IS ENTERED, THE INTERCEPT IS DISPLAYED.

094PROGRAM STEPS
ROBERT FREDERIC MENZI
CH-GENEVA.

50005D 67-COMBINATIONS OF FOUR.

BEFORE PLAY BEGINS, YOU SPECIFY THE NUMBER OF DIGITS (2-10) WHICH ARE AVAILABLE FOR CALCULATOR. HE CHOOSE A NUMBER OF 4 DIGITS. YOUR AIM IS TO GUESS THE NUMBER. BY FALSE NUMBER, CALCULATOR DISPLAYS THE NUMBER OF DIGITS ON THE RIGHT AND ON THE FALSE PLACE. IF A NUMBER IS RIGHT, HE DISPLAYS THE NUMBER OF GUESSES AND THE NUMBER ITSELF. AFTER THAT HE LOOKS FOR A NEW NUMBER IN THE LIMIT FOR A NEW GAME AUTOMATICALLY.

222PROGRAM STEPS
JOACHIM WELTERS
D-LAUBACH.

50006D 67-FRACTIONS:ADDITION, DIVISION MULTIPLICATION, SUBSTRACTION.

THIS PROGRAM FINDS THE SOLUTION OF TWO FRACTIONS IN THE FOUR BASE ARITHMETICS.

123PROGRAM STEPS
JOACHIM WELTERS
D-LAUBACH.

50007D 97-PRIMES, PRIME-FACTORS WITH EXPONENTS, FACTORS OF AN INTEGER.

PROGRAM CALCULATES PRIMES GREATER THAN N INDICATING TWINS OF PRIMES, GIVES THE DECOMPOSITION OF AN INTEGER IN POWERS OF PRIMES, LISTS ALL FACTORS OF A GIVEN INTEGER AND CALCULATES THE SUM OF THESE FACTORS (EXCLUDED THE INTEGER ITSELF).

221PROGRAM STEPS
PETER MANOGG
I-CASCIAGO.

50008D 67-ENERGY TURNOVER (OPEN SYSTEM).

PROGRAM FINDS RESP. QUOTIENT, TURNOVER, CO2 EXPIRED, O2 INSPIRED, REDUCED VENTILATION FROM DATA MEASURED BY A DOUGLAS-BAG-SYSTEM.

121PROGRAM STEPS

50008D (CONTD)

HEINZ HOFMANN
CH-ZURICH.

50009D 67-AIR REFRACTION.

AIR REFRACTIVE INDEX, REFRACTION CORRECTION FOR ANY GIVEN TEMPERATURE, PRESSION AND ZENITHAL DISTANCE, UP TO 70 DEGREES. WAVELENGTH CORRECTION (DIFFERENTIAL REFRACTION) IS ACCURATE IN THE 0.2-4.0 MICRONS RANGE. THIS PROGRAM IS DESIGNED PRINCIPALLY FOR ASTRONOMICAL USE.

124PROGRAM STEPS
DIDIER PELAT
F-MEUDON.

50010D 97-GAMMA FUNCTION FOR COMPLEX ARGUMENTS.

PROGRAM EVALUATES THE GAMMA FUNCTION FOR COMPLEX ARGUMENTS.

220PROGRAM STEPS
KIM KARLIN
FINLAND - TURKU.

50011D 97-JACOBIAN ELLIPTIC FUNCTIONS.

THE PROGRAM EVALUATES THE JACOBIAN ELLIPTIC FUNCTIONS SN(U/M), CN(U/M) DN(U/M) AND THEIR INVERSES FOR REAL VALUES OF THE ARGUMENT U AND 0<M<1 BY USING THE METHOD OF THE ARITHMETIC-GEOMETRIC MEAN.

211PROGRAM STEPS
KIM KARLIN
FINLAND - TURKU.

50012D 67-SCHALU FOR UP TO 4.

SCHALU IS A GAME TO TEST YOUR REMEMBRANCE. YOU HAVE TO KEEP 6 CARDS IN YOUR MIND.

109PROGRAM STEPS
JUERGEN BAUERMEISTER
D-GOSLAR.

50013D 67-SIMPSON INTEGRAL.

THE PROGRAM SOLVES A GIVEN INTEGRAL BY THE SIMPSON METHOD.

077PROGRAM STEPS
JUERGEN BAUERMEISTER
D-GOSLAR.

50014D 97-CONVERSIONS.

20 CONVERSIONS (ENGLISH-METRIC) ON ONE CARD. THE PROGRAM ITSELF CONTAINS 5 CONVERSIONS AND IS RECORDED ON SIDE 1. SIDE 2 CONTAINS DATA (PRIMARY REGISTERS) FOR ANOTHER 15 CONVERSIONS. FEATURE: CARD CAN EASY BE ADAPTED FOR ONE'S PERSONAL NEEDS, WITHOUT CHANGING THE PROGRAM.

109PROGRAM STEPS
A. VERMISSEN
D-MARSBERG.

50015D 97-REACTANCE/PARALLEL RESONANT CIRCUIT.

PROGRAM CALCULATES: (1) DEPENDENCE BETWEEN FREQUENCY, INDUCTANCE, CAPACITANCE AND REACTANCE. (2) VALUES IN LOSSLESS AND LOSSY PARALLEL RESONANT CIRCUITS: FREQUENCY, INDUCTANCE, CAPACITANCE, SERIES RESISTANCE, PARALLEL RESISTANCE, Q-FACTOR, BANDWITH, TOTAL REACTANCE.

224PROGRAM STEPS
A. VERSMISSEN
D-MARSBERG.

50016D 67-INHOMOGENEOUS 4-EQUATIONS-

50016D (CONTD)

00000D SYSTEM WITH AUTO DATA ENTRY

THIS PROGRAM SOLVES A SYSTEM OF FOUR SIMULTANEOUS EQUATIONS BY CRAMER'S RULE. SIMILAR TO PROGRAM 00146D THE CALCULATOR QUEUES THE USER AS TO WHICH OF THE COEFF. TO ENTER BY DISPLAYING A BLINKING NUMBER FROM 1 TO 20. THEN THE FOUR VARIABLES ARE COMPUTED AND DISPLAYED AUTOMATICALLY. THERE ARE POSSIBILITIES (1) TO RECALL THE SOLUTION (2) TO RECALL AND CHANGE SINGLE COEFFICIENTS AND (3) TO CALCULATE THE VALUE OF A 4X4 DETERMINANT.

224PROGRAM STEPS
DIRK ZABEL
D-BREMEN.

50017D 67-LADDER NETWORK ANALYSIS.

PROGRAM COMPUTES INPUT ADMITTANCE AND TRANSFER FUNCTION OF A LADDER NETWORK WITH MAXIMUM TEN IMPEDANCES EACH IMPEDANCE MAY CONSIST OF TWO RESISTANCES, TWO CAPACITORS AND TWO INDUCTANCES. IN MANY CASES COMPUTATION MAY BE REPEATED AT DIFFERENT FREQUENCIES WITHOUT ENTERING NETWORK ELEMENTS AGAIN.

204PROGRAM STEPS
ATTILIO FARINA
I-TORINO.

50018D 67-TRANSISTOR AMPLIFIER WITH COMMON ELECTRODE IMPEDANCE.

PROGRAM COMPUTES VOLTAGE GAIN, INPUT AND OUTPUT IMPEDANCES OF A TRANSISTOR AMPLIFIER (ANY CONFIGURATION) GIVEN RELEVANT Y PARAMETER, INPUT IMPEDANCE LOAD IMPEDANCE AND COMMON ELECTRODE IMPEDANCE.

194PROGRAM STEPS
ATTILIO FARINA
I-TORINO.

50019D 67-OHM LAW IN CONDUCTOR APPLICATION.

COMPUTE: ELECTRIC CIRCUIT IN DC. VOLTAGE, INTENSITY, RESISTANCE, POWER, WITH THREE EQUATIONS, AND DENSITY, WIRE DIAMETER, AREA, LENGTH AND WEIGTH, WITH TWO EQUATIONS.

223PROGRAM STEPS
FELIPE PAZ
SPAIN - MADRID.

50020D 67-OHM LAW DOUBLE EQUATION IN AC APPLICATION.

COMPUTE: ELECTRIC CIRCUIT IN AC. VOLTAGE. INTENSITY. POWER. COSINUS PHI. INDUCTIVE REACTANCE. CAPPACITIVE REACTANCE. IMPEDANCE. RESISTANCE. FREQUENCY. INDUCTANCE. CAPPACITY. IN DOUBLE EQUATION.

215PROGRAM STEPS
FELIPE PAZ FERNANDEZ
SP-MADRID.

50021D 97-ECONOMIC ORDER QUANTITY VARIABLE SALES.

NORMAL EOQ FORMULA'S WILL NOT HANDLE SALES WHICH VARY PER PERIOD, I.E. SEASONAL ETC. PROGRAM HANDLES THIS PROBLEM FOR UP TO 13 PERIODS.

111PROGRAM STEPS
BART ONKENHOUT
NL-BLARICUM.

50022D 97-EXPONENTIAL SMOOTHING SINGLE, DOUBLE, TRIPLE.

GIVEN INPUT OF ALPHA PROGRAM

50022D (CONTD)

PERFOMS SINGLE, DOUBLE OR TRIPLE EXPONENTIAL SMOOTHING. INPUT CAN BE DATA POINTS OR PREVIOUSLY RECORDED SMOOTHED VALUES.

221PROGRAM STEPS
BART ONKENHOUT
NL-BLARICUM.

50023D 97-DISTRIBUTION OF ACCUMULATION OF POINTS GAINED IN AN EXAMINATION.

THIS PROGRAM STORES VALUATIONS GAINED IN AN EXAMINATION REACHING FROM "-1"(NO TRY TO SOLVE THE PROBLEM) OVER "0" (TRIED BUT COMPLETELY FAILED) UP TO 103 (ONE WILL NORMALY CHOOSE 100 AS COMPLETE SOLVATION) AND FINALLY PRINTS THE STATISTIC OF HOW MANY PARTICIPANTS HAVE HOW MANY POINTS INCLUDING THE TOTAL ACCUMULATION. PRINT MAY BE DONE IN COLUMNS WHICH HEIGHT CORRESPONDS TO THE NUMBER OF PARTICIPANTS HAVING REACHED THE SAME NUMBER OF POINTS.

224PROGRAM STEPS
WOLFGANG BOHN
D-6100 DARMSTADT.

50024D 67-SENTENTIAL LOGIC FOR UP TO 9 UNKNOWNS (PROPOSITIONS).

GIVEN AN EXPRESSION (LOGICAL PUZZLE TTL CIRCUITS...) IN (UNKNOWN) PROPOSITIONS P1,P2,...,PN (N NO LARGER THAN 9) AND BOOLEAN OPERATORS "NOT","AND","OR","IF...THEN","EITHER...OR","IF AND ONLY IF...THEN","NAND","NOR", PROGRAM FINDS ALL SETS OF TRUTH VALUES FOR THE PROPOSITIONS PJ THAT RENDER THE EXPRESSION A TRUE STATEMENT.

093PROGRAM STEPS
THOMAS VON RANDOW
D-HAMBURG.

50025D 97-KRUSKAL-WALLIS'S H TEST.

CALCULATES KRUSKAL-WALLIS'S H WHICH DETERMINES THE PROBABILITY OF NULL HYPOTHESIS: NO DIFFERENCE BETWEEN N SAMPLES (INDEPENDANT). DISTRIBUTION FREE TEST.

200PROGRAM STEPS
ALEXANDRE GEREBTZOFF
F-MONTIGNY-LE-TILLEUL.

50026D 67-ECG VECTOR ANALYSIS.

THIS PROGRAM COMPUTES THE ELECTRICAL HEART AXIS FROM THE ECG STANDARD-LEADS I,II,III. IT GIVES YOU ALSO THE LENGTH OF THE VECTOR IN THE UNITS YOU HAVE ENTERED THE DATA.

220PROGRAM STEPS
HEINZ HOFMANN
CH-ZURICH.

50027D 67-4 EQUATIONS WITH 4 UNKNOWNS.

THIS PROGRAM CALCULATES 4 EQUATIONS WITH 4 UNKNOWNS. SOLUTION BY GAUSSIAN ELIMINATION PROCEDURE.

222PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

50028D 97-FIND REAL AND COMPLEX ZEROS OF A POLYNOM UP TO 9TH ORDER.

SINGLE ZEROS OF A POLYNOM (DEGREE = 9) ARE COMPUTED BY A COMPLEX NEWTON-ITERATION. IT IS POSSIBLE TO CALCULATE THE VALUE (REAL AND IMAGINAR PART) OF F(P) AND F'(P) WHERE P=X+JY.

183PROGRAM STEPS
EUGEN MUELLER
D-MUENCHEN.

50029D 67-CAR SIMULATOR.

INPUTS: TURNING ANGLE AND ACCELERATION OR BRAKING. OUTPUTS (AFTER / SECOND INTERVAL): 9 DIFFERENT DATA, E.G.: CAR POSITION, VELOCITY, THE ANGLE BETWEEN THE DIRECTION OF THE CAR AND THE ROAD, TIMEKEEPER, ETC. IF YOU DRIVE TOO HARD, YOU MAY START TO SLIDE OR LEAVE THE TRACK. THE ROAD IS COMPOSED OF (UP TO 49) PLATES (LENGTH 5CM, WIDTH 10M). A PLATE CAN BE EITHER STRAIGHT OR ONE OF THE 8 POSSIBLE FORMS OF CURVE. THE PROGRAM CAN KEEP TWO CARS ON THE ROAD AT A TIME.

224PROGRAM STEPS
MIKA KORHONEN
FINLAND - HELSINKI

50030D 97-NORMALIZE AND DENORMALIZE OF RLC IN ELECTRONIC CIRCUITS.

DEPENDING OF A REFERENCE RESISTOR AND A REFERENCE FREQUENCY THE PROGRAM ALLOWS THE CALCULATION OF ANY NORMALIZED R,L,C. IF THE ENTERED DATA ARE NORMALIZED VALUES, THE RESULTS ARE DENORMALIZED.

086PROGRAM STEPS
EUGEN MUELLER
D-MUENCHEN.

50031D 67-AMINO ACID ANALYSIS CONVERSION FROM N MOL TO UG.

THE PROGRAM CONVERTS THE N MOLS (FROM A COMPUTING INTEGRATOR) OF AN AMINO ACID TO UG AND CALCULATES THE PERCENTAGE DISTRIBUTION OF THE DIFFERENT AMINO ACIDS.

075PROGRAM STEPS
URS MARTI
CH-ZURICH.

50032D 97-PRIME NUMBERS LIST BETWEEN TWO GIVEN INTEGERS.

THIS PROGRAM PRINTS THE LIST OF PRIME INTEGERS BETWEEN TWO GIVEN INTEGERS YOU CAN LIST FROM THE SMALLEST TO THE LARGER OR THE CONTRARY. YOU WILL BE SURPRISED BY THE RAPIDITY OF EXECUTION.

106PROGRAM STEPS
JEAN CLAUDE PICARD
F-GERZAT.

50033D 67-THE BEST CURVE FITTING.

THIS PROGRAM COMPUTES WITH CARD A THE CORRELATION COEFFICIENT AND THE REGRESSION COEFFICIENTS A AND B OF: Y=A*X+B, Y=A EXP B*X, Y=A*LN X + B AND Y = A*X**B, BY ENTERING(ONLY ONCE) N PAIRS OF XO AND YO, BE THE LEAST SQUARES METHOD.
WITH CARD B, PROGRAM COMPUTES THE BEST CURVE FIT AND THE REGRESSION COEFFICIENTS OF THEM,THE ESTIMATE OF X ON Y OR Y ON X AND THE STANDARD ERROR OF ESTIMATE. YOU CAN OLSO CHANGE ANY OF THE DATA-PAIRS BY ANOTHER.

416PROGRAM STEPS
JAN VAN THIELEN
B-STABROEK.

50034D 97-STORAGE OF STANDARDIZED DATA FILE ON MAGNETIC CARD.

PROGRAM STORES UP TO 20 DATA INTO CONSECUTIVE REGISTERS AND WRITES CONTENTS ON MAGNETIC CARD. FACILITIES FOR INSPECTION, CORRECTION, AND PRINTING OF STORED DATA ARE PROVIDED. FOR SPECIAL PURPOSES (CORRELATION, REGRESSION ETC.) DATA CAN BE KEPT AS PAIRS IN CORRESPONDING REGISTERS.

50034D (CONTD)

169PROGRAM STEPS
HANS-EBERHARD ZAHN
D-BERLIN.

50035D 97-FISHER EXACT PROBABILITY TEST FOR 2X2 CONTINGENCY TABLE.

PROGRAM DETERMINES THE EXACT PROBABILITY OF THE OCCURENCE OF A GIVEN 2X2 CONTINGENCY TABLE INCLUDING THE PROBABILITIES OF THE MORE EXTREME OUTCOMES WHEN MARGINAL SUMS REMAIN CONSTANT.

175PROGRAM STEPS
HANS-EBERHARD ZAHN
D-BERLIN.

50036D 97-SUNRISE AND SUNSET.

THIS PROGRAM CALCULATES IN STANDARD TIME(HOURS, MINUTES, MILTIPLES OF 10 SECONDS) THE TIMES WHEN THE SUN IS HIGHEST ABOVE HORIZON (ZENITH) AND WHEN THE UPPER EDGE OF THE SUN TOUCHES HORIZON (SUNRISE AND SUNSET). INPUT DATA ARE LATITUDE AND LONGITUDE OF OBSERVER, TIME ZONE AND DATE. COEFFICIENTS USED IN THE CALCULATION ARE STORED ON A DATA CARD, WHICH MAY CONTAIN PARTS OF THE INPUT DATA.

221PROGRAM STEPS
GUNTER SCHNELL
D-LILIENTHAL.

50037D 97-SPECIAL FUNCTIONS IN PHYSICS.

THIS PROGRAM COMPUTES SOME OF THE MOST COMMONLY USED SPECIAL FUNCTION MAINLY IN PHYSICS: ASSOCIATED LEGENDRE POLYNOMIALS, ASSOCIATED LAGUERRE POLYNOMIALS, CONFLUENT HYPERGEOMETRIC FUNCTIONS, GAUSSIAN HYPERGEOMETRIC FUNCTIONS AND GEGENBAUER ULTRASPHERICAL POLYNOMIALS. MANY OTHER SPECIAL FUNCTIONS CAN BE EXPRESSED IN TERMS OF THESE.

164PROGRAM STEPS
CLAUDIO BENSKI
F-GRENOBLE.

50038D 67-LOXODROMIC NAVIGATION (DEAD RECKONING-RHUMBLINE).

NAVIGATION COMPUTATIONS ON THE MERCATOR PROJECTION. COMPUTATION OF THE UPDATED POSITION WHEN INITIAL POSITION, COURSE AND DISTANCE ARE GIVEN. COMPUTATION OF COURSE AND DISTANCE WHEN INITIAL AND FINAL POSITION ARE GIVEN.

173PROGRAM STEPS
ROBERT FREDERIC MENZI
CH-GENEVA.

50039D 67-POLYNOMIAL DIVISION.

SOLVES DIVISION OF POLYNOMIALS UP TO THE 19TH DEGREE.

077PROGRAM STEPS
AXEL STRUBE
D-WOLFHAGEN-ISTHA.

50040D 67-DIVISION OF TWO NUMBERS.

DIVIDES TWO NUMBERS WITHOUT LIMIT OF CIFRES BEHIND THE DECIMAL POINT.

041PROGRAM STEPS
AXEL STRUBE
D-WOLFHAGEN-ISTHA.

50041D 67-ESTIMATION OF THE ACCURACY OF OPERATORS.

THIS PROGRAM CALCULATES THE ROOT MEAN SQUARE ERROR OF THE OPERATORS: 10**X ,LN, COS, TG**XY-1, FOR PSEUDO-RANDOM VALUES OF THE ARGUMENT, INSIDE A ZONE AND FOR A

50041D (CONTD)

NUMBER OF STEPS AT THE DISPOSAL OF THE USER. MAXIMAL ERRORS AND CORRESPONDING ARGUMENTS ARE AVAILABLE.

152PROGRAM STEPS
ANDRE LONGATTE
F-CHATENAY-MALABRY.

50042D 67-BINOMIAL FUNCTIONS FAVORS EXTREME PARAMETERS.

THIS PROGRAM CALCULATES THE BINOMIAL CUMULATIVE FUNCTION, P(X) BY CALCULATING THE DENSITY FUNCTION AND ADDING OR SUBTRACTING STEP BY STEP. INITIAL VALUES: P(0), P(N) OR P(L) (I.E. LAST CALCULATED VALUE) ARE SELECTED SO THAT FEWEST POSSIBLY STEPS ARE EXECUTED. THIS FEATURE INCREASES ACCURACY AND LOWERS RUNTIME FOR THE PROGRAM.

120PROGRAM STEPS
SCREN VIDEBEK NIELSEN
DK-STRUER.

50043D 67-EARTH PRECESSION.

THIS PROGRAM GIVES THE EXACT PRECESSION CORRECTION FOR EQUATORIAL COORDINATES. THE CORRECTION IS EXACT EVEN NEAR THE POLES, AND FOR LONG PERIODS OF TIME. THIS PROGRAM IS MAINLY DESIGNED FOR ASTRONOMICAL PURPOSES. TWO CARDS.

160PROGRAM STEPS
PELAT DIDIER
F-MEUDON.

50044D 97-FIRST BOUNDARY VALUE PROBLEM FOR THE HEAT FLOW EQUATION.

THE PROGRAM COMPUTES THE SOLUTION OF THE PARABOLIC DIFFERENTIAL EQUATION
UT = UXX , 0<X<1, 0<T<OR= T
WITH GIVEN BOUNDARY VALUES
U(X,0) = F(X), U(0,T) = G(T),
U(L,T) = H(T).

076PROGRAM STEPS
KURT HAWLITSCHEK
D-ULM - LEHR.

50045D 67-DIVISIONS OF AN INTEGER.

PROGRAM LOOKS FOR ALL POSSIBLE DIVISIONS (TWO INTEGERS) OF AN INTEGER.

093PROGRAM STEPS
CHRISTOPH GRABER
CH-THERWIL.

50046D 97-SIMPLE LINEAR REGRESSION - CONFIDENCE/PREDICTION LIMITS.

PROGRAM FITS LINEAR EQUATION Y=A + BX BY LEAST SQUARES METHOD. BESIDES A, B AND R**2, THE T-TEST VALUE (TEST OF NULL HYPOTHESIS OF CORRELATION) AND THE CONDITIONAL STANDARD DEVIATION SY/X ARE CALCULATED. GIVEN X AND PERCENTILE OF T-DISTRIBUTION, A LINEAR ESTIMATE OF Y WITH CONFIDENCE LIMITS OR PREDICTION LIMITS OF NEW OBSERVATIONS IS CALCULATED. YOU CAN PLOT THE REGRESSION LINE WITH CONFIDENCE AND PREDICTION BELT.

174PROGRAM STEPS
GUENTER SCHNELL
D-LILIENTHAL.

50047D 67-CUBIC INTERPOLATING SPLINE 2 CARDS - CARD 1.

PROGRAM COMPUTES A CURVE (AND THE CURVE OF ITS FIRST DEVIRATED) THROUGH MIN.5 TO MAX.9 GIVEN STRONG POINTS, WHICH MUST BE ACQUIDISTANT. THE NUMBER OF INTERPOLATED POINTS BETWEEN TWO STRONG POINTS MAY BE

50047D (CONTD)

CHOSEN BY THE USER.

205PROGRAM STEPS
HANS-PETER WEBER
CH-ZURICH.

50048D 67-CUBIC INTERPOLATING SPLINE 2 CARDS - CARD 2.

SEE CARD 1 ON PROGRAM 50047 D.

224PROGRAM STEPS
HANS-PETER WEBER
CH-ZURICH.

50049D 67-EXACT DEFLECTION OF THE CURVED BEAM.

THIS PROGRAM CAN CALCULATE THE DEFLECTION OF THE CURVED BEAM (PISTON RING) WITH AN ACCURACY OF ONE UNIT OF THE NINTH DIGIT. IT USES THE TEN FIRST ORDERS OF BESSEL FUNCTION, BUT CAN BE USED FOR BESSEL ONLY AS WELL.

209PROGRAM STEPS
REINHARD M. MUELLER
D-LAUENAU.

50050D 67-3X3 MATRIX OPERATIONS.

THIS PROGRAM ADDS, SUBTRACTS, MULTIPLIES AND DIVIDES TWO 3X3 MATRICES. FURTHER YOU CAN CALCULATE THE DETERMINANT, THE INVERSE AND THE TRANSPOSE OF A MATRIX. THE MATRIX-OPERATIONS CAN BE CHAINED BY A LEFT TO RIGHT HIERARCHY.

222PROGRAM STEPS
PETER LAEDRACH
CH-WORB.

50051D 67-MASTER-MIND.

THIS PROGRAM TESTS A PREVIOUSLY GENERATED NUMBER (LINE OF CODE PEGS) WITH YOUR SUPPOSED NUMBERS AND GIVES AS INFORMATION THE NUMBER OF 'BLACK' AND 'WHITE' KEY PEGS. YOU CAN CHOSE UP TO 9 COLOURS AND LINES WITH UP TO 8 CODE PEGS.

126PROGRAM STEPS
PETER LAEDRACH
CH-WORB.

50052D 67-ARITHMETIC TRAINER.

PROGRAM IS AN IMPROVED VERSION OF SC-13 A IN STANDARD PAC. PERMITS SELECTION OF DIFFERENT MAXIMA FOR THE TWO RANDOM NUMBERS USED IN THE PROBLEM. AUTOMATIC TESTING OF USER'S SEED. ALTERNATIVE TO MACHINE SKEW AVAILABLE. PROVIDES AUTOMATIC PENALIZATION FOR CREATING A REVIEW OF RESULTS, AND EASY RECALL OF PROBLEM IF INCORRECT KEY IS PUNCHED TO ANSWER.

224PROGRAM STEPS
E.J. ROBINSON
F-PARIS.

50053D 67-COMBINED COMPRESSIVE AND BENDING STRESS IN RECT. R.C.SECT.

GIVEN: DIMENTIONS OF CONCRETE SECTION; COMPRESSED AND TENSIONED STEEL AREAS; YOUNG'S MODULUS RATIO; NORMAL FORCE AND BENDING MOMENT, THIS PROGRAM COMPUTES COMPRESSIVE STRESS IN CONCRETE AND TENSILE STRESS IN STEEL.

180PROGRAM STEPS
BRUNO ROMANO
I-GENOVA.

50054D 67-COMBINED COMPRESSIVE AND BENDING STRESS IN CIRC. R.C. SECT.

GIVEN: RADIUS OF CONCRETE AND

50054D (CONTD)

REINFORCEMENT FOR A CIRCULAR SECTION, LONGITUDINAL STELL AREA, YOUNG'S MODULUS RATIO, NORMAL FORCE AND BENDING MOMENT, THIS PROGRAM COMPUTES COMPRESSIVE STRESS IN CONCRETE AND TENSILE STRESS IN STEEL.

221PROGRAM STEPS
BRUNO ROMANO
I-GENOVA.

50055D 97-SOLUTION OF 3 EQUATIONS WITH 3 COMPLEX VARIABLES.

PROGRAM FINDS SOLUTION BY MEANS OF GAUSSIAN ELIMINATION. THE COEFFICIENTS CAN BE STORED OR RECALLED BY KEYING IN THEIR INDICES.

223PROGRAM STEPS
PETER SCHMALE
NL-DELFT.

50056D 97-FIVE-FIELD-BEAM, EXTREM BENDING MOMENTS (OWN WEIGHT / USEFUL LOAD).

THE PROGRAM COMPUTES THE MAX. AND MIN. BENDING MOMENTS FOR UNIFORMLY DISTRIBUTED LOAD (OWN WEIGHT AND USEFUL LOAD). SPAN LENGTH CAN BE DIFFERENT AND MOMENTS OF INERTIA CAN BE DIFFERENT FROM SPAN TO SPAN. THE DISTANCE FROM LEFT SUPPORT TO THE PLACE OF EXTREM MOMENT IS ALSO COMPUTED.

224PROGRAM STEPS
HANSPETER BERNET
CH-BERN.

50057D 67-TRANSFORMER DESIGN.

COMPUTE: MAGNETIC DENSITY IN CORE. DUTY CICLE. POWER TRANSFORMER. FREQUENCY. CURRENT DENSITY IN ELECTRIC WINDING. LOSS IN CORE AT MAGNETIC FLUX BM. TRUNS PAR VOLT. CORE AREA IN CM**2. CORE AREA IN THREE-PHASE TRANSFORMER. TURNS PAR VOLT IN THREE-PHASE TRANSFORMER.

197PROGRAM STEPS
FELIPE PAZ
SPAIN - MADRID.

50058D 97-POLYNOMIALS:HORNER-SCHEME I,II.

HORNER-SCHEME I MAY BE USED TO COMPUTE EVALUATION AND DIVISION BY (X-A) OF POLYNOMIALS UP TO OPTIONAL DEGREE DISPLAYING THE VALUE RESP. THE CHANGED COEFFICIENTS AND THE REMAINDER OF THE DIVISION. HORNER-SCHEME II TRANSFORMS POLYNOMIALS UP TO 22TH DEGREE PN ANX**N.... INTO PN BN(X-A)**N... DISPLAYING THE CHANGED COEFFICIENTS B0,B1,B2.. ...BN.

067PROGRAM STEPS
JOACHIM GERLACH
D-MODAUTAL.

50059D 97-PERMUTATIONS, VARIATIONS, COMBINATIONS.

THIS PROGRAM CALCULATES THE NUMBER OF PERMUTATIONS, VARIATIONS AND COMBINATIONS OF A GIVEN SET OF ELEMENTS, DIFFERENT OR PARTIALLY EQUAL. THE NUMBER OF THE ELEMENTS OF THE SET MAY EXCEED 69, EXCEPT IN THE CASE OF PERMUTATIONS WITH DIFFERENT ELEMENTS.

062PROGRAM STEPS
JOACHIM GERLACH
D-MODAUTAL.

50060D 97-ESTIMATE OF THE ORDER FOR LOWPASS-FILTERS.

THE PROGRAM COMPUTES THE NECESSARY ORDER OF BUTTERWORTH, CHEBYSCHEFF AND ELLIPTIC LOWPASS FILTERS FOR

50060D (CONTD)

ANY NORMALIZED STOP-FREQUENCY, REFLECTION FACTOR AND ATTENUATION IN THE STOP BAND.

108PROGRAM STEPS
EUGEN MUELLER
D-MUENCHEN.

50061D 97-ELLIPTIC FUNCTIONS.

THE PROGRAM COMPUTES THE ELLIPTIC FUNCTIONS NS(U,K), CN(U,K) AND DN(U,K) BY ADDING THE FIRST 12 TERMS OF THE FOURIER SERIE OF THE SN-FUNCTION.

132PROGRAM STEPS
EUGEN MUELLER
D-MUENCHEN.

50062D 67-BINARY = DECIMAL-CONVERSION.

PROGRAM CONVERTS A NUMBER IN DECIMAL-SYSTEM TO A NUMBER IN BINARY-SYSTEM AND REVERSE.

145PROGRAM STEPS
PETER KELLER
CH-ZURICH.

50063D 67-TWO WAY ANALYSIS OF VARIANCE (CROSSED CLASSIFICATION).

THE PROGRAM ANALYSES THE TOTAL VARIABILITY OF A SET OF DATA INTO COMPONENTS, WHICH CAN BE ATTRIBUTED TO DIFFERENT SOURCES OF VARIATION. ROW AND COLUMN EFFECTS AND IN CASE OF REPLICATIONS INTERACTIONS ARE TESTED INDEPENDENTLY. THE ANOVA TABLE IS GENERATED FOR THE MODEL WITHOUT REPLICATIONS AND FOR THE FIXED AND RANDOM MODEL. IN THE LATTER CASES THE NUMBER OF REPLICATIONS IS NOT LIMITED BUT HAS TO BE EQUAL IN EACH CELL.

145PROGRAM STEPS
FRANK ENGEL
D-KOELN.

50064D 67-FAST FACTORING AND STORING OF PRIMES AND THEIR EXPONENTS.

GIVEN AN INTEGER N< OR = TO 999,999,999 COMPUTES AND STORES ALL ITS PRIME FACTORS AND EXPONENTS. EACH OF "N" PRIME FACTORS CAN BE DISPLAYED IN THE COURSE OF FACTORING, OTHERWISE THE PROGRAM STOPS WHEN FACTORIZATION IS OVER.

172PROGRAM STEPS
GIANCARLO CORDONI
I-MONTEBELLUNA.

50065D 67-BARREL.

THE PROGRAM COMPUTES THE UNKNOWN VALUE (H,D,D,M,V) WITH 4 GIVEN VALUES OF THE BARREL.

112PROGRAM STEPS
JUERGEN BAUERMEISTER
D-GOSLAR.

50066D 67-SCHALU FOR UP TO 20.

SCHALU IS A GAME TO TEST YOUR REMAMBRANCE. YOU HAVE TO KEEP UP TO 19 CARDS IN YOUR MIND.

127PROGRAM STEPS
JUERGEN BAUERMEISTER
D-GOSLAR.

50067D 67-MOLAR MASS.

PROGRAM CALCULATES THE MOLAR MASS (AND THE CONTENTS IN %) OF COMPOUNDS CONTAINING ONE OR MORE OF THE FOLLOWING ELEMENTS: C,H,N,O,F,CL,BR,I,B,P,S,NA,K.

223PROGRAM STEPS

50067D (CONTD)

HELLMUTH DECKERS
D-MAINZ.

50068D 67-INTERGRATION OF STRONGLY OSCILLATING FUNCTIONS.

THIS PROGRAM INTEGRATES FUNCTIONS CONTAINING AN EXPONENTIAL TO AN IMAGINARY POWER: OF THE FORM F(X) EXPIAX.

199PROGRAM STEPS
JEROME LAUFER
F-ANGERS.

50069D 97-SORTING PROGRAM.

PROGRAM SORTS A SET OF 20 REAL NUMBERS FROM THE LOWEST TO THE HIGHEST USING A SIMULATION OF 2 INDEXES IN I AND J.

083PROGRAM STEPS
GIORGIO MERLANI
I-MONZA - MILANO.

50070D 97-5X5 MATRIX AND LNEAR SYSTEM.

PROGRAM COMPUTES THE DETERMINANT OF A 5X5 MATRIX AND, WITH THE SECOND CARD, IT SOLVES A SYSTEM OF LINEAR EQUATIONS IN 5 UNKNOWNS. IT IS POSSIBLE TO STORE THE ORIGINAL MATRIX OF THE COEFFICIENTS AND THE TRANSFORMED TRIANGULAR MATRIX ON TWO DATA CARDS.

405PROGRAM STEPS
GIORGIO MERLANI
I - MONZA-MILANO.

50071D 67-STRAIN GAGE ROSETTES 45 DEGREES.

DETERMINATION OF THE PRINCIPAL STRAINS AND STRESSES AND THEIR DIRECTIONS FROM A ROSETTE OF THREE STRAIN GAGES AT 45 DEGREES (RECTANGULAR ROSETTE).

140PROGRAM STEPS
JEAN AVRIL
F-MALAKOFF.

50072D 67-GREGORIAN AND JULIAN CALENDARS.

THIS PROGRAM GIVES THE DAY OF THE WEEK AND THE JULIAN DAY NUMBER FOR ANY GIVEN GREGORIAN OF JULIAN DATE A.D. IT ALSO CALCULATES THE NUMBER OF DAYS BETWEEN TWO GIVEN DATES IN THE GREGORIAN OR THE JULIAN CALENDARS. FURTHERMORE, THE PROGRAM CONVERTS ANY GREGORIAN DATE INTO THE CORRESPONDING JULIAN ONE, AND VICE VERSA.

224PROGRAM STEPS
JOHN MIDTDAL
N-OSLO.

50073D 67-DATE OF EASTER.

THIS PROGRAM GIVES THE GREGORIAN DATE OF EASTER FOR ANY YEAR IN THE PERIOD FROM WHEN THE GREGORIAN CALENDAR WAS INTRODUCED AND UP TO A.D. 2499, AND THE JULIAN DATE OF EASTER FOR ANY YEAR AFTER A.D. 325, WHEN THE COUNCIL OF NICE ADOPTED THE RULE FOR FIXING THE DATE OF EASTER. THE PROGRAM ALSO GIVES THE DAY OF THE WEEK FOR ANY GIVEN GREGORIAN OF JULIAN DATE A.D.

223PROGRAM STEPS
JOHN MIDTDAL
N-OSLO.

50074D 67-LAGRANGIAN POINTS L1 L2 L3 FOR CIRCULAR ORBITS.

GIVEN THE MAGNITUDES (ABSOLUTE OR RELATIVE) OF TWO MASSES IN CIRCULAR ORBIT ABOUT EACH OTHER, PROGRAM COMPUTES THE DISTANCES FROM THEIR CENTRE-OF-MASS TO THE THREE

50074D (CONTD)

COLINEAR LAGRANGIAN POINTS ("LIBRATION POINTS") L1 L2 AND L3. THE OTHER TWO ("TROJAN") POINTS L4 AND L5 ARE NOT FOUND, BEING TRIVIAL CASES. DISTANCES OF MASSES FROM CENTRE-OF-MASS ARE ALSO AVAILABLE. ERROR IS ONE MILLIONTH PERCENT OR BETTER. ONE HALF CARD ONLY.

105PROGRAM STEPS
ANDREW MICHAEL STEPHENSON
UK-HIGH WYCOMBE.

50075D 67-DIFFERENTIAL EQUATIONS RUNGE-KUTTA - GILL METHOD.

THIS PROGRAM SOLVES A SYSTEM OF N SIMULTANEOUS LINEAR OR NON LINEAR DIFFERENTIAL EQUATIONS. THE PROGRAM ACCOMODATES UP TO FIVE DIFFERENTIAL EQUATIONS. PROGRAM STEPS 164 THROUGH 224 ARE AVAILABLE FOR GENERATING THE DIFFERENTIAL EQUATIONS. THE SUBROUTINE IS CALLED BY GSB C.

163PROGRAM STEPS
GIUSEPPE TOSATTO
I-PADOVA.

50076D 67-5X5 AND 4X4 MATRIX OPERATIONS.

THIS ONE-CARD PROGRAM CAN FIND THE DETERMINANT OF 5X5 OR 4X4 MATRIX; CAN INVERT 4X4 MATRIX AND CAN SOLVE 4 LINEAR EQUATIONS IN 4 UNKNOWNS. MATRIX ELEMENTS ARE ENTERED ONLY ONCE AND ARE SAVED BY THE PROGRAM.

210PROGRAM STEPS
ATTILIO FARINA
I-TORINO.

50077D 67-6X6 DETERMINANT.

THIS PROGRAM COMPUTES THE DETERMINANT OF A 6X6 MATRIX. MATRIX ELEMENTS ARE ENTERED ONLY ONCE.

218PROGRAM STEPS
ATTILIO FARINA
I-TORINO.

50078D 67-UNIVERSAL AND DC MOTOR DESIGN.

COMPUTE: MAGNETIC FIELD. IN AIR SPACE. LENGTH IN AIR SPACE. PILING CORE LENGTH. TANGENTIAL ARMATURE SPEED. CONDUCTORS IN ARMATURE SLOTS. AMPERE TURN FOR NECESSARY MAGNETIC FIELD. INDUCTIVE TENSION IN ARMATURE TERMINALS. POWER. EFFICIENCY. NUMBER OF MAGNETIC POLES.

200PROGRAM STEPS
FELIPE PAZ
SPAIN - MADRID.

50079D 67-CALCULATION OF PER CENT OF A FORMULA.

CONVERTS THE AMOUNT A,B,C,...X. OF EACH COMPONENT OF A FORMULA IN PER CENT. THE FORMULA CAN CONTAIN UP TO 24 COMPONENTS.

062PROGRAM STEPS
ROBERT FREDERIC MENZI
CH-GENEVA.

50080D 67-STREAM NAVIGATON I.

BASIC COMPUTATION FOR NAVIGATION WHEN STREAMS ARE PRESENT: COURSE TO SAIL THROUGH WATER AND GROUND SPEED, AND, COURSE SAILED OVER GROUND AND GROUND SPEED.

096PROGRAM STEPS
ROBERT FREDERIC MENZI
CH-GENEVA.

50081D 67-COMPASS DEVIATION - COEFFICIENTS.

50081D (CONTD)

COMPUTES THE COEFFICIENTS OF THE COMPASS DEVIATION CURVE, AND COMPASS DEVIATION AT ANY COMPASS COURSE.

120PROGRAM STEPS
ROBERT FREDERIC MENZI
CH-GENEVA.

50082D 67-SUNDIAL CALCULATIONS AND EQUATION - OF - TIME.

THE PROGRAM PERFORMS THE CALCULATIONS REQUIRED FOR THE MARKING OUT OF A SUNDIAL. THE PLANE OF THE DIAL MAY BE AT ANY ANGLE TO THE VERTICAL AND FACE IN ANY DIRECTION OTHER THAN DUE EAST OR DUE WEST. THE SO-CALLED EQUATION-OF-TIME GIVES DIFFERENCES BETWEEN SUNDIAL TIME AND CLOCK TIME. THE PROGRAM CALCULATES THESE FOR ANY DAY OF THE YEAR.

190PROGRAM STEPS
JAMES P.R. HIRST
UK-ESHER.

50083D 97-STEAM HEATING, CURVE PLOT.

THIS PROGRAM CALCULATES A SET OF DATA PAIRS (TIME, TEMPERATURE) USED TO PLOT A TEMPERATURE GRAPH, TO SHOW THE TEMPERATURE INCREASE IN A LIQUID PRODUCT HEATED BY STEAM IN A COILED OR JACKETED VESSEL.

128PROGRAM STEPS
OVE VILSTRUP
DK-SONDERBORG.

50084D 97-TRUTH TABLE OF BOOLEAN FUNCTIONS.

GIVEN A BOOLEAN FUNCTION UP TO TEN VARIABLES PROGRAM FINDS THE TRUTH TABLE AND PRINTS ITS MINTERMS (FUNCTION TRUE) OR MAXTERMS (FUNCTION FALSE).

162PROGRAM STEPS
FRIEDRICH SCHNEEBERGER
A-GRAZ.

50085D 97-DATE AFTER X DAYS OR BEFORE X DAYS.

PROGRAM COMPUTES THE EXACT DATE (DAY, MONTH, YEAR) AFTER OR BEFORE X DAYS FROM THE INITIAL DATE. VALUABLE FROM THE YEAR 1582 AND RESPECTING LEAP YEARS.

190PROGRAM STEPS
HANSPETER BERNET
CH-BERN.

50086D 67-NEWTON ITERATION FOR A SYSTEM OF 2 EQUATIONS IN 2 VAR.

PROGRAM SOLVES THE PAIR OF EQUATIONS:
F(X,Y) = 0
G(X,Y) = 0
BY THE NEWTON ITERATIVE METHOD.

123PROGRAM STEPS
JEHANGER GRAMI
D-MUNICH.

50087D 67-ONE WAY PHASE VARIATION.

FROM OSCILLOGRAMS SHOWING SINUS OR COSINUS FUNCTIONS OR THEIR SQUARES, THIS PROGRAM CALCULATES THE VARIATIONS OF THE ANGLES (PHASES) WHICH INCREASE OR DECREASE BETWEEN ANY COUPLE OF POINTS CHOOSEN ON THE CURVES.

139PROGRAM STEPS
RENE BAILLY-SALINS
F - IS-SUR-TILLE.

50088D 97-PERSPECTIVE VIEW OF A SURFACE DEFINED BY A FUNCTION.

THIS PROGRAM OUTPUTS CO-ORDINATES OF A SERIES OF POINTS WHICH WHEN PLOTTED BY USER FORM A PERSPECTIVE VIEW OF A SURFACE DEFINED BY A FUNCTION Z=F(X,Y) SPECIFIED BY USER. USER DECIDES AREA TO BE PLOTTED, DENSITY OF PLOTTED POINTS AND CO-ORDINATES OF THE VIEWPOINT. OUTPUT OF HIDDEN POINTS IS SUPPRESSED.

271PROGRAM STEPS
DAVID PEDLAR
UK-WOKINGHAM.

50089D 67-5TH DEGREE EQUATION.

PROGRAM SOLVES FIFTH DEGREE EQUATIONS WITH REAL COEFFICIENTS. ANY COEFFICIENT MAY BE ZERO, SO THAT ALSO FOURTH AND THIRD DEGREE EQUATIONS CAN BE HANDLED. PROGRAM STOPS AFTER CALCULATION IS MADE; ALL ROOTS ARE THEN DISPLAYED IN RECTANGULAR OR POLAR FORM AT WILL. COEFFICIENTS ARE SAVED; DIFFICULT CASES NOT SOLVED BY PROGRAM 00068 D CAN BE SOLVED TOO.

224PROGRAM STEPS
ATTILIO FARINA
I-TORINO.

50090D 67-TRANSISTOR Y PARAMETERS CONVERSION.

PROGRAM CONVERTS TRANSISTOR Y PARAMETERS TO H PARAMETERS OR VICE VERSA; CONVERTS ALSO Y PARAMETERS FOR COMMON-EMITTER CONFIGURATION TO Y PARAMETERS FOR COMMON-COLLECTOR OR COMMON-BASE CONFIGURATON (OR VICE VERSA). ANY OF THE Y OR H PARAMETERS MAY BE ENTERED IN POLAR OR RECTANGULAR FORM; H PARAMETERS (OR Y DERIVED FROM H) MAY BE OBTAINED POLAR OR RECTANGULAR AT WILL.

151PROGRAM STEPS
ATTILIO FARINA
I-TORINO.

50091D 97-TRIANGLE CALCULATIONS.

PROGRAM CALCULATES SIDES AND ANGLES OF A TRIANGLE, IF THREE PIECES ARE GIVEN, MOREOVER THE AREA. DIFFERENCES FROM SD-07A: GIVEN PIECES ARE NOT RECALCULATED (WITH ROUNDING ERRORS) BUT KEPT AS GIVEN (ANGLES IN THEIR DECIMAL VALUES). CHOICE OF PRINT OR DISPLAY. ALL ANGULAR MODES INCLUDING DEGREES, MINUTES, SECONDS. CHOICE OF DIFFERENT DISPLAY MODE (NUMBER OF DIGITS) FOR SIDES AND ANGLES. SUBROUTINES: THIRD ANGLE, SUPPLEM. ANGLE, SECOND TRIANGLE, REPEAT VALUES.

219PROGRAM STEPS
WOLFRAM SCHWABHAUSER
D-STUTTGART.

50092D 67-DOPPELKOPF.

THE PROGRAM HELPS YOU TO COUNT THE POINTS FOR 4 PLAYERS. HIGHEST SCORE PLAYER WHO HAS TO GIVE THE CARDS AND THE NUMBER OF SOLI.

074PROGRAM STEPS
JURGEN BAUERMEISTER
D-GOSLAR.

50093D 67-PI-DETERMINATION BY TRAPEZIUM METHOD.

THE PROGRAM CALCULATES PI. DETERMINATION BY TANGENT AND CHORD TRAPEZIUMS.

076PROGRAM STEPS
JURGEN BAUERMEISTER
D-GOSLAR.

50094D 67-ADDING OF NOISE SOURCES AS A FUNCTION OF DISTANCE.

PROGRAM ADDS SOUND PRESSURE LEVELS OF DIFFERENT SOUND SOURCES AT DIFFERENT PLACES TO COME TO THE ACTUAL SOUND PRESSURE LEVEL AT A PARTICULAR PLACE.
GROUPS OF SOURCES CAN BE ADDED TOGETHER IN FIVE DIFFERENT REGISTERS.
THE TOTAL OF ALL SOURCES IS SEPARATELY ADDED.

095PROGRAM STEPS
P.L.V.D. WOUDE
NL-TETERINGEN.

50095D 97-VARIATION SOUND PRESSURE LEVEL IN ROOM REGARDING DISTANCE.

PROGRAM CALCULATES VOLUME; TOTAL SURFACE AREA; ABSORPTION UNITS; ROOM CONSTANT; AVERAGE ABSORPTION COEFFICIENT; TOTAL SOUND LEVEL; REVERBERANT SOUND LEVEL AND DIRECT SOUND LEVEL VARIATIONS OF ROOMS WITH NORMAL PROPORTIONS.

115PROGRAM STEPS
P.L.V.D. WOUDE
NL-TETERINGEN.

50096D 67-SOLVING FIVE EQUATIONS IN FIVE UNKNOWNS.

THIS PROGRAM SOLVES A SYSTEM OF FIVE LINEAR EQUATIONS IN FIVE UNKNOWNS BY THE METHOD OF GAUSSIAN ELIMINATION. ONE CAN ALSO COMPUTE THE ESTIMATED VALUE.
IT IS ALSO POSSIBLE TO SOLVE FOUR OR THREE EQUATIONS IN FOUR OR THREE UNKNOWNS.

447PROGRAM STEPS
JAN VAN THIELEN
B-STABROEK.

50097D 67-PHOTOMACROGRAPHY - 35MM.

THIS PROGRAM CALCULATES FROM PARTICULAR PROBLEMS OF CLOSE-UP PHOTOGRAPHY OR PHOTOMACROGRAPHY, DIFFERENT INFORMATION SUCH AS: MAGNIFICATION RATE, PHOTOGRAPHIC RANGE, DEPTH OF FIELD, NECESSARY EXTENSION LENGTH, DISTANCE FROM SUBJECT TO FILM PLANE, DIOPTER STRENGHT OF CLOSE-UP LENS, DISTANCE FROM SUBJECT TO FLASH. INPUT DATA ARE FOCAL LENGTH OF LENS, CHOSEN APERTURE AND GUIDE NUMBER OF FLASH.

161PROGRAM STEPS
FRANCIS PARENT
F-STRASBOURG.

50098D 67-DECISION MAKING, DECISION NAME.

MAKES ONE-STEP DECISIONS DEPENDING ON NOT MORE THAN 9 CONDITIONS LEADING TO NOT MORE THAN 9 ACTIONS.

020PROGRAM STEPS
ALFREDO BRAND
D-MUENCHEN.

50099D 97-KAPREKAR CONSTANT-MANIPULATION OF DIGITS-DIGIDITATION.

THE SAME MANIPULATION USED WITH 4 DIGITS TO OBTAIN CONSTANT 6174 CAN BE APPLIED FROM 2 TO 9 DIGITS. WITH 3 AND 9 DIGITS FIND CONSTANTS 495 AND 864197532. OTHER SETS OF CONSTANTS FOR OTHER SETS OF DIGITS ARE FOUND. WITH FLAG 1 YOU CAN OPERATE NORMAL DIGIDITATION. SPECIAL DIGIDITATION SEQUENCES CAN BE FORMED BY CHANGING THE NUMBER IN STO A.

164PROGRAM STEPS
ITO BUDA
I-TRIESTE.

50100D 67-OPERATIONAL STACK OF FOUR RATIONAL NUMBERS.

THIS PROGRAM CREATES AN OPERATIONAL STACK OF FOUR RATIONAL NUMBERS. FUNCTIONS ARE: A:ENTER; B:+; C:-; D:X; E:DIVIDE; THE STACK BEHAVES EXACTLY LIKE THE USUAL HP STACK OF REAL NUMBERS. THE RESULT IS ALWAYS SIMPLIFIED WITH A POSITIVE DENOMINATOR.

097PROGRAM STEPS
MORITZ HERVE LOUIS
F-SAINTES.

50101D 97-DEGRESSIVE INTEREST.

PROGRAM SHOWS FIX AMORTIZATION AND DEGRESSIVE INTEREST.

056PROGRAM STEPS
JAN-OLOV SJOELUND
S-BROMMA.

50102D 97-PI.

CALCULATES THE FIRST 85 DIGITS OF PI, USING 12-TUPLE PRECISION ARITHMETIC.

170PROGRAM STEPS
ROBERT PURVES
UK-LONDON.

50103D 97-FINITE GEOMETRIC SERIES.

GIVEN ANY 3 OF THE 5 VALUES OF A FINITE GEOMETRIC SERIES (FIRST ELEMENT A1, QUOTIENT Q, NUMBER OF ELEMENTS N, LAST ELEMENT AN, SN=A1+A2+...+AN), THE REMAINING 2 ARE CALCULATED. OF THE 10 CASES, 2 ARE SOLVED BY AN ITERATIVE METHOD (NEWTON). ALL VALUES ARE ASSUMED TO BE POSITIV. THOUGH IN A NUMBER OF CASES NEGATIVE SOLUTIONS MAY BE FOUND.

223PROGRAM STEPS
GUENTER SCHNELL
D-LILIENTHAL.

50104D 97-STEAM HEATING, CURVE FITTING.

THIS PROGRAM IS AN APPLICATION OF THE STANDARD PAC PROGRAM, CURVE FITTING, USED TO CALCULATE A CURVE FROM A SET OF DATA PAIRS (TIME, TEMPERATURE) FOR A LIQUID HEATED BY STEAM IN A COILED OR JACKETED VESSEL. THE MEAN HEAT TRANSFER MAY BE CALCULATED, BASED ON THE CURVE FIT.

203PROGRAM STEPS
OVE VILSTRUP
DK-SONDERBORG.

50105D 67-NETWORK ANALYSIS.

THIS PROGRAM EVALUATES THE NODE VOLTAGES OF PASSIVES LINEARES NETWORKS WITH FOUR PRINCIPLES NODES. REQUIRED DATA ARE BRANCHES ADMITTANCES AND SOURCE VOLTAGE.

217PROGRAM STEPS
CAZORZI MARIO
D-MUNICH.

50106D 67-BUTTERWORTH, TCHEBYCHEFF, AND ELLIPTIC FILTER DEGREE.

CALCULATES NECESSARY DEGREE FOR LOWPASS, HIGHPASS, BANDBASS AND BANDSTOPP FILTERS OF THE BUTTERWORTH, TCHEBYCHEFF, INVERSE OR ELLIPTIC TYPE WHEN THE BAND LIMITS AND ATTENUATION SPECIFICATIONS ARE GIVEN.

181PROGRAM STEPS
NILS HAAHEIM
N-TRONDHEIM.

50107D 97-NON LINEAR DISTORTION CALCULATION.

50107D (CONTD)

PROGRAM CALCULATES DISTORTION IN PROC. FROM A SPECIFIED NUMBER OF FOURIER COEFFICIENTS WHICH ARE FOUND BY AN INTEGRATING ROUTINE. USER ALSO SPECIFIES THE AMPLITUDE AND DC-LEVEL OF THE IMPUTSIGNAL. THE FUNCTION DISCRIBING THE CIRCUIT MAY BE EXPLICIT OR IMPLICIT.

153PROGRAM STEPS
PETER SCHMALE
NL-DELFT.

50108D 67-CLOTHOIDA "A" DETERMINATION.

KNOWN:TWO POINTS B & D OF THE ORIGIN TANGENT C CENTER OF THE CIRCUMFERENCE AND R RADIUS. GIVE: A PARAMETRE, COORDINATES OF CONTACT CIRCUMFERENCE-CLOTHOIDA POINT M TO ANGLE OF TANGENT IN CONTACT POINT. L LENGTH FROM THE ORIGIN - O ORIGIN COORDINATES - P PROJECTION OF CENTER C ON THE ORIGIN TANGENT AND DISTANCE PC.

223PROGRAM STEPS
PIERRE SILVAN
F-CHAMBERY.

50109D 67-RE-SECTION WITH MANUAL DATA I/P OR DATA LOADING FROM CARDS.

THE PROGRAM CALCULATES A POINT FROM THREE PONTS THE CO-ORDINATES OF WHICH ARE KNOWN. IMPUT DATA ARE THE CO-ORDINATES OF STATIONS 1,2 AND 3 (WHICH MAY BE ENTERED MANUALLY OR BY MEANS OF DATA CARDS) AND THE INCLUDED ANGLES ALPHA AND BETA. AFTER CALCULATION, THE DISPLAY SHOWS CO-ORDINATES, MODE (360 OR 400) AND THE ACCURACY OR INDICATES WHETHER THE REULST MAY BE ERRONEOUS BECAUSE THE FOUR POINTS MAY BE LOCATED ON OR NEAR THE COMMON (DANGER) CIRCLE.

217PROGRAM STEPS
M. HOOIJBERG
NL-DRUNEN.

50110D 67-INTERSECTING LINES WITH 3, 4 OR 5 POINTS.

THE PROGRAM CALCULATES THE POINT OF INTERSECTION OF TWO LINES, THE POINT OF INTERSECTION OF A LINE AND A BEARING FROM A THIRD POINT OR THE POINT OF INTERSECTION OF A LINE AND A BEARING THROUGH A POINT, PARALLEL TO A SECOND LINE. THE CO-ORDINATES ARE CALCULATED IN METERS OR FEET, THE MODE IS 360 OR 400.

154PROGRAM STEPS
M.HOOIJBERG
NL-DRUNEN.

50111D 67-PRESSURE AND ENERGY CONVERSIONS.

THIS PROGRAM CONVERTS PRESSURE UNITS BETWEEN: N/M**2, MB, KP/CM**2 TORR, AND ATM AND ENERGY UNITS BETWEEN: JOULE, KPM, KWH, KCAL AND EV.

158PROGRAM STEPS
GERALD BULCZYNSKI
D-BERLIN.

50112D 67-51 DIES.

IT'S A CARD GAME FOR 1 TO 4 PLAYERS AND FOR YOUR CALCULATOR. 32 CARDS ARE STORED AND RECALLED BY A PSEUDO-RANDOM GENERATOR. AFTER TAKING A CARD YOU HAVE TO ADD IT TO ALL FOREGOING SCORES. BUT SOMETIMES YOU HAVE THE POSSIBILITY TO REDUCE THE SUM. YOU HAVE LOST, WHEN YOU MUST INCREASE IT TO MORE THAN 50 POINTS. AFTER ENDING A GAME ALL LOST GAMES ARE DISPLAYED.

223PROGRAM STEPS

50112D (CONTD)

GERALD BULCZYNSKI
D-BERLIN.

50113D 67-FRENCH INCOME TAX.

THIS PROGRAM GIVES THE INCOME TAX IN FUNCTION OF THE INCOME AND OF THE NUMBER OF FAMILY PARTS, ACCORDING TO THE FRENCH REGULATION FOR 1977, IT CAN BE USED FOR ANOTHER YEAR BY ALTERATION OF THE STORED DATA.

027PROGRAM STEPS
ANDRE LONGATTE
F-CHATENAY MALABRY.

50114D 67-REDUCED DEFINITE QUADRATIC FORMS AND CLASS NUMBER.

THIS PROGRAM DISPLAYS ALL NON EQUIVALENT REDUCED BINARY QUADRATIC FORMS OF GIVEN NEGATIVE DISCRIMINANT, COUNTS THEM AND STOPS DISPLAYING THEIR NUMBER. IF ONE SPECIFIES A SQUARE-FREE POSITIVE NUMBER D, ONE OBTAINS THE CLASS NUMBER OF THE COMPLEX QUADRATIC NUMBER FIELD Q(SQRT(-D)).

120PROGRAM STEPS
J.E. MEBIUS
NL-BERKEL.

50115D 67-RESIDUE CLASS ARITHMETIC.

THIS PROGRAM PERFORMS THE MAIN OPERATIONS OF RESIDUE CLASS ARITHMETIC, VIZ. ADDITION, SUBTRACTION, MULTIPLICATION, DIVISION, REDUCTION OF A NUMBER WITH RESPECT TO THE MODULUS, CHANGING SIGN, INVERSION AND EXPONENTIATION.

122PROGRAM STEPS
J.E. MEBIUS
NL-BERKEL

50116D 67-CODER - DECODER.

CALCULATOR OPERATES AS A CYPHERING MACHINE ORIENTED TOWARDS THE NON-TECHNICAL USER. SIMILAR TO "GEHEIMSCHREIBER" USED BY GERMAN HIGH COMMAND IN WORLD WAR 2 BUT FAR MORE COMPLEX. ROUTINES ALLOW CONVENIENT PROCESSING OF NUMBER PAIRS IN RANGE 00-99, INCLUDING SAFE HANDLING OF UP TO FIVE 'KEYS' AND EXTENSIVE USE OF MAG CARDS. BASIS OF SCRAMBLERS IS PSEUDORANDOM SEQ.GEN. IN HP HANDBOOK: TOTAL PERMUTATIONS EXCEED 3 EXP 28. NB: TO BE APPLIED WITH CAUTION.

223PROGRAM STEPS
ANDREW MICHAEL STEPHENSON
HIGH WYCOMBE.

50117D 67-PARABOLIC CURVE FIT.

THE PROGRAM GENERATES A PARABOLIC FUNCTION TO FIT A SET OF DATA POINTS. RANDOMLY SPACED VALUES MAY BE USED. A MINIMUM OF THREE DATA POINTS ARE REQUIRED TO DESCRIBE THE FUNCTION.

282PROGRAM STEPS
JEREMY W. HIGGINS
I-MILAN.

50118D 67-TIDE CALCULATION I.

COMPUTES HEIGHT OF WATER ABOVE CHART DATUM AT ANY TIME BETWEEN HIGH (OR LOW) AND LOW (OR HIGH) WATER. COMPUTES TIME FOR ANY HEIGHT BETWEEN HIGH (OR LOW) AND LOW (OR HIGH) WATER. THE PROGRAM WORKS EITHER WITH EBB OR FLOOD, AND WITH HIGH AND LOW WATER IN THE SAME DAY OR IN TWO CONSECUTIVE DAYS.

084PROGRAM STEPS

50118D (CONTD)

ROBERT FREDERIC MENZI
CH-GENEVA.

50119D 67-CIRCUMZENITHAL ALTITUDES (LONGITUDE BY TRANSIT TIME).

COMPUTES THE DIFFERENCE OF LONGITUDE BETWEEN DR LONGITUDE AND EXACT LONGITUDE, FROM TWO OBSERVATIONS OF EQUAL ALTITUDES, BEFORE AND AFTER CULMINATION OF CELESTIAL BODY (MAINLY THE SUN).

085PROGRAM STEPS
ROBERT FREDERIC MENZI
CH-GENEVA.

50120D 97-COMBUSTION STOICHIOMETRY OF SOLID AND LIQUID FUELS.

FOR A GIVEN FUEL ANALYSIS (% BY WEIGHT) AND INPUT THE PROGRAM COMPUTES THE TOTAL OXYGEN AND AIR DEMAND. AFTER ENTERING OXYGEN AND/OR AIR INPUT THE SMOKE GAS COMPOSITION IN MOLES, NM**3 AND VOL. % IS CALCULATED.

221PROGRAM STEPS
HELMUT GROHMANN
A-BRUCK/MUR.

50121D 67-TANGENTS TO A CIRCLE FROM A POINT.

GIVEN A CIRCLE (AS X**2 + Y**2 + A*X + B*Y + C = 0, OR C(XC;YO) AND RADIUS "R") AND A POINT P(XP;YP), CP>OR EQUAL R, THE PROGRAM COMPUTES THE EQUATION OF THE TANGENTS Y=M*N+N TO THE CIRCLE THROUGH "P", THE ABSCISSAE OF TAGENTIAL POINTS "XT" AND "XT1", AND THE VALUES OF "CP" AND "PT"; MOREOVER IF XC,YO,R ARE KNOWN GIVES "A", "B", "C" AND VICE VERSA.

197PROGRAM STEPS
GIANCARLO CORDONI
I-MONTEBELLUNA.

50122D 97-LIST OF SPORT RESULTS (RACES WITH ONE OR MORE PASSAGES).

THE PROGRAM IS ESPECIALLY FOR SLALOM-COMPETITIONS. IT LISTS THE RESULTS OF THE FIRST PASSAGE IN THE RIGHT ORDER.
THE RESULTS OF FURTHER PASSAGES ARE ADDITIONED TO THE FIRST RESULTS, THE RESULTS ARE ORDERED FROM 1 TO 20. THE PROGRAM BRINGS AUTOMATICALLY THE NUMBERS IN THE ORDER OF 15 TO 1 AND THEN, FOLLOWING THE "BIPO-RULE", THE OTHER NUMBERS IN THE ORDER OF THE FIRST RESULTS.

224PROGRAM STEPS
HANSPETER BERNET
CH-BERN.

50123D 67-RESONANCE CIRCUIT.

THIS PROGRAM CALCULATES RESONANCE FREQUENCY, INDUCTANCE, CAPACITANCE AND RESISTANCE ATRESONANCE FREQUENCY OF A LOSSFREE PARALLEL CIRCUIT, IF AT LEAST TWO OF THOSE VALUES ARE GIVEN.

157PROGRAM STEPS
GISBERT DUPONT
D-VIERSEN.

50124D 97-COMBUSTION STOICHIOMETRY OF CASEOUS FUELS.

FOR A GIVEN FUEL ANALYSIS (VOL.%) AND INPUT THE PROGRAM COMPUTES THE OXYGEN AND AIR DEMAND. AFTER ENTERING OXYGEN AND/OR AIR-INPUT THE SMOKE GAS COMPOSITION IN MOLES, NM3 AND VOL.% IS CALCULATED.

215PROGRAM STEPS
HELMUT GROHMANN
A-BRUCK/MUR.

50125D 67-RUSSIAN ROULETTE.

A DUEL WITH A FOUR-SHOT-REVOLVER LOADED ONLY WITH ONE BALLET. EACH PLAYER HAS TO TURN ROUND THE MAGAZINE, AIM THE REVOLVER AT HIS HEAD AND FIRE. THE PLAYER "REMAINING" IS THE WINNER. HP-67 PROVIDES THE REVOLVER AND KEEPS SCORE OF THE PLAYERS'FORTUNE.

064PROGRAM STEPS
THOMAS J. KRUEMMEL
D-BONN-IPPENDORF.

50126D 67-MACH VALUE FOR AIRCRAFTS.

THIS PROGRAM COMPUTES THE MACH VALUE M FOR AIRCRAFTS, GIVEN A HEIGHT (FT OR M) AND A SPEED "CAS" (NAUT.MILES/H OR KM/H).

080PROGRAM STEPS
THOMAS J KRUEMMEL
D-BONN-IPPENDORF.

50127D 67-FORMULA AND MOLEKULAR WEIGHT FROM ANALYTICAL DATA.

THE PROGRAM CALCULATES THE FORMULA AND MOLECULAR WEIGHT ANALYTICAL DATA OF THE ELEMENTS HYDROGEN, CARBON, NITROGEN, OXIGEN AND CHLORINE.

219PROGRAM STEPS
ROLF HUELNHAGEN
D-DUESSELDORF.

50128D 67-ADDING AND SUBTRACTING DB'S TO GET: DB(A); DB(LIN); LEG AND EDB.

PROGRAM CALCULATES: (1) DB(LIN) VALUE AS AN ADDITION RESULT FROM DB'S OF THE FREQUENCY SPECTRUM (2) DB(A) VALUE AS A RESULT FROM ADDING THE TOTAL FREQUENCY SPECTRUM REGARDING THE CORRECTIONFACTOR FOR EACH FREQUENCY. (3) ADDITION OF DB VALUES IN ORDER TO GET THE TOTAL SOUND PRESSURE LEVEL AND THE EQUIVALENT SOUND PRESSURE LEVEL. (4) THE RESULT OF SUBTRACTING TWO SOUND PRESSURE LEVELS EXPRESSED IN DB.

117PROGRAM STEPS
P.L.V.D. WOUDE
NL-TETERINGEN.

50129D 67-QUADRATIC EQUATION.

THE PROGRAM USES ONLY ONE LABEL (YOU CAN USE THE LABELS B,C,D,E FOR OTHER PROGRAMS) AND NO REGISTER. YOU WILL ALSO GET THE VALUES P AND Q FOR THE REDUCED EQUATION (X**2+PX+Q=0) BESIDES THE ROOTS X1 AND X2 (REAL OR COMPLEX).

037PROGRAM STEPS
JURGEN BAUERMEISTER
D-GOSLAR.

50130D 67-SCHALU FOR TWO

SCHALU IS A GAME TO TEST YOUR REMEMBRANCE. YOU HAVE TO KEEP 6 CARDS IN YOUR MIND. YOU PLAY AGAINST THE COMPUTER.

135PROGRAM STEPS
JURGEN BAUERMEISTER
D-GOSLAR.

50131D 67-EXTRAPOLATION.

THIS PROGRAM CALCULATES SUCCESSIVE EXTRAPOLATED ESTIMATES OF THE LIMIT OF SLOWLY CONVERGENT OR SEMI-CONVERGENT SEQUENCES. THE NUMBERS IN THE SEQUENCE OR THE TERMS IN THE SERIES EXPANSION MAY BE CALCULATED IN A MAIN PROGRAM DEFINED BY THE USER, OR THEY MAY BE GIVEN AS INPUT FROM THE KEYBOARD.

50131D (CONTD)

093PROGRAM STEPS
JOHN MIDTDAL
N-OSLO.

50132D 97-THE MAZE PROGRAM.

FIND YOUR WAY THROUGH A MAZE DEFINED BY A MATHEMATICAL FUNCTION. THE MAZE CONSISTS OF AN INFINITE NUMBER OF SQUARE ROOMS WITH UP TO 4 EXITS EACH. DECIDE WHICH ONE TO TAKE AND MOVE INTO THE NEXT ROOM. CHANGE THE DEFINING FUNCTION FOR A NEW MAZE.

103PROGRAM STEPS
DAVID PEDLAR
UK-WOKINGHAM.

50133D 97-3 DIMENSIONAL SATELLITE TRAJECTORY SIMULATION.

THIS PROGRAM GIVES AN INCREMENTAL SOLUTION TO SATELLITE TRAJECTORIES. INPUT INITIAL POSITION AND VELOCITY. OUTPUTS POSITION AND/OR VELOCITY AT TIME INTERVALS GIVEN BY USER. DECREASE DT FOR GREATER ACCURACY.

055PROGRAM STEPS
DAVID PEDLAR
UK-WOKINGHAM.

50134D 97-SORTING.

PROGRAM SET AND PRINT 48 NUMBERS (MAX 5 FIGURES) IN GOOD ORDER.

193PROGRAM STEPS
JAN BRINK
NL-AMSTELVEEN.

50135D 67-STAIRS DESIGN.

THIS PROGRAM COMPUTES 7 VARIABLES REQUIRED FOR STAIRS DESIGN. THE USER SELECTS TWO IMPERIOUS DATA AT LEAST AND PROGRAM GIVES HIM THE OTHERS, THE 7 CHARACTERISTICS ARE: NUMBER OF STEPS, HEIGHT AND THREAD OF EACH STEP, HEIGHT TO CLIMB, LENGHT OF THREAD LINE, AND FOR SPIRAL STAIRS, RADIUS OF THREAD LINE AND ANGLE BETWEEN THE FIRST AND THE LAST STEP.

224PROGRAM STEPS
FRANCIS PARENT
F-STRASBOURG.

50136D 67-THE LORENTZ CURVE AND THE LORENTZ INDEX.

THE PROGRAM CALCULATES AND DISPLAYS THE POINTS OF A LORENTZ CURVE AND OPTIONALLY THE CORRESPONDING LORENTZ INDEX. THE LORENTZ CURVE CAN BE USED TO COMPARE TWO GROWTH-RATES OR AS IN THE CITED EXAMPLE: TO RELATE SOME CHARACTERISTICS TO THE AREA WHICH THEY OCCUPY; THEREBY GIVING SOME MEASURE OF LOCATIONAL CONCENTRATION.

097PROGRAM STEPS
ERIK GJOE GELEFF
DK-RUNGSTED.

50137D 67-4X4 COMPLEX MATRIX.

PROGRAM CALCULATES THE COMPLEX VALUE (IN RECTANGULAR AND POLAR FORM) OF ANY 4X4 MATRIX, WITH REAL OR COMPLEX ELEMENTS.

196PROGRAM STEPS
RONALD D'HAEZE
B-GHENT.

50138D 67-7TH DEGREE EQUATION.

THIS PROGRAM FINDS TWO ROOTS (REAL OR COMPLEX) OF A 7TH DEGREE

50138D (CONTD)

EQUATION AND REDUCES THE POLYNOMIAL TO 5TH DEGREE, READY TO BE PROCESSED BY PROGRAM 50089 D WHICH FINDS THE OTHER FIVE ROOTS.

336PROGRAM STEPS
ATTILIO FARINA
I-TORINO.

50139D 67-HYPERBOLICS: ASYMPTOTIC EXPENSIONS.

THIS PROGRAM COMPUTES THE HYPERBOLIC FUNCTIONS AND THEIR INVERSES BY USING THEIR ASYMPTOTIC EXPENSIONS FOR SMALL VALUES OF THE ARGUMENT IN ORDER TO GET; THE BEST ACCURACY AS POSSIBLE.
WHEN COMPUTING THE FUNCTIONS THE CALCULATOR BEHAVES THE SAME WAY HE DOES FOR AN ORDINARY INNER FUNCTION.

185PROGRAM STEPS
FRANCOIS TERNANT
F-LE PLESSIS-ROBINSON.

50140D 67-ASTROLOGERS ASPECTARIAN GIVES 66 ASPECTS BETWEEN 12 POINTS.

PROGRAM CAN AUTO/MANUALLY DISPLAY IN SEQUENCE ALL OF THE 66 ANGULAR RELATIONSHIPS (ASPECTS) BETWEEN 12 POINTS, II ASPECTS TO ONE POINT, OR ONE ASPECT BETWEEN PAIRS. THE DATA INPUT ROUTINE LABELS THE PLANETS WITH TRADITIONAL NUMBERS TO FACILITATE IDENTIFICATION DURING SINGLE STEP READOUT. FOR THE ASPECT CHART SUPPLIED THE PRGM DISPLAYS IN 0-180 FMT THE ASPECTS OF EACH ROW ANGLE TO POINTS ADDRESSED IN EACH COLUMN, IN THE ORDER LEFT TO RIGHT FOR EACH CONSECUTIVE ROW.

223PROGRAM STEPS
LEON GEE
UK-NORTHOLT.

50141D 67-FUNCTION ANALYSIS.

PROGRAM FINDS F(X), F'(X), F''(X), F'''(X), THE SOLUTION OF F(X)=0, F'(X)=0, F''(X)=0 (USING TANGENT METHOD) AND THE INTEGRAL (USING SIMPSON'S RULE) OF FUNCTIONS KNOWN EXPLICITLY.

110PROGRAM STEPS
HARRY WALENDA
D-HANNOVER.

50142D 67-AUTOMATIC CALCULATION OF TRAVERSES.

THIS PROGRAM CALCULATES TRAVERSES WITH A 7 NEW-POINT MAXIMUM. CALCULATION WITH JUNCTION / END POINT OR CONNECTION / CLOSING DIRECTION. YOU HAVE TO KEY IN TRAVERSE ANGLES AND DISTANCES ONLY ONE TIME. IT WILL DISPLAY THE FOLLOWING FACTS: CLOSING ERROR OF A TRAVERSE ANGULAR CLOSURE, LONGITUDINAL ERROR, LATERAL ERROR ALL WITH MAXIMAL ERROR, CORRECTED TRAVERS ANGLES, DISTANCE ERROR AND THE NEW-POINT COORDINATES.

416PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

50143D 67-SOLUTION OF F'(X), F'(X)=0, F(X), F(X)=0.

THIS PROGRAM CALCULATES F(X), F(X)=0, F'(X), F'(X)=0 (MINIMA, MAXIMA) OF A FUNCTION. USING OF NEWTON'S ITERATION SYSTEM. IT GUARANTEES AN APPROXIMATION FOR EVERY INTERVAL.

134PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

50144D 67-FISHERS LOGARITHMIC DISTRIBUTION

PROGRAM PROVIDES A MAXIMUM LIKELIHOOD ESTIMATE OF THE PARAMETER OF FISHERS LOGARITHMIC DISTRIBUTION AND EMPLOYS THIS IN CALCULATING THE EXPECTED FREQUENCIES FOR SAMPLE DATE.

090PROGRAM STEPS
A.J.C. BALFOUR
UK-HALTON.

50145D 97-MAGIC SQUARES.

GIVEN THE ORDER OF ANY SQUARE YOU CAN BUILD A MATRIX IN WHICH THE SUM OF THE NUMBERS OF ANY LINE COLUMN AND DIAGONAL IS EQUAL.
CARD 1: ODD AND DOUBLE EVEN ORDER (3,5,7 ETC. AND 4,8,12 ETC.)
CARD 2: SIMPLY EVEN ORDER (6,10, 14 ETC.).

368PROGRAM STEPS
ITC BUDA
I-TRIESTE.

50146D 67-LINEAR SYSTEMS OF THE N-ORDER 5<N<10.

THE SOLUTION OF N-ORDER LINEAR SYSTEMS
N=5 OR 6 AND 6<N<10.

758PROGRAM STEPS
FLOR EMIEL BERTIAU FIERENS
B-ANTWERP.

50147D 67-INTERNAL VALIDATION OF DISCRIMINATION FUNCTION.

GIVEN A DISCRIMINATION FUNCTION, CALCULATED BY STRICTLY FISHERIAN METHOD, BETWEEN TWO GROUPS KNOWN:
1) TO BE FREE OF A CERTAIN DISEASE
2) TO BE ATTACKED BY THIS DISEASE.
THE PROGRAM CALCULATES THE INTERNAL VALIDATION OF THE FUNCTION, I.E.: VALUE OF X (DISPLAYED OR PRINTED) FOR EACH INDIVIDUAL OF THE SAMPLES; GROUPED MEANS OF X; COMMON VARIANCE DEGREES OF FREEDOM; R2 AND F. THE NECESSARY INGREDIENTS ARE READY FOR USE IN PART 2:EFFICACITY CURVE (WITHOUT TRANSCRIPTION).

110PROGRAM STEPS
RABELLE GUY
F-BEAUVAIS.

50148D 67-EFFICACITY CURVE FOR DISCRIMINATION FUNCTION.

THE DISCRIMINATION HAS BEEN VALIDATED IN PART 1. AN INDIVIDUAL IS NOW SUBMITTED TO THE SAME EXAMINATIONS AS THE TWO GROUPS MENTIONED IN PREVIOUS PART. THE FUNCTION AWARDS HIM THE MARK X. IN A NEO-BAYESIAN APPROACH, THIS PART CALCULATES THE PROBABILITY OF THE OBSERVED X BEING DUE TO CAUSE 1 (OR 2). INPUTS REQUIRED ARE: DEGREES OF FREEDOM; GROUPED MEANS OF X; SQUARE ROOT OF THE COMMON VARIANCE. THE VALIDATION PROVIDES THEM.

073PROGRAM STEPS
GUY RABELLE
F-BEAUVAIS.

50149D 67-NOISE FIGURE/TEMPERATURE INTERCONVERSION.

INTERCONVERSION BETWEEN NOISE FIGURE (NF), NOISE FACTOR (F) AND TEMPERATURE (K).

043PROGRAM STEPS
MARCEL BICHARA
CH-GENEVA.

50150D 67-COMPOSITE QUALITY-FACTOR Q.

CALCULATES THE COMPOSITE QUALITY FACTOR, Q, OF A VIBRATING SYSTEM COMPOSED OF NO MORE THAN THREE

50150D (CONTD)

STUCK TOGETHER BARS OF WHICH IS KNOWN THE QUALITY-FACTOR OF EACH, THEIR LENGTH AND THE FREQUENCY OF VIBRATION. ONE CAN CALCULATE THE COMPOSITE Q FOR ANY HARMONIC.

153PROGRAM STEPS
MARCEL BICHARA
CH-GENEVA.

50151D 67-DISCOUNTED CASH FLOW RETURN.

CALCULATES DISCOUNTED CASH FLOW RETURN (DCFR, ALSO KNOWS AS IRR OR IIR) AND PRESENT VALUES (PVP) FOR UP TO 38 UNEVEN CASH FLOWS (POSITIVE AND/OR NEGATIVE). PVP MAY BE OBTAINED AT ANY NUMBER OF RATES DISCOUNTED TO ANY YEAR. USER IS PROMPTED BY YEAR NUMBER ON INPUT, AND ALLOWED TO REVIEW AND MODIFY ENTRIES AS REQUIRED. TWO PROGRAM VERSIONS PROVIDED; A FAST 20 YEAR PROGRAM AND A SOMEWHAT SLOWER 38 YEAR PROGRAM.

218PROGRAM STEPS
L.FREDERICK COFFEY
UK-LONDON.

50152D 67-ORTHODROMY.

CALCULATES COURSE AND DISTANCE BETWEEN TWO POINTS; COORDINATES OF DESTINATION GIVEN ORIGIN, COURSE AND DISTANCE; COORDINATES OF ANY POINT OF GREAT CIRCLE JOINING TWO POINTS, GIVEN LATITUDE OR LONGITUDE. CORRECT COURSE DEVIATIONS. MAP OUT COMPLEX ROUTES BETWEEN TWO POINTS. WORK OUT ANY NUMBER OF STOPOVERS, AVOIDING DANGEROUS OR RESTRICTED AREAS. MAKE ALLOWANCE FOR AIRCRAFT CRUISING RADIUS. GO BACK AND TRY ALTERNATIVE ROUTES. CHANGE FINAL DESTINATION AT WILL.

224PROGRAM STEPS
CHARLES SCHREIDER
F-PARIS.

50153D 67-BIORHYTHMS AND COINCIDENCES.

THIS PROGRAM CALCULATES THE THREE DATES OF THE PHYSICAL (23 DAYS), SENSITIVITY (28 DAYS) AND COGNITIVE (33 DAYS) - CYCLES (BETWEEN MARCH 1 1900 AND FEBRUARY 28, 2100). YOU ALSO MAY CALCULATE THE COINCIDENCE OF TWO OF THE THREE CYCLES IN ONE OF FOUR POINTS (E.G.: MAXIMUM, MINIMUM, PASSING THE ZERO LINE).

220PROGRAM STEPS
LEO SCHOPF
A-VIENNA.

50154D 67-ROOTS OF A N-DEGREE POLYNOMIAL (N MAX=8) REAL OR COMPLEX COEFF.

THIS PROGRAM COMPUTES THE N-ROOTS OF A POLYNOMIAL OF DEGREE N(N-MAX =8) WITH REAL OR COMPLEX COEFFICIENTS. THE NEWTON FORMULA XI+1=XI - FXI F'XI TO MAKE BETTER AND BETTER APPROXIMATIONS OF THE ROOT IS USED.
YOU CAN FOLLOW THE EVOLUTION OF THE ROOT AND THE APPROXIMATIONS OR COMPUTE DIRECTLY THE ROOT. THE APPROXIMATION IS BETTER THAN 10**-3 . AN OTHER APPROXIMATION IS POSSIBLE IF YOU WANT IT.

205PROGRAM STEPS
JAN VAN THIELEN
B-STABROEK.

50155D 67-GENERALIZED GAMMA FUNCTION.

THIS PROGRAM APPROXIMATES THE VALUE OF GAMMA FUNCTION FOR ALL REAL NUMBERS LESSER THAN 70 AND LARGER THAN - 70.

172PROGRAM STEPS
OLIVIER LAMIT

50155D (CONTD)

F-PARIS.

50156D 67-SEXTANT ALTITUDES CORRECTIONS.

CORRECTION OF THE OBSERVED SEXTANT ALTITUDES (HO) BY THE SIMPLIFIED METHOD USED AT SEA, FOR SUN AND MOON (LOWER AND UPER LIMB), STARS AND PLANETS.

162PROGRAM STEPS
ROBERT FREDERIC MENZI
CH-GENEVA.

50157D 67-POLARIS LATITUDE.

LATITUDE DETERMINATION BY OBSERVATION OF THE POLARIS ALTITUDE.

083PROGRAM STEPS
ROBERT FREDERIC MENZI
CH-GENEVA

50158D 67-DISTANCE TO OBJECT BY VERTICAL SEXTANT ALTITUDE.

PROGRAM GIVES ANY ONE OF THE THREE FOLLOWING VARIABLES, IF THE TWO OTHERS AND THE HEIGHT OF EYE OF THE OBSERVER ARE ENTERED: 1. DISTANCE TO OBJECT SHORT OF OR BEYOND HORIZON IN NAUTICAL MILES.
2. HEIGHT OF THE OBJECT ABOVE SEA LEVEL IN METER.
3. VERTICAL SEXTANT ANGLE IN MINUTES OF ARC BETWEEN TOP OF OBJECT AND ITS BASE OF THE HORIZON.

103PROGRAM STEPS
DIETRICH ENSS
D-BARSBUETTEL.

50159D 97-MAH JONGG WIN CALCULATION.

THIS PROGRAM CALCULATES FOR EACH OF THE FOUR PLAYERS THE WINNING SCORE AFTER EACH GAME OF THE FAMOUS CHINESE TABLE GAME.

224PROGRAM STEPS
HELLMUT BOSTELMANN
D-BRAUNSCHWEIG.

50160D 67-GREATCIRCLE NAVIGATION AND PLOTTING NO.1 ALL MAIN PROBLEMS.

THIS PROGRAM CALCULATES ALMOST ALL POSSIBLE DATA OF A GREATCIRCLE WHICH IS DEFINED BY TWO POSITIONS. ENTRY IS LATITUDE AND LONGITUDE OF BOTH POSITIONS. OUTPUT IS TOTAL DISTANCE AND TRACK, VERTEX-COORDINATES, INTERMEDIATE DISTANCES, TRACKS AND COORDINATES.

224PROGRAM STEPS
HELLMUT MUELLER
D-DIETZENBACH.

50161D 67-GREATCIRCLE NAVIGATION AND PLOTTING NO.2 TWO DIFFER.PROBLEMS.

PROGRAM CALCULATES TWO DIFFERENT PROBLEMS:
A) COORDINATES OF A POSITION "B" DEFINED BY TRACK AND DISTANCE FROM POSITION "A".
B) GIVEN A GC-TRACK FROM 1 TO 2 IT CALCULATES THE FOLLOWING DATA OF ONE OR MORE ABEAM POSITIONS (3).
1. DISTANCE FROM 1 TO ABEAM 3
2. DISTANCE PASSING ABEAM 3
3. LAT. AND LONG. OF POS. M (ABEAM 3).

197PROGRAM STEPS
HELMUT MUELLER
D-DIETZENBACH.

50162D 67-OPERATIONAL STACK OF 4 COMPLEX NUMBERS.

THIS PROGRAM CREATES AN OPERATIONAL STACK OF 4 COMPLEX NUMBERS, SO THAT

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RPN CAN BE USED TO EVALUATE COMPLEX EXPRESSIONS. FUNCTIONS ARE:
1) ENTER; 2) ADD; 3) SUBTRACT;
4) MULTIPLY; 5) DIVIDE; 6) INVERSE;
7) SQUARE ROOT; 8) RAISE TO POWER;
9) ROLL DOWN THE STACK;
10) EXCHANGE X WITH Y REGISTERS.
THE STACK DROPS AFTER ANY TWO-NUMBER OPERATION.

099PROGRAM STEPS
ATTILIO FARINA
I-TORINO.

50163D 67-POLYNOMIAL CALCULATION BY NEWTON.

THIS PROGRAM SOLVES POLYNOMIALS DEGREE 8 AND BELOW BY MEANS OF AN APPROACHING METHOD BY NEWTON.

186PROGRAM STEPS
JOACHIM DOLIFF
D-HANNOVER.

50164D 67-MOLEKULAR WEIGHT AND PERCENTAGE FROM FORMULAR.

THE PROGRAM CALCULATES THE MOLEKULAR WEIGHT AND PERCENTAGE FROM THE FORMULAR.

096PROGRAM STEPS
ROLF HUELNHAGEN
D-DUESSELDORF.

50165D 67-NAVAL BATTLE.

ONE PLAYER IS THE ASSAILANT WHO TRY TO DESTROY ENEMY'S POSITIONS. FOR THAT, HE MOVES HIS THREE BATTLE SHIPS AND FIRE WITH THEIR GUNS. HE MUST ESCAPE HIDDEN MINEFIELD. THE OTHER PLAYER, THE OPPONENT, HAS A SUBMARINE WITH TORPEDOS AND A COAST BATTERY FOR DEFEND HIMSELF. THE BATTLE TAKES ON A 100X100 MAXIMUM GRID-MAP OF YOUR CHOICE, WITH COAST, PENINSULAS ISLANDS....

224PROGRAM STEPS
FRANCIS PARENT
F-STRASBOURG

50166D 97-FIRST KIND BESSEL FUNCTION FOR NONINTEGER ORDERS.

PROGRAM CALCULATES THE VALUE OF F(X) WHERE F=N+A FOR REAL X (-K<N<K AND -1.0<A<OR EQUAL 1.0).

207PROGRAM STEPS
KLAAS HUNTENDAM
NL-EINDHOVEN.

50167D 67-STATUS.

PROGRAM DISPLAYS (IN THE ORDER SHOWN) THE CONTENTS OF REGISTERS T,Z,Y,X,LAST X;I=25,E=24...,A=20, S9=19,...,S0=10,9,...,0 AS AN EXTENSION OF THE G-STK AND H-REG COMMANDS (FOR THE -97, THE PROGRAM PRINTS THE CONTENTS). A FEATURE TO DISPLAY THE FLAG STATUS (1 FOR SET, 0 FOR CLEAR) AND THE ANGLE MODE (0 FOR DEG, 1, FOR RAD AND 2 FOR GRD) IS INCLUDED.

223PROGRAM STEPS
HELLMUTH DECKERS
D-MAINZ.

50168D 67-PARABOLIC CURVE FIT.

FOR A SET OF DATA POINTS THIS PROGRAM FITS A PARABOLA BY A LEAST SQUARES PROCEDURE. IT CALCULATES THE REGRESSION COEFFICIENTS AND THE COEFFICIENT OF DETERMINATION. ALSO PROJECTIONS OF Y VALUES CAN BE MADE.

205PROGRAM STEPS
ERIK GJOE GELEFF
DK-RUNGSTED.

50169D 67-INTERPOLATION USING AITKEN FORMULA

THIS PROGRAM USES THE AITKEN INTERPOLATION FORMULA TO APPROXIMATE THE Y VALUE FOR A GIVEN X VALUE. IT USES FIVE SETS OF X AND Y DATA WITH UNIFORMLY SPACED ABSCISSAE AS INPUT.

141PROGRAM STEPS
M. HOOIJBERG
NL-DRUNEN

50170D 67-ACOUSTIC POSITIONING CALCULATION AND L.S. ADJUSTMENT.

THIS PROGRAM CALCULATES THE POSITION OF A SHIP BY MEANS OF ACOUSTIC SLANT RANGES TO TWO OR MORE TRANSPONDERS. THE FINAL POSITION IS ADJUSTED BY MEANS OF THE LEAST SQUARES METHOD, AND THE STANDARD ERRORS OF THE ADJUSTED VALUES ARE CALCULATED.

223PROGRAM STEPS
M. HOOIJBERG
NL-DRUNEN.

50171D 97-6X6 MATRIX OPERATIONS.

PROGRAM CALCULATES THE INVERSE OF A SYMMETRIC 6X6 MATRIX, AND SOLVES A SYSTEM OF 6 SIMULTANEOUS EQUATIONS IN 6 UNKNOWNS, BY MULTIPLYING THE INVERSE MATRIX WITH A 6-ELEMENT-VECTOR.

874PROGRAM STEPS
GEORG RAABE
D-BRAUNSCHWEIG.

50172D 67-CARDIOVASCULAR DISEASE RISK.

THIS PROGRAM COMPUTES THE PROBABILITY OF DEVELOPING A CARDIOVASCULAR DISEASE WITHIN EIGHT YEARS BY ENTERING: SEX,AGE, SERUM CHOLESTEROL, SYSTOLIC BLOOD PRESSURE, LEFT VENTRICULAR HYPERTROPHY, GLUCOSE INTOLERANCE AND CIGARETTE SMOKING.
COMPUTED IS ALSO THE AVERAGE RISK TO A PERSON OF THAT AGE AND THE RELATIVE RISK. ONE PROGRAM CARD AND ONE DATA CARD.

148PROGRAM STEPS
ROELF BACKUS
NL-SCHIEDAM.

50173D 97-BOUNDARY-VALUE PROBLEMS FOR Y''=F(X,Y,Y').

THIS PROGRAM MAY BE USED TO SOLVE DIFFERENTIAL EQUATIONS OF SECOND ORDER WITH INHOMOGENEOUS BOUNDARY CONDITIONS.

147PROGRAM STEPS
KURT HAWLITSCHEK
D-ULM-LEHR.

50174D 97-BODE-PLOTS FOR LINEAR RATIONAL SYSTEMS UP TO 5TH ORDER.

THE PROGRAM COMPUTES THE BODE-PLOTS FOR LINEAR RATIONAL SYSTEMS UP TO FIFTH ORDER. INPUT DATA ARE THE ORDER AND THE COEFFICIENTS OF THE NUMERATOR AND THE DENOMINATOR POLYNOMIALS PLUS THE STARTING VALUE OF THE ANGULAR FREQUENCY AND THE TOTAL NUMBER AND THE NUMBER PER DECADE OF FREQUENCY POINTS. THE OUTPUT CONSISTS EITHER OF THE ABSOLUTE VALUE (IN DECIBEL) AND THE PHASE ANGLE OR OF THE REAL AND IMAGINARY PART OF THE FREQUENCY RESPONSE.

223PROGRAM STEPS
FRANK DOERRSCHEIDT
D-PADERBORN.

50175D 67-ARITHMETICAL AND GEOMETRICAL PROGRESSION.

THE PROGRAM COMPUTES THE UNKNOWN VALUES OF A1, D OR Q, N, AN, SN. YOU CAN GET THE VALUES FOR ARITHMETICAL AND/OR GEOMETRICAL PROGRESSION. YOU CAN CHANGE ONLY ONE OF THE GIVEN DATAS. (3).

217PROGRAM STEPS
JURGEN BAUERMEISTER
D-GOSLAR.

50176D 97-CHECKDIGIT SYSTEM BY MODULO 11.

OFTEN IT IS NECESSARY TO PROTECT NUMBERS AGAIN INPUT ERRORS IN EDP SYSTEMS. THIS PROGRAM CHECKS A GIVEN NUMBER, COMPLETES A GIVEN NUMBER AND PRINTS A CATALOGUE OF RIGHT NUMBERS BY MODULO 11 CHECKDIGIT SYSTEM.

142PROGRAM STEPS
WERNER SCHULZE
D-BIELEFELD.

50177D 67-PARALLEL CONNECTION OF RESISTORS

THE PROGRAM CALCULATES THE VALUE OF TWO RESISTORS WHICH CONNECTED IN PARALLEL RESULT IN A PARTICULAR WANTED RESISTOR.

224PROGRAM STEPS
ALEXANDER WEIGELT
CH-ST GALLEN.

50178D 67-RANGING UP TO 48 INTEGERS.

PROGRAM RANGES DECREASING A SET OF UP TO 48 INTEGERS < 100,000.

107PROGRAM STEPS
LAZARE SAPORTA
F-LA TRONCHE.

50179D 67-STREAM NAVIGATION II (COMPASS COURSE, COURSE OVER GROUND).

COMPUTES COMPASS COURSE FROM COURSE OVER GROUND, OR COURSE OVER GROUND FROM COMPASS COURSE. THE PROGRAM CONTAINS THE DEVIATION CURVE USED BY THE CRUISING CLUB OF SWITZERLAND FOR ITS NAVIGATION COURSES, BUT ANY DEVIATION CURVE MAY BE USED.

215PROGRAM STEPS
ROBERT FREDERIC MENZI
CH-GENEVA.

50180D 97-SUNRISE SUNSET AND TWILIGHT.

THIS PROGRAM CALCULATES IN STANDARD TIME(ROUNDED TO MINUTES) THE TIMES WHEN TWILIGHT BEGINS, THE SUN RISES THE SUN IS HIGHEST, THE SUN GOES DOWN, TWILIGHT ENDS. INPUT DATA ARE LATITUDE AND LONGITUDE OF OBSERVER, TIME ZONE AND DATE. COEFFICIENTS USED IN THE CALCULATION ARE STORED ON A DATA CARD, WHICH MAY CONTAIN PARTS OF THE INPUT DATA. CALCULATED TIMES ARE ACCURATE WITHIN 2 MINUTES.

224PROGRAM STEPS
GUENTER SCHNELL
D-LILIENTHAL.

50181D 67-GOLDEN SEARCH OF A MAXIMUM.

THIS PROGRAM FINDS THE MAXIMUM OF A USER SUPPLIED UNIMODAL FUNCTION UP TO A GIVEN RESOLUTION. THIS IS DONE BY MEANS OF THE NEAR TO OPTIMUM, GOLDEN SECTION SEARCH. A TEST FUNCTION IS GIVEN WITH THE PROGRAM WHICH ALLOWS THE USER TO PLAY A WIDE RANGE INTEGER GUESSING GAME.

110PROGRAM STEPS
DIDIER PELAT
F-MEUDON.

50182D 67-DIFFERENTIAL EQUATIONS.

THE PROGRAM SOLVES UP TO FOURTH ORDER DIFFERENTIAL EQUATIONS BY THE FOURTH-ORDER RUNGE KUTTA METHOD.

187PROGRAM STEPS
AUNE SIGVARD
S-OREBRO.

50183D 67-LEARNING CURVES AND DECREASE OF PRODUCTION TIMES.

THIS PROGRAM CALCULATES AND SUCCESSIVELY SHOWS THE AVERAGE UNIT TIMES, THE AVERAGE TOTAL TIMES AND THE SUM OF CORRESPONDING HOURS PER RUN OF PRODUCTS. IT CALCULATES THE TOTAL SUM OF PRODUCTIVE HOURS FOR ALL THE RUNS AND THE CORRESPONDING AVERAGE TOTAL TIME FOR A GIVEN FINANCIAL YEAR. THE FORMULATION IS IN ACCORDANCE WITH WRIGHT'S LAW. THIS PROGRAM ALLOWS SEARCHING EACH FACTOR OF THE BASIC FORMULA BEFORE GENERAL CALCULATION.

221PROGRAM STEPS
FRANCOIS LEFEBVRE
F-CHALLANS.

50184D 67-PULSE WIDTH MODULATOR.

PROGRAM HELPS DESIGNING THE MOST SIMPLE NON-LINEAR PULSE WIDTH MODULATOR CIRCUIT FOR HIGHLY LINEAR PERFORMANCE.

102PROGRAM STEPS
FRANZ WALLNER
D-BERLIN.

50185D 67-QUARTIC COMPLEX EQUATION.

THIS PROGRAM SOLVES A QUARTIC EQUATION WITH COMPLEX PARAMETERS SPECIAL CARE HAS BEEN USED TO OBTAIN GOOD ACCURACY.

332PROGRAM STEPS
ATTILIO FARINA
I-TORINO.

50186D 67-GAMMA AND POLY GAMMA FUNCTIONS.

THE PROGRAM COMPUTES VALUES OF GAMMA, DIGAMMA OR TRIGAMMA FUNCTIONS, WITH VERY GOOD ACCURACY, FOR AN ARGUMENT LESS THAN 70, DIFFERENT FROM ZERO OR NEGATIVE INTEGER.

223PROGRAM STEPS
JEAN BARFETY
F-LE RAINCY.

50187D 97-CURVE FITTING BY POLYNOM OF 5TH ORDER.

PROGRAM APPROXIMATES GIVEN VALUES IN A SYSTEM OF LINEAR COORDINATES TO A POLYNOMIAL FUNCTION OF DEGREE 5. TO RUN THE PROGRAM YOU NEED PROGRAM NUMBER 50171 D: 6X6 MATRIX OPERATIONS.

224PROGRAM STEPS
GEORG RAABE
D-BRAUNSCHWEIG.

50188D 67-BOOLEAN/SWITCHING ALGEBRA AND LOGIC PUZZLES.

THIS PROGRAM COMPUTES THE TRUTH-TABLE OF A BOOLEAN FUNCTION WITH UP TO 24 (INPUT OR INTERNAL) VARIABLES, COMPUTES THE TRUTH-VALUE OF A SYSTEM OF LOGICAL STATEMENTS (AS IN LOGICAL PUZZLES). PERMUTATIONS OF THE INPUT VARIABLES ARE GENERATED BY A FAST CASCADING SUBROUTINE. TWO OUTPUT-ROUTINES ARE AVAILABLE (DEPENDING ON THE NUMBER OF INPUT VARIABLES). NINE LOGICAL OPERATION ARE AVAILABLE.

098PROGRAM STEPS

50188D (CONTD)

JIM R. KUTSCHERA
D-FRANKFURT.

50189D 67-INTEGER SOLUTIONS TO LINEAR EQUATIONS & GRTST CMMN DIVISOR

THE PROGRAM USES DIOPHANTINE ANALYSIS TO FIND INTEGER SOLUTIONS TO EITHER (I) A LINEAR EQUATION WITH TWO UNKNOWNS, OR (II) A PAIR OF SIMULTANEOUS LINEAR EQUATIONS WITH THREE UNKNOWNS. IT ALSO CALCULATES THE GREATEST COMMON DIVISOR OF A SET OF POSITIVE NUMBERS (NOT NECESSARILY INTEGERS).

206PROGRAM STEPS
JAMES P.H. HIRST
UK-ESHER.

50190D 97-DESCRIBING-FUNCTION FOR GENERALIZED RELAY CHARACTERISTIC.

THE DESCRIBING-FUNCTION N(A) OR THE NEGATIVE INVERSE DESCRIBING-FUNCTION NJ(A) FOR THE GENERALIZED RELAY CHARACTERISTIC IS COMPUTED. INPUT DATA ARE THE STARTING VALUE OF THE INPUT AMPLITUDE, THE INCREMENT OF AMPLITUDE, THE TOTAL NUMBER OF AMPLITUDE STEPS AND THE ACTUAL FORM (IDEAL, WITH HYSTERESIS WITH DEADSPACE, WITH DEADSPACE AND HYSTERESIS) AND THE PARAMETERS OF THE RELAY CHARACTERISTIC.

223PROGRAM STEPS
FRANK OGERRSCHEIDT
D-PADERBORN.

50191D 97-BOUNDARY VALUE PROBLEMS FOR INHOMOGEN, HEAT FLOW EQUATIONS.

THE PROGRAM COMPUTES THE SOLUTION OF THE PARABOLIC DIFFERENTIAL EQUATION.

143PROGRAM STEPS
KURT HAWLITSCHEK
D-ULM-LEHR.

50192D 67-TRANSISTOR H-PARAMETERS FOR SERIES-FEEDBACK.

THE PROGRAM CALCULATES THE H-PARAMETERS FOR SERIES FEEDBACK FROM THE TRANSISTOR-PARAMETERS AND THE EMITTER-RESISTANCE AND ENABLES IN CONJUNCTION WITH PROGRAM 00023 D THE CALCULATION OF THE TRANSISTOR AMPLIFIER PERFORMANCE WITH SERIES-FEEDBACK.

220PROGRAM STEPS
JURGEN NORRENBERG
TANZANIA - DAR ES SALAAM.

50193D 67-RAY TRACING FOR REFRACTOR DESIGNING.

THIS PROGRAM CALCULATES SPHERICIAL ABBERATION AND COMA FOR A GIVEN SET OR SYSTEM OF LENS PROVIDING THAT RADI; INDEX OF REFRACTION, SPACING OF LENS AND INCIDENT RAY ANGLE IS KNOWN., THE PROGRAM IS DIVIDED INTO TWO PARTS. ONE FOR ATM'S WHO WISH TO DESIGN A TELESCOPE OBJECTIVE AND THE SECOND PART IS FOR AN ARBITRARY SYSTEM (ATM=AMATEUR TELESCOPE MAKER).

637PROGRAM STEPS
JEROME LAUFER
F-ANGERS.

50194D 97-5X5 MATRIX OPERATIONS WITH NOT-SYMMETRIC COEFFICIENTS.

THIS PROGRAM CALCULATES THE INVERSE OF A 5X5 MATRIX WITH NOT-SYMMETRIC COEFFICIENTS, AND SOLVES A SYSTEM OF 5 SIMULTANEOUS EQUATIONS IN 5 UNKNOWNS. ALL SOLUTIONS ARE SAVED IN REGISTERS OR ON CARD.

820PROGRAM STEPS

50194D (CONTD)

GEORG RAABE
D-BRAUNSCHWEIG.

50195D 97-N-TH DEGREE POLYNOMIAL N<= 10 BAIRSTOW METHOD.

PROGRAM CALCULATES ALL ROOTS OF POLYNOMIALS UP TO 10TH DEGREE (REAL AND/OR COMPLEX ROOTS) THE PROGRAM CAN BE USED IN CONJUNCTION WITH PROGRAM 50196 D (4TH-DEGREE POLYNOMIAL) FOR GETTING THE SOLUTION FASTER, BUT ITS NOT NECESSARY.

216PROGRAM STEPS
NORBERT GERBER
D-REMAGEN.

50196D 97-4TH DEGREE POLYNOMIAL.

PROGRAM CALCULATES THE REAL AND/CR COMPLEX ROOTS OF 2ND, 3RD OR 4TH DEGREE POLYNOMIALS WITHOUT ITERATION.

201PROGRAM STEPS
NORBERT GERBER
D-REMAGEN.

50197D 67-CALCULATE POINTS DETERMINED IN A NET OF A LIGNING BASES SU 1.

IT CALCULATES THE DISTANCE BETWEEN STARTING POINT AND ENDPOINT, THE DISTANCE ERROR, THE MAXIMAL DISTANCE ERROR, THE COORDINATES OF THE BASE POINT, THE COORDINATES OF THE LATERAL POINTS, THE GRID-BEARING OF THE SIDE A-B AND THE TRIG. FUNCTION. IF YOU KNOW THE COORDINATES OF THE LATERAL POINTS, IT WILL BE POSSIBLE TO CALCULATE THE COORDINATES OF THE BASE-POINT AND THE DISTANCE TO A AND THE LENGTH OF THE LATERAL SIDE.

222PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

50198D 67-CALCULATION OF AREAS SU2.

THE PROGRAM CALCULATES AREAS, WITH COORDINATES (WITH THE GAUSSIAN TRIANGLE FORMULA, AND IT CALCULATES THE DISTANCE BETWEEN TWO POINTS). OF TRAPEZIUMS (NORMAL AND CROSSED), OF CIRCLES, OF CIRCLE SEGMENTS (THE PROGRAM CALCULATES ALSO THE CENTRAL ANGLE, THE ARC LENGTH AND THE MID ORDINATE), OF TRIANGLES WITH TWO DISTANCES AND ONE ANGLE (SAS),WITH TRIANGLE SIDES.

186PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

50199D 67-TRANSFORM RECTANGULAR AND POLAR COORDINATES SU 3.

THE PROGRAM CHANGES POLAR COORDINATES IN RECTANGULAR COORDINATES AND RECTANGULAR COORDINATES IN POLAR COORDINATES. IT IS POSSIBLE TO BEGIN EITHER WITH TWO BASE-POINTS OR WITH ONE BASE POINT AND THE GRID-BEARING. THE PROGRAM CALCULATES THE DISTANCE,THE TRAVERSE ANGLES AND THE GRID-BEARINGS, OR THE COORDINATES YX OF THE NEW-POINT.

097PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

50200D 67-PYTHAGOREAN TRIPLETS.

PYTHAGOREAN TRIPLETS (P,Q,R)SATISFY P**2 = Q**2+R**2, P=A**2+B**2, Q=2AB, R=A**2-B**2, WHERE HCD(A,B)= 1 & A+B IS ODD.THIS PROG.GIVES (1) A LIST OF TRIPLETS, STARTING FROM A GIVEN INTEGER A; (2) ALL TRIPLETS WITH A GIVEN P; (3) ALL TRIPLETS

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WITH A GIVEN Q; (4) ALL TRIPLETS WITH A GIVEN R.

172PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

50201D 67-CENTER OF GRAVITY.

GIVEN F(X) AND F'(X) AND AN INTERVAL (A,B), WHERE F(X) AND F'(X) ARE CONTINUOUS, THIS PROGRAM FINDS THE ORTHONORMAL COORDINATES OF THE CENTERS OF GRAVITY:
(1) OF THE PLANE SURFACE S, BORDERED BY Y=F(X), Y=0, X=A, X=B,
(2) OF THE VOLUME, OBTAINED BY REVOLVING S AROUND THE X-AXIS;
(3) OF THE PART OF THE CURVE F(X) BETWEEN THE POINTS WITH ABSCISSA'S A AND B;
(4) OF THE SURFACE OF REVOLUTION, GENERATED BY THE ARC SUB (3), WHEN REVOLVING AROUND THE X-AXIS.

139PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

50202D 67-SKITTLE SCORE KEEPER.

THE SCORES OF UP TO NINETEEN PLAYERS ARE KEPT AND UPDATED SEPARATELY, THE PROGRAM COMPUTES AT ANY TIME FOR ANY PLAYER THE AVERAGE COUNT (NO OF HITS DIVIDED BY NO OF THROWS) AND GIVES THE PLACE OF THAT PLAYER. ALSO THE TOTAL AVERAGE (OF ALL PLAYERS) IS GIVEN.

076PROGRAM STEPS
DIETRICH ENSS
D-BARSBUETTEL.

50203D 67-RUNNING FIX.

PROGRAM GIVES TRUE BEARING AND DISTANCE IN N.MILES TO ANY OBJECT FOR THE TIME OF THE LATEST BEARING. IF THE COORDINATES OF THE OBJECT HAVE BEEN ENTERED THE SHIP'S POSITION (LAT.AND LONG.) IS ALSO GIVEN. FURTHERMORE THE COURSE MADE GOOD (OR CHART COURSE) MAY BE RECALLED.

135PROGRAM STEPS
DIETRICH ENSS
D-BARSBUETTEL.

50204D 67-SIGHT REDUCTION I.

PROGRAM REDUCES EITHER ONE OR TWO SEXTANT ALTITUDES TO TRUE ALTITUDES WHICH ARE USED FOR COMPUTATION OF A LINE OF POSITION OR OF FIX IN FOLLOWING PROGRAMS.

208PROGRAM STEPS
DIETRICH ENSS
D-BARSBUETTEL.

50205D 67-SIGHT REDUCTION II - LINE OF POSITION.

THIS PROGRAM IS TO BE USED IN SEQUENCE TO PROGRAM SIGHT REDUCTION I. IT GIVES THE ELEMENTS OF A LINE OF POSITION FROM A SIGHT, EXPRESSED IN ONE POINT ON THAT LINE (LATITUDE AND LONGITUDE) AND IN THE DIRECTION OF THE LINE POSITION.

090PROGRAM STEPS
DIETRICH ENSS
D-BARSBUETTEL.

50206D 67-SIGHT REDUCTION III - FIX.

THIS PROGRAM IS TO BE USED IN SEQUENCE TO PROGRAM SIGHT REDUCTION I, IT GIVES A FIX FROM TWO ASTRONOMICAL SIGHTS, IF THE SHIP WAS SAILING BETWEEN OBSERVATIONS AND DATA WERE ENTERED THE FIRST ALTITUDE WILL BE CORRECTED

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ACCORDINGLY, IF A DEAD RECKONING POSITION WAS ENTERED THE ERROR IN DEAD RECKONING POSITION WILL BE GIVEN.

224PROGRAM STEPS
DIETRICH ENSS
D-BARSBUETTEL.

50207D 67-EARTH'S BULKHEAD DESIGN.

OIPTIMAL DESIGNING PROGRAM OF A BULKHEAD BASED ON RECURRENT ANALYSIS WITH VERTICAL INTERIOR PARAMETER.

202PROGRAM STEPS
DANIEL BASTIDA OBIOLS
SPAIN - BARCELONA.

50208D 67-CLOTHOIDA AND PARALLELS' LAYOUT.

ENTERS: COORDINATES OF CLOTHOIDA ORIGIN, ONE POINT OF ORIGIN TANGENT CLOTHOIDA PARAMETRE A, WISE. SET OF PROGRAMS WHICH GIVES IN THE MOST DEVELOPED PART: FOR A LENGHT "L" ON THE CLOTHOIDA, "D" DISTANCE OF THE TWO PARALLELS, "D" DISTANCE BETWEEN RESEARCHED POINTS ON CLOTHOIDA: RADIUS AND ANGULUS FROM ORIGIN, COORDINATES IN THE ORIGIN TANGENT SYSTEM, BEND, TANGENTS ANGULUS, COORDINATES IN LOCAL SYSTEM, COORDINATES OF PARALLELS POINTS AND SAME RESULTS FOR NEXT POINTS.

217PROGRAM STEPS
PIERRE SILVAN
F-CHAMBERY.

50209D 67-GC-NAV. NO.3 CROSSPOINT OF TWO GREATCIRCLES.

PROGRAM CALCULATES THE COORDINATES OF THAT POINT, WHERE TWO GREAT-CIRCLES ARE CROSSING,BOTH VERTEX DATA NEEDED THEREFORE ARE CALCULATED BY THE FIRST PART. IF THESE DATA ARE KNOWN BY ANY OTHER SOURCE, THEY CAN BE FED IN DIRECTLY.

223PROGRAM STEPS
HELMUT MUELLER
D-DIETZENBACH.

50210D 97-OPTIMIZATION (HOOKE AND JEEVES METHOD).

THIS PROGRAM SEARCHES FOR A MINIMUM OF A USER SUPPLIED FUNCTION. ACCORDING TO THE METHOD OF "HOOKE AND JEEVES" UP TO 5 INDEPENDENT VARIABLES CAN BE USED.

154PROGRAM STEPS
H.P. FRANSEN
NL-DEN HAAG.

50211D 97-KT-KQ-J VALUES FOR SHIP-PROPELLERS.

GIVEN ALL BUT ONE OF THE VARIABLES USED IN THE THREE BASIC EQUATIONS FOR CALCULATING THE KT-KQ AND J VALUES, THE PROGRAM CALCULATES THE MISSING ONES. ALSO THE POWER NEEDED AND THE PROPELLER EFFICIENCY CAN BE CALCULATED.

216PROGRAM STEPS
H.P. FRANSEN
NL-DEN HAAG

50212D 67-CURVE IN DB FOR A RIAA CORRECTION MAG-CELL FILTER.

THIS PROGRAM COMPUTES DIFFERENT POINTS (IN DECIBEL) OF A RIAA CORRECTION CURVE (FREQUENCY FUNCTION) FOR A GIVEN SET OF R/C VALUES OF THE FILTER. MAY BE USED FOR CHECK A HI-FI PRE-AMPLIFIER MAGNETIC-CELL INPUT.

081PROGRAM STEPS

50212D (CONTD)

ALAIN PINAUD
F-PLAISIR.

50213D 67-R,C,TIME COMPUTATION FOR A TTL ONE-SHOT SN 74123.

GIVEN TWO VARIABLES (R,C,T) AND THE PROGRAM COMPUTES THE THIRD. IF A DIODE IS USED (C=ELECTROLYTIC CAPACITOR), KEY "D" ALTERS A CONSTANT IN THE PROGRAM.

085PROGRAM STEPS
ALAIN PINAUD
F-PLAISIR.

50214D 97-BESSEL FUNCTIONS FRACTIONAL.

THIS PROGRAM COMPUTS THE BESSEL FUNCTIONS JV WHERE V IS A POSITIVE OR NEGATIVE AND FRACTIONAL ORDER AND X IS POSITIVE.

218PROGRAM STEPS
PETER MILING
D-LIPPSTADT.

50215D 67-PERMISSIBLE NOISE EXPOSURES REGARDING ISO RIGGG AND OSHA.

PROGRAM CALCULATES THE SOUND-DOSE AS A FUNCTION OF SOUND PRESSURE LEVEL AGAINST EXPOSURE TIME BASED ON:
ISO-R-IGGG "ASSESSMENT OF OCCUPATIONAL NOISE EXPOSURE FOR HEARING CONSERVATION PURPOSES (EUROPE) AND OCCUPATIONAL SAFTEY AND HEALTH ACT (OSHA), SUCCEEDING THE WALSH HEALEY ACT IN NORTH AMERICA.

150PROGRAM STEPS
P.L.V.D. WOUDE
NL-TETERINGEN.

50216D 67-EXPANDED OPERATIONAL STACK OF SIX COMPLEX NUMBERS.

BOTH REGISTERS R1 TO R9 AND X,Y,Z,T CREATE AN OPERATIONAL STACK FOR EVALUATIONS OF COMPLICATED EXPRESSIONS WITH COMPLEX NUMBERS (UP TO SIX) BY RNP.
FUNCTIONS ARE: ENTER (TO BE USED ONLY FOR MEMORIZATIONS OF A NEW COMPLEX NUMBER BEFORE OR DURING A CALCULUS), ADD, SUBTRACT,MULTIPLY, DIVIDE,RAISE A COMPLEX NUMBER TO A COMPLEX POWER (RECIPROCAL, NEPERIAN LOG. AND N-ROOTS).

221PROGRAM STEPS
GIANCARLO CORDONI
I-MONTEBELLUNA.

50217D 97-EARTH-PRESSURE COEFFICIENTS.

PROGRAM CALCULATES THE COEFFICIENTS OF EARTH PRESSURE (ACTIVE AND PASSIVE); THE FRACTION OF THE EARTH PRESSURE RESULTING FROM COHESION AND THE ANGLE OF THE MOVING SOIL-WEDGE.

189PROGRAM STEPS
GEORG RAABE
D-BRAUNSCHWEIG.

50218D 67-DISCRETE CUBICAL INTEGRATION AND INTERPOLATION.

INTEGRATES OVER A GIVEN INTERVAL, IF FOUR OR MORE FUNCTIONAL VALUES ARE KNOWN. REQUIRES NEITHER EQUAL SPACING NOR THE FUNCTIONAL VALUES OF THE ENDPOINTS. NO UPWARD LIMIT ON THE NUMBER OF POINTS USED. THE INTEGRAND IS APPROXIMATED SEGMENTWISE WITH EXACT-FITTING CUBICAL POLYNOMIALS, WHOSE COEFFICIENTS ARE EXPLICITLY CALCULATED. ADDITIONAL FEATURES ARE CUBICAL INTERPOLATION AND INTEGRATION OVER SMALL INTERVALS.

195PROGRAM STEPS

50218D (CONTD)

VOLKER MULTHOPP
D-UELZEN.

50219D 97-INCOMPLETE BETA FUNCTION.

PROGRAM EVALUATES THE INCOMPLETE BETA FUNCTION. CUMULATIVE BINOMIAL DISTRIBUTION, STUDENT'S T-DISTRIBUTION, F-DISTRIBUTION, BETA FUNCTION (FOR BOTH ARGUMENTS POSITIVE) AND GAMMA FUNCTION (0<X<70) CAN ALSO BE EVALUATED WITH THE PROGRAM TYPICAL EXECUTION TIMES ARE ABOUT 1.5 MINUTES.

204PROGRAM STEPS
KIM KARLIN
FINLAND - TURKU.

50220D 97-SPHERICAL HARMONICS.

THIS PROGRAM WILL COMPUTE THE SPHERICAL HARMONICS FOR ANY L & M, NON NEGATIVE INTEGERS, AND FOR ANY REAL ANGLES THETA AND PHI.

112PROGRAM STEPS
CLAUDIC BENSKI
F-GRENOBLE.

50221D 97-EXCHANGE RATES.

EXCHANGE RATES OF DIFFERENT COUNTRIES, PLEASE NOTICE THAT THIS PROGRAM CAN BE USED FOR ANY CHANGING YOU WOULD LIKE TO DO, FOR EXAMPLE: LENGTH, WEIGHT, PRESSURE, CUBIC UNITS AND POWER. WE ENCLOSED FOR EXAMPLE OUR CARD FOR LENGTH CHANGING. ONLY THE PART FOR THE DATE IS MISSING. THE REST OF THE PROGRAM IS IDENTICALLY THE SAME. ONLY THE NUMBER OF STEPS IS IN THESE CASES 105.

110PROGRAM STEPS
KNAEPPER FRED
SPAIN - MADRID.

50222D 67-CORRELATED RANDOM NUMBERS.

PROGRAM PRODUCES PAIRS (W1,W2) OF STANDARDIZED NORMALLY DISTRIBUTED RANDOM NUMBERS WITH GIVEN CORRELATION COEFFICIENT RHO. IT MAY ALSO BE USED AS A SUBROUTINE (E.G. FOR A SIMULATION PROBLEM) USING ONLY 69 PROGRAM STEPS. THE PROGRAM CALCULATES THE MEANS OF W1 AND W2, THE STANDARD DEVIATIONS OF W1 AND W2 AND THE CORRELATION COEFFICIENT R(W1,W2) OF A SAMPLE OF SIZE N.

110PROGRAM STEPS
DIETER WICKMANN
D - AACHEN.

50223D 67-ADIABATE AND ISOTHERME COMPRESSION FOR IDEAL GAS.

CALCULATES FOR IDEAL GAS:
ADIABATIC DISCHARGE TEMPERATURE FOR THE COMPRESSION AND THE EXPANSION.
IT ALSO CALCULATES THE ADIABATIC AND ISOTHERME COMPRESSION'S POWER INPUT AND EXPANSION'S POWER OUTPUT.

080PROGRAM STEPS
HANS-RUDOLF JOST
CH - MUENCHENSTEIN.

50224D 67-GEODIMETER 6/A.

THIS PROGRAM COMPUTES THE SLOPE DISTANCE FROM THE READINGS GIVEN BY A GEODIMETER MODEL 6A. IF THE APPROXIMATE DISTANCE IS KNOWN, ONLY PHASE READINGS ON 3 FREQUENCIES ARE NECESSARY. A ROUTINE IS INCLUDED FOR CALCULATING THE METEOROLIGICAL CORRECTION.

213PROGRAM STEPS
TONY NORRIE
SEYCHELLES - VICTORIA.

50225D 67-FIBONACCI NUMBERS.

THIS PROGRAM COMPUTES ALL FIBONACCI-NUMBERS BETWEEN TWO INTERGERS, THE NUMBER OF THEM, FINDS IF AN INTEGER IS A FIBONACCINUMBER AND HIS RANGENUMBER.

125PROGRAM STEPS
RONALD VAN THIELEN
B - STABROEK.

50226D 67-FOOTBALL-BASKETBALL-AND VOLLEYBALLGAMES.

WITH THIS PROGRAM YOU CAN PLAY A FOOTBALL-A BASKETBALL- OR A VOLLEYVALLGAME. THE PSEUDORANDOM NUMBER GENERATOR OF THE HP PROGRAM NO. 00104 D IS USED. THE STRUCTURE OF THE PROGRAM IS SO THAT THE "HOMECLUB" AS A SMALL ADVANTAGE. YOU CAN ALSO SELECT ANOTHER SEED AND YOU TEST HIM.

213PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50227D 67-GEOCENTRIC COORDINATES OF PLANETS AND COMETS.

THIS PROGRAM COMPUTES THE GEOCENTRIC RIGHT ASCENSION AND DECLINATION WITHOUT PERTURBATIONS FOR ALL PLANETS, ASTEROIDS, AND PERIODIC COMETS. REQUIRED DATA ARE THE ORBIT DATES, WHICH ONLY ONCE MUST BE PREPARED BY THE PREPROGRAM (17 STEPS). THE PROGRAM DESCRIPTION INCLUDES THE PRESENT ORBIT DATES FOR ALL PLANETS (AND FOR COMET HALLEY 1985/86) AND THE YEARLY ALTERATION VALUES; SO POSITIONS OF FORMER OR LATER YEARS CAN BE COMPUTED, TOO.

172PROGRAM STEPS
LOTHAR BUETTNER
D - OBERHAUSEN.

50228D 97-5 SIMULTANEOUS EQUATIONS IN 5 UNKNOWNS.

THE CALCULATOR INSTRUCTS THE USER WHICH DATA VALUE TO ENTER, BY DISPLAYING THE INDICES UNTIL ALL VALUES HAVE BEEN ENTERED. THE ANSWER WILL THEN BE PRINTED.

193PROGRAM STEPS
NORBERT GERBER
D - REMAGEN.

50229D 97-6 SIMULTANEOUS EQUATIONS IN 6 UNKNOWNS.

THE CALCULATOR INSTRUCTS THE USER WHICH DATA VALUE TO ENTER, BY DISPLAYING THE INDICES UNTIL ALL VALUES HAVE BEEN ENTERED. THE ANSWER WILL THEN BE PRINTED OUT.

224PROGRAM STEPS
NORBERT GERBER
D - REMAGEN.

50230D 97-SPHERICAL DEWAR CONTAINER LEVEL GAUGE.

THIS PROGRAM COMPUTES THE DISTANCES (IN MM) BETWEEN THE MARKS TO BE MADE ON A LEVEL SCALE, CORRESPONDING TO FIXED VALUES OF THE CONTENT (IN LITERS) OF A SPHERICAL LIQUID CONTAINER (LIKE MANY DEWARS FOR LIQUIFIED GASES).

207PROGRAM STEPS
FRANCOIS HAENSSLER
CH - GENEVE.

50231D 67-DIFFERENTIAL PROBLEMS.

THIS PROGRAM SOLVES SYSTEMS OF ONE, TWO, THREE AND FOUR DIFFERENTIAL

50231D (CONTD)

EQUATIONS OF FIRST ORDER BY THE FOURTH ORDER RUNGE-KUTTA METHOD. THEREFORE MANY DIFFERENTIAL PROBLEMS OF HIGHER ORDER CAN BE RESOLVED BY MEANS OF THIS PROGRAM.

140PROGRAM STEPS
UBALDO NOCERA
I - TUGLIE.

50232D 97-DIRECT PIAL COMPILER.

PIAL MEANS PROGRAMMING IN ALGEBRAIC LANGUAGE. PIAL CONSISTS OF ASSIGNMENT, LOOP AND I/O INSTRUCTIONS. PIAL PROVIDES A MACHINE INDEPENDANT WAY TO WRITE SHORT PROGR. QUICKLY. ALTHOUGH PAIL WAS DESIGNED WHEN WRITING A COMPILER FOR THE HP-97, USERS OF OTHER PROGRAMMABLE CALC. WITH SUFFICIENT MEMORY SPACE COULD WRITE PIAL COMPILERS FOR THEIR CALC. THE USE OF A COMPILER PROVIDES INSIGHT INTO SPECIFIC COMPUTER PROBLEMS AND MAKES IT POSSIBLE TO ADEPT THE MACHINES POSSIBILITIES TO OWN DEMANDS.

224PROGRAM STEPS
PETER SCHMALE
NL - DELFT.

50233D 97-CONTINOUS BEAM OF 2 SPANS AND CANTILEVER ARMS.

THIS PROGRAM CALCULATES MOMENT AND SHEAR AT POINTS OF THEIR MAXIMUM OR MINIMUM AND NEXT TO THE BEARINGS UNIFORMLY DISTRIBUTED LOADS, DIFFERENT FOR EACH SPAN AND CANTILEVER ARM ARE POSSIBLE. THE LENGTH OF THE CANTILEVER ARMS MAY BE ZERO. ALL RESULTS AE STORED IN THE CALCULATOR.

224PROGRAM STEPS
GEORG RAABE
D - BRAUNSCHWEIG.

50234D 97-5X5 MATRIX OPERATIONS WITH SYMMETRIC COEFFICIENTS.

THIS PROGRAM CALCULATES THE INVERSE OF A 5X5 MATRIX AND SOLVES A SYSTEM OF 5 SIMULTANEOUS EQUATIONS IN 5 UNKNOWNS, BY USING THE INVERSE MATRIX. IN DIFFERENT TO PROGRAM 50194 D THE COEFFICIENTS OF THE MATRIX ARE SYMMETRIC: A(I,J)=A(J,I) ALL SOLUTIONS ARE STORED IN THE CALCULATOR.

434PROGRAM STEPS
GEORG RAABE
D - BRAUNSCHWEIG.

50235D 97-4X4 MATRIX OPERATIONS WITH SYMMETIC COEFFICIENTS.

THIS PROGRAM CALCULATES THE INVERSE OF A 4X4 MATRIX AND SOLVES A SYSTEM OF 4 SIMULTANEOUS EQUATIONS IN 4 UNKNOWNS. IN DEFFERENT TC PROGRAM NR. 00069 D THE COEFFICIENTS OF THE MATRIX ARE SYMMETRIC:
A(I,J) = A(J,I).
ALL SOLUTIONS ARE STORED IN THE CALCULATCR.

311PROGRAM STEPS
GEORG RAABE
D - BRAUNSCHWEIG.

50236D 97-555 TIMER DESIGN.

PROGRAM CALCULATES COMPONENT VALUES FOR SPECIFIED TIME DELAY USING 555 I.C. IN MONOSTABLE CONFIGURATION, AND FOR SPECIFIED PERIOD AND DUTY CYCLE IN ASTABLE CONFIGURATION WILL ALSO CALCULATE TIME OR PERIOD GIVEN THE COMPONENT VALUES.

201PROGRAM STEPS
COLIN CUNNINGHAM
UK - KEW,RICHMOND/SURREY.

50237D 67-DATE CONVERTER FOR BUSINESS AND LOGISTIC CALCULATION.

CALCULATION OF RUNNING DAY UP TO A DAY IN A YEAR WITH CONSIDERATION OF LEAP-YEARS.

063PROGRAM STEPS
OLAF GOETTE
D - LILIENTHAL.

50238D 97-GAMMA-FUNCTION APPROXIMATION.

THIS PROGRAM APPROXIMATES THE GAMMA FUNCTION FOR VALUES RANGING FROM -69,9 THROUGH 70,9.

208PROGRAM STEPS
PETER MILING
D-LIPPSTADT.

50239D 67-POLYNOMIAL DIVISION.

THE PROGRAM PERFORMS DIVISION BETWEEN A UP TO 9TH DEGREE POLYNOMIAL BY A UP TO 3RD DEGREE POLYNOMIAL WITH COMMON ROOTS. IT ALSO HELPS TO FIND REAL ROOTS AND EVALUATES THE GIVEN POLYNOMIAL FOR VARIOUS X-VALUES.

211PROGRAM STEPS
JENS SUCKSDORFF
S - STOCKHOLM.

50240D 97-DEPTH OF FIELD OF PHOTOGRAPHIC LENSES.

CALCULATES AND PRINTS A COMPLETE DEPTH-OF-FIELD TABLE FOR ANY GIVEN LENS (GIVEN APERTURE, FOCAL LENGTH IN MM, AND SMALLEST AVAILABLE DIAPHRAGM SETTING). CIRCLE OF CONFUSION MAY BE SPECIFIED; IF NOT SPECIFIED,PROGRAM WILL ASSUME IT AS ONE ONE-THOUSANDTH OF FOCAL LENGTH. PROGRAM ALSO PRODUCES, FOR EACH DIAPHRAGM SETTING, THE "PROXIMITY-INFINITY SETTING", AND THE CORRESPONDING NEAR POINT, FROM WHICH SHARPNESS WILL EXTEND REARWARD TOWARD AND UP TO INFINITY.

210PROGRAM STEPS
WALTER H. OETTINGER
A - VIENNA.

50241D 67-EXTERIOR AND INTERIOR TANGENTS OF TWO CIRCLES.

COMPUTES LENGTH AND AZIMUTH OF THE TANGENTS AND THE COORDINATES OF THE CONTACT-POINTS, GIVE TWO CENTRE POINTS WITH RADIUS.

102PROGRAM STEPS
CHRISTIAN LANDOLT
CH - BECKENRIED.

50242D 67-LEVELING BETWEEN TWO KNOWN HEIGHTPOINTS WITH ADJUSTMENT.

GIVEN TWO HEIGHTS (START AND END) AND MAX. 22 BACK-AND FORESIGHTS THE PROGRAM COMPUTES THE ERROR AND THE ADJUSTED HEIGHTS. ONLY ONE INPUT OF THE DATAS. NO SIGHTS BETWEEN BACK AND FORESIGHTS.

056PROGRAM STEPS
CHRISTIAN LANDOLT
CH - BECKENRIED.

50243D 67-SINKING SHIPS.

TEN SHIPS OF VARICUS SIZES ARE RANDOMLY GENERATED AND HIDDEN IN A 10X10 GRID. IN THIS OLD SCHOOLGAME YOUR TASK IS TO HIT AND SINK THESE SHIPS USING AS FEW BOMBS AS POSIBLE. AFTER EACH BOMB HP-67/97 OUTPUTS SELECTED SQUARE AND RESULT. IF A HIT IS MADE, TYPE OF SHIP THAT WAS HIT IS SHOWN EXACTLY AS IN THE ORIGINAL GAME.

224PROGRAM STEPS
GORAN THORNBLAD

50243D (CONTD)

S-BROMMA.

50244D 97-TIME RESPONSE OF A FIRST ORDER LINEAR RATIONAL SYSTEM.

THE RESPONSE OF A LINEAR RATIONAL SYSTEM OF FIRST ORDER TO AN INITIAL CONDITION AND/OR IMPULSE, STEP, RAMP AND PARABOLA INPUTS IS COMPUTED. THE FOLLWING DATA HAVE TO BE ENTERED: STARTING TIME, TIME INCREMENT, FINAL TIME, THE PARAMETERS OF THE SYSTEM, THE INITIAL VALUES OF THE INPUT AND OUTPUT FUNCTIONS AND THE AMPLITUDE OF THE FORCING FUNCTION. THE RESPONSE IS COMPUTED FROM THE EXACT ANAYLTIC SOLUTION.

224PROGRAM STEPS
FRANK DOERRSCHEIDT
D-PADERBORN.

50245D 67-ELECTRONICS/SLIDE RULE.

PROGRAM COMPUTES:
1) FREQUENCY, INDUCTANCE, CAPACITANCE, REACTANCE OF PARALLEL AND SERIES TUNED CIRCUITS.
2) ADMITTANCE MEASUREMENTS VIA QMETER AUXILIARY COIL METHCD.
3) SERIES VERSUS PARALLEL IMPEDANCE CONVERSION.

224PROGRAM STEPS
PIERRE GRANIER
F-VANVES.

50246D 67-CUBIC COMPLEX EQUATION.

THS PROGRAM FINDS THE THREE GENERALLY COMPLEX ROOTS OF A CUBIC EQUATION WITH COMPLEX COEFFICIENTS.

210PROGRAM STEPS
ATTILIC FARINA
I-TORINO.

50247D 97-BODE PLOT OF CONTROL SYSTEM.

THE PROGRAM COMPUTES A BODE-PLOT OF A CONTROL SYSTEM CONSISTING OF LAGS OF 1ST ORDER (UP TO FOUR NUMBERS) AND 2ND ORDER, DELAY, GAIN,INTEGRATORS, DERIVATORS, POLYNOMIALS OF 1ST ORDER (UP TC FOUR NUMBERS) AND 2ND ORDER. THE PROGRAM PROVIDES GAIN AND PHASE INFORMATION FOR EVERY NUMBER AND / OR THE TOTAL.

224PROGRAM STEPS
SIGVARD AUNE
S-CREBRO.

50248D 67-SUM FORMULA FROM ANALYSIS DATA.

GIVEN THE RESULTS OF A QUANTITATIVE ELEMENTAL ANALYSIS, PROGAM FINDS OUT A POSSIBLE SUM FORMULA. THE COMPOUND CONSIDERED MAY CONTAIN ONE OR MORE ATOMS OF THE FOLLOWING ELEMENTS: C,H,N,O,F,CL,BR,I,B,P,S, NA,K.
A DIAGNOSTIC IS ISSUED IF THE TOTAL PERCENTAGE IS LOWER THAN 99 OR GREATER THAN 101.

224PROGRAM STEPS
HELLMUTH DECKERS
D-MAINZ.

50249D 67-MEASUREMENT OF ACCELERATION VELOCITY AND DISPLACEMENT.

PROGRAM CALCULATES THE TWO UNKNOWN OF THE ACCELERATION,VELOCITY AND DISPLACEMENT WHEN ONE OF THE THREE IS KNOWN AT A CERTAIN FREQUENCY. PROGRAM CALCULATES SOUND PRESSURE LEVEL LV IN DB AT A CERTAIN FREQUENCY WHEN THE VELOCITY IS KNOWN IN UNITS M/S OF A VIBRATING SURFACE.

122PROGRAM STEPS

50249D (CONTD)

P.L.V.D. WOUDE
NL-TETERINGEN.

50250D 67-PERSPECTIVE DRAWING.

THIS PROGRAM DRAWS FOR YOU, POINT BY POINT, ON YOUR DRAWING BOARD, THE THREE DIMENSIONAL SUBJECT OR LANDSCAPE OF YOUR CHOICE, SELECT THE POSITION OF THE OBSERVER WITH REGARD TO THE SUBJECT, CHOOSE HIS SIGHT DIRECTION, AND DRAW YOUR PICTURE AS LARGER AS YOU WANT.

090PROGRAM STEPS
FRANCIS PARENT
F-STRASBOURG.

50251D 67-TABLES OF THE SUN.

THIS PROGRAM COMPUTES RIGHT ASCENSION AND DECLINATION OF THE SUN FOR ANY GIVEN DATE AND HOUR. SEVERAL OTHER PARAMETERS FOR THE SUN ARE ALSO COMPUTED. FOR THE XXTH CENTURY THE PRECISION IS APPROXIMATELY ONE SECOND OF TIME.

203PROGRAM STEPS
FRANCIS C. MICHEL
B-BRUSSELS.

50252D 97-ASTRO FIX.

PROGRAM REDUCES ANY NUMBER OF ASTRO SIGHTS, ALLOWING FOR DISTANCE BETWEEN SIGHTS, AND STATISTICALLY FILTERS THEM - BY THE METHOD OF LEAST SQUARES - TO GIVE THE MOST ACCURATE POSITION FIX AT THE TIME OF THE LAST SIGHT.

224PROGRAM STEPS
GERALD A. BAYNE
F-CANNES.

50253D 97-TWO WAY ANALYSIS OF VARIANCE.

THIS PROGRAM CAN BE USED FOR VARIANCE ANALYSIS, WHEN THE NUMBER OF ROWS <=9 AND COLUMNS <=9. IT IS ONLY NECESSARY TO INPUT EVERY RESULT ONCE.

150PROGRAM STEPS
OTTO WELDINGH
DK-MUNDELSTRUP.

50254D 67-TEMPERATURE DISTRIBUTION IN A GREY STELLAR ATMOSPHERE.

THIS PROGRAM COMPUTES THE TEMPERATURE IN A STELLAR ATMOSPHERE USING THE CONSTANT OPACITY APPROXIMATION.

186PROGRAM STEPS
DELCROIX A.J.S.
B-MONS.

50255D 67- 4 X 4 MATRIX OPERATIONS.

THIS PROGRAM CALCULATES THE DETERMINANT AND INVERSE OF 4 X 4 MATRIX AND MULTIPLIES IT BY A 4-ELEMENT COLUMN MATRIX, SO PERMITTING THE SOLUTION OF 4 SIMULTANEOUS EQUATIONS. RE-ENTRY OF INVERTED MATRIX IS NECESSARY; BUT PROVISION HAS BEEN MADE FOR SIMPLIFIED (MANUAL) RE-ENTRY OF MATRIX ELEMENTS AFTER A LABELLED HP-67 DISPLAY.

224PROGRAM STEPS
ANDREW M. STEPHENSON
UK - HIGH WYCOMBE.

50256D 97-TRADE BUSINESS. PLAN GAME.

YOUR CALCULATOR SIMULATES A MARKET UP TO FIVE COMPANIES. IT WILL MAKE YOU A PROFIT AND LOSS CALCULATION AND A STATISTIC FOR EACH PERIOD AND EACH COMPANY. A MARKET ANALYSIS WILL HELP YOU TO MAKE FURTHER

50256D (CONTD)

DECISIONS.

326PROGRAM STEPS
WERNER SCHULZE
D-BIELEFELD.

50257D 67-TRIANGLE SOARING.

PROGRAM CALCULATES ON THE BASIS OF THE COORDINATES OF ANY THREE TURNPOINTS, THE ESTIMATED WIND AND THE ESTIMATED TRUE AIRSPEED ALL INTERESTING DATA FOR THE PILOT: DISTANCE, FLIGHTTIME, SPEED ABOVE GROUND, TRUE TRACK, WIND CORRECTION ANGLE FOR EACH LEG SEPARATE; TOTAL DISTANCE; DISTANCE OF THE SHORTEST LEG IN PERCENT; TOTAL FLIGHTTIME; AND SPEED ABOVE GROUND AVERAGED FOR THE WHOLE FLIGHT.

435PROGRAM STEPS
BLUME MARTIN
D-SUNDERN.

50258D 67-GAME OF DICE.

HERE YOU CAN PLAY DICE. YOUR OUTCOMES WILL BEADED AND SHOWN TO YOU AT THE END OF THE GAME. MAXIMUM: 18 PLAYERS.

111PROGRAM STEPS
MICHAEL WILCKE
D - BERLIN.

50259D 97-EULER F.PRIME FACTORS NUMBER, PRODUCT AND SUM OF DIVISORS.

ENTER A NUMBER AND HP PRINTS:
1) LIST OF PRIME FACTORS
2) EULER FUNCTION
3) NUMBER OF DIVISORS
4) PRODUCT OF DIVISORS
5) SUM OF DIVISORS CONTAINS A NOTE ON PERFECT NUMBERS ALSO.
IT IS A FAST PROGRAM BECAUSE PRIME FACTORS AND THEIR EXPONENTS ARE MEMORIZED.

201PROGRAM STEPS
ITO BUDA
I-TRIESTE.

50260D 67-SHORE NAVIGATION.

THE PROGRAM PERFORMS THE CALCULATIONS INVOLVED WITH THE GREAT CIRCLE NAVIGATION. THE FIRST SECTION COMPUTES COURSE AND DISTANCE FOR ANY GIVEN TWO POINTS COORDINATES, THE SECOND ONE ALLOWS THE EXTIMATION OF THE POSITION.

211PROGRAM STEPS
R.P. GIARDINA
I-TORINO.

50261D 67-CO2 MIG WELDING PARAMETERS PROGRAM.

PROGRAM FULFILLS THE NECESSARY REQUIREMENTS TO DETERMINE THE MOST IMPORTANT PARAMETERS IN THE FIELD OF MIG WELDING. THE DESIGNER/OPERATOR OF WELDING MACHINES DETERMINE THE FOLLOWING VALUES: POWER CONSUMED BY THE ARC. THICKNESS OF THE PIECE TO BE WELDED. DIAMETER OF SUPPLY WIRE. ARC TENSION. SPEED OF SUPPLY WIRE. INTENSITY OF WELDING CURRENT. CALIBRE OF SUPPLY WIRE IN GR/M. METAL CONSUMED IN THE WELDING ROD . METAL DEPOSITED. SECTION OF SUPPLY WIRE.

217PROGRAM STEPS
FELIPE PAZ
SPAIN - MADRID.

50262D 67-ELECTRONIC EMISSION FILAMENT DESIGN AND THERMAL INFLUENCE.

THIS PROGRAM WAS ESPECIALLY DESIGNED TO BE USED TO CALCULATE THE RESISTANCE OF ALL CONDUCTORS AND THE SAME PROGRAM BY THE APPLI-

50262D (CONTD)

CATION OF RICHARDSON AND LANGMUIR EQUATIONS, FILAMENTS WITH CATHODIC FUNCTION ARE CALCULATED AND THE FOLLOWING MAGNITUDES; TEMPERATURE RESISTANCE, DIAMETER, SECTION, WEIGHT, ELECTRONIC EMISSION, CATODE SURFACE CURRENT AND AVERAGE LIFE OF THE FILAMENT IN FUNCTION TO THE TEMPERATURE.

224PROGRAM STEPS
FELIPE PAZ
SPAIN - MADRID.

50263D 67-PARALLELCOUPLING RESISTORS.

COMPUTES TWO RESISTORS WHO PARALLEL-CLUTCH WITH EACH OTHER GIVES A RESISTORVALUE.

091PROGRAM STEPS
STEFEN LIND
S-BALSTA.

50264D 67-MODE OF FUNCTIONS EQUIDISTANT DATA KNOWN. FLUOX PEAKS.

FUNCTION BEING KNOWN FOR (ARBITRARY) EQUIDISTANT VALUES Y' OF VARIABLE:
1) (EVENTUALLY) GROUND IS SUBSTRACTED FROM 9 VALUES (4 CM EACH SIDE OF MAXIMUM DATA);
2) A FOURTH DEGREE POLYNOM IS ADJUSTED TO THE 9 VALUES (USING FISHER ORTHOGONAL POLYNOMS);
3) RESIDUAL RELATIVE VARIANCE IS COMPUTED;
4) COEFF. OF ADJUSTED POLY.& OF ITS DERIVEE Y" ARE COMPUTED & STANDARD DEVIATION OF X EVALUATED;
5) ROOT OF Y" IN ARBITRARY UNITY.

224PROGRAM STEPS
ANDRE RIVIERE
F - BOURG LA REINE.

50265D 97-I/O OPTIMIZATION.

THIS PROGRAM "INPUTS" AND "OUTPUTS" DATA AS MENTIONED WITH THE PROGRAMS "OPTIMIZATION (HOOKE AND JEEVES)" AND "RANDOM SEARCH".
RANDOM SEARCH, PROGRAM NUMBER: 50266 D.

096PROGRAM STEPS
H.P. FRANSEN
NL-DEN HAAG.

50266D 97-RANDOM SEARCH.

GIVEN A FUNCTION F(X1,X2...XN) WITH UP TO 4 INDEPENDENT VARIABLES, THE PROGRAM GENERATES RANDOM POINTS WITHIN A GIVEN SEARCH SPACE AND SELECTS THAT GENERATED POINT WITH THE LOWEST FUNCTION VALUE.
THIS PROGRAM IS WRITTEN IN CONJUNCTION WITH THE PROGRAMS "OPTIMIZATION" PROGRAM NUMBER: 50210 D AND "I/O OPTIMIZATION" PROGRAM NUMBER: 50265 D.

145PROGRAM STEPS
H.P. FRANSEN
NL-DEN HAAG.

50267D 97-N*K CONTINGENCY TABLE.

THIS PROGRAM COMPUTES THE CHI-SQUARE STATISTIC WITH (N-1)(K-1) DEGREES OF FREEDOM FOR TESTING THE INDEPENDENCE OF TWO VARIABLES. ALSO PEARSON'S COEFFICIENT OF CONTINGENCY C, WHICH MEASURES THE DEGREE OF ASSOCIATION BETWEEN THE TWO VARIABLES, IS OBTAINED.

200PROGRAM STEPS
H.P. FRANSEN
NL-DEN HAAG.

50268D 97-ITTC'57 THREE DIMENSIONAL EXTRAPOLATION; EFFECTIVE POWER.

THIS PROGRAM CALCULATES THE

50268D (CONTD)

EFFECTIVE POWER USING RESISTANCE TEST DATA. THE CALCULATIONS ARE BASED ON THE ITTC'57 FRICTION LINE.
(SHIP VALUES CORRECTED FOR 15 DEGREE C. SEAWATER TEMPERATURE).

178PROGRAM STEPS
H.P. FRANSEN
NL-DEN HAAG.

50269D 97-HUGHES THREE DEMENSIONAL EXTRAPOLATION; EFFECTIVE POWER.

THIS PROGRAM CALCULATES THE EFFECTIVE POWER USING RESISTANCE TEST DATA. THE CALCULATIONS ARE BASED ON THE HUGHES FRICTION LINE (SHIP VALUES ARE CORRECTED FOR 15 DEGREE C.SEA WATER TEMPERATURE).

181PROGRAM STEPS
H.P. FRANSEN
NL-DEN HAAG.

50270D 97-SCHOENHERR THREE DIMENSIONAL EXTRAPOLATION; EFFECTIVE POWER.

THIS PROGRAM CALCULATES THE EFFECTIVE POWER USING RESISTANCE TEST DATE. THE CALCULATIONS ARE BASED ON THE SCHOENHERR FRICTION LINE (SHIP VALUES ARE CORRECTED FOR 15 DEGREE C. SEA WATER TEMPERATURE).

203PROGRAM STEPS
H.P. FRANSEN
NL-DEN HAAG.

50271D 67-12 PERIOD MOVING AVERAGE AND DESEASONALISING FACTORS.

CALCULATES MOVING AVERAGE FOR "MID-POINT" PERIOD BY INCLUDING HALF OF FIRST AND THIRTEENTH PERIODS IN MOVING TOTAL. AFTER INPUT OF ALL DATA POINTS, CALCULATES MULTIPLICATIVE DESEASONALISING FACTORS, WHICH ARE HELD IN SUCCESSIVELY ADDRESSED STORAGE REGISTERS, AND ARE THEREFORE READILY AVAILABLE FOR USE IN SUBSEQUENT FORECASTING PROGRAMS (E.G., "FORECASTING WITH ADAPTIVE RESPONSE RATE").

222PROGRAM STEPS
MARTIN HUMPHRIES
UK-BROMSGROVE.

50272D 67-FORECASTING WITH ADAPTIVE RESPONSE RATE.

MODIFIED EXPONENTIAL SMOOTHING; SMOOTHING CONSTANT AUTOMATICALLY ADJUSTS ACCORDING TO STABILITY/INSTABILITY OF SYSTEM (TRIGG & LEACH). PROVISION FOR UP TO 15 PERIODS MULTIPLICATIVE SEASONALITY. PROCEDURES FOR BOTH SETTING UP SYSTEM AND ROUTINE FORECASTING. SUITABLE FOR USE WITH OUTPUT FROM "12-PERIOD MOVING AVERAGE AND DESEASONALISING FACTORS".

186PROGRAM STEPS
MARTIN HUMPHRIES
UK-BROMSGROVE.

50273D 67-GREATCIRCLE-NAVIGATION NR.4 COORDINATES BY TWO DISTANCES.

THIS PROGRAM CALCULATES THE COORDINATES BY THE DISTANCE FROM TWO GIVEN LOCATIONS. ESPECIALLY DESIGNED FOR INFLIGHT UPDATING OF INERTIAL NAVIGATION SYSTEMS (INS) ANY OTHER GEODETIC PROBLEM MAY BE SAVED.

182PROGRAM STEPS
HELMUT MUELLER
D-DIETZENBACH.

50274D 67-SUNRISE/SUNSET INFLIGHT PLUS AZIMUTH.

50274D (CONTD)

THIS PROGRAM CALCULATES TIME, POSITION AND AZIMUTH OF SUNRISE OR SUNSET OBSERVED BY AN AIRCRAFT INFLIGHT. IF CONSIDERS FLIGHTLEVEL AND TOPS OF CLOUDS.
MAY ALSO BE USED FROM FIX OR MOVING POSITION ON GROUND.

213PROGRAM STEPS
HELMUT MUELLER
D-DIETZENBACH.

50275D 67-ASTRONOMIE/ASTRO-NAV. NR.2 SUNDATA/SUNRISE + SUNSET/AZIMUTH.

FOLLOWING ASTO NR.1, PROGRAM CALCULATES:
1) EQUATION OF TIME
2) DECLINATION OF SUN
3) GHA OF SUN.
FURTHER: TIMES OF SUNRISE/SET AND AZIMUTH.

219PROGRAM STEPS
HELMUT MUELLER
D-DIETZENBACH.

50276D 67-ASTRONOMIE - ASTRONAVIGATION NR.1-GHA OF ARIES+SUNDATA-START.

FOR ALL ASTRO-NAVIGATION AND PRECISE SUNDATA THIS PROGRAM CALCULATES:
1) THE GREENWICH HOUR ANGLE OF ARIES (GHA GAMMA).
2) NUMBER OF DAYS SINCE 1.1.1900.
FURTHER: THE FIRST PART OF SUNDATA PROGRAM WICH CONTINUES IN PROGAM ASTRO NR. 2.

223PROGRAM STEPS
HELMUT MUELLER
D-DIETZENBACH.

50277D 97-STABILITY TEST FOR LINEAR SYSTEMS UP TO 9TH ORDER.

THE STABILITY OF LINEAR SYSTEMS UP TO NINTH ORDER IS TESTED BY APPLICATION OF ROUTH CRITERION. INPUT DATA ARE THE ORDER AND THE PARAMETERS OF THE CHARACTERISTIC POLYNOMIAL N(S). THE PROGRAM COMPUTES THE ROUTH TABLE AND OUTPUTS IS FIRST COLUMN. THE NUMBER OF CHANGES OF SIGN IN THIS COLUMN IS EQUAL TO THE NUMBER OF ROOTS OF THE CHARACTERISTIC EQUATION WITH POSITIVE REAL PART. IF THIS NUMBER IS ZERO THE SYSTEM IS STABLE.

222PROGRAM STEPS
FRANK DOERRSCHEIDT
D-PADERBORN.

50278D 67-LAGRANGIAN INTERPOLATION.

PROGRAM WILL EVALUATE FOR AN ARGUMENT X THE LAGRANGIAN INTERPOLATING POLYNOMIAL PN(X) OF DEGREE N WHICH PASSES THROUGH N+1 GIVEN POINTS; (0<N<10).

136PROGRAM STEPS
JOSE REYES ESTEBAN
SPAIN - AVILES.

50279D 67-PERCENT COMPOSIT.OF ORG.COMPOUND FROM EMPIRICAL FORMULA.

PROGRAM USES A DATA CARD CONTAINING ATOMIC WEIGHTS TO CALCULATE THE MOLECULAR WEIGHT AND PERCENT COMPOSITION OF AN ORGANIC COMPOUND FROM ITS EMPIRICAL FORMULA.
MAY CONTAIN C, H, O, S, HALOGENS, AND ONE ADDITIONAL ELEMENT WHOSE ATOMIC WEIGHT MUST BE KEYED IN BY THE USER. OUTPUT FORMAT: (NO. ATOMS ELEMENT), (PERCENT ELEMENT PRESENT) ENABLES USER TO CHECK INPUT.

063PROGRAM STEPS
PAUL DAVIS
UK-WATFORD.

50280D 67-RECTANGULAR BEAM DESIGN.

PROGRAM GIVES ALL DATA NECESSARY TO EVALUATE THE SUITABILITY OF A SIMPLY SUPPORTED RECTANGULAR TIMBER BEAM.

197PROGRAM STEPS
ALAN PERKS
UK-POOLE.

50281D 67-TIMBER I BEAM DESIGN AID.

PROGRAM PROVIDES A DESIGN AID OR CHECK ON ASSUMED "I" SECTION.

207PROGRAM STEPS
ALAN PERKS
UK-POOLE.

50282D 67-FIXED-TUNED CIRCUITRY.

PROGRAM FINDS UNKNOWN VALUES IN TUNED CIRCUITS
(SERIAL OR PARALLEL).

210PROGRAM STEPS
CHRISTOPHER A. HOEFLIGER
CH-ZUERICH.

50283D 67-INTERMODULATION-DISTORTION COMPUTING.

YOU'VE GOT A L.F. WAVE-ANALYSER LIKE THE MARVELLOUS HP-3581A AND YOU'RE AFRAID ABOUT INTERMODULATION DISTORTION MEASUREMENTS, BECAUSE THERE ARE SO MANY VALUES YOU HAVE TO ALLOW FOR? FORGET YOUR TROUBLES HERE IS A PROGRAM THAT WILL LIBERATE YOU FROM ALL CALCULATION. IT WILL COMPUTE THE NEXT SPURIOUS FREQUENCY AT WHICH YOU WILL GET A READING, YOU ENTER THE LEVEL... NEXT FREQUENCY, LEVEL ENTERING... UNTIL THE CALCULATOR KNOWS ENOUGH TO COMPUTE YOUR INTERMODULATION-DISTORTION-FACTOR.

099PROGRAM STEPS
CHRISTOPHER A. HOEFLIGER
CH-ZUERICH.

50284D 67-BESSEL FUNCTION.

THIS PROGRAM COMPUTES THE BESSEL FUNCTIONS JV (X), WHERE V IS AN HALF-INTEGER ORDER:
V=N+1/2, N=(0, +OR-1, +OR-2,...)
BY CALCULATING OF ELEMENTARY FUNCTIONS.

110PROGRAM STEPS
PETER MILING
D-LIPPSTADT.

50285D 67-SUBMARINE CHASER.

YOU ARE IN COMMAND OF A SUBMARINE CHASER, AND BY A SONAR YOU MUST LOCATE AND DESTROY TEN SUBMARINES POSITIONED IN A 10X10 GRID, SO AS TO BE NEITHER SIDE BY SIDE NOR CORNER BY CORNER.
THE PROGRAM ALLOWS YOU TO FIRE SEPARATELY EACH POINT OF THE GRID, TELLS YOU IF A SUB WAS HIT, DESTROYS IT SO THAT YOU CANNOT HIT IT TWICE, RECORDS THE MISSES, AND POINTS OUT WHEN THE GAME IS OVER.

188PROGRAM STEPS
GIANCARLO CORDONI
I - MONTEBELLUNA.

50286D 67-POLYNOMIAL DIVISOR WITH AUTO DATA ENTRY.

THIS PROGRAM ENABLES YOU TO DEVIDE A REAL POLYNOMIAL OF UP TO THE 22ND DEGREE (WITH AUTO DATA ENTRY) USING HORNER'S RULE. THE MONOMIAL CAN BE MANUALY INSERTED OR AUTOMATICALY COMPUTED. REDIVIDING AND/OR RECALLING THE ANSWER ARE INCLUDED IN HIS POSSIBILITIES.

141PROGRAM STEPS
GUY HAEGENS

50286D (CONTD)

B-BERCHEM.

50287D 67-INTEGRO-EXPONENTIAL FUNCTIONS OF N-TH ORDER.

THIS PROGRAM COMPUTES THE N-TH ORDER INTEGRO-EXPONENTIAL FUNCTIONS FOR ANY NON NEGATIVE, INTEGER VALUE OF N AND ANY NON NEGATIVE VALUE OF THE ARGUMENT.

216PROGRAM STEPS
A.J.S. DELCROIX
B-MONS.

50288D 97-RADAR PLOTTING.

PROGRAM RESOLVES A SERIES OF RADAR OBSERVATIONS TO GIVE A CONTINUOUS RECORD OF TARGET SHIP'S SPEED AND COURSE, AND ITS CLOSEST POINT OF APPROACH. IF A DESIRED CLOSEST APPROACH IS SPECIFIED, PROGRAM WILL GIVE COURSE ALTERATION TO STARBOARD. TRIAL ALTERATIONS TO PORT OR SPEED CHANGES MAY BE CONSIDERED, AN ALSO A PASS AHEAD SITUATION WITH INCREASE OF SPEED.

223PROGRAM STEPS
GERALD A. BAYNE
F - CANNES.

50289D 97-MAGNETIC COMPASS SWING AND ANALYSIS OF DEVIATION ERROR.

PROGRAM SUMS 8 OBSERVATIONS - AT 45 DEG. INTERVALS - IN EITHER DIRECTION, TO GIVE A MAGNETIC COMPASS DEVIATION CURVE. MAGNETIC BEARINGS OF A DISTANT FIXED OBJECT MAY BE USED, OR PELORUS BEARINGS ADDED TO SHIP'S HEAD COMPASS. COMPASS ERRORS 'B','C','D',& 'E' MAY BE FOUND AND ANALYSED, FOR SUBSEQUENT CORRECTION. ERROR 'A' MAY BE FOUND IF THE MAGNETIC BEARING OF THE OBJECT IS KNOWN.

180PROGRAM STEPS
GERALD A. BAYNE
F-CANNES.

50290D 67-LINEAR SYSTEMS IN 5 UNKNOWNS.

THIS PROGRAM SOLVES A SYSTEM OF SIMULTANEOUS EQUATIONS IN 5 UNKNOWNS, PROVIDED THAT THE MATRIX OF COEFFICIENTS IS NON SINGULAR. THE METHOD USED, IS THAT OF GAUSSIAN ELIMINATION WITH PARTIAL PIVOTING.

443PROGRAM STEPS
MARTIN KAWALETZ
D-SALZGITTER.

50291D 67-BEAM DESIGN FOR NON CENTRAL POINT LOAD.

DESIGN OF RECTANGULAR TIMBER BEAM WITH NON CENTRAL POINT LOAD. ACCOUNT IS TAKEN OF BENDING, DEFLECTION, SHEAR, BEARING LENGTH AND GIVES DEPTH TO BREADTH RATIO. ALL DATA IS OUT PUT TO ENABLE CALCULATION SHEET TO BE COMPLETED.

219PROGRAM STEPS
ALAN PERKS
UK - POOLE.

50292D 67-LEAST SQUARES ADJUSTMENT OF AN INTERSECTION.

TO DETERMINE THE COORDINATES OF STATION P, DIRECTIONS HAVE BEEN MEASURED FROM SURROUNDING STATIONS, THE COORDINATES OF WHICH ARE KNOWN. THE APPROX. COORDINATES OF P' ARE THEN CALCULATED. THE PROGRAM GIVE A LEAST SQUARES ADJUSTMENT AND CALCULATES THE STANDARD ERRORS AND THE COMPONENTS OF THE STANDARD ERROR ELLIPSE ACCORDING TO THE GEOMETRIC PARAMETERS INVOLVED.

50292D (CONTD)

398PROGRAM STEPS
M. HOOIJBERG
NL - DRUNEN.

50293D 97-INDEPENDENT T-VALUE.

CALCULATES T(IND), DEGREES OF FREEDOM AND THE MEANS, STANDARD DEVIATIONS AND STANDARD ERRORS OF THE MEANS. PROGRAM CONTAINS ALL FACILITIES TO CORRECT, EXCLUDE AND ADD MORE DATA. OPTION FOR PRINTING OF ENTERED DATA.

185PROGRAM STEPS
ANDERS KALLNER
S - STOCKHOLM.

50294D 67-LEAST SQUARES ADJUSTMENT OF A RE-SECTION.

TO DETERMINE THE COORDINATES OF STATION P, DIRECTION HAVE BEEN MEASURED TOWARDS SURROUNDING STATIONS, THE COORDINATES OF WHICH ARE KNOWN. THE APPROX. COORDINATES OF P' ARE THEN CALCULATED. THIS PROGRAM GIVES A LEAST SQUARE ADJUSTMENT AND CALCULATES THE STANDARD ERRORS AND THE COMPONENTS OF THE STANDARD ERROR ELLIPSE ACCORDING TO THE GEOMETRIC PARAMETERS INVOLVED.

446PROGRAM STEPS
M HOOIJBERG
NL - DRUNEN.

50295D 67-ANALYSIS OF SAMPLE FROM MIXED POPULATIONS.

GIVEN A SAMPLE IN WHICH, SUPPOSEDLY TWO POPULATIONS ARE PRESENT:
1) NOT DESEASED 2) DESEASED.
THE TWO MEANS AND THE TWO STANDARD DEVIATIONS FORM A HYPOTHESIS. THE PROGRAM DISPLAYS (PRINTS) THE SUM OF QUADRATIC RESIDUALS REMAINING AFTER THE BEST ADJUSTMENT OF HYPOTHESIS TO OBSERVATIONS. IT ALSO CALCULATES THE CORRESPONDING CONTRIBUTION OF (1) TO THE SAMPLE AND THE RESIDUAL IN EACH CLASS. THIS IS THE CELL OF A DIRECTED EXPERIMENTAL PROCESS TRENDING TOWARD ESTIMATES TO THE 4TH PARAMETER

361PROGRAM STEPS
GUY RABELLE
F - BEAUVAIS.

50296D 97-POLYNOMIAL SOLUTIONS USING BAIRSTOW'S METHOD.

PROGRAM SOLVES POLYNOMIALS WITH REAL COEFF. FROM ORDER 10 DOWN TO 3 USING BAIRSTOW'S METHOD OF FINDING QUADRATIC FACTORS (X**2+PX+9). THE ROOTS OF THESE FACTORS ARE THEN CALCULATED IN THE NORMAL WAY. THE PROCESS CAN BE CONTINUED UNTIL ALL THE ROOTS HAVE BEEN DETERMINED.

223PROGRAM STEPS
KLAAS MUNTENDAM
NL - EINDHOVEN.

50297D 67-2ND ORDER FILTERS TRANSFER FUNCTION.

PROGRAM COMPUTES TRANSFER FUNCTION VOUT/VIN OF LOW-PASS, HIGH-PASS, OR BAND-PASS SECOND ORDER FILTERS. OPTIONS THAT MAYBE SELECTED ARE: N DIFFERENT SECTIONS AND/OR GRAPH OF RESPONSE VERSUS FREQUENCY AND/OR ADDITION OF RESULTS. TRANSFER FUNCTION IS GIVEN IN POLAR FORM (AMPLITUDE AND PHASE RESPONSE) AND TIME DELAY COMPUTATION IS ACHIEVED.

224PROGRAM STEPS
PIERRE GRANIER
F - VANVES.

50298D 67-SEA WAR.

ONE AIRCRAFT-CARRIER (4 SQUARES), TWO BATTLE SHIPS (3 SQUARES), THREE CRUISERS (2 SQUARES EACH) AND FOUR TORPEDO BOATS ARE RANDOMLY PLACED ON 10 BY 10 GRID. SHIPS TO BE SUNK BY POUNDS OF 3 SHOTS EACH.

224PROGRAM STEPS
PETER AMLINGER
A-PERCHTOLDSDORF.

50299D 67-LINEAR INTERPOLATION OVER A SET OF POINTS.

THIS PROGRAM COMPUTES THE VALUE OF A FUNCTION WITHIN AN INTERVAL GIVEN A SET OF POINTS ARBITRARILY SPACED. THE FUNCTION IS APPROXIMATED BY A LINEAR SEGMENT BETWEEN EACH POINT. MAXIMUM NUMBER OF POINTS: TEN.

073PROGRAM STEPS
PIERRE GRANIER
F - VANNES.

50300D 67-MAH JONG SCORE KEEPER.

PROGRAM CALCULATES AND KEEPS THE SCORES FOR 2 - 4 PLAYERS.

112PROGRAM STEPS
KURT ASTRAND
S - GOTEBORG.

50301D 67-VARIATIONS OF GEOCENTRIC COORDINATES DUE TO PRECESSION.

PROGRAM CONVERTS THE GEOCENTRIC COORDINATES OF AN ASTRONOMICAL OBJECT (STAR, STAR CLUSTER, NEBULA, GALAXY, ETC) FROM AN EPOCH INTO ANOTHER, BECAUSE THEIR POSITIONS ARE CHANGING SLOWLY DUE TO THE PRECESSION OF THE EARTH. ANY EPOCHS AND THE DIRECTION OF THE CONVERSION ARE FREE ELIGIBLE. PROGRAM IS ABLE TO CONSIDER THE PROPER MOTIONS OF A STAR BETWEEN THE CHOSEN EPOCHS, IF THEY ARE KNOWN.

219PROGRAM STEPS
LOTHAR BUETTNER
D - OBERHAUSEN.

50302D 97-ALCOHOL SOLUTIONS AND WINE DILUTIONS.

1) COMPUTES ANY ETHYLALCOHOL SOLUTION IN VOLUME AND WEIGHT, GIVEN THE DEGREE OF ETHYLALCOHOL AND HIS SPECIFIC GRAVITY (FOR WEIGTH CALCULATION ONLY). INTERPOLAT.OF THE SPECIFIC GRAVITY.
2) TO RAISE OR LOWER THE ALCOHOL DEGREE OF A WINE BY ADDITION OF A RICHER OR POORER GRADE IN ALCOHOL CONTENT. TO DETERMINE THE ALCOHOL DEGREE OF A MIXTURE OF TWO OR MORE WINES WITH KNOWN DEGREES.

111PROGRAM STEPS
RENE BERTEELE
B - BRUSSELS.

50303D 97-SAILING TIME.

PROGRAM COMPUTES THE TIME NECESSARY TO SAIL FROM INITIAL TO FINAL POINT.
INPUTS ARE RIGHT AND LEFT COURSE (DEGREES AND KNOTS), THE CURRENT (DEGREES AND KNOTS), WIDTH AND LENGTH OF THE CHANNEL FOR ZIG-ZAG NAVIGATION.

056PROGRAM STEPS
RENE BERTEELE
B-BRUSSELS

50304D 97-TIDE CALCULATION (HEIGHT).

PROGRAM COMPUTES THE HEIGHT OF THE SEA (ANY LENGTH UNIT) AT ANY TIME

50304D (CONTD)

BETWEEN HIGH AND LOW WATER (OR LOW AND HIGH WATER), GIVEN THE TIME FOR HIGH AND LOW WATER, THE ALTITUDE OF THE SEA BY HIGH AND LOW WATER. THE TIME TO CALCULATE THE HEIGHT OF THE SEA (BETWEEN H.W. AND L.W.).

153PROGRAM STEPS
RENE BERTEELE
B - BRUSSELS.

50305D 97-SPACE WAR AUTOPILOT.

A SUPPLEMENT TO PROGRAM 00179 D, 'SPACE WAR', FOR LAZY SPACECRAFT COMMANDERS. COMPUTES COORDINATES FOR MOVES AND TORPEDOES READY FOR INPUT.

110PROGRAM STEPS
THOMAS. J. KRUEMMEL
D - BONN-IPPENDORF.

50306D 67-TWO COUPLED 1ST ORDER ORDINARY DIFFERENTIAL EQUATIONS.

PROGRAM SOLVES THE INITIAL VALUE PROBLEM CONNECTED WITH A SYSTEM OF TWO FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS. IT USES THE WELL-KNOWN 4TH ORDER RUNGE-KUTTER METHOD WITH RUNGE'S COEFFICIENTS. NO SEPARATE START UP PROCEDURE IS REQUIRED.

128PROGRAM STEPS
J.E. MEBIUS
NL -BERKEL EN RODENRYS.

50307D 67-NEGATIVE BINOMIAL DISTRIBUTION MAXIMUM LIKELIHOOD FIT.

PROGRAM PROVIDES A MAXIMUM LIKELIHOOD ESTIMATE OF THE PARAMETER K OF THE NEGATIVE BINOMIAL DISTRIBUTION, AND EMPLOYS THIS IN CALCULATING THE EXPECTED FREQUENCIES FOR SAMPLE DATA.

173PROGRAM STEPS
A.J.C. BALFOUR
UK - RAF HALTON.

50308D 97-FRESNEL INTEGRALS.

PROGRAM WILL COMPUTE THE SINE AND COSINE FRESNEL INTEGRALS FOR ANY VALUE OF THE ARGUMENT, FROM ZERO TO INFINITY. A MIXED SERIES EXPANSION-NUMERICAL FIT APPROACH IS USED TO INSURE GOOD ACCURACY OVER THE ENTIRE RANGE OF THE ARGUMENT.

112PROGRAM STEPS
CLAUDIO BENSKI
F - GRENOBLE CEDEX.

50309D 67-HARMONIC DISTORTION.

PROGRAM IS AN EASY-TO-USE WAY TO COMPUTE "HARMONIC DISTORTIONS" FOR THOSE PEOPLE, WHO HAVE THE PLEASURE TO WORK WITH THE FAMOUS HP-3581-A WAVE ANALYSER (OR SOMETHING ELSE). YOU JUST HAVE TO ENTER THE LEVELS OF THE NTH HARMONIC (IN DB) AND THE CALCULATOR WILL COMPUTE YOUR TOTAL HARMONIC DISTORTION, CALLED THD. IT ALSO STORES ALL VALUES YOU HAVE ENTERED.

088PROGRAM STEPS
CHRISTOPHER A. HOEFLIGER
CH - ZUERICH.

50310D 67-GEORGE SIMON OHM'S LAW.

COMPUTES U; I; R; P (TWO VALUES MUST BE GIVEN);
U PEAK-TO-PEAK INTO U RMS
AND U IN DBN AND REVERSE.

136PROGRAM STEPS
CHRISTOPHER A. HOEFLIGER
CH - ZUERICH.

50311D 67-CURVE FIT; OPTION TO STORE DATA AND TO PROCESS STOREDDATA.

PROGRAM NUMBER SD-03 OF HP-67/97 STANDARD PAC IS MODIFIED BY ADDING CAPABILITY OF STORING DATA POINTS AND / OR PROCESSING STORED DATA POINTS.

224PROGRAM STEPS
ROLAND KOESTRING
D - MUENCHEN.

50312D 67-"SAFETY" NIMB (NO TRAPS ALLOWED).

NIM PLAYED WITH ONE PILE OF VARIABLE QUANTITY AND A MAX. NUMBER OF OBJECTS TO BE REMOVED. ALSO VARIABLE (WITH SPECIAL LIMITATIONS TO MAKE THE GAME DIFFICULT) ALMOST ALL KIND OF TRAPS AGAINST THE MACHINE ARE PROVIDED.

125PROGRAM STEPS
ALBERTO LOZANO
SPAIN - BARCELONA.

50313D 97-PIAL EXECUTER.

PROGRAM EXECUTES NUMERICALLY CODED INSTRUCTIONS IN THE DATA REGISTER. THE INSTRUCTION SET IS THE SAME AS THAT OF THE DIRECT PIAL COMPILER SO THAT COMPILER PIAL PROGRAMS CAN BE EXECUTED. IT IS ALSO POSSIBLE TO ENTER A PROGRAM IN THE FORM OF 1-DIGIT NUMBERS. THE SOFTWARE THAT MAKES A FOR-NEXT LOOP POSSIBLE IS CONTAINED IN THIS PROGRAM.

224PROGRAM STEPS
PETER SCHMALE
NL - DELFT.

50314D 67-DIFFERENTIAL FUNCTIONS: BETA, GAMA, BESSEL, HYPERGEOMETRIC.

COMPUTES, TYPICALLY TO BETTER THAN SEVEN SIGNIFICANT FIGURES, VALUES FOR BETA, GAMMA, BESSEL AND HYPER-GEOMETRIC FUNCTIONS. FEATURES FAST-GAMMA AND MAXIMISATION OF INPUT VALUE PERMITTED RANGES.

224PROGRAM STEPS
ANDREW M. STEPHENSON
UK - HIGH WYCOMBE/BUCKS.

50315D 97-67-CALCULATOR-TECHNICAL AIDS.

PART 1 GIVES AN EASY METHOD TO CHECK THE SET STATUS (FORMAT, DISPLAY MODE, POSITION OF FLAGS, ANGULAR MODE) OF THE CALCULATOR OF THE SET STATUS RECORDED ON ANOTHER MAGNETIC CARD. PART 2 ALLOWS TO RECORD ALL DATA (OF ADRESSABLE REGISTERS, STACK AND "LAST X") ON ONE MAGNETIC CARD AND TO LOAD THEM AGAIN. PART 3 CLEARS REGISTERS USED FOR SIGMA +. PART 4 CLEARS STACK.

109PROGRAM STEPS
WOLFRAM SCHWABHAUSER
D - STUTTGART.

50316D 67-GREAT CIRCLE - RHUMB LINE NAVIGATION.

PROGRAM CLACULATES GREAT CIRCLE DISTANCE AND COURSE, AND RHUMB LINE DISTANCE AND COURSE. PROGRAM ALSO COMPUTES DISTANCE TO 1 DEGREE CHANGE OF GC COURSE, LATITUDE OF VERTEX. ENTER LONGITUDE, AND PROGRAM COMPUTES LATITUDE ON GREAT CIRCLE.

197PROGRAM STEPS
JAN ANDERSEN
N - BERGEN.

50317D 67-DEAD RECKONING.

PROGRAM COMPUTES ARRIVAL POSITION

50317D (CONTD)

OF THE DAY'S RUN.

123PROGRAM STEPS
JAN DIDR. ANDERSEN
N - BERGEN.

50318D 67-COMPOSITE SAILING.

PROGRAM COMPUTES NECESSARY INFORMATION FOR COMPOSITE SAILING. FOR FURTHER GREAT CIRCLE AND RHUMB LINE PROBLEMS, SEE PROGRAM: GREAT CIRCLE - RHUMB LINE NAVIGATION.

161PROGRAM STEPS
JAN DIDR. ANDERSEN
N - BERGEN.

50319D 67-SOLUTION OF A SUPER ABUNDANT LINEAR SYSTEM.

THE PROGRAM COMPUTES A SET OF THREE VALUES THAT BEST FIT (BY MAKING MINIMUM THE SUM OF SQUARES OF THE DIFFERENCES) A SYSTEM OF MORE THAN THREE LINEAR EQUATIONS WITH ONLY THREE UNKNOWNS. THE PROGRAM ALSO WORKS WITH TWO UNKNOWNS.

197PROGRAM STEPS
JEAN BARFETY
F - LE RAINCY.

50320D 97-X - Y PLOTTER.

THIS PROGRAM UTILIZES THE PRINTER AS AN X-Y PLOTTER. TO PLOT USER DEFINED EXPLICIT FUNCTIONS OF Y=F (X) OF UNLIMITED HIGH DEGREE. PROGRAM CAN BE USED FOR SOLVING ROOTS, FOR LOCATING MAXIMA AND MINIMA AND FOR GRAPHICAL DISPLAY OF FUNCTIONAL RELATIONSHIPS. SUCCESSIVE INCREMENT OF X WILL PLOT THE VALUE OF Y REPRESENTED BY THE LOCATION OF THE DECIMAL POINT IN A 10 DIGITS NUMBER OF ONES AND ZEROS.

092PROGRAM STEPS
GERARD A.A. WESTEN
NL - DORDRECHT.

50321D 97-ANALYSIS OF PERSONAL FINANCES.

ALLOWS PROJECTING INDIVIDUAL FINANCIAL SITUATIONS INTO FUTURE. MOST USEFUL FOR PERSON APPROACHING RETIREMENT. TAKES INTO CONSIDERATION ESTIMATED FUTURE INFLATION AND INTEREST-EARNING RATES. INPUTS, RELATED TO BASE YEAR, ARE SAVINGS ON HAND, ANNUAL INCOME, ANNUAL NEEDS, PLUS SIX SPECIFIC PAYMENTS WHICH MAY BE OF SIX TYPES: (A) ONE TIME; (B) BEGINNING SOME FUTURE YEAR; (C) STOPPING SOME FUTURE YEAR; EACH BEING EITHER "FIXED", OR "INFLATION-COMPENSATED".

210PROGRAM STEPS
WALTER H. OETTINGER
A - VIENNA.

50322D 67-ORTHODROMIC SAILING.

THIS PROGRAM CALCULATES THE ELEMENTS FOR AN ORTHODROMIC SAILING (DISTANCE, COURSE, VERTEX'S COORDINATES, THE GIVRY'S DRIFT CORRECTION, THE CORRECTED COURSE), THE LOXODROMIC DISTANCE AND THE GAIN RESULTING FROM INPUT SAILING POINT AND ARRIVAL POINT.

212PROGRAM STEPS
GILLES SAUVAGNAT
F - BRON.

50323D 67-LOXODROMIC SAILING.

THIS PROGRAM CALCULATES THE LOXODROMIC COURSE AND THE LOXODROMIC DISTANCE RESULTING FROM INPUT SAILING POINT AND ARRIVAL POINT.

50323D (CONTD)

137PROGRAM STEPS
GILLES SAUVAGNAT
F - BRON.

50324D 67-HERMITIAN INTERPOLATION.

IF THE VALUES OF A FUNCTION Y(X), AS WELL AS THE VALUES OF THE DERIVATIVE Y' (X) ARE GIVEN FOR N+1 POINTS X0, X1,...XN, THEN THIS PROGRAM FITS A 2N+1 DEGREE POLYNOMIAL P(X) TO THESE DATA, SUCH THAT P(X) PASSES THROUGH (X0,Y0), (X1,Y1),...(XN,YN) AND P'(X) THROUGH (X0,Y'0), (X1,Y'1),...(XN, Y'N), AND FOR A GIVEN X, EVALUATES P(X). - (1 < N + 1 < 8).

180PROGRAM STEPS
JOSE REYES ESTEBAN
SP - AVILES-OVIEDO.

50325D 67-RECTANGULAR VECTOR OPERATIONS AND STACK.

PROGRAM PERFORMS CROSS PRODUCT, DOT PRODUCT, ADDITION AND CONVERSION BETWEEN SPHER/CARTESIAN COORDINATES ON TWO OR THREE DIMENSIONAL VECTORS EXPRESSED IN CARTESIAN FORM ALSO FINDS ANGLE BETWEEN VECTORS. FOUR DIMENSIONAL ARITHMETIC AND DOT PRODUCT (FOR MATRIX MULTIPLICATION) AND FULLY ADMINISTRATIVE CAPABILITIES SUCH AS A TWO-STACK REGISTER AND TWO LAST VECTOR REGISTERS.

222PROGRAM STEPS
JENS SUCKSDORFF
S - STOCKHOLM.

50326D 67-SOLUTION OF GENERAL 3 BY 3 GAMES

THIS PROGRAM FINDS THE OPTIMAL STRATEGY OF A GENERAL, TWO PLAYERS, ZERO SUM, 3 BY 3 GAME. THE STRATEGY IS THE BEST FOR THE MINIMAX POINT OF VIEW. INPUT IS THE 3 BY 3 MATRIX OF MEAN PROFIT, OUTPUT IS THE MEAN PROFIT EXPECTED FROM THE STRATEGY AND ALL PROBABILITIES DEFINING THE TWO PLAYERS' STRATEGIES.

222PROGRAM STEPS
DIDIER PELAT
F - MEUDON.

50327D 67-CODE-BREAKER.

WITH THIS PROGRAM YOUR HP BECOMES A REAL CODE-BREAKER. HE FINDS EVERY CODE OF THREE DIFFERENT NUMBERS BETWEEN 1 AND 5, 1 AND 5 INCLUDED IN MAXIMUM 13 TRY'S, BUT WHEN HE NEEDS MORE THAN 10 TRY'S, HE LOSES; OTHERWISE YOU WIN.

217PROGRAM STEPS
RONALD VAN THIELEN
B - STABROEK.

50328D 67-SEA-BATTLE.

WITH THIS PROGRAM YOU CAN PLAY A VERY POPULAR GAME (IN BELGIUM) AS A FLEET ADMIRAL YOU MUST DESTROY THE FLEET OF THE ENNEMY IN THE SHORTEST TIME. THE POSITION OF THE 10 SHIPS ARE UNKNOWN BUT THEY ARE SOMEWHERE IN A SEA OF 10 BY 10. NOW YOU MUST SHOOT WITH ROCKETS. IF YOU ARE SUCCESSFUL THE HP INDICATES THE KIND OF THE SHIP. OTHERWISE THE ROCKET FALLS INTO THE WATER. THAT IS INDICATED TOO.

089PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50329D 67-RIGID FOOTING ON GROUP OF VERTICAL AND RAKED PILES.

THE CALCULATION IS MADE OF THE STRAINS EXERTED BY A RIGID FOOTING

50329D (CONTD)

ON A GROUP OF VERTICAL AND RAKED PILES ASSUMING THE DISTRIBUTION OF THE PILES TO BE ARBITRARY AND THE FOUNDATION SUBJECT TO BATTERED ACTION. PILES ARE DOUBLY ARTICULATED AND INFINITELY FLEXIBLE - RESOLUTION IS FOR A TWO DIMENTIONAL PROBLEM.

160PROGRAM STEPS
PIERRE SILVAN
F - CHAMBERY.

50330D 67-HIGH VACUUM TECHNIC EQUATIONS AND ELECTRONIC IONIZATION.

THE CONSTRUCTION OF VACUUM TUBES REQUIRES A HIGH DEGREE OF SKILL AND A GREAT KNOWLEDGE OF ASSOCIATED TECHNICS WITH OBTAINING AND MAINTAINING A HIGH VACUUM.

224PROGRAM STEPS
FELIPE PAZ
SP - MADRID.

50331D 67-REINFORCED CONCRETE RECTANGULAR SECTION SIMPLE AND COMPOUND BENDING

THIS PROGRAM GIVES STRESSES AND NEUTRAL AXIS IN A RECTANGULAR SECTION WITH COMPRESSED FRAME WORK. CALCULATION IS DONE IN AN ELASTICITY SCOPE N=15.

213PROGRAM STEPS
PIERRE SILVAN
F - CHAMBERY.

50332D 97-TWO WAY ANALYSIS OF VARIANCE WITH REPLICATIONS.

THISD PROGRAM CARRIES OUT AN ANALYSIS OF VARIANCE FOR THE EFFECTS OF TWO FACTORS (ROWS AND COLUMNS) WHERE THERE ARE REPLICATED OBSERVATIONS IN EACH CELL. THE NUMBER OF ROWS AND REPLICATIONS IS UNLIMITED; THE NUMBER OF COLUMNS IS LIMITED TO A MAXIMUM OF 10. SUMS OF SQUARES, DEGREES OF FREEDOM MEAN SQUARES AND F-TEST RESULTS ARE PRINTED OUT FOR DIRECT USE. DATA CORRECTION IS PROVIDED.

223PROGRAM STEPS
ROBIN BATHE
CH - PFEFFINGEN.

50333D 67-DIVISION OR POLYNOMIALS.

THIS PROGRAM PERFORMS THE DIVISION OF POLYNOMIALS OF DEGREE 1 THRU 9 BY POLYNOMIALS OF DEGREE 1 THRU 4. ENTERING THE COEFFICIENTS IS EASY TO REMEMBER BECAUSE THE DEGREE OF EACH TERM IS EQUAL TO THE NUMBER OF ITS REGISTER. THE COEFFICIENTS OF THE QUOTIENT AND OF THE REMAINDER ARE DISPLAYED IN DESCENDING POWERS AFTERTHE DEGREE OF THE TERM. DEGREE 0 CORRESPONDS TO A CONSTANT.

219PROGRAM STEPS
JEAN HORVILLE
F - GENTILLY.

50334D 67-NORMAL AND LOGNORMAL FIT.

GIVEN A SET OF (GROUPED) DATA POINTS THE PROGRAM (USED OPTIONALLY WITH PROGRAM 00101D) FITS THE DATA TO A NORMAL (OR A LOGNORMAL) DISTRIBUTION WITH CHI SQUARE GOODNESS OF FIT TEST.

102PROGRAM STEPS
JEAN DUTERTRE
F - PARIS.

50335D 67-DOSE RESPONSE LOGIT ANALYSIS.

GIVEN NUMBER OF SUCCESS, SAMPLE SIZE AND DOSE FOR UP TO 15 POINTS, THE PROGRAM PERFORMS LOGIT ANALYSIS COMPUTES PERCENTAGE WITH CONFIDENCE

50335D (CONTD)

LIMITS FOR ANY GIVEN DOSE, AND ESTIMATES LETHAL DOSE 50 AND STANDARD DEVIATION. LOGIT ANALYSIS GIVES ABOUT THE SAME RESULTS AS PROBIT, IS EASIER TO PERFORM, AND ANALYSING SUCH PROBLEMS AS IRRADIATION ONES, IS EVEN MORE SUITABLE.

213PROGRAM STEPS
JEAN DUTERTRE
F - PARIS.

50336D 97-PLANE OF TRANSPOSITION BY WILLIOT.

THE PROGRAM COMPUTES THE VERTICAL DEFLECTIONS OF A STEEL-FRAME WORK FROM THE BAR TENSIONS, LENGTHS OF BARS, DIMENSIONS OF CROSS SECTIONS AND DIRECTIONS OF THE FORCE.

154PROGRAM STEPS
HANSPETER BERNET
CH - ITTIGEN.

50337D 67-THREE COUPLED 1ST ORDER ORDINARY DIFFERENTIAL EQUATIONS.

THIS PROGRAM SOLVES THE INITIAL VALUE PROBLEM CONNECTED WITH A SYSTEM OF THREE FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS. IT USES THE WELL-KNOWN 4TH ORDER RUNGE-KUTTA METHOD WITH RUNGES' COEFFICIENTS. NO SEPARATE START-UP PROCEDURE IS REQUIRED.

181PROGRAM STEPS
J.E. MEBIUS
NL - BERKEL EN RODENRIJS.

50338D 97-BOUNDARY VALUE PROBLEMS FOR Y''=F(X,Y,Y').

THIS PROGRAM MAY BE USED TO SOLVE DIFFERENTIAL EQUATIONS OF THE FORM:
Y''=F(X,Y,Y')
WITH BOUNDARY CONDITIONS
Y(A)+ALPHA.Y(B)=GAMMA
Y'(A)+BETA.Y'(B)=DELTA.

157PROGRAM STEPS
KURT HAWLITSCHEK
D - ULM-LEHR.

50339D 97-EXTREMES OF A FUNCTION.

PROGRAM FINDS MAXIMUMS OR MINIMUMS OF A FUNCTION (FIELD I OR FIELD IV)

142PROGRAM STEPS
MAX MULZER
D - ILLERTISSEN.

50340D 67-HEAT GAIN THROUGH WALLS.

PROGRAM EVALUATES THE HEAT GAIN THROUGH A WALL IN A BUILDING EVERY HOUR DURING A DAY. THE TEMPERATURE INSIDE IS SUPPOSED TO BE CONSTANT. CONDITIONS OUTSIDE FLUCTUATE ACCORDING TO A PREDETERMINED CYCLE OF SOL-AIR TEMPERATURES. THE WALL IS DESCRIBED BY MEANS OF A SET OF TRANSFER FUNCTION COEFFICIENTS RELATED TO THE CONSTITUTION OF THE WALL.

218PROGRAM STEPS
ANTONI QUINTANA
SP - BARCELONA.

50341D 67-ARBITRARY LINEAR NETWORK FREQUENCY RESPONSE.

THIS PROGRAM COMPUTES THE FREQUENCY RESPONSE OF ANY LINEAR NETWORK (FILTER, SERVOMECANISM, ETC..), GIVEN THE TRANSFER FUNCTION COEFFICIENTS UP TO ANY ARBITRARY ORDER. RESULTS ARE OBTAINED IN RECTANGULAR AND/OR POLAR FORM (DBS, DEGREES) AND USER MAY REQUEST GRAPH PLOTTING VERSUS FREQUENCY WITHIN ANY INTERVAL.

50341D (CONTD)

224PROGRAM STEPS
PIERRE GRANIER
F - VANVES.

50342D 97-TOWERS OF HANOI.

1 TO 9 DISKS WITH DIFFERENT DIAMETERS ARE ARRANGED IN ONE OF THREE TOWERS A, B, AND C. USER'S TASK IS TO MOVE (BY TAKING THE SMALLEST DISK OFF A TOWER AND PUTTING IT ONTO ANOTHER, THEN BEING SMALLEST DISK OF THIS TOWER) ALL DISKS TO ONE OF THE TWO OTHER TOWERS.

198PROGRAM STEPS
THOMAS KRUEMMEL
D - BONN-IPPENDORF.

50343D 67-DIFFERENTIAL EQUATIONS SYSTEM OF FIRST ORDER.

THIS PROGRAM SOLVES A SYSTEM OF TWO DIFFERENTIAL EQUATIONS OF FIRST ORDER WHO'S GIVEN IN THE FORM:
Y'=F(X,Y(X),Z(X))
Z'=G(X,Y(X),Z(X))
BY THE FOURTH ORDER RUNGE-KUTTA METHOD.

133PROGRAM STEPS
PETER MILING
D - LIPPSTADT.

50344D 97-DANGEROUS SWITCHBOARD.

TRY TO CONNECT A BULB WITH ITS PLUG-SOCKET BY A 9X9 GRID SWITCHBOARD. EACH SQUARE OF WHICH CONTAINS 1 TO 9 ENERGY UNITS. YOUR TASK IS TO MAKE THE BULB GLOW WITHOUT EXCEEDING THE LIMIT OF 90 UNITS OTHERWISE THE BULB WILL BURST AND YOUR GAME IS LOST. YOU MAY DISPOSE OF THE (LIMITED) HELP OF A ENERGY-METER.

216PROGRAM STEPS
THOMAS J KRUEMMEL
D - BONN-IPPENDORF.

50345D 67-TURING MACHINE SIMULATOR.

PROGRAM SIMULATES THE WORK OF A BINARY TURING MACHINE. SIMULATION IS ACCOMPLISHED DISPLAYING SUCCESSIVE QUADRUPLES WHICH REPRESENTS STATUS, SCANNED SYMBOL AND SYMBOLS ON THE TAPE. PRACTICAL LIMITATIONS OF SIMULATED MACHINE ARE 22 STATUS, AND LENGTH OF TAPE UP TO 32 CELLS EACH SIDE OF READER HEAD.

169PROGRAM STEPS
ANTONIO VERA
SPAIN - MADRID.

50346D 97-PRIVATE ACCOUNT MANAGEMENT.

THIS PROGRAM COMPUTES THE NEW BALANCE OF A PRIVATE ACCOUNT FROM ITS PRECEDENT STATE AND ACHIEVED OPERATIONS. IT ALSO CHECKS THE STATEMENT OF BANK AND GIVES A LIST OF OPERATIONS NOT RECORDED BY THE BANK. FINALLY, THIS PROGRAM RECORDS THE NEW STATE OF ACCOUNT FOR THE NEXT MANAGEMENT. IF THE USER HAD OMITTED ANY OPERATION, THE COMPUTER SHOWS AND INTEGRATES IT.

223PROGRAM STEPS
JEAN-JACQUES LONDON
F - PARIS.

50347D 97-FACTORIAL PERMUTATION AND COMBINATION.

THIS PROGRAM CAN CALCULATE ALL THE ORIGINAL 00102D CAN DO. OPTIONALLY IT CALCULATES FACTORIAL, PERMUTATION AND COMBINATION WITH REPETITION AND IT CAN PRINT ALL BINOMIAL-COEFFICIENTS OF AN

50347D (CONTD)

INTEGER.

201PROGRAM STEPS
CHRISTOPHER A. HOEFLIGER
CH - ZURICH.

50348D 67-GAME OF "5,000".

THIS PROGRAM DISPLAYS A RANDOM SHOT OF 5 NUMBERS (BET.1 AND 6).AFTER ANALYSIS OF THIS SET IT COMPUTES THE CORRESPONDING VALUE OF POINTS AND ACCORDING TO THE COINFIGURATION (SERIES,TRIPLETS..)THE REMAINING NUMBERS ARE AUTO.REPLAYED.IF NOT THE PLAYER CAN CHOSE REPLAY OR STOP IN THE LAST CASE,THE SCORE IS UPDATED AND THE GAME RESTARTED BY ANOTHER PLAYER(UP TO FOUR).IN THE FIRST CASE,THE NEW CONFIGURATION MUST BE SIGNIFICANT OTHERWISE POINTS OF THE PREVIOUS SHOT ARE LOST.

190PROGRAM STEPS
ALAIN PINAUD
F - PLAISIR

50349D 67-ALGEBRAIC NOTATION.

IN PARALLEL WITH THE REVERSE POLISH NOTATION, THIS PROGRAM GIVES THE ALGEBRAIC NOTATION (EQUALS KEY) WITH TWO LEVELS OF PARENTHESES.

066PROGRAM STEPS
ALAIN PINAUD
F - PLAISIR.

50350D 67-RE-SECTION + INTERSECTION L.S. ADJUSTMENT LINK PROGRAM.

THIS PROGRAM LINKS THE LEAST SQUARES ADJUSTMENT OF A RE-SECTION WITH THAT OF AN INTERSECTION (OR A RE-SECTION OF AN EXCENTRIC STATION), AND CALCULATES THE STANDARD ERRORS AND THE COMPONENTS OF THE STANDARD ERROR ELLIPSE ACCORDING TO THE GEOMETRICAL PARAMETERS INVOLVED.
THE PROGRAM LINKS NO. 50292D WITH NO. 50294D.

180PROGRAM STEPS
M. HOOIJBERG
NL - DRUNEN.

50351D 67-THE COMPLETE ISOTOPIC RULE.

THIS PROGRAM USES THE COMPLETE ISOTOPIC RULE TO DETERMINE THE FUNDAMENTAL VIBRATION FREQUENCIES OF A MONOSUBSTITUTED ISOTOPIC MOLECULE FROM THE FUNDAMENTAL VIBRATION FREQUENCIES OF THE DI-SUBSTITUTED MOLECULE AND THE PARENT MOLECULE. IT CAN THUS BE USED FOR CHECKING VIBRATIONAL ASSIGNMENTS OF MOLECULAR SPECTROSCOPIC DATA OBTAINED FROM ISOTOPIC MOLECULES.

189PROGRAM STEPS
T. STROYER-HANSEN
DK - ODENSE.

50352D 67-ERLANG-DISTRIBUTION.

THE ERLANG-DISTRIBUTION OCCURS IN THE CONTEXT OF QUEVEING PROBLEMS. THE PROGRAM CALCULATES (1) THE FREQUENCY DISTRIBUTION AND (2) THE CUMULATIVE DISTRIBUTION FUNCTION. IT PRODUCES (3) ERLANG-DISTRIBUTED RANDOM NUMBERS AND A SIMULATED ERLANG-DISTRIBUTION. IT CALCULATES (4) 20 INTERVAL BOUNDARIES. THE SIMULATED DISTRIBUTION CAN BE COMPARED (5) WITH THE CORRESPONDING EXPECTATIONS.

173PROGRAM STEPS
DIETER WICKMANN
D - AACHEN.

50353D 67-PROPAGATION OF ERRORS SU4.

50353D (CONTD)

THE PROGRAM CALCULATES THE PROPAGATION OF ERRORS IN EQUATION SYSTEMS, WITH THE LAW OF THE PROPAGATION OF ERRORS. IT IS POSSIBLE TO OBSERVE THE PROPAGATION IN DEPENDENCE ON MAXIMAL 9 VARIABLES. YOU HAVE TO KNOW THE MEAN SQUARE ERRORS OF THE ARITHMETIC MEAN OF ALL VARIABLES. THE FUNCTION YOU HAVE TO KEY IN ONLY ONE TIME.

047PROGRAM STEPS
JOHANNES GRUSS
D - WIESBADEN.

50354D 67-97 SETTING OUT OF ARC OF CIRCLE SU5.

THE PROGRAM CALCULATES THE FOLLOWING CASES:
MAIN POINTS, DETAIL POINTS, STAKING OUT RECTANGULAR FROM THE TANGENT, RECTANGULAR FROM THE CHORD AND POLAR FROM ONE TANGENT-POINT.
THE PROGRAM CONTAINS PRINTING ORDERS.

219PROGRAM STEPS
JOHANNES GRUSS
D - WIESBADEN.

50355D 67-GUESS!

CHOOSE A BOUND (2N-1) THINK ON A NUMBER WITHIN THIS BOUND AND AFTER THE DISPLAY OF FEW GROUPS OF NUMBERS, AND YOUR ANSWERS (YES LBLB NO LBLC IF THE NO. HAS BEEN DISPLAYED OR NOT) DEPRESS ANSWER LBLD AND THE HP-67 WILL DISPLAY THE NO. YOU THOUGHT.

063PROGRAM STEPS
MANUEL CAPDEVILA
SP - ARENYS DE MAR.

50356D 67-INTERSECTION OF CIRCLES SU6.

THE PROGRAM CALCULATES THE FOLLOWING CASES OF INTERSECTION OF CIRCLES: TANGENTS / CIRCLE,LINE/CIRCLE, CIRCLE / CIRCLE. THE PROGRAM CALCULATES THE COORDINATES OF THE INTERSECTION POINTS.

177PROGRAM STEPS
JOHANNES GRUSS
D - WIESBADEN.

50357D 67-ASTRO-EUROP 1 RAMC - MC - ASC - KODESC.

INPUT BIRTHPLACE LONGI.AND LATITUDE SIDER.TIME AND EUROP TIME.
STOP 1 YOU RECEIVE MC /HMS
STOP 2 YOU RECEIVE ASCENDENT /HMS
STOP 3 YOU RECEIVE KODESCENDENT/HMS

202PROGRAM STEPS
HEINZ T. SPECHT
D - BIETIGHEIM-BISSINGEN.

50358D 67-ARITHMETIC PROGRESSIONS.

CALCULATES ANY TERM OR SUM OF TERMS OF AN ARITHMETIC PROGRESSION AND THE ARITHMETIC MEAN OF 2 NUMBERS. FIRST TERM, COMMON DIFFERENCE AND NUMBER OF TERMS OR OF THE TERM FROM NTH OR SUM.

016PROGRAM STEPS
MICHEL BEHNA
KUWAIT - KUWAIT.

50359D 67-CONTINGENCY TABLE.

THE PROGRAM CALCULATES THE CHI-SQUARED STATISTIC WITH (R-1)(S-1) DEGREES OF FREEDOM OF AN R TIMES S CONTINGENCY TABLE.

079PROGRAM STEPS
DIETER WICKMANN
D - AACHEN.

50360D 67-ELLIPTIC LOW-PASS FILTERS. LOSS, STEEPNESS, AND DEGREE.

AN ELLIPTIC LOW-PASS FILTER IS CHARACTERIZED BY FIVE QUANTITIES, PASSBANDLOSS, AP, END OF PASSBAND, FP (OMEGA P), STOPPBANDLOSS, AS, BEGINNING OF STOPPBAND, FS (OMEGA S), AND THE DEGREE. GIVEN FOUR OF THE FIVE QUANTITIES, THE PROGRAM CALCULATES THE FIFTH.

223PROGRAM STEPS
NILS HAAHEIM
N - TRONDHEIM.

50361D 67-ITERATIVE SOLUTION OF SYSTEMS OF EQUATIONS.

PROGRAM SOLVES SYSTEMS OF LINEAR AND NONLINEAR EQUATIONS BY GAUSS-SEIDEL'S METHOD. A TEST FOR CONVERGENCE IS PROVIDED TOO.

130PROGRAM STEPS
GUIDO PETZ
S - SOLNA.

50362D 97-DIRECT BISECTION.

GIVEN RECTANGULAR COORDINATES OF TWO BASES AND ANY NUMBER OF POINTS, PROGRAM FINDS INITIAL SET-UP OF TRANSITS AT BOTH STATIONS, THEN ANGLE UNDER WHICH POINT IS SEEN FROM STATION.

098PROGRAM STEPS
SANDRO ROCCI
SP - MADRID

50363D 67-LENS PARAMETERS.

THIS PROGRAM COMPUTES ALL UNKNOWN LENS PARAMETERS FOR A SIMPLE LENS IF TWO OF THE FOLLOWING ARE GIVEN; FOCAL LENGTH, IMAGE DISTANCE, OBJECT DISTANCE, MAGNIFICATION OR LENS STRENGTH (DIOPTRIC). PARAMETERS CAN BE DISPLAYED AND ENTERED IN INCHES AND IN MILLIMETRES. BOTH REAL AND VIRTUAL PARAMETERS CAN ENTER OR COMPUTE, FOR DIVERGING AND CONVERGING LENSES.

173PROGRAM STEPS
GUY M. HAEGENS
B - BERCHEM.

50364D 67-CLASSIFICATION OF CONIC SECTIONS.

PROGRAM WILL DERERMINE THE NATURE OF A GIVEN CONIC SECTION, AND IF THE GIVEN CONIC SECTION IS NON-DEGENERATE, IT WILL SUCCESSIVELY ROTATE AND TRANSLATE THE GRID TO GIVE A SIMPLIFIED EQUATION OF THE CONIC SECTION.

224PROGRAM STEPS
GUY M. HAEGENS
B - BERCHEM.

50365D 67-STEP MOTOR DRIVE I.

THE PROGRAM OPERATES WITH THE BASIC EQUATIONS OF A STEP MOTOR DRIVE. IT COMPUTES FROM THE PARAMETERS OF THE MACHINE, I.E. THE MOTORLOAD ALL DATA WHICH ARE REQUIRED FOR THE CALCULATION OF THE OPTIMAL STEP MOTOR.

205PROGRAM STEPS
CLAUS WEHRMANN
D - EXTERTAL 1.

50366D 67-STEP MOTOR DRIVE II.

THE PROGRAM OPERATES WITH 2 PARAMETERS OF THE LOAD AND 5 PARAMETERS OF THE MOTOR WHICH CAN BE OBTAINED FROM THE DATA SHEETS. THE CALCULATION CAN BE DONE EITHER FOR START-STOP-MODE OR

50366D (CONTD)

ACCELERATION MODE.

182PROGRAM STEPS
CLAUS WEHRMANN
D - EXTERTAL 1.

50367D 67-GENERAL 3 BY 3 GAME.

ONCE THE MACHINE HAS LEARNED THE RULE OF THE GAME AND DETERMINED STRATEGY WITH PROGRAM 50326D YOU CAN PLAY WITH IT. REMEMBER THE MACHINE PLAYS THE MINIMAX STRATEGY AND YOU CERTAINLY FIND IT HARD TO BEAT. YOU MUST HAVE PROGRAM 50326D SEPARATELY. WITH THESE TWO PROGRAMS YOU CAN PLAY WITH THE MACHINE ANY KIND OF 3 BY 3 GAMES. A TEST CARD IS GIVEN.

112PROGRAM STEPS
DIDIER PELAT
F-MEUDON.

50368D 97-INFLUENCE LINE OF MOMENTS ABOUT POINTS OF SUPPORT.

PROGRAM COMPUTES THE INFLUENCE-LINES OF MOMENTS ABOUT POINTS OF SUPPORT AND LISTS THEM UP. THE INFLUENCE OF A CONSOLE-MOMENT ON BOTH ENDS OF THE BEAM IS COMPUTED TOO.

224PROGRAM STEPS
HANSPETER BERNET
CH - ITTIGEN.

50369D 67-ASTRO NAVIGATION NO.3 FIXSTAR DATA.

PROGRAM CARDS CONTAINING DATA FOR 38 FIXSTARS: SIDERIAL HOUR ANGLES AT 1.1.1900 (SHA), ANNUAL CHANGE IN SHA, DECLINATION AT 1.1.1900 (GAMMA), ANNUAL CHANGE IN DECLIN. TO BE USED WITH ASTRO NO.1: 50276D AND NO.4: 50370D.

202PROGRAM STEPS
HELMUT MUELLER
D - DIETZENBACH.

50370D 67-ASTRO NAVIGATION NO.4 POSITION OF STAR, SIGHT REDUCTION.

THIS PROGRAM CALCULATES:
A) SIDERIAL HOUR ANGLE AND DECLINATION OF STARS
B) AFTER ENTRY OF ASSUMED POSITION COORDINATES: LOCAL HOUR ANGLE (LHA) HEIGHT COMPUTED (HC), AND AZIMUTH (ZN). HC+ZN IS AUTOMAT. STORED FOR 3 OBSERVATIONS.

175PROGRAM STEPS
HELMUT MUELLER
D - DIETZENBACH.

50371D 67-ASTRONAVIGATION NO. 5 - MPP AND FIX BY 2 OR 3 OBSERVATIONS.

THIS PROGRAM HAS TO FOLLOW ASTRO NO. 4 AFTER USE OF SEXTANT. IT CALCULATES FROM ENTRY OF HEIGHT OBSERVED (HO) THE MOST PROBABLE POSITION (MPP) FOR ONE OBSERVATION OR THE ACTUAL POSITION FROM 2 OR 3 OBSERVATIONS.

109PROGRAM STEPS
HELMUT MULLER
D - DIETZENBACH.

50372D 67-TEMPERATUR-DEWPOINT-RELATIV HUMIDITY/CELSIUS-FAHRENHEIT.

THIS PROGRAM CALCULATES RELATIV HUMIDITY FROM TEMPERATUR AND DEWPOINT FROM TEMP. AND REL. HUMIDITY AND CELSIUS-FAHRENHEIT CONVERSIONS.

081PROGRAM STEPS
HELMUT MULLER
D - DIETZENBACH.

50373D 67-VOLUME OF PARTIAL FILLED CYLINDR. SPHERICAL BOTTOM TANKS.

PROGRAM CALCULATES THE VOLUME OF PARTIAL FILLED, HORIZONTAL SITUATED, CYLINDRICAL TANKS WITH SPERICAL; BOTTOMS.

224PROGRAM STEPS
HARALD NEUBURG
A - VIENNA.

50374D 67-MOVING AND CENTERED AVERAGE.

THIS PROGRAM IS A REVISED VERSION OF SD-01A. THE PROGRAM CALCULATES MOVING AND CENTERED-MOVING AVERAGE. DIFFERENCE BETWEEN ACTUAL VALUE AND AVERAGE; AND SEASONAL INDEX.

224PROGRAM STEPS
HARM P. MILLAARD
NL - CAPELLE A/D YSSEL.

50375D 97-BINDING RINGS SYSTEM.

THIS PROGRAM COMPUTES ALL THE NECESSARY PARAMETERS ENABLING THE DESIGN AND CONSTRUCTION OF A SYSTEM COMPORTING 2 TO 8 PRESTRESSED STEEL RINGS PROVIDING LATERAL SUPPORT TO A TUNGSTEN CARBIDE DIE (OR ANVIL) IN A VERY HIGH PRESSURE APPARATUS LIKE BELT, GIRDLE OR BRIDGMAN ANVILS.

326PROGRAM STEPS
FRANCOIS HAENSSLER
CH - GENEVA.

50376D 97-BANK STATEMENT AUDITING.

PROGRAM COMPUTES AND OUTPUTS FINAL BALANCE OF BANKING STATEMENT WITH CHEQUE COUNTERFOIL AND BANKING ORDER OR CASH AFTER CREDIT AND DEBIT.

112PROGRAM STEPS
PIERRE MAIRE
F - FONTAINE.

50377D 97-RECURSIVE MULTIPLICATION OF POLYNOMIALS.

THE PROGRAM COMPUTES THE PRODUCT OF POLYNOMIALS P(X) = Q1(X) Q2(X).. QM(X) FOR POLYNOMIALS QJ(X) UP TO FIFTH AND P(X) UP TO NINTH ORDER. THE COEFFICIENTS OF THE POLYNOMIALS QJ(X) HAVE TO BE ENTERED.

203PROGRAM STEPS
FRANK DORRSCHEIDT
D - PADERBORN.

50378D 97-GRAPHICAL OUTPUT OF FUNCTIONS.

THE HP-97 PRINTER IS USED TO GIVE A GRAPHICAL OUTPUT OF A FUNCTION KEYED IN BY THE USER. USER SELECTS X INTERVAL, SCALE AND NUMBER OF POINTS. OUTPUT OF PLOTTED POINTS INDICATED BY ONE'S ON A FIELD OF ZEROS. ALSO INDICATION ARE PROVIDED FOR WHEN FUNCTION IS OFF SCALE.

062PROGRAM STEPS
MARTIN LESSER
S - LULEA.

50379D 67-ROULETTE.

YOU CAN PLAY ROULETTE FOR A GIVEN CODE-NUMBER, IN WHICH IS THE STAID-MONEY, THE SORT OF PLAY, YOUR NUMBER AND YOUR CHOICE, THE COMPUTER CALCULATES YOUR NEW ACCOUNT AND THE ACCOUNT OF THE BANK (MAX.8 PLAYERS OR MAX. 9 PLAYS OF 1 PERSON FOR A PLAY). FOR THE SECOND PART OF THE PROGRAM THE CALCULATOR TAKES HIS CARD AUTOMATICALLY. YOU HAVE ONLY TO TURN IT.

349PROGRAM STEPS
JOACHIM WELTERS
D-LAUBACH 1.

50380D 97-N-ADIC ALGORITHM FOR ALL NUMERICAL SYSTEMS.

N-ADIC ALGORITHM - GIVEN ANY FRACTION A/B WITH A<B THE PERIOD IS PRINTED IN BLOCKS OF TEN OR LESS DIGITS.- FOR NUMERICAL SYSTEMS >10, NUMBERS THAT SHOULD BE CHANGED WITH SYMBOLS ARE PRINTED SEPARATELY WITH A DIFFERENT DISPLAY.

142PROGRAM STEPS
ITC BUDA
I - TRIESTE.

50381D 67-SOLUBILITY.

THE PROGRAM INTERCHANGEABLY SOLVES FOR SOLUBILITY, SOLUBILITY PRODUCT, VOLUME OR/AND AMOUNT OF RESOLVED MASS OF A GIVEN SUBSTANCE. YOU CAN CHOOSE WHETHER INPUT OR OUTPUT ONE IN GRAM OR MOL. IT ALSO CONVERTS MOL TO GRAM AND VICE VERSA.

123PROGRAM STEPS
GUNVALD HARKET
N - ASKER.

50382D 67-TEMPERATURE VARIATIONS THROUGH AN INSULATED SLAB.

THE LINEAR DIFFERENTIAL EQUATION OF CONDUCTION OF HEAT IN AN ISOTROPIC SOLID, BOUNDED BY TWO PARALLEL PLANES, THERMALLY INSULATED AND WITH AN INITIAL TEMPERATURE F(X) ADMITS A SOLUTION IN THE FORM OF INFINITE SERIE WITH INTEGRAL COEFFICIENTS. THE SPATIAL AND TEMPORAL VALUES OF TEMPERATURE IN THE SLAB ARE CALCULATED WITH GOOD APPROXIMATION BY SUMMING THE N< OR EQUAL TO 19 FIRST TERMS OF THE SERIE.

096PROGRAM STEPS
RENE BAILLY-SALINS
F - IS-SUR-TILLE.

50383D 67-COMBINATION OF OFTEN USED ASTRONOMIC PROGRAMS.

THIS PROGRAM COMBINATION CONTAINS: 1. CONVERSION SOLAR TIME INTO SIDEREAL TIME; 2. CONVERSION SIDEREAL TIME INTO SOLAR TIME; 3. COMPUTATION OF AZIMUTH AND ALTITUDE WITH SOLAR TIME; 4. COMPUTATION OF AZIMUTH AND ALTITUDE WITH SIDEREAL TIME; 5. COMPUTATION OF DECLINE TIME; 6. COMPUTATION OF RISE TIME. REQUIRED DATA ARE RIGHT ASCENSION AND DECLINATION OF THE OBJECT, AND THE GEOGRAPHIC COORDINATES OF THE OBSERVATION PLACE.

196PROGRAM STEPS
LOTHAR BUTTNER
D - OBERHAUSEN 1.

50384D 67-STATISTIC CLASSES SUMMATIONS FROM RANDOM SAMPLES DATAS.

COMPUTE GENERAL CLASSES DISTRIBUTIONS FROM CLASSES DISTRIBUTIONS IN EACH OF NON ORDERED NUMEROUS SAMPLES. AUXILIARY PROGRAM, COMPUTING CLASS ORDINAL NUMBER, EXTEND METHOD TO COLLECTIONS OF INDIVIDUAL OBJECTS RELATIVE DATAS.

050PROGRAM STEPS
ANDRE RIVIERE
F - BOURG-LE-REINE.

50385D 67-FRACTIONS.

THIS PROGRAM ALLOWS FOR CHAINED CALCULATIONS WITH FRACTIONS THE FOUR OPERATIONS OF ARITHMETIC. THE RESULT IS A FRACTION.

150PROGRAM STEPS
DIETER BODENSCHATZ
D - NUERNBERG.

50386D 67-NON - LINEAR OPTIMATION.

50386D (CONTD)

GIVEN A COST'S FUNCTION AND A PROCEED'S FUNCTION, THE PROGRAM CALCULATES NET PROFIT RANGE, MAXIMUM NET PROFIT, PRODUCTION AT LOWEST COSTS AND COSTS OF AN ADDITIONALLY PRODUCED UNIT (TO BE USED IN CONNECTION WITH SD-09 A).

207PROGRAM STEPS
AXEL STRUBE
D - WOLFHAGEN-ISTHA.

50387D 97-VECTOR DIFFERENTIAL EQUATIONS BY MODIFIED EULER-METHOD.

THE PROGRAM SOLVES VECTOR DIFFERENTIAL EQUATIONS UP TO FIFTH ORDER BY MODIFIED EULER METHOD. IT SOLVES SCALAR DIFFERENTIAL EQUATIONS TOO BY FORMULATING THESE AS A VECTOR DIFFERENTIAL EQUATION. INPUT DATA ARE: THE ORDER OF THE DIFFERENTIAL EQUATION (N), THE STEP SIZE (H), THE INITIAL AND FINAL VALUE OF THE INDEPENDENT VARIABLE (XO, XF) AND THE N INITIAL VALUES OF THE DEPENDENT VECTOR VARIABLE (YO).

172PROGRAM STEPS
FRANK DORRSCHEIDT
D - PADERBORN.

50388D 97-METAL-SHEET. SQUARE/ROUND TRANSFORMING OFF-CENTERED.

THIS PROGRAM COMPUTES THE MEASUREMENTS OF THE METAL SHEET USED TO FORM A RECTANGULAR TO ROUND TRANSFORMER BETWEEN A ROUND AND A SQUARED TUBE WITH PARALLEL BASE AND TOP PLANE. (OFF CENTER).

223PROGRAM STEPS
OTTO WELDINGH
DK - MUNDELSTRUP.

50389D 97-ONE-ARMED BANDIT.

PROGRAM FOR PLAYING ONE-ARMED BANDIT ON A HP-97.

112PROGRAM STEPS
OTTO WELDINGH
DK - MUNDELSTRUP.

50390D 67-ASTRO-EUROPE - II BIRTH-PLACE HOUSES.

FROM RAMC AND LATITUDE OF BIRTH-PLACE YOU RECEIVE THE 6 HOUSE-CUSPS OF GOH.
THIS PROGRAM CAN ALSO BE USED AS SECOND PROGRAM TO ASTRO-EUROPE I

177PROGRAM STEPS
HEINZ SPECHT
D - BIETIGHEIM-BISSINGEN.

50391D 97-HIGHWAY CIRCULAR CURVE WITH SPIRAL TRANSITIONS.

GIVEN LENGTH OF SPIRAL L AND RADIUS OF CIRCULAR CURVE R, PROGRAM COMPUTES FIRST A SET OF SIX PARAMETERS PERTAINING TO THE SPIRAL; THEN ENTERING THE ANGLE OF THE TANGENTS, FOUR MORE PARAMETERS PERTAINING TO THE PARTICULAR CURVE ARE COMPUTED. THUS ANY CURVE CAN BE FITTED TO ANY ANGLE BETWEEN TANGENTS. FURTHERMORE, LAYOUT DATA ARE COMPUTED, BOTH IN RECTANGULAR OR POLAR COORDINATES, FOR ANY POINT DEFINED BY ITS DISTANCE TO THE POINT OF TANGENCY.

218PROGRAM STEPS
SANDRO ROCCI
SP - MADRID.

50392D 67-LINEAR / POWER CURVE FIT FOR 3 INDEPENDENT VARIABLES.

FOR A SET OF N DATA POINTS (3 INDEPENDENT VARIABLES) THIS PROGRAM

50392D (CONTD)

FITS EITHER A LINEAR EQUATION OF THE FORM T=A+BX+CY+DZ OR A POWER CURVE OF THE FORM T=AXB.YC.ZD BY THE LEAST SQUARE METHOD. GAUSS'S ELIMINATION METHOD IS APPLIED TO SOLVE THE SYSTEM OF LINEAR EQUATIONS.

440PROGRAM STEPS
ROLAND KOESTRING
D - MUNICH.

50393D 97-ORIFICE PROGRAM FOR FIVE SQUARE EDGE ORIFICE TAP TYPES.

THIS PROGRAM SOLVES THE ORIFICE EQUATIONS FOR SQUARE-EDGED,FLAT PLATE,CONCENTRIC ORIFICES.GIVEN TWO OF THE FOLLOWING THREE VARIABLES,THE PROGRAM CALCULATES THE THIRD:METER DIFFERENTIAL,MASS FLOWRATE,ORIFICE HOLE DIAMETER.THE PROGRAM IS APPLICABLE IN ENGLISH,METRIC AND SI UNIT SYSTEM;FOR LIQUID,GAS AND STEAM SERVICE;FOR FLANGE,RADIUS,CORNER, VENA CONTRACTA AND PIPE TAP LOCATIONS;FOR DRAIN/VENT HOLE PROVISIONS;ACCORDING TO ASME/ISO EQUATIONS.THE PROGRAM PRINTS ALL INPUT INTERMEDIATE AND FINAL RESULTS.

999PROGRAM STEPS
GERARD A.A. WESTEN
NL - DORDRECHT

50394D 67-POLYNOMIAL INTERPOLATION BY NEWTON'S METHOD.

THE PROGRAM FINDS THE POLYNOMIAL WHICH IS DEFINED BY THE CONDITION P(XI)=YI (I=0,1...N) WITH ANY SET OF POINTS XO,YO,TO XN,YN, WHERE N IS AN INTEGER GREATER THAN ZERO AND LESS THAN TEN. IT USES P(X)=AO+(X-XO)A1+(X-XO)(X-X1)A2+... +(X-XO)...(X-XM)AN AND M=N-1. THIS IS VERY HELPFUL IF YOU HAVE TO CALCULATE P(X) WITH VARIOUS ARGUMENTS.

142PROGRAM STEPS
DIRK ZABEL
D - BREMEN.

50395D 67-CHANGE DECIMAL IN RATIONAL NUMBER.

WITH THIS PROGRAM YOU CAN CHANGE A DECIMAL NUMBER IN A RATIONAL NUMBER GIVEN OR TWO NOMINATORS, OR TWO DENOMINATORS, BETWEEN THE RATIONAL MUST BE FALL. THE PROGRAM CHOOSES THE BEST RATIONAL AND GIVES YOU THE DIFFERENCE BETWEEN THE BEST RATIONAL AND THE DECIMAL. IF A SOLUTION IS NOT POSSIBLE WITH THE GIVEN LIMITS, THE PROGRAM GIVES YOU THE MINIMUM NOMINATOR OR DENOMINATOR.

151PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50396D 67-DESTROY THE ENEMYROCKET.

YOU ARE THE COMMANDER OF A BASE ON AN ISLAND. FROM A HOSTILE SUBMARINE, WHICH IS SOMEWHERE ON THE SEA, A ROCKET WITH AN ATOMIC WAR-HEAD IS RELEASED AIMING TO THE BASE. THE COORDINATES X, AND Y OF THE SUBMARINE ARE DETERMINED BIJ A SEED AND A RANDOM NUMBER GENERATOR. THE HOSTILE ROCKET MUST BE DESTROYED WITH THE HELP OF DEFENCE-ROCKETS.

224PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50397D 97-CIRCLES IN BOX.

FINDS NUMBER OF CIRCLES OF IDENTICAL SIZE THAT CAN BE PACKED INTO A BOX.

206PROGRAM STEPS

50397D (CONTD)

BENGT LARSSON
S - STOCKHOLM.

50398D 67-NORMAL DISTRIBUTION: PROBABILITY FUNCTION.

THIS PROGRAM COMPUTES WITH HIGHER ACCURACY (TO 10S) FOR ANY GIVEN X, THE STANDARD NORMAL DENSITY FUNCTION Z(X) AND THE NORMAL INTEGRAL Q(X).

223PROGRAM STEPS
JEAN BARFETY
F - LE RAINCY.

50399D 67-POWER IN POLYPHASE SYSTEMS & INSTRUMENT RESPONSE.

THIS PROGRAM COMPRISES A NUMBER OF COMPATIBLE SECTONS FOR THE CALCULATION OF POWER AND INSTRUMENT RESPONSE IN UNBALANCED POLYPHASE SYSTEMS. IT INCLUDES SYMMETRICAL COMPONENTS ANALYSIS, SYNTHESIS OF UNBALANCED SYSTEMS FROM SEQUENCE COMPONENTS, COMPLEXOR PRODUCTS, QUOTIENTS SUMS AND DIFFERENCES. ALL CALCULATIONS MAY BE PERFORMED WITH RECTANGULAR OR POLAR COORDINATES.

212PROGRAM STEPS
SIDNEY WALLACE ECKETT
UK - BUCKHURST HILL.

50400D 67-ASTRO-EUROP-3 HOUSES BY REGIOMANTAN.

FROM RAMC AND LATITUDE OF BIRTHPLACE YOU RECEIVE 6 CUSPS OF REGIOMANTAN. THIS PROGRAM CAN ALSO BE USED AS SECOND CARD TO ASTRO 1.

155PROGRAM STEPS
HEINZ SPECHT
D - BIETIGHEIM BISSINGEN.

50401D 67-BEAMS CALCULATION.

THIS PROGRAM CALCULATES SUPPORT PRESSURES, BENDING MOMENTS AND MIN. MOMENT OF RESISTANCE (FOR A GIVEN MAX. ADMITTED BENDING STRESS) OF A BEAM SIMPLY SUPPORTED, LOADED WITH CONCENTRATED LOADS (UP TO 7). THE BENDING MOMENTS AND THE MIN. MOMENTS OF RESISTANCE CAN BE CALCULATED INDEPENDENTLY, WITHOUT ANY PREVIOUSLY DETERMINED SEQUENCE.

205PROGRAM STEPS
PAOLO PELLICIARDI
I - BOLOGNA.

50402D 97-PLANETARY AND SOLAR EPHEMERIS CALCULATION.

USING THE ORBITAL ELEMENTS OF THE EARTH AND ANY OTHER PLANET THIS PROGRAM CALCULATES THE UNDISTURBED ECLIPTIC AND EQUATORIAL COORDINATES AND THE DISTANCE FROM EARTH OF THE PLANET AND THE SUN FOR A GIVEN TIME.

224PROGRAM STEPS
THOMAS BAUMANN
D - AUMUEHLE.

50403D 67-HELICAL-INVOLUTE GEAR.

THE USER HAS TO CHOOSE: NUMBER OF TEETH, MODULE, PRESSURE ANGLE, HELIX ANGLE AND THE ADDENDUM MODIFICATION.
PROGRAM COMPUTES: MEASUREMENT OVER PINS AND/OR BASE TANGENT LENGTH.

222PROGRAM STEPS
HANS-PETER WEBER
CH - ZURICH.

50404D 67-CODE BREAKER.

50404D (CONTD)

EITHER MACHINE OR OTHER PLAYER GENERATES A 6 DIGIT CODE. MACHINE GIVES YOU HOW MANY CORRECT DIGITS YOU HAVE GUESSED IN THE CORRECT POSITION AND IN THE INCORRECT POSITION. 999.999 POSSIBLE CODES FOR YOU TO BREAK.

212PROGRAM STEPS
DENNIS CINTRA-LEITE
UK - LONDON.

50405D 67-NORMAL AND INVERSE NORMAL DISTRIBUTIONS.

REVISION OF STATISTICS PAC PROGRAM ST1-09A1&2 "NORMAL AND INVERSE NORMAL DISTRIBUTION" SUCH THAT ONLY ONE CARD IS NOW NEEDED. THIS WAS DONE BY ELIMINATION OF THE PRINT OPTION AND SOFTWARE ERROR MESSAGES TOGETHER WITH THE ROUNDING OF VARIABLES B5,B4,B3,B2, AND B1, IN THE LEAST SIGNIFICANT DIGIT. DECREASE IN ACCURACY IS TOLERABLE. PROGRAM SHOULD BE PARTICULARLY USEFULL TO HP-67 USERS WHO DO NOT WANT TO WASTE TIME IN READING 2 CARDS (IT IS EASIER LOOKING UP A TABLE).

224PROGRAM STEPS
DENNIS CINTRA-LEITE
UK - LONDON.

50406D 97-INTERPOLATION BY LAGRANGE FROM 2 TO 9 POINTS.

THE PROGRAM INTERPOLATES BY THE FORMULA OF LAGRANGE, FROM 2 TO 9 GIVEN POINTS. REPETITIONS ARE POSSIBLE, BECAUSE THE COEFFICIENTS REMAIN UNCHANGED IN THE MEMORY.

112PROGRAM STEPS
HANSPETER BERNET
CH - BERN.

50407D 97-CONGRUENT TRANSFORMATIONS.

THIS PROGRAM CALCULATES THE CARTESIAN COORDINATES OF THE IMAGE POINT P' OF P AT ONE OF THE FOLLOWING CONGRUENT TRANSFORMATIONS
1. REFLECTION IN A STRAIGHT LINE GIVEN BY TWO POINTS
2. ROTATION ABOUT A GIVEN POINT FOR A GIVEN ANGLE
3. TRANSLATION ALONG A VECTOR GIVEN BY TWO POINTS.

145PROGRAM STEPS
BERND SCHULTHEISS
D - FREIBURG IM BREISGAU.

50408D 97-STRAIGHT-LINE-EQUATION-FORMS.

PROGRAM TRANSFORMS THE EQUATION OF A STRAIGHT LINE INTO GENERAL LINEAR FORM, TANGENT FORM, INTERCEPT FORM, PERPENDICULAR FORM (HNF) POINT-GRADIENT FORM AND TWO-POINTS FORM.

224PROGRAM STEPS
BERND SCHULTHEISS
D - FREIBURG IM BREISGAU

50409D 67-ASCENT AND DECLINE OF STARS.

PROGRAM DETERMINES THE TIME OF ARISE AND SET OF STARS, SUN AND PLANETS TO A GIVEN POINT AND THE TIME OF CULMINATION AND ALTITUDE DUE TO THIS TIME.

224PROGRAM STEPS
GERHARD STREIT
D - HEILBRONN.

50410D 67-PROGRAM TO CALCULATE MEAN + CONF LIM. LOGNORMAL DISTRIBUTION.

THE PROGRAM CALCULATES PARAMETER ESTIMATES FOR THE LOGNORMAL DISTRIBUTION: MEAN AND VARIANCE, COEFFICIENT OF VARIATION AND THE JOINT

50410D (CONTD)

CONFIDENCE REGION BY MOOD'S METHOD.

224PROGRAM STEPS
M. HOOIJBERG
NL - DRUNEN.

50411D 67-HYPERBOLA FITTING.

THE PROGRAM FITS A SET OF DATA POINTS TO TWO TYPES OF HYPERBOLAS.

173PROGRAM STEPS
ALEXANDER WEIGELT
CH - ST-GALLEN.

50412D 67-BIPOLAR CURVILINEAR COORDINATES.

PROGRAM TRANSFORMS CARTESIAN COORDINATES IN BIPOLAR COORDINATES AND VICE VERSA.

157PROGRAM STEPS
GEORGES ARDICHVILI
B - BRUSSELS.

50413D 67-TEMPERATURE VARIATIONS THROUGH AN INSULATED DISK.

THE LINEAR DIFFERENTIAL EQUATION OF CONDUCTION OF HEAT IN AN ISOTROPIC THIN DISK OR INFINITE CYLINDER, THERMALLY INSULATED WITH AN INITIAL TEMPERATURE F(R), ADMITS A SOLUTION IN THE FORM OF "FOURIER BESSEL"SERIES. THE SPATIAL AND TEMPORAL VALUES OF TEMPERATURE IN THE MATTER ARE CALCULATED WITH GOOD APPROXIMATION BY SUMMING THE N < OR EQUAL TO 7 FIRST TERMS OF THE SERIE.

182PROGRAM STEPS
RENE BAILLY-SALINS
F - IS-SUR-SALINS.

50414D 67-COMPLETE ELLIPTIC INTEGRALS.

THIS PROGRAM CALCULATES:
1. THE GENERAL ELLIPTIC INTEGRAL OF THE SECOND KIND CEL2(X,A,B),
2. THE COMPLETE ELLIPTIC INTEGRAL OF THE FIRST KIND K(X),
3. THE COMPLETE ELLIPTIC INTEGRAL OF THE SECOND KIND E(X),
4. THE ELLIPTIC INTEGRALS B(X) AND D(X).

095PROGRAM STEPS
WOLFGANG EMRHARDT
D - GOETTINGEN.

50415D 67-ECONOMIC PURCHASING WITH QUANTITY DISCOUNTS.

TRADES OFF DISCOUNTS, ORDERING COSTS AND STORAGE COSTS TO CALCULATE PURCHASE QUANTITY THAT MINIMISES TOTAL COSTS. A CHOICE OF TWO SLIGHTLY DIFFERENT TOTAL COST MODELS ARE INCORPORATED. UP TO NINE PRICE BANDS CAN BE ACCOMODATED IF ONLY ONE PRICE BAND USED (I.E., NO DISCOUNTS), PROGRAM CALCULATES STANDARD ECONOMIC ORDER QANTITY (EOQ).

154PROGRAM STEPS
MARTIN HUMPHRIES
UK - BROMSGROVE, WORCS.

50416D 67-SOME MEASUREMENTS OF SHAPE.

CALCULATES THE AREA, THE COORDINATES OF THE CENTROID, AND THE INDICES OF COMPACTNESS AND ELONGATION, AND THE ORIENTATION FOR ANY POLYGONAL SHAPE EXPRESSED IN TERMS OF THE CARTESIAN COORDINATES OF ITS VERTICES. THIS IS SUITABLE FOR MEASURING ANY PLANAR SHAPE WHETHER GEOGRAPHICAL, ENGINEERING OR GEOMETRICAL. THE SHAPE NEEDS NOT TO BE SIMPLY CONNECTED, BUT MAY HAVE "HOLES", OR UNCONNECTED COMPONENT SHAPES.

151PROGRAM STEPS

50416D (CONTD)

THOMAS BISS
UK - BROMSGROVE-WORCS.

50417D 67-2 X 2 CONTINGENCY TABEL, EXACT FISHER'S TEST AND CS OR YATES'CS

WHEN CALCULATED VALUES ARE TOO LOW, CS CANNOT BE USED WITHOUT CORRECTION. THIS PROGRAM CALCULATES CS OR IF NECESSARY IT DOES AUTOMATICALLY THE CORRECTION FOR THE CONTINUITY (YATES). (YOU CAN CHOOSE 5 OR BETTER 10 AS THE LIMIT FOR THE CHOICE BETWEEN CORRECTED OR NOT CORRECTED CS). IF CALCULATED VALUES ARE VERY LOW (E.G. UNDER 2) OR IF IT IS ANY DOUBT, YOU CAN CHOOSE THE CALCULATION OF EXACT PROBABILITY (EVEN IF AN INTERMEDIATE CALCULATION IS OVER 69!). (CS = CHI-SQUARE).

210PROGRAM STEPS
ALAIN GUERIN
F - PARIS.

50418D 67-EIGENVALUES FOR SYMMETRIC 5 X 5 MATRIX.

THIS PROGRAM CALCULATES APPROXIMATIONS OF THE EIGENVALUES OF A SYMMETRIC 5 X 5 MATRIX BY THE JACOBI-ALGORITHM.

215PROGRAM STEPS
AXEL-THOMAS BRUENGER
D - ROSENGARTEN 5.

50419D 67-97 PULMONARY FUNCTIONS VK BMV BLV O2 - RESORPTION.

PROGRAM CALCULATES: VITAL-CAPACITY, TURNOVER, BREATH-MINUTE-VOLUME, O2-RESORPTION, BREATH-LIMITING-VALUE.

200PROGRAM STEPS
INGOLF SEELEMANN
D - BOTTROP.

50420D 67-ARCHERY.

THE POINTS OF EVERY SHOT OBTAINED AT A SHOOTING MATCH OR A SIMILAR CONTEST WERE STORED IN THE REGISTERS. THE TOTAL RESULT OF EVERY PARTICIPANT CAN BE DISPLAYED IN THREE DIFFERENT MANNERS.
- IN ORDER OF THE NUMBERS OF THE PARTICIPANTS
- IN ORDER OF THE POINTS OF THE PARTICIPANTS (BEST RESULTS FIRST)
- THE AVERAGE POINTS OF EVERY PARTICIPANTS.

223PROGRAM STEPS
PAUL MAIER
CH - SCHAFFHAUSEN.

50421D 67-SYSTEMS OF DIFFERENTIAL EQUATIONS.

PROGRAM SOLVES SYSTEMS OF UP TO 4 1TH ORDER DIFFERENTIAL EQUATIONS OR OF 2 2TH ORDER D.E. SOLVES EVEN 3TH AND 4TH ORDER D.E. THE 4TH RUNGE-KUTTA METHOD IS USED.

158PROGRAM STEPS
GUIDO PETZ
S - SOLNA.

50422D 67-POLYGONAL AREA AND CENTRE OF POLYGONAL MASS CALCULATION.

THE PROGRAM CALCULATES THE AREA WITHIN A POLYGONAL BOUNDARY AND THE CENTRE OF MASS IN COORDINATES. INPUT EITHER BEARING+DISTANCE OR X-Y COORDINATES.

128PROGRAM STEPS
M. HOOIJBERG
NL - DRUNEN.

50423D 67-INTERPOLATION USING AITKEN FORMULA (N = 8).

50423D (CONTD)

GIVEN EIGHT PAIRS OF VALUES OF XI AND YI, THIS PROGRAM COMPUTES A CORRESPONDING VALUE OF XO BY USING AITKEN FORMULA, A METHOD OF ITERATIVE DIRECT LINEAR INTERPOLATION OR INVERSE LINEAR INTERPOLATION.

196PROGRAM STEPS
M. HOOIJBERG
NL - DRUNEN.

50424D 67-MULTIPLE 2-POINT GAUSS-LEGEND INTEGRATION.

THIS PROGRAM (ONE OF A SUITE) ESTIMATES THE VALUE OF AN INTEGRAL OVER A FINITE RANGE. THE RANGE OF INTEGRATION IS FIRST DIVIDED INTO A (USER SPECIFIED) NUMBER OF EQUAL SUB-INTERVALS AND THE 2-POINT GAUSS LEGEND METHOD IS APPLIED TO EACH SUB-INTERVAL. BY CHANGING THE NUMBER OF SUB-INTERVALS, THE ACCURACY OF THE RESULTS CAN BE ASSESSED. OF PARTICULAR INTEREST TO TEACHERS OF NUMERICAL ANALYSIS.

106PROGRAM STEPS
ROBERT J. M. CROZIER
SCOTLAND - PAISLEY.

50425D 67-MULTIPLE 3-POINT GAUSS-LEGEND INTEGRATION.

THIS PROGRAM (ONE OF A SUITE) ESTIMATES THE VALUE OF AN INTEGRAL OVER A FINITE RANGE, THE RANGE OF INTEGRATION IS FIRST DIVIDED INTO A (USER SPECIFIED) NUMBER OF EQUAL SUB-INTERVALS AND THE 3-POINT GAUSS LEGEND METHOD IS APPLIED TO EACH SUB-INTERVAL, BY CHANGING THE NUMBER OF SUB-INTERVALS, THE ACCURACY OF THE RESULTS CAN BE ASSESSED OF PARTICULAR INTEREST TO TEACHERS OF NUMERICAL ANALYSIS.

106PROGRAM STEPS
ROBERT J. M. CROZIER
SCOTLAND - PAISLEY.

50426D 67-MULTIPLE 4-POINT GAUSS-LEGEND INTEGRATION.

THIS PROGRAM (ONE OF A SUITE) ESTIMATES THE VALUE OF AN INTEGRAL OVER A FINITE RANGE. THE RANGE OF INTERGRATION IS FIRST DIVIDED INTO A (USER SPECIFIED) NUMBER OF EQUAL SUB-INTERVALS AND THE 4-POINT GAUSS LEGEND METHOD IS APPLIED TO EACH SUB-INTERVAL. BY CHANGING THE NUMBER OF SUB-INTERVALS, THE ACCURACY OF RESULTS CAN BE ASSESSED. OF PARTICULAR INTEREST TO TEACHERS OF NUMERICAL ANALYSIS.

106PROGRAM STEPS
ROBERT J.M. CROZIER
SCOTLAND - PAISLEY.

50427D 67-MULTIPLE 5-POINT GAUSS-LEGEND INTEGRATION.

THIS PROGRAM (ONE OF A SUITE) ESTIMATES THE VALUE OF AN INTEGRAL OVER A FINITE RANGE, THE RANGE OF INTERGRATION IS FIRST DIVIDED INTO A (USER SPECIFIED) NUMBER OF EQUAL SUB-INTERVALS AND THE 5-POINT GAUSS LEGEND METHOD IS APPLIED TO EACH SUB-INTERVAL. BY CHANGING THE NUMBER OF SUB-INTERVALS, THE ACCURACY OF THE RESULTS CAN BE ASSESSED OF PARTICULAR INTEREST TO TEACHERS OF NUMERICAL ANALYSIS.

106PROGRAM STEPS
ROBERT J.M. CROZIER
SCOTLAND - PAISLEY.

50428D 67-ROMBERG METHOD.

THIS PROGRAM FINDS INTEGRALS OF FUNCTIONS KNOWN EXPLICITLY USING ROMBERG METHOD. THE ERROR IS LESS THAN A GIVEN CEILING.

50428D (CONTD)

112PROGRAM STEPS
FRANZ WAGNER
D - MUNICH.

50429D 67-D (HKL) AND CELL-RECIPROCAL.

PROGRAM COMPUTES D(HKL) AND THE CELL-RECIPROCALS A*,B*,C*,ALPHA, BETA, GAMMA.

224PROGRAM STEPS
JO GEUSKENS
NL - MAASTRICHT.

50430D 67-RECIPROCITY EFFECT / BELLOW FACTOR.

PROGRAM FINDS EXPOSURE TIME CORRECTED FOR BELLOW FACTOR AND RECIPROCITY EFFECT GIVEN LENS USED, EXTENSION AND UNCORRECTED EXPOSURE TIME FROM LIGHT METER. AS OPTION THE BELLOW FACTOR, STEPS INCREASE AND SCALE FACTOR. IS COMPUTED FROM LENS; EXTENSION OR BELOW FACTOR, STEPS INCREASE AND EXTENSION GIVEN USED LENS AND DESIRED SCALE FACTOR.

163PROGRAM STEPS
JENS SUCKSDORFF
S - STOCKHOLM.

50431D 67-NAVIGATION 1A.

THIS PROGRAM SOLVES WIND TRIANGLE NAVIGATION PROBLEMS, OF THE SIX VARIABLES (TRUE AIR SPEED (TAS), HEADING (HDG), TRUE TRACK (TTR), WIND DIRECTION/WIND VELOCITY (W/V) AND GROUND SPEED (GS), YOU CAN CALCULATE:# WIND CORRECTION ANGLE HDG/TTR,# TTR/GS, AND # W/V, BY RESPECTIVELY ENTERING THE REMAINING VARIABLES. TAS CAN BE CALCULATED FROM MACHNUMBER AND AIR TEMPERATURE ALSO TIME/DISTANCE AND DISTANCE/TIME CALCULATIONS CAN BE MADE.

224PROGRAM STEPS
ROBERT VAN GELDER
NL - REEUWIJK.

50432D 67-BACK INTERSECTION OF TWO POINTS HANSEN.

GIVEN TWO POINTS A AND B WITH COORDINATES YA,XA,YB,XB AND FOUR ANGLES QPA = ALPHA, APB = BETA, PQB = GAMMA, BQA = SIGMA. THE PROGRAM COMPUTES THE COORDINATES OF THE WANTED POINTS P AND Q AND THE DISTANCE BETWEEN P AND Q.

099PROGRAM STEPS
CHRISTIAN LANDOLT
CH - BECKENRIED.

50433D 67-DISC FILES BLOCKING AND PROCESSING.

GIVEN LOGICAL RECORD LENGTH, MINIMUM BLOCKING FACTOR AND MAXIMUM BLOCK SIZE THE PROGRAM FINDS OPTIMAL BLOCKING FACTOR, BLOCK SIZE AND NUMBER OF BLOCKS PER TRACK, GIVEN THESE PARAMETERS PLUS THE NUMBER OF LOGICAL RECORDS, NB. OF DATA TRACKS PER CYLINDER, TRANSMISSION SPEED, ROTATIONAL DELAY AND SEEN TIME THE PROGRAM COMPUTES SPACE NEEDED, SEQUENTIAL PROCESSING TIME AND INDEXED-SEQUENTIAL ACCESS TIME.

222PROGRAM STEPS
AVIGDOR LUTTINGER
F - LYON.

50434D 67-TRANSLATION, ROTATION, REFLECTION AND AFFINITY.

PROGRAM CALCULATES TWO DIMENSIONAL TRANSLATION, ROTATION, REFLECTION, CENTRIC EXPANSION, AXIS AFFINITY OF ANY ANGLES, AND GENERAL AFFINITY CORRESPONDING TO A 2 X 2 - MATRIX

50434D (CONTD)

AND AN XY-VECTOR OF YOUR OWN CHOICE

199PROGRAM STEPS
GERALD BULCZYNSKI
D - BERLIN.

50435D 97-DESCRIBING - FUNCTION FOR MODIFIED LINEAR CHARACTERISTIC.

THE DESCRIBING FUNCTION N(A) OR THE NEGATIVE INVERSE DESCRIBING FUNCTION NJ(A) FOR THE GENERALIZED LINEAR CHARACTERISTIC IS COMPUTED. INPUT DATA ARE THE STARTING AND THE FINAL VALUE OF INPUT AMPLITUDE, THE INCREMENT OF AMPLITUDE AND THE PARAMETERS OF THE FOLLOWING CHARACTERISTICS: LINEAR WITH SATURATION, LINEAR WITH HYSTERESIS AND SATURATION, LINEAR WITH DEAD ZONE AND SATURATION, AND LINEAR WITH DEAD-ZONE, HYSTERESIS AND SATURATION.

294PROGRAM STEPS
FRANK DORRSCHEIDT
D - PADERBORN.

50436D 67-GEOCENTRIC COORDINATES OF THE SUN.

THIS PROGRAM COMPUTES THE GEOCENTRIC COORDINATES RIGHT ASCENSION AND DECLINATION WITHOUT PERTURBATIONS FOR THE SUN. AT ANY POINT OF TIME WITHIN +/- 5 YEARS THE RESULTS DIFFER ONLY +/- 2 SECONDS IN RA AND +/- 12" IN DECL. FROM THE CORRECT POSITIONS. REQUIRED DATA ARE THE ORBIT DATES OF THE EARTH, WHICH ARE RECORDED ON THE SECOND SIDE OF THE MAGNETIC CARD. THE PROGRAM DESCRIPTION INCLUDES THEIR ANNUAL VARIATIONS; SO POSITIONS OF FORMER OR LATER YEARS CAN BE COMPUTED TOO.

103PROGRAM STEPS
LOTHAR BUTTNER
D - OBERHAUSEN 1.

50437D 97-LOTTERY 600 NUMBERS WITHOUT REPEATS.

PROGRAM DRAWS RANDOMLY FROM UP TO 600 NUMBERS WITHOUT REPEATING. EACH SOTRES 30 BITS.

155PROGRAM STEPS
JEAN-CLAUDE HENTSCH
CH - GENEVA.

50438D 67-HYPERGEOMETRIC FUNCTION FRESNEL INTEGRALS.

THIS PROGRAM COMPUTES THE VALUES OF THE CONFLUENT HYPERGEOMETRIC FUNCTION M(A, C, Z), AND OF THE FRESNEL INTEGRALS C(Z), S(Z)]

135PROGRAM STEPS
PETER MILING
D - LIPPSTADT.

50439D 97-WEIGHT-MOLAR CONVERSION OF COMPOSITION.

CONVERTS THE CHEMICAL COMPOSITION OF A MATERIAL CONTAINING UP TO EIGHT CONSTITUENTS FROM WEIGHT PERCENT TO MOLAR PERCENT OR VICE VERSA.

156PROGRAM STEPS
MICHAEL CABLE
UK - SHEFFIELD.

50440D 67-FREQUENCY OF FLOODS - GUMBEL DISTRIBUTION.

PROGRAM EXTRAPOLATED FLOOD-VALUES FOR A RECURRENCE INTERVAL TR=5-10-50-100-500-1000-5000-10000 YEARS. INPUT: FLOOD VALUES FOR N. YEARS (AVAILABLE) OUTPUT: TR, K, Q MIN, Q MED, A MAX FOR ALL TR;G-MEAN, SX,N.

50440D (CONTD)

133PROGRAM STEPS
GABRIEL MONCAYO
D - FRANKFURT.

50441D 67-CIRCUMMERIDIAN ALTITUDES (ALTITUDE AT MERIDIAN PASSAGE).

COMPUTES THE ALTITUDE OF A CELESTIAL BODY AT NORTH MERIDIAN PASSAGE WHEN AN ALTITUDE BEFORE OR AFTER MERIDIAN PASSAGE IS KNOWN.

068PROGRAM STEPS
ROBERT F. MENZI
CH - GENEVA.

50442D 67-TIDE CALCULATION II TIME AND HEIGHT IN SECONDARY PORTS.

COMPUTES TIME AND HEIGHT OF HIGH AND LOW WATER IN SECONDARY PORTS, WHEN TIMES AND HEIGHTS IN THE STANDARD PORT ARE GIVEN. INPUT DATA ARE THOSE GIVEN BY THE TIDE TABLES ENTERED IN THE SAME ORDER. A ROUTINE PERMITS TO WRITE A DATA CARD FOR ANY SECONDARY PORT. WATER HEIGHT AT ANY TIME, TIME FOR ANY WATER HEIGHT, AND MEAN WATER LEVEL CAN BE COMPUTED.

210PROGRAM STEPS
ROBERT F. MENZI
CH - GENEVA.

50443D 67-BRIDGE SCORE CALCULATOR AND KEEPER.

PROGRAM CALCULATES THE BRIDGE SCORES FROM THE NUMBER OF BIDDEN AND TAKEN TRICKS. VULNERABILITY IS AUTOMATICALLY CONTROLLED BY THE PROGRAM. THE POINTS ARE DISTRIBUTED TO THE FOUR PLAYERS. GAME OR PART-SCORE AND TOTAL POINTS CAN EASILY BE DISPLAYED. THE RESULT AFTER EACH PLAY CAN BE RECORDED ON A DATA CARD.

223PROGRAM STEPS
KURT ASTRAND
S - GOTEBORG

50444D 97-TWO FIELD BEAM.

THE PROGRAM COMPUTES BEAMFORCES OF TWO FIELD BEAMS.

139PROGRAM STEPS
FREY MARTIN
CH - OLTEN.

50445D 97-CONTPACK.

PROGRAM PACKS CASES OF THE SAME DIMENSIONS INTO A GREATER CONTAINER IN SUCH A WAY THAT IT WILL HOLD THE HIGHEST NUMBER OF CASES. IN EACH LAGER ONLY ON HEIGHT IS ALLOWED, AND ONE AND TWO BLOCK CONFIGURATONS ARE COMPUTED.

407PROGRAM STEPS
BENGT LARSSON
S - STOCKHOLM.

50446D 67-MOVING AVERAGE.

INITIALLY WRITTEN FOR CALCULATING OVER STOCKS PRICES, THIS PROGRAM ALLOWS THE COMPUTATION OF ANY MOVING AVERAGE OVER 40 NUMBERS INTEGERS AND POSITIVES MAXIMUM AND 1 TO 5 FIGURES MAXIMUM. SO THAT, THIS PROGRAM IS CONVENIENT FOR 40, 30, 18 AND 10-WEEK MOVING AVERAGES WHICH ARE THE MOSTLY EMPLOYED IN TECHNICAL ANALYSIS.

085PROGRAM STEPS
BECKERS JEAN-PIERRE GUILLAUME
B - NAMUR.

50447D 97-MERIDIONAL PARTS.

50447D (CONTD)

COMPUTES NUMBER OF MERIDIONAL PARTS FOR THE CLARKE SPHEREOIDS OF 1866 - 1880.

154PROGRAM STEPS
NEVILLE A. MORRIS
UK - LINCOLN.

50448D 67-WALL STREET GAME.

YOU START ON THE STOCK MARKET WITH A 15,000 DOLLAR CAPITAL. WITH THIS CAPITAL YOU CAN BUY SHARES OF RESP. 100, 200, 300, 400 OR 500 DOLLARS. BY WAY OF SPECULATION, YOU SHOULD TRY TO REALIZE A MAXIMUM PROFIT IN A PERIOD OF 30 DAYS, BY BUYING AND SELLING SHARES. THE SHARE-QUOTATIONS ARE DETERMINED EVERY DAY AND CAN BE RECALLED.A SPECIAL RANDOM NUMBER GENERATOR TO DETERMINE THESE QUOTES (THE UPS AND DOWNS) IS USED. THE DIFFERENCE BETWEEN THE "SELLING" SHARES AND "BUYING" SHARES BECOMES YOUR "CASHMONEY".

222PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50449D 67-RELATIONS OF THE CORRECTED POISSON-DISTRIBUTION.

PROGRAM EXAMINES THE RELATION BETWEEN THE DISTRIBUTION OF A POPULATION AND THE EXPECTED DISTRIBUTION GIVEN BY THE CORRECTED POSSION DISTRIBUTION. YOU CAN ALSO TEST THIS RELATION WITH THE CHI-SQUARE TEST, CORRECTED BY YATES, WITH (N-1) DEGREES OF FREEDOM. ALSO YOU CAN COMPUTE THE ESTIMATED DISTRIBUTION.

199PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50450D 67-BASE CONVERSIONS AND ARITHMETICS

PROGRAM CONVERTS POSITIVE INTEGERS FROM ANY BASE (INTEGER VALUE FROM 2 TO 99 INCLUSIVE) TO BASE TEN AND VICE-VERSA. IT ALSO PERFORMS ADDITIONS AND SUBTRACTIONS OF ANY BASE (2 TO 99) POSITIVE INTEGERS. OPERATIONAL STACK BEHAVES AS IN BUILT IN OPERATIONS (CONVERSION, ADDITION AND SUBTRACTION), PERMITTING RPN CHAINED OPERATIONS.

212PROGRAM STEPS
LUTTINGER AVIGDOR
F - LYON.

50451D 97-ANALYSIS OF VARIANCE 3X4.

COMPLETE COMPUTATION AND PRINTOUT OF ANOVA-TABLE INCLUDING F-TESTS OF EFFECTS (ROWS, COLUMNS, INTERACTION ROWS X COLUMNS) AGAINST "WITHIN MEAN SQUARES" FOR A DOUBLE ENTRY TABLE WITH 3 ROWS AND 4 COLUMNS AND DELIBERATE DIFFERENT N'S IN CELLS.

224PROGRAM STEPS
HANS EBERHARD ZAHN
D - BERLIN.

50452D 97-PREPARATION OF BASIC DATA FOR ANALYSIS OF VARIANCE.

IN PREPARATION OF QUICK PERFORMANCE OF MORE COMPLEX ANALYSIS OF VARIANCE (E.G. 2 OR MORE LEVELS) VALUES CHARACTERIZING CELL-DISTRIBUTIONS OF DELIBERATE SIZE ARE COMPUTED AND STORED ON MAGNETIC CARDS. THERE IS AN OPTION FOR PRINTOUT OF BASIC STATISTICS.

155PROGRAM STEPS
HANS-EBERHARD ZAHN
D - BERLIN.

50453D 97-ROOT LOCI FOR LINEAR SINGLE LOOP SERVO SYSTEMS.

50453D (CONTD)

THE PROGRAM COMPUTES THE ROOT LOCI OF A LINEAR SINGLE LOOP SERVO SYSTEM OF UP TO FIFTH ORDER. THE COEFF. OF THE CHARACTERISTIC EQUATION D(S) ARE COMPUTED FROM OPEN LOOP TRANSFER FUNCTION FO(S) FIRST, THEN THE ROOTS OF D(S) ARE DETERMINED BY USE OF PROGR.00068D. INPUT DATA ARE THE ORDER OF NOMINATOR AND DENOMINATOR POLYNOMIALS OF FO(S), THE GAIN CONSTANT K AND THE POLES AND ZEROS OF FO(S).

207PROGRAM STEPS
FRANK DOERRSCHEIDT
D - PADERBORN.

50454D 67-CHECKSUM COMPUTATION.

THIS PROGRAM COMPUTES THE CHECKSUM OF A SET OF BYTES (HEXADECIMAL FORM). FAST RESULT.

056PROGRAM STEPS
ALAIN PINAUD
F - PLAISIR.

50455D 67-AIR NAVIGATION PROGRAM.

THIS PROGRAM ACCEPTS THE TRUE TRACK AND THE DISTANCE OF A LEG TO BE FLOWN EITHER DIRECTLY FROM THE KEYBOARD OR VIA A LEG SEQUENCE NUMBER FROM A DATA CARD, AND COMPUTES DRIFT CORRECTION ANGLE, TRUE HEADING, MAGNETIC HEADING, GROUNDSPEED, FLIGHT TIME PER LEG AND TOTAL FLIGHT TIME. IT ALSO COMPUTES LANDING HEAD-AND CROSSWIND COMPONENTS. LEG DATA CARDS CAN CONTAIN UP TO 40 LEGS. A SEPARATE PROGRAM IS AVAILABLE TO WRITE DATA CARDS.

165PROGRAM STEPS
J.E. MEBIUS
NL - BERKEL & RODENRYS.

50456D 67-AIR NAVIGATION LEG DATA PROGRAM.

WITH THIS PROGRAM ONE CAN BUILD, UPDATE AND INSPECT LEG DATA (I.E., TRACK AND DISTANCE TO BE FLOWN) AND WRITE THEM ONTO A DATA CARD. ONE CARD ACCOMODATES TWO TRACKS EACH CONTAINING DATA OF UP TO 20 LEGS. THESE DATA CARDS MAY BE USED IN CONNECTION WITH THE AIR NAVIGATION PROGRAM FROM THE SAME AUTHOR.

120PROGRAM STEPS
J.E. MEBIUS
NL - BERKEL & RODENRYS.

50457D 67-RECURSIVE PROGRAMMING SUPPORT ROUTINES.

THIS PACKAGE FACILITATES RECURSIVE PROGRAMMING. A RECURSIVE ROUTINE IS A ROUTINE THAT MAY CALL ITSELF FROM WITHIN; IT MUST MAINTAIN A STACK FOR RETURN ADDRESSES AND ONE FOR ARGUMENTS AND INTERMEDIATE RESULTS. UP TO 21 DATA ITEMS MAY BE STACKED; WHEN YOU SPECIFY 2(5,10,15) RETURN POINTS YOU MAY STACK UP TO 30 (13,9,7) RETURN ADDRESSES. THE SUPPORT ROUTINES TAKE 48 LOCATIONS, THE INITIALIZATION AND THE EXAMPLE, 46.

094PROGRAM STEPS
J.E. MEBIUS
NL - BERKEL & RODENRYS.

50458D 97-HISTOGRAM LIST AND PLOTTER.

THIS PROGRAM SORTS INPUT DATA IN A SELECTABLE NUMBER OF GROUPS OF EQUAL WIDTH BETWEEN UPPER AND LOWER EXPECTED LIMITS. THE BEST QUANTITY OF GROUPS CAN BE SELECTED BY THE CALCULATOR ITSELF BY SPECIFYING THE RANGE OF EXPECTED INPUTS.

50458D (CONTD)

223PROGRAM STEPS
FRED KNAEPPER
SPAIN - MADRID.

50459D 67-VERY LARGE AND SMALL NUMBERS.

PROGRAM OPERATES AT NUMBERS FROM 10↑↑-10^M TO 99999 X 10↑↑10^M DEFINED FUNCTIONS ARE: +, -, X, :, 1/X, E**X, Y**X, N!, LOG, LN, STORE AND RECALL AT ALL REGISTORS (NOT A, B). STACK ONLY 3 REGISTORS DEEP.

112PROGRAM STEPS
HORST VOELZ
D - BERLIN.

50460D 67-TRANSFORMER CALCULATION.

WITH THIS PROGRAM TRANFORMERS CAN BE CALCULATED, WHICH HAS ONE PRIMARY WINDING AND 3 SECONDARY WINDINGS IN MAXIMUM. THE INVARIABLE VALUES MUST BE TAKEN OUT OF THE ACCOMPANIED TABLE. THE TRANSFORMER-CORES ARE C-CORES CUT OF ORIENTED SILICON-IRON.

209PROGRAM STEPS
RAINER BIRKEN.
D - FRIOKHEIM.

50461D 67-THERMODYNAMIC SOUNDING.

THIS PROGRAM COMPUTES, IN A METEOROLOGICAL SOUNDING WITH RADIO ONDE,THE GEOPOTENTIAL, DEW-POINT TEMPERATURE AND LAPSE RATE OF TEMPERATURE OF THE SIGNIFICANT LEVELS. IT ALSO COMPUTES THE GEOPOTENTIAL, TEMPERATURE, HUMIDITY AND DEW-POINT TEMPERATURE OF THE STANDARD ISOTERIC SURFACES.

223PROGRAM STEPS
EUGENIO OLIVA
SPAIN - MADRID.

50462D 67-NYQUIST, BODE, BLACK-NICHOLS DIAGRAMS.

THIS PROGRAM GIVES A POINT OF NYQUIST OR BODE OR BLACK-NICHOLS DIAGRAM OF THE OPEN-LOOP TRANSFER FUNCTION OR THE CLOSED-LOOP TRANSFER FUNCTION FOR EACH VALUE OF THE PULSATION PROVIDED THAT THE FEEDBACK IS UNITY AND THAT THE FORWARD TRANSFER FUNCTION IS G(S)=P8(S)*K *EXP(-TAU*S)/P9(S) WHERE PN IS A POLYNOMIAL UP TO THE NTH ORDER WITH THE LST COEFFICIENT EQUAL TO THE UNITY.

223PROGRAM STEPS
PHILIPPE LEMAIRE
B - CHENEE.

50463D 67-AREA BOUNDED BY TWO OVERLAPPED CIRCLES.

WITH THIS PROGRAM YOU CAN COMPUTE THE AREA BOUNDED BY TWO OVERLAPPED CIRCLES. THE CIRCLES ARE GIVEN BY THE COORDINATES OF THE CENTER AND THE RADIUS. IN AN X-Y PLANE. YOU MUST START WITH THE GREATEST CIRCLE IT IS ALSO POSSIBLE TO RECALL THE LENGHT OF THE CHORD LINE AND THE COORDINATES OF THE POINTS OF INTERSECTION.

224PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50464D 67-INTERPOLATIONS BY NEWTON DESCENDING POLYNOMIALS.

THIS PROGRAM COMPUTES VALUES OF A FUNCTION AND AN APPROXIMATION OF THE FIRST DERIVATIVE FOR EVERY ABSCISSA WITHIN A DEFINED INTERVAL BY MEANS OF THE NEWTON DESCENDING POLYNOMIAL. THE USER SPECIFIES POINTS WHICH MUST BE ACQUIDISTANT; (UP TO 18 POINTS).

50464D (CONTD)

163PROGRAM STEPS
JEAN M. DEROCHETTE
B - HUY.

50465D 67-FUNCTION MINIMIZATION WITH ALTERNATING DIRECTIONS.

PROGRAM FINDS THE MINIMUM (MAXIMUM) OF A FUNCTION OF TWO VARIABLES BY AN ITERATIVE METHOD STARTING WITH A GUESS VALUE FOR THE PLACE WHERE MIN.(MAX.) MAY BE.
THE METHOD USED IS THE SO CALLED ALTERNATING DIRECTIONS AND IS TRIMMED FOR TWO VARIABLES AND STACK ARITHMETIC FOR MAXIMUM EFFICIENCY AND SPEED.

086PROGRAM STEPS
JEHANGER GRAMI
D - MUENCHEN.

50466D 97-COMPUTING BASIC-DATES OF ASTROLOGICAL HOROSCOPE.

PROGRAM COMPUTES AND DOCUMENTS FROM INPUP-DATES THE HOROSCOPE BASIC DATES (LOCAL TIME, GREENWICH-TIME FOR PLANETS-COMPUTING AND ARMC FOR COMPUTING CUPS OF HOUSES) WHICH ARE NECESSARY FOR HOROSCOPE COMPUTING. BESIDES IT CHANGES INPUT DATA AND DOCUMENTS THEM IF NECESSARY BESIDES OF THE UNCHANGED INPUT DATES.PROG.SHOWS BY NEGATIVE OUTPUT DATA IF THE EPHEMERIS OF THE DAY BEFORE IS NECESSARY AND DOCUMENTS (AS A NEGATIVE RESULT) THE COMPUTED SIDEREAL TIME OF THE DAY BEFORE IF NECESSARY. GOES WITH 50467D,50468D.

224PROGRAM STEPS
WERNER POPP
D - GETTORF.

50467D 97-COMPUTING LONGITUDE OF PLANETS FROM MIDDAY EPHEMERIS (DD.MMSS).

IN ADDITION TO CARD - 0 - = COMPUTING BASIC DATES OF ASTROLOGICAL HOROSCOPE THIS PROGRAM = CARD - 1A - WANTS INPUTS OF SIGN AND ECLIPTIC LONGITUDES OF SUN, MOON AND PLANETS FROM A MIDDAY EPHEMERIS (DD.MMSS) LIKE THE ASTROLOGICAL VOLUME (EPHEMERIDEN - 1890 - 1950/ KUENDIG/METZT/ZUERICH) AND COMPUTES ECLIPTICAL LONGITUDES.
THIS PROGRAM GOES WITH NUMBER 50466D AND NUMBER 50468D.

157PROGRAM STEPS
WERNER POPP
D - GETTORF.

50468D 97-COMPUTING LONGITUDE OF PLANETS FROM MIDNIGHT EPHEMERIS (DD.MMM).

IN ADDITION TO CARD - 0 - = COMPUTING BASIC DATES OF ASTROLOGICAL HOROSCOPE THIS PROGRAM = CARD - 1 B - WANTS INPUTS OF SIGN AND ECLIPTIC LONGITUDES OF SUN, MOON AND PLANETS FROM A MIDNIGHT EPHEMERIS (DD.MMM) LIKE THE COMPLETE PLANETARY EPHEMERIS 1950 - 2000 A.D. (HIERATIC PUBLISHING) AND COMPUTES ECLIPTICAL LONGITUDES. THIS PROGRAM GOES WITH PROGRAM NUMBER 50466D AND NUMBER 50467D.

169PROGRAM STEPS
WERNER POPP
D - GETTORF.

50469D 97-PLOTTING MATHEMATICAL FUNCTIONS.

THE PROGRAM PLOTS ANY MATHEMATICAL FUNCTION WITHIN A CHOSEN RANGE AND A CHOSEN DIFFERENCE OF THE ABSCISSA VALUES WITH +- 5% ACCURACY OVER THE RANGE OF THE ORDINATE VALUES.
SIDE 1 PLOTS THE GRAPH WITH BEAMS OF 1S, SIDE 2 PLOTS THE GRAPH WITH DECIMAL POINTS, 1S ON THE LEFT AND 0S ON THE RIGHT SIDE OF THEM.

50469D (CONTD)

104PROGRAM STEPS
J. WOLFGANG ISSLER
D - STUTTGART.

50470D 67-POLYNOM INTERPOLATION UP TO 5(6) TH DEGREE; EXPLICIT FACTORS.

THIS PROGRAM CALCULATES THE FACTORS OF A POLYNOM OF DEGREE N-1 THAT FITS A SET OF N GIVEN COUPLES OF X AND Y. THESE FACTORS CALCULATED, VALUES OF Y TO INTERMEDIATE VALUES OF X MAY BE FOUND. AUTOMATIC DISPLAY OF COUPLES X,Y TO EQUALLY SPACED VALUES OF X IS ALSO AVAILABLE. OPERATING LIMITS: NUMBER N RESTRICTED TO BE WITHIN 2 TO 7, LIMITS INCLUDED. IF NO VALUE X OF THE GIVEN COUPLES X,Y IS EQUAL TO ZERO, THE UPPER LIMIT IS REDUCED TO 6.

224PROGRAM STEPS
RUDOLF SEYSEN
D - FRANKFURT.

50471D 67-GLIDER PERFORMANCE ANALYSIS.

GIVEN TWO POINTS OF MEASURED PERFORMANCE FOR ANY GLIDER, PROGRAM GIVES REMAINDER OF POLAR CURVE, MAX L/D, AIRSPEED FOR ANY L/D, MIN SINK, AIRSPEED FOR MIN SINK, SPEED TO FLY IN ANY AIR HEADWIND, MACREADY SPEEDS FOR ANY THERMAL STRENGTH, AVERAGE CROSS COUNTRY SPEED. THE USER MAY INCREASE OR DECREASE ALL UP WEIGHT. INITIALISING DATA FOR FOURTEEN DIFFERENT GLIDERS SUPPLIED.

141PROGRAM STEPS
DON WEBBER
UK - YATELEY.

50472D 67-TEACHERS' PET.

WITH THIS PROGRAM YOU CAN COMPUTE THE GENERAL SCORE AND THE PERCENT OF THE RESULTS OF PUPILS WITH DIFFERENT MAXIMUM SCORES.

138PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50473D 67-VOLUME OF OIL IN A TANK.

WITH THIS PROGRAM YOU CAN COMPUTE THE VOLUME OF OIL IN A HOLLOW CLOSED CYLINDRICAL CONTAINER, GIVEN THE RADIUS AND THE LENGTH OF THE CONTAINER AND THE DEPTH OF THE OIL. YOU CAN ALSO COMPUTE THE EMPTY PART OF THE CONTAINER AND THE PRICE YOU MUST PAY TO FULL THE CONTAINER AGAIN.

084PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50474D 67-ANNUAL COST AND NPV CAPITAL PROJECT APPRAISAL.

ANNUAL COST IS A TECHNIQUE OF PROJECT APPRAISAL, WHEREBY THE COMPARISON BETWEEN AN INITIAL CASH OUTLAY AND THE SUBSEQUENTLY ARISING CASH FLOWS IS EXPRESSED IN TERMS OF AN ANNUAL UNIFORM AMOUNT. THE TECHNIQUE CAN BE USED TO EXPRESS BENEFIT OF CASH INFLOWS AS WELL AS COSTS. ANNUAL COST IS A FORM OF DISCOUNTED CASH FLOW APPRAISAL ALTERNATIVE TO NPV OR IRR.

201PROGRAM STEPS
WILLIAM F.A. STEELE
UK - FROME.

50475D 67-YACHTRACING COMPUTATIONS CLOSEHAULED ON TIDAL WATER.

COMPUTES APPARENT WIND ANGLE (CORRECTED FOR HEEL AND DRIFT) TRUE WIND VELOCITY AND DIRECTION, YACHT'S VELOCITY MADE GOOD TO WINDWARD (THROUGH MOVING WATER AS WELL AS OVER GROUND), RESOLVES PROBLEM WHICH TACK IS MORE FAVOURABLE AS A RESULT OF TIDAL CURRENT AND DISPLAYS 17 VALUES SHOWING COMPLETE PICTURE OF YACHT'S MOVEMENT THROUGH WATER AND OVER GROUND (ALSO IF TACKED) FROM SPEEDOMETER, CLINOMETER, ANEMOMETER WIND ANGLE METER, COMPASS, DRIFT & TIDAL INFORMATION.

224PROGRAM STEPS
HENDRIK ZUIDERBAAN
NL - DORDRECHT.

50476D 67-ELLIPTIC LOW-PASS FILTERS. POLES AND ZEROS.

GIVEN THE DEGREE, PASSBAND RIPPLE AND SELECTIVITY, THE POLES AND ZEROS OF NORMALIZED ELLIPTIC LOW-PASS TRANSFER FUNCTIONS ARE FOUND. ELLIPTIC FUNCTIONS ARE COMPUTED BY THE METHOD OF ARITHMETIC-GEOMETRIC MEAN. EVEN ORDER FUNCTIONS DOES NOT HAVE A TRANSMISSION ZERO AT INFINITY.

392PROGRAM STEPS
NILS HAAHEIM
N - TRONDHEIM.

50477D 97-THERMODYNAMIC FUNCTIONS OF TEMPERATURE

IT IS ASSUMED THAT IN A FINITE TEMPERATURE INTERVAL GIBBS FREE ENERGY CAN BE EXPRESSED BY : G=G0+G1*T+G2*T**2+G3*T**3+ GAMMA*T*LN(T).WITH THE FIVE COEFFICIENTS AS INPUT THE PROGRAM SETS UP THE COEFFICIENTS OF SIMILAR EXPRESSIONS FOR THE ENTHALPY,HEAT CAPACITY ENTROPY AND EQUILIBRIUM CONSTANT.VALUES OF THESE FUNCTIONS CAN BE CALCULATED FOR ANY TEMPERATURE.TEMPERATURES FOR WHICH A THERMODYNAMIC FUNCTION HAS A GIVEN VALUE CAN BE FOUND BY ITERATION.

221 PROGRAM STEPS.
KNUD ANDERSEN
DK-VEDBAEK

50478D 97-STABILITY OF LINEAR SAMPLED DATA CONTROL SYSTEMS.

THE PROGRAM TESTS THE STABILITY OF A LINEAR SAMPLED DATA CONTROL SYSTEM UP TO NINTH ORDER BY REDUCTION METHOD, MAKING USE OF A THEOREM BY ROUCHE. INPUT DATA ARE THE ORDER OF THE CHARACTERISTIC POLYNOMIAL N(Z) AND THE COEFF. OF N(Z). THE CONTROL SYSTEM IS STABLE, IF THE HIGHEST COEFFICIENTS OF CERTAIN REDUCED POLYNOMIALS ARE GREATER THAN THE ABSOLUTE VALUES OF THE LOWEST COEFFICIENTS.

161PROGRAM STEPS
FRANK DOERRSCHEIDT
D - PADERBORN.

50479D 97-NUMBER OF PRIMES UP TO N.

ALL THE MULTIPLES OF THE PRIMES UP TO THE SQUARE ROOT OF N ARE ELIMINATED AND CONSEQUENTLY THE NUMBER OF PRIMES UP TO N IS GIVEN. THIS ALGORITHM IS LESS TIME CONSUMING THAN THE COMPLETE SIEVE. THE ADVANTAGE FOR N > 500 IS ALREADY MORE THAN 50%.

339PROGRAM STEPS
ITO BUDA
I - TRIESTE.

50480D 67-HELIOCENTRIC COORDINATES AND ELONGATIONS OF PLANETS.

THIS PROGRAM COMPUTES: 1. THE HELIOCENTRIC COORDINATES LONGITUDE AND LATITUDE IN THE ECLIPTIC FOR ALL PLANETS, ASTEROIDS, AND COMETS; 2. THE ELONGATION OF THE OBJECT; 3. THE DATES OF THE MAXIMUM ELONGATIONS FOR THE INNER PLANETS RESP. THE DATES OF THE OPPOSITIONS FOR THE OUTER PLANETS; 4. THE DATES FOR THE MINIMUM ELONGATIONS (=CONJUNCTIONS); 5. THE DISTANCES OF THE PLANETS AND THEIR ANGLE-DIAMETERS FROM THE EARTH. THE PROGRAM, DESCRIPTION INCLUDES ALL REQUIRED ORBIT DATES FOR ALL PLANETS.

223PROGRAM STEPS
LOTHAR BUTTNER
D - OBERHAUSEN.

50481D 97-ABSORPTION OR DESORPTION OF GAS IN STATIC LIQUID.

CALCULATES THE QUANTITY OF GAS PHASE CONSTITUENT ABSORBED INTO OR DESORBED FROM A SEMI-INFINITE STATIC POOL OF LIQUID WHEN PROCESS IS CONTROLLED BY DIFFUSION IN THE LIQUID AND A SPECIFIED MASS TRANSFER COEFFICIENT AT THE INTERFACE. THE INTERFACE CONCENTRATION IS ALSO EVALUATED.

215PROGRAM STEPS
MICHAEL CABLE
UK - SHEFFIELD.

50482D 67-INTEGRATION OF A FOUR VARIABLES DIFFERENTIAL SYSTEM.

THIS PROGRAM USES "FOUR ITERATIONS RUNGE METHOD" IN A VECTORIAL FORM TO CALCULATE VALUES IN SEQUENCE OF A FOUR VARIABLES DIFERENTIAL SYSTEM - LINEAR OR NOT. IT CAN TREAT TWO VARIABLES SECOND ORDER SYSTEM OR FOURTH ORDER DIFFERENTIAL EQUATION.

077PROGRAM STEPS
ANDRE LONGATTE
F - CHATENAY-MALABRY.

50483D 67-SORTED PERMUTATIONS.

PROGRAM DISPLAYS PERMUTATIONS OF UP TO 20 DISTINCT ELEMENTS REPRESENTED EACH BY A NUMBER, SORTED IN INCREASING ORDER AND STARTING FROM ANY ARBITRARY PERMUTATION. IT MAY BE USED TO GET THE NEXT PERMUTATION OF A GIVEN ONE, OR TO GET A SORTED LIST OF PERMUTATIONS UP TO THE GREATEST ONE. PROGRAM INCLUDES A 43 STEP ROUTINE WHICH MAY BE USED SEPARATELY, TO SORT ANY NUMBER OF CONSECUTIVE REGISTERS. TWO RUN MODES AND TWO DISPLAY ROUTINES MAY BE SELECTED.

177PROGRAM STEPS
ANTONIO VERA
SP - MADRID.

50484D 67-MEMORY FOR NUMBERS.

THE PROGRAM CALCULUS UP TO 20 NUMBERS. YOU CAN CHANGE QUANTITY AND THE MAGNITUDE OF THE NUMBERS. AFTER GUESSING ALL NUMBERS THE CALCULATOR TELLS YOU IF AND HOW MISTAKES YOU DO.

090PROGRAM STEPS
HARMS BECKER
D - HOHENLIMBURG.

50485D 67-LADDER-NETWORK CALCULATIONS.

COMPUTES THE IMPEDANCE AND TRANSFER CARACTERISTICS OF A LADDER-NETWORK OF ANY NUMBER OF IMPEDANCES. EACH IMPEDANCE CAN BE A COMPLEX COMBINATION OF UP TO 15 SERIAL AND/OR PARALLEL ELEMENTS (R, L, C). THE ELEMENTS ARE CODED AND STORED IN THE CALCULATOR (MAX 15) OR ON MAGNETIC CARDS. THEIR CODES DETERMINE THEIR NATURE AND FUNCTION CALCULATIONS CAN BE MADE FOR DIFFE-

PROGRAM ABSTRACTS

50485D (CONTD)

RENT FREQUENCIES AND LOAD IMPEDANCES WITHOUT REINTRODUCING THE ELEMENTS OR BY JUST READING DATA-CARDS.

224PROGRAM STEPS
L. DE BERSUDER
F - ST. MARTIN D'HERES.

50486D 67-WIRE SIZE CONVERSION TABLE.

PROGRAM WILL CONVERT AMERICAN WIRE GAUGE SIZE TO DIAMETER OF WIRE AND VICE VERSA.
THE PROGRAM COMPUTES CROSS SECTION, FUSING CURRENT, WEIGHT PER LENGTH, RESISTANCE PER LENGTH AND RESISTANCE PER WEIGHT. COMPUTATION WILL BE MADE IN INCH, FOOT AND POUND OR IN MILLIMETER, KILOMETER AND KILOGRAM.

126PROGRAM STEPS
PETER ZECHNER
D - MUNICH.

50487D 97-EARTH-THRUST ON A RETAINING WALL WITH BACK-PLACED SLOPE.

PROGRAM COMPUTES THE EARTH-THRUST ON A RETAINING-WALL WHEN THE SLOPE ABOVE THE WALL IS PLACED BACK AND PLANES AND SLOPE CAN BE CHARGED WITH DIFFERENT LOADS. EARTH-THRUST IS DETERMINED BY COULOMBS' LAW.

190PROGRAM STEPS
HANSPETER BERNET
CH - BERN.

50488D 97-INVERSE BISECTION.

GIVEN RECTANGULAR COORDINATES OF TWO BASES, PROGRAM FIRST FINDS INITIAL SET-UP OF TRANSITS AT BOTH BASES, I.E. AZIMUTH TOWARDS THE OTHER BASE. THEN, FOR A POINT DEFINED BY THE AZIMUTHS OF SIGHTINGS FROM BOTH BASES, COORDINATES ARE COMPUTED. ANY NUMBER OF POINTS CAN BE COMPUTED IN SEQUENCE. RESULTS AND DATA ARE SUITABLY PRINTED.

104PROGRAM STEPS
SANDRO ROCCI
SP - MADRID.

50489D 67-SUBSONIC BALISTIC.

THIS PROGRAM COMPUTES THE SPEED AND THE COORDINATES OF A SOLID MOVING IN THE AIR AT SUBSONIC SPEED, IN FUNCTION OF TIME. IT GIVES ALSO THE RANGE AND TIME OF IMPACT. EXPONENTIAL DECREASING OF DENSITY OF THE AIR WITH ALTITUDE IS ASSUMED. IT CONTAINS THE "INTEGRATION OF DIFFERENTIAL SYSTEM PROGRAM" NO. 50482D.

149PROGRAM STEPS
ANDRE LONGATTE
F - CHATENAY-MALABRY.

50490D 67-ROMBERG INTEGRATION.

THE VALUE OF THE INTEGRAL FROM A TO B OVER F(X) IS FOUND BY EXTRAPOLATING A SERIES OF CHORD-TRAPEZIUM SUMS. F(X) MUST BE KNOWN EXPLICITLY.

090PROGRAM STEPS
MARTIN KAWALETZ
D - SALZGITTER 1.

50491D 67-ARITHMETIC TO GIVEN BASIS.

THIS PROGRAM CALCULATES THE FOUR OPERATIONS OF ARITHMETIC TO A GIVEN BASIS (2 INF.OR EQUAL TO B INF. OR EQUAL TO 99).

136PROGRAM STEPS
DIETER BODENSCHATZ
D - NURNBERG.

50492D 97-FITTING OF EQUILIBRIUM OR RATE CONSTANTS.

THE INPUT IS A SET OF EQUILIBRIUM CONSTANTS OR RATE CONSTANTS K MEASURED AT DIFFERENT TEMPERATURES T. THE PROGRAM CALCULATES THE COEFFICIENTS OF THOSE TWO FUNCTIONS A' +B'/T AND A + B/T + C*LN(T) THAT PROVIDE THE BEST LEAST SQUARES FITS TO THE LN(K) VALUES. IN ADDITION THE STANDARD DEVIATIONS OF LN(K) ARE PRINTED. K VALUES MAY BE CALCULATED FOR ANY TEMPERATURE.

224PROGRAM STEPS
KNUD ANDERSEN
DK - VEDBAEK.

50493D 67-COEFFICIENTS OF THE CHARACTERISTIC EQUATION OF 4 X 4 MATR.

PROGRAM CALCULATES EXACTLY (NO ITERATIVE METHOD) THE 5 (OR 4) COEFFICIENTS OF THE CHARACTERISTIC EQUATION OF 4 X 4 (OR 3 X 3) NON SYMETRIC (AND OF COURSE SYMETRIC) MATRIX. PROGRAM CALCULATES THEREFORE 1 4 X 4, 4 3 X 3, AND 6 2 X 2 DETEREMINANTS. MATRIX ELEMENTS MAY BE ENTERED EITHER BY PRESSING R/S OR DURING A PAUSE, AND ARE SAVED BY THE PROGRAM. P.S. PROGRAM DO NOT SOLVE 4TH (OR 3RD) DEGREE CHARACTERISTIC EQUATION.

224PROGRAM STEPS
ERIC MARCHAL
B - BRUSSELS.

50494D 67-SOLUTION OF 3 NONLINEAR EQUATIONS.

PROGRAM SOLVES 3 NONLINEAR EQUATIONS BY STEFFENSEN'S METHOD.

185PROGRAM STEPS
GUIDO PETZ
S - SOLNA.

50495D 67-MULTIPLE INTEGRALS.

PROGRAM COMPUTES SINGLE, DOUBLE OR TRIPLE INTEGRALS OF FUNCTIONS OF 1, 2, OR 3 VARIABLES OVER A FINITE INTERVAL, RECTANGULAR REGION IN THE PLANE OR A PARALELEPIPED IN 3-SPACE. EVEN RICHARDSON EXTRAPOLATION (DEFERRED APPROACH TO THE LIMIT) CAN BE PERFORMED.

175PROGRAM STEPS
GUIDO PETZ
S - SOLNA.

50496D 67-THREE-VALUED LOGIC.

IN THIS PROGRAM 10 THREE-VALUED-LOGICAL OPERATORS CALCULATE THE TRUTH VALUE (T=1, F=1, I=0) OF A COMPOUND PROPOSITION WHEN YOU KNOW THE TRUTH VALUE OF COMPONENT PROPOSITIONS. THE PROGRAM USES RPN AND OPERATIONAL STACK OF CALCULATOR.

118PROGRAM STEPS
ATTILIO LESILIO
I - MILANO.

50497D 67-ACID-BASE BALANCE.

1. PROGRAM CALCULATES PKA(PKB), IF YOU GIVE IN THE CONCENTRATION AND THE PH-VALUE.
2. PROGRAM CALCULATES THE PH-VALUE, IF YOU GIVE IN PKA(PKB), AND THE CONCENTRATION.(BUT ONLY IF PK<0 OR PK>4).
3. CONVERSIONS: PH<->OH CONCENTRATION / PH<->HYDROGEN ION CONCENTRATION.

172PROGRAM STEPS
RAINER WURZEL
D - VECHTA.

50498D 97-DIAGRAM OF MOLLIER (X,I).

50498D (CONTD)

PROGRAM CALCULATES ABSOLUTE HUMIDITY, DENSITY, ENTHALPY AND DEW POINT OF MOIST AIR ON INPUT OF TEMPERATURE, PRESSURE AND RELATIVE HUMIDITY OF THE MOIST AIR.
ONCE CALCULATED THOSE THERMODYNAMIC PROPERTIES, PROGRAM PERMITS CALCULATION OF A NEW SET OF VALUES FOR THE PROPERTIES MENTIONED ACCORDING TO CHANGES OF TEMPERATURE OF THE MOIST AIR (HEATING OR/AND COOLING).

224PROGRAM STEPS
ROBERT F.J. VAN DAMME
B - TIENEN.

50499D 67-REACTION TIME INDICATOR WITH NON NORMALIZED NUMBERS.

THIS PROGRAM COMPUTES YOUR PERSONAL REACTION TIME. IT PERFORMS PREPARING-TIMES BETWEEN 1 AND 9 SECONDS. ADVANTAGES: VERY COMFORTABLE, DARK DISPLAY DURING THE PREPARING-TIME!
ONE HALF DATA CARD.

110PROGRAM STEPS
MICHAEL SCHMIDT
D - HEIDENHEIM.

50500D 67-MATE YOUR HP'S KING WITH KING BISHOP KNIGHT, IN 35 MOVES.

YOU HAVE 35 MOVES TO MATE YOUR HP'S BLACK KING. YOUR PIECES ARE KING KNIGHT AND A WHITE BISHOP. THE CALCULATOR PLAYS A SIMPLE BUT EFFICIENT DEFENCE. YOU CAN INPUT ANY STARTING POSITION OR USE THE SUPPLIED STANDARD POSITION. RARE BAD MOVE CAN BE CORRECTED BY GIVING AN ? TO THE CALCULATOR.

214PROGRAM STEPS
DIDIER PELAT
F - MEUDON.

50501D 67-JACOBIAN ELLIPTIC FUNCTIONS, DEGREES VERSION.

COMPUTATION OF THE JACOBIAN ELLIPTIC FUNCTIONS SN, CN, DN ,BY MEANS OF THE DESCENDING LANDEN TRANSFORMATION. MODULUS: YOU DO NOT SPECIFY JACOBI'S MODULUS K, BUT RATHER YOU SPECIFY PHI EQ. ARCSINK IN DEGREES. ARGUMENT: TO BE SPECIFIED IN DEGREES, WHERE 360 DEGREES CORRESPOND TO A FULL PERIOD 4K OF THE FUNCTIONS SN, CN. INACCURACY IS ABOUT FOUR PARTS IN TEN BILLION.

153PROGRAM STEPS
J.E. MEBIUS
NL - BERKEL EN RODENRIJS.

50502D 67-LAGRANGIAN INTERPOLATION.

THIS PROGRAM COMPUTES THE LAGRANGE POLYNOMIAL FOR N GIVEN POINTS.
IT ALSO ALLOWS THE SELECTION OF TWO DIFFERENT ROUTINES COMPUTING THE INTERPOLATION POLYNOMIAL WHETHER THE ABSCISSAS OF THE GIVEN POINTS ARE EQUALLY SPACED OR NOT.

224PROGRAM STEPS
FRANCOIS GERARD TERNANT
F - LE PLESSIS/ROBINSON.

50503D 67-TUNGSTEN INERT GASS WELDING PARAMETERS PROGRAM.

THIS PROGRAM FULFILLS THE NECESSARY REQUIREMENTS IN THE FIELD OF TIG WELDING. THE OPERATORS CAN MAKE USE OF THIS PROGRAM TO DETERMINE THE FOLLOWING VALUES: POWER CONSUMED BY THE ARC. - THIKNESS OF THE PIECE TO BE WELDED. - ARC TENSION.- ARC INTENSITY. - SPEED OF WELDING JOINT. - DIAMETER OF TUNGSTEN ELECTRODE. - OPTIMAL LENGTH OF ARC. - CONSUMABLE GASS FLOW. - CALIBRE OF WELDING JOINT.

50503D (CONTD)

171PROGRAM STEPS
FELIPE PAZ
SP - MADRID.

50504D 97-AQUEOUS SOLUTIONS OF MAGNESIUM CHLORIDE.

FOR AN AQUEOUS SOLUTION OF MAGNESIUM CHLORIDE THE PROGRAM COMPUTES FOR EACH TEMPERATURE DENSITY, MOLAR CONCENTRATION, PERCENT MAGNESIUM CHLORIDE, CONCENTRATION IN GRAMS PER LITER EACH FROM ANOTHER.

217PROGRAM STEPS
HELMUT GROHMANN
A - BRUCK/MUR.

50505D 97-RESIDENCE TIME IN CONTINUOUS STIRRED VESSEL BATTERIES.

THE PROGRAM COMPUTES THE MASS FRACTION R WITH A RESIDENCE TIME GREATER THAN T IN A CONTINUOUS STIRRED TANK REACTOR BATTERY. THE PROGRAM COMPUTES ALSO THE PERCENTUAL RESIDENCE TIME DISTRIBUTION VALUE DR/DT. A LIST OF T, R, DR/DT - VALUES CAN BE COMPUTED WITH INPUT OF T1 AND T2 AND THE STEP WIDTH BETWEEN THE T - VALUES TO BE USED.

151PROGRAM STEPS
HELMUT GROHMANN
A - BRUCK/MUR.

50506D 97-SCREEN ANALYSIS.

FROM GIVEN MASS FRACTIONS IN WEIGHT UNITS OBTAINED E.G. BY A SCREEN ANALYSIS THE PROGRAM CALCULATES THE PERCENTUAL MASS FRACTIONS, AND THE SUMS OF THE PERCENTUAL MASS FRACTIONS.

058PROGRAM STEPS
HELMUT GROHMANN
A - BRUCK/MUR.

50507D 97-HYDROCHLORIC ACID - CONVERSION OF CONCENTRATION SPECIFIC.

THE PROGRAM CALCULATES CONVERSIONS BETWEEN THE FOLLOWING CONCENTRATION SPECIFICATIONS: DENSITY AT 20 DEGREES CENTIGRADE, G HCL/L ACID, WEIGHT PER CENT ACID, MOL HCL/L, PH. THE WATER-CONCENTRATION IN G H2O/L AND WEIGHT PER CENT H2O IN MURIATIC ACID CAN ALSO BE CALCULATED.

204PROGRAM STEPS
HELMUT GROHMANN
A - BRUCK/MUR.

50508D 67-GENERATION OF SYNTHETIC SEQUENCES OF ANNUAL DISCHARGES.

ASSUMING A GIVEN SEQUENCE OF ANNUAL FLOWS QI, QI+1, QI+2...QI+N. THIS PROGRAM COMPUTES: GAMMA=AUTO CORRELATION COEFFICIENT; VARIANCE; SYNTHETIC SEQUENCES OF FLOWS WITH RANDOM VARIABLES NORMAL DISTRIBUTED OF THE FORM.

224PROGRAM STEPS
GABRIEL MONCAYO
D - FRANKFURT.

50509D 97-DOMINANT REAL EIGENVALUE AND EIGENVECTOR OF 3 X 3 MATRIX.

PROGRAM CALCULATES DOMINANT REAL EIGENVALUE AND CORRESPONDING EIGENVECTOR USING VON MISES' METHOD. SMALLEST REAL EIGENVALUE AND CORRESPONDING EIGENVECTOR MAY BE OBTAINED USING SD-10A FOR MATRIX INVERSION.

168PROGRAM STEPS
GERALD FARIN
D - BRAUNSCHWEIG.

50510D 67-RATIONAL INTERPOLATION.

THE PROGRAM CALCULATES A RATIONAL INTERPOLATING FUNCTION USING THIELE'S FRACTION-SERIES THROUGH MIN. 2 TO MAX. 10 POINTS, WHICH DOESN'T NEED TO BE EQUIDISTANT. FOR AN EVEN NUMBER OF POINTS IT IS FURTHERMORE POSSIBLE TO GIVE IN THE VALUE OF THE FUNCTION AT INFINITY.

109PROGRAM STEPS
WOLFGANG WILHELM
CH - NUSSBAUMEN.

50511D 67-FOUR KINDS OF INTERSECTING POINTS.

THIS PROGRAM COMPUTES THE COORDINATES OF THE INTERSECTING POINTS:
1. INTERSECTING POINT OF TWO LINES.
2. INTERSECTING POINT OF ONE LINE AND AN ORTHOGONAL LINE OF THE FIRST LINE.
3. INTERSECTING POINT WHICH WAS DETERMINED BY TWO POINTS AND THEIR ANGLE RIGHT.
4. INTERSECTING POINT WHICH WAS DETERMINED BY TWO POINTS AND THEIR INCLUDED ANGLES.

214PROGRAM STEPS
JOACHIM DOLIFF
D - HANNOVER 1.

50512D 97-COLOUR ANALYSIS BY CIE 16-POINT METHOD.

PROGRAM COMPUTES LUMINOSITY AND THE COLOUR COORDINATES SMALL-X AND SMALL-Y WHEN GIVEN THE VALUES OF REFLECTION FOR 16 EQUIDISTANT WAVELENGTHS BETWEEN 400 AND 700 NANOMETERS.

223PROGRAM STEPS
FIN K.L. UTNE
N - ASKIM.

50513D 97-67-INTERMEDIATE GEAR.

THIS PROGRAM LETS YOU KNOW THE X AND Y COORDINATES FOR ONE INTERMEDIATE GEAR.

093PROGRAM STEPS
BENGT THURING
S - CREBRO.

50514D 97-POLYNOMIAL SOLUTIONS INPUT-PROG FOR 00068D.

PROGRAM MAKES THE INPUT OF MAIN-PROG 00068D EASYER. THE COEFFICIENT OF THE HIGHEST DEGREE X**N MAY NOT BE EQUAL 1. ALSO THIS PROGRAM, WHEN MAIN-PROG 00068D DETECTED THE ERROR (SEE REMARK 2 ON PAGE 2 OF 00068D), IS USEFUL TO GET THE REGISTERS OK TO RUN THE MAIN PROG 00068D FURTHER ON.

077PROGRAM STEPS
GEORG RAABE
D - BRAUNSCHWEIG.

50515D 67-STANDARDELLIPSE.

THIS PROGRAM CALCULATES THE ELEMENTS OF STANDARDELLIPSE FOR A POINT THAT IS CALCULATED FROM THREE POINTS THE COORDINATES OF WHICH ARE KNOWN. COORDINATES OF THE NEW POINT MUST BE KNOWN. INPUT DATA ARE THE COORDINATES OF STATIONS 1,2 AND 3 AND THESE OF THE NEW POINT. THE STANDARD ERROR OF DIRECTION MEASURING IS ANOTHER INPUT DATA.

224PROGRAM STEPS
ULRICH KULLE
D - OLDENBURG.

50516D 67-ATMOSPHERIC REFRACTION.

THIS PROGRAM COMPUTES THE APPARENT EQUATORIAL COORDINATES OF A CELESTIAL OBJECT SEEN FROM THE GROUND,

50516D (CONTD)

WHOSE REAL EQUATORIAL COORDINATES ARE KNOWN. (THE DIFFERENCE BEING DUE TO THE ATMOSPHERIC REFRACTION). THIS PROGRAM MUST BE USED AFTER INITIALIZATION BY THE "SIDEREAL TIMER" PROGRAM.

180PROGRAM STEPS
J. LION
B - MONS.

50517D 67-ASTRONOMICAL COORDINATE TRANSFORMATION.

THIS PROGRAM TRANSFORM EQUATORIAL COORDINATES INTO ECLIPTIC AND VICE VERSA. IT ALSO APPLIES THE PRECESSION ON THE EQUATORIAL COORDINATES.

172PROGRAM STEPS
A.J.S. DELACROIX
B - MONS.

50518D 67-BERNOULLI NUMBERS.

COMPUTES AND DISPLAYS THE 58 FIRST BERNOULLI NUMBERS.

112PROGRAM STEPS
A.J.S. DELACROIX
B - MONS.

50519D 67-SIDEREAL TIMER.

THIS PROGRAM USES THE GEOGRAPHICAL LONGITUDE AND THE DATE TO TRANSFORM CIVIL LOCAL TIME INTO SIDEREAL LOCAL TIME AND VICE VERSA. IT HAS THE ABILITY OF UPDATING THE SIDEREAL TIME ABOUT EVERY 2 SIDEREAL SECONDS. IT ALSO INCLUDES A TIMER CALIBRATION ROUTINE.

198PROGRAM STEPS
A.J.S. DELACROIX
B - MONS.

50520D 67-APPROXIMATION BY LEGENDRE POLYNOMIALS UP TO DEGREE 7.

THIS PROGRAM APPROXIMATES A FUNCTION, DEFINED BY A SET OF EQUALLY SPACED DATA POINTS, BY LEGENDRE POLYNOMIALS OF ANY DEGREE UP TO 7, USING THE LEAST SQUARES METHOD. SIMULTANEOUS COMPUTATION OF UP TO 8 COEFFICIENTS AND OF THE SUM OF SQUARED ERRORS FOR EACH DEGREE. CHOICE BETWEEN TRAPEZIUM, SIMPSON OR NEWTON-COTES (5) INTEGRATION. PROJECTIONS OF Y VALUES CAN BE MADE THE ORTHOGONAL LEGENDRE FUNCTIONS AVOID LONG MATRIX OPERATIONS, SO THAT THE PROGRAM IS VERY SHORT AND SAFE.

223PROGRAM STEPS
HENRIQUE E. ADLER
P - OPORTO.

50521D 67-THREE-PLAY.

IN A THREE*THREE SQUARE THE PLAYER AND THE CALCULATOR MUST TRY TO OCCUPY THREE FIELDS IN A ROW OR IN DIAGONAL.

208PROGRAM STEPS
JOCHEN WIECHERN
D - VISSELHOEDE.

50522D 67-REGATTA.

PROGRAM GIVES FOR UP TO NINE YACHTS RESULTS AND INTERMEDIATE RESULTS OF YACHT RACES RUN ACCORDING TO ICR-RULE OR ANY OTHER RULE USING "CORRECTED TIME=ELAPSED TIME X TIME CORRECTION FACTOR" FOR THE PLACING OF THE YACHTS, HANDICAPS EXPRESSED IN TIME AND LEAD OF ANY YACHT OVER ANY OTHER YACHT ARE VALUABLE INFORMATION FOR THE PARTICIPANT.

193PROGRAM STEPS
DIETRICH ENSS

50522D (CONTD)

D - BARSBUETTEL.

50523D 67-PH TITRATION CURVE.

THIS PROGRAM PLOTS THE TITRATION CURVE OF A WEAK ACID BY A STRONG BASE, OR OF A WEAK BASE BY A STRONG ACID. THE PROGRAM COMPUTES THE VOLUME OF REAGENT REQUIRED TO NEUTRALISE A VOLUME OF ACID OR BASE, AND THE CORRESPONDING PH. THE PROGRAM IS VALID FOR DILUTE SOLUTIONS.

138PROGRAM STEPS
MICHEL SIGUET
B - PLANCENOIT(LASNE).

50524D 67-97 SOLUTION OF HANSENS PROBLEM SU10.

YOU NEED TWO MARKS WITH A GREATER DISTANCE TO THE NEW POINT, THEIR COORDINATES HAS TO BE KNOWN. YOU OBSERVE THE DIRECTIONS TO THE REMAINING THREE POINTS FROM BOTH NEW POINTS. THE PROGRAM CALCULATES THE COORDINATES OF THE NEW POINTS.

224PROGRAM STEPS
JOHANNES GRUSS
D - WIESBADEN.

50525D 67-97 TRAVERSE WITHOUT ORIENTATION AUTOMATIC SU11.

YOU HAVE TO KNOW THE COORDINATED STARTING-AND END POINT. YOU OBSERVE ONLY THE TRAVERSE ANGLES AND THE DISTANCES BETWEEN THE TWO POINTS. NOW THE PROGRAM CALCULATES AN OPEN-END TRAVERSE AND TRANSFORMS THE LOCAL COORDINATES IN THE SAME SYSTEM LIKE THE ENDPOINTS. THE PROGRAM CALCULATES ALSO THE DISTANCE ERROR AND THE MAX. ERROR. FIT FOR 7 NEW POINTS.

335PROGRAM STEPS
JOHANNES GRUSS
D - WIESBADEN.

50526D 67-SPIRAL CURVE LAYOUT SU9.

YOU HAVE TO KNOW THE RADIUS OF THE FOLLOWING CIRCLE AND THE PARAMETER OF THE SPIRAL (KLOTHOIDE). NOW IT IS POSSIBLE TO CALCULATE ALL VALUES FOR STAKING OUT. POLAR-(FROM THE STARTING POINT) AND RECTANGULAR COORDINATES FOR DIFFERENT LENGTHS OF THE KLOTHOIDE, THEIR TOTAL LENGTH, THE SPIRAL ANGLE (TAU), THE MIDPOINT COORDINATES, THE TANGENT AT THE STARTING POINT, AT THE END POINT, THE CIRCLE TANGENT, THE TWO INTERSECTION POINTS OF THE TANGENTS AND THEIR DISTANCE.

224PROGRAM STEPS
JOHANNES GRUSS
D - WIESBADEN.

50527D 67-97 SIMILARITY TRANSFORMATION BY CALCULATION LINE SU13.

WITH TWO KNOWN POINTS, IN LOCAL AND STANDART COORDINATES, IT IS POSSIBLE TO TRANSFORM OTHER POINTS WITH LOCAL IN STANDART COORDINATES, THE PROGRAM CALCULATES ALSO THE DISTANCE ERROR AND THE MAX. ERROR.

203PROGRAM STEPS
JOHANNES GRUSS
D - WIESBADEN.

50528D 67-97 REDUCTION TO CENTRE OF STANDPOINTS SU12.

THE PROGRAM REDUCES DIRECTIONS OBSERVED NEAR THE CENTRE TO DIRECTIONS OBSERVED IN THE CENTRE. YOU HAVE TO KNOW THE DIRECTION TO THE CENTRE AND THE DISTANCE TO THE STANDPOINT.

144PROGRAM STEPS

50528D (CONTD)

JOHANNES GRUSS
D - WIESBADEN.

50529D 67-INTERSECTION OF LINES SU7.

THE PROGRAM CALCULATES THE FOLLOWING CASES: 4 POINTS SECTION, 5 POINTS PARALLEL SECTION, 5 POINTS PERPENDICULAR SECTION, DISTANCE/DIRECTION SECTION. THE PROGRAM CONTAINS PRINTING ORDERS FOR HP-97.

207PROGRAM STEPS
JOHANNES GRUSS
D - WIESBADEN.

50530D 67-COUNTERSECTION SU8.

YOU KNOW THE COORDINATES OF 4 POINTS. MEASURED ARE THE TWO ANGLES
1.STANDING ON B FROM P TO N (NEW POINT)
2.STANDING ON N FROM A TO C.
THE PROGRAM CALCULATES THE COORDINATES OF THE NEW POINT

224PROGRAM STEPS
JOHANNES GRUSS
D - WIESBADEN.

50531D 67-ALMANAC DATA INPUT.

THIS PROGRAM ALLOWS THE USE OF ALMANAC DATA (CONCERNING PLANETS, NON-LISTED STARS, SUN, MOON). THE INPUTS ARE GREENWICH HOUR ANGLE, DECLINATION AND THE VARIATION IN ONE (1) HOUR OF THESE QUANTITIES. THE TIME (GMT) FOR WHICH GHA AND DEC ARE CORRECT IS ALSO AN INPUT.

101PROGRAM STEPS
CHRISTIAN VERMEULEN
B - KORTRIJK.

50532D 67-FIX BY TWO AND THREE OBSERVATIONS - 97.

THIS PROGRAM COMPUTES UP TO THREE INTERSECTIONS FORMED BY TWO LOP'S (LINE OF POSITION), IF A THREE-CELESTIAL-BODY-FIX IS SELECTED THE PROGRAM DETERMINES THE CENTROID OF THE TRIANGLE FORMED BY THE THREE LOP'S.

204PROGRAM STEPS
CHRISTIAN VERMEULEN
B - KORTRIJK.

50533D 67-LOCAL HOUR ANGLE & SIGHT REDUCTION TABLE & MOST PROBABLE POSITION

THIS PROGRAM COMPUTES THE LHA AND DEC OF A PLANET OR STAR, THE HC (COMPUTED ALTITUDE) AND ZN (AZIMUTH OF THE CELESTIAL BODY (IT REPLACES THE HO 214/249 TABLES), WITH THIS DATA AND DATA COMPUTED IN PRECEDENT PROGRAMS IT COMPUTES THE INTERCEPT (A) AND THE MPP(MOST PROBABLE POSITION). THE PRGM ACCEPTS UP TO THREE CELESTIAL BODIES. ORDERING OF OTHER PRGMS IS NECESSARY.

218PROGRAM STEPS
CHRISTIAN VERMEULEN
B - KORTRIJK.

50534D 97-LONG-TERM STAR ALMANAC 1.

EACH CARD CONTAINS DATA FOR FIVE STARS: SHA (1900) (SIDEREAL HOUR ANGLE OF A STAR IN 1900) DELTA SHA (ANNUAL CORRECTION), DEC (1900) (DECLINATION IN 1900) AND DELTA DEC (ANNUAL CORRECTION). INSTRUCTIONS AND DATA ARE ALSO GIVEN TO MAKE MORE CARDS.

194PROGRAM STEPS
CHRISTIAN VERMEULEN
B - KORTRIJK.

50535D 67-LONG-TERM ARIES ALMANAC.

50535D (CONTD)

THIS PROGRAM COMPUTES THE GREENWICH HOUR ANGLE OF THE FIRST POINT OF ARIES (THE VERNAL EQUINOX) THE CELESTIAL REFERENCE POINT FROM WHICH SHA (SIDERAL HOUR ANGLE IS MEASURED); DATA INPUT FOR TIME IS MANUALLY OR AUTOMATICALLY SUPPLIED FROM THE DR & SAC-PRGM; DATA OUTPUT IS STORED FOR FURTHER OPERATIONS. (THREE OBJECTS CAN BE STORED).

215PROGRAM STEPS
CHRISTIAN VERMEULEN
B - KORTRIJK.

50536D 97-LOSE THREE.

GAME BETWEEN YOU AND PROGRAM. EACH STARTS WITH 3 STICKS. YOU AND PROGRAM SELECT A NUMBER OF YOUR STICKS IN SECRET. BOTH GUESS THE SUM AND NEAREST WIN. YOU WILL GUESS IN ORDER, AND THE FIRST GUESS WILL LEAD THE OTHER. THE LOSER LOSES A STICK AND IF SOMEONE LOSES ALL 3 STICKS, HE LOSES THE WHOLE GAME. THE PROGRAM TAKES CARE OF ALL CALCULATIONS AND PRINT RESULTS.

209PROGRAM STEPS
LARS-ERIK SVAHN
S - FARSTA.

50537D 67-SPHERICAL FITTING.

GIVEN THE COORDINATES X, Y AND Z OF N POINTS (N=MAX. = 6), THIS PROGRAM COMPUTES THE THREE COORDINATES OF THE CENTER AND THE RADIUS OF THE SPHERICAL FIT. YOU CAN ALSO COMPUTE THE MAXIMUM DIFFERENCE BETWEEN THE POINTS AND THE SPHERE AND ALSO CHANGE A POINT BY ANOTHER.

156PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50538D 67-CHEBYCHEV-LINE.

WITH THIS PROGRAM YOU CAN COMPUTE THE "CHEBYCHEV-LINE" OR EQUAL ERROR LINE, THIS IS EXACTLY THE ONE STRAIGHT LINE WHICH MISSES ALL THREE POINTS BY EQUAL AMOUNTS AND WITH ALTERNATING SIGNS.

097PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50539D 67-GEODETIC LINES IN NON-EUCLIDEAN SPACES.

WITH THIS PROGRAM YOU CAN COMPUTE THE GEODETIC-LINE BETWEEN TWO POINTS IN A ONE, A TWO OR A THREE DIMENSIONAL SPACE (EUCLIDEAN OR NON-EUCLIDEAN). YOU MUST DETERMINATE THE SPACE BY THE METRIC COEFFICIENTS GIJ (THE BASIC GEOMETRIC TENSOR). TO COMPUTE THE SHORTEST CONNECTION BETWEEN THE TWO POINTS, YOU MUST DIVIDE A LINE ON THE SURFACE INTO SMALL, MEASURABLE SECTIONS OF LENGTH.

138PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50540D 67-COMPLETE ELLIPTIC INTEGRALS AND JACOBIAN ZETA FUNCTION.

BASED ON THE BARTKY-TRANSFORMATION, THIS PROGRAM COMPUTES THE GENERAL COMPLETE ELLIPTIC INTEGRAL CEL (KC, P, A, B) AND THE JACOBIAN ZETA FUNCTION Z (PHI, KC). IN ADDITION, THE FOLLOWING FUNCTIONS ARE PRESENTED: HEUMANN'S LAMBDA FUNCTION AND THE COMPLETE ELLIPTIC INTEGRALS OF THE FIRST, SECOND AND THIRD KIND.

224PROGRAM STEPS
WOLFGANG EHRHARDT
D - GOETTINGEN.

50541D 67-TRIGONOMETRIC & HYPERBOLIC FUNCTIONS OF COMPLEX VARIABLE.

PROGRAM FINDS EVERYONE OF TRIGONOMETRIC OR HYPERBOLICAL FUNCTIONS AND THEIR INVERSE, ARCS AND ARGUMENTS.

223PROGRAM STEPS
FELIPE LANDA
SP - CORDOBA.

50542D 67-MONTE CARLO.

ONE OR TWO PLAYERS CAN PLAY ROULETTE AGAINST THE HP 67/97 ACTING AS BANK AND CROUPIER. EACH PLAYER CAN BET UP TO 5000000 UNITS OF YOUR CURRENCY ON MAX. 7 OF 9 DIFFERENT TYPES OF STAKES. IF YOU MANAGE TO BREAK THE BANK, THIS IS OUTPUT AND GAME IS OVER. THE ROULETTE WHEEL INDICATES RED AND BLACK NUMBERS ACCORDING TO THE RULES OF ROULETTE AND CAN BE USED SEPARATELY.

224PROGRAM STEPS
GORAN THORNBLAD
S - BROMMA.

50543D 67-DISTANCE AND DIRECTION FOUND BY QTH-LOCATOR.

PROGRAM COMPUTES THE DISTANCE BETWEEN TWO LOCATIONS AND THE DIRECTION IN THAT YOU HAVE TO TURN THE ANTENNA BY USING THE QTH-LOCATORS OF THESE TWO LOCATIONS. QTH-LOCATORS ARE USED BY RADIO AMATEURS IN EUROPE CONCERNED IN VHT-UHF-DX-OPERATION. IN CONTESTS MANY DISTANCES BETWEEN TWO STATIONS HAVE TO BE CALCULATED.

107PROGRAM STEPS
KARL-HEINZ EFKEMANN
D - HASELUNNE.

50544D 97-FITTING OF DATA BY THEORETICAL DISTRIBUTIONS.

PROGRAM FITS A SET OF DATA TO:
A BINOMINAL DISTRIBUTION, A POISSON DISTRIBUTION, A NORMAL DISTRIBUTION.

224PROGRAM STEPS
HARTMUT REH
D - BERNKASTEL-KUES.

50545D 97-PHOTO: COLOUR-TEMPERATURE.

HAVING ENTERED COLOUR - TEMPERATURE OF THE AVAILABLE LIGHT AND FILM TYPE, THIS PROGRAM DETERMINES THE CORRECT CONVERSION-FILTER(S) FOR BEST RESULTS. IN ORDER TO OUTPUT ONLY THOSE FILTERS THE USER OWNS AND REALLY HAS AT HAND, A DATA-CARD WITH THE AVAILABLE FILTER-VALUES IS NECESSARY ALSO USEFUL FOR CONVERSIONS "MIRED"-VALUE <-> COLOUR-TEMPERATURE (DEGREE KELVIN).

093PROGRAM STEPS
ULRICH JANSEN
D - ERKELENZ.

50546D 97-NEXT DATE OF EQUAL WEEKDAY.

PROGRAM CALCULATES THE NEXT DATE WHICH COMBINES DAY AND MONTH WITH THE SAME WEEKDAY AS THE INPUT DATE. BECAUSE NO PRINT-STATEMENT APPEARS, THIS PROGRAM MAY RUN ON HP-67 WITHOUT ANY RESTRICTION OF COMFORT.

106PROGRAM STEPS
ULRICH JANSEN
D - ERKELENZ.

50547D 97-SYSPLOT-AID.

PROGRAM COMPARES UP TO 4 INPUT-VALUES WITH EACH OTHER BY PRINTING UP TO 4 COLUMNS WITH A HEIGHT EQUIVALENT TO THE CORRESPONDING VALUE.

50547D (CONTD)

FIGURE-SIZE IS USER-DEFINABLE.

190PROGRAM STEPS
ULRICH JANSEN
D - ERKELENZ.

50548D 67-MEDICAL PARAMETERS FOR PARENTERAL SUBSTITUTION.

PROGRAM CALCULATES SOME PARAMETERS FOR PARENTERAL SUBSTITUTION: BODY SURFACE AREA, LOSS OF WATER AND ELECTROLYTES (NA, K), THE SERUM OSMOLARITY, THE SERUM BICARBONATE, THE IONISATED PART OF CLACIUM, THE INULIN CLEARANCE (ESTIMATED BY PLASMA CREATININE), THE PAH CLEARANCE (ESTIMATED BY PSP-TEST).

214PROGRAM STEPS
LUDWIG STRAUSS
D - BURSTADT.

50549D 67-REDUCTION OF EDM POLAR SURVEYING

THIS PROGRAM COMPUTES DISTANCE REDUCTION, WHEREAT THE DISTANCES (DISTANCE FROM THEODOLITE TO EDM AND EDM TO REFLECTOR) BE MEASURED WITH AN EDM (ELECTRONIC DISTANCE METER), STANDING ON EXCENTRE, AND THE ANGLES (VERTICAL ANGLE TO REFLECTOR AND EDM AND HORIZONTAL ANGLE BETWEEN REFLECTOR,THEODOLITE, EDM) BE MEASURED WITH AN THEODOLITE STANDING ON CENTRE.

079PROGRAM STEPS
JOACHIM DOLIFF
D - HANNOVER 1.

50550D 67-NUMBER FLIPPING.

PROGRAM FLIPS POSITIVE INTEGER NUMBERS (IT REVERSES DIGITS OF A NUMBER FROM LEFT TO RIGHT). IT IS INTENDED TO BE USED AS A SUBROUTINE TO ENHANCE THE RANDOMNESS OF A RANDOM NUMBERR GENERATING ALGORITHM

031PROGRAM STEPS
IKLIL KAYIHAN
T - ISTANBUL.

50551D 67-PULLEYS - LEVERS - WINCHES.

PROGRAM SOLVES PULLEYS, WINCHES AND LEVERS PROBLEMS (FORCE, SPACE, WORK, MOMENT, ETC...).

196PROGRAM STEPS
PIERRE PIRAUX
B - MARCINELLE.

50552D 67-FINANCIAL CONTROL.

THIS PROGRAM IS USED TO CONTROL YOUR STATE OF ACCOUNT BY STORING THE DATE OF THE LAST ACCOUNT-MOVEMENT AND AFTER ITS EXISTING STATE OF ACCOUNT ON SEVERAL ACCOUNTS.

095PROGRAM STEPS
GISBERT DUPONT
D - VIERSEN.

50553D 67-HOUND AND RABBIT.

TWO PURSUIT GAMES: ON A N BY 50 RECTANGLE A "RABBIT" MOVES. THE PLAYER, MOVING SIMILARLY, AIMS TO HIT ITS COORDINATES. FIRST MODE: THE RABBIT CAN ACCELERATE TWICE AS FAST AS THE HOUND, BUT MOVES COMPLETELY AT RANDOM. SECOND MODE: BOTH HAVE THE SAME POSSIBILITIES, BUT THE RABBIT SENSES THE PRESENCE OF THE TOC NEAR HOUND, THEN CHOOSING THE BEST POSSIBLE ESCAPE. NEVERTHELESS YOU MAY FIND A STRATEGY TO HUNT IT DOWN.

224PROGRAM STEPS
FRANZ KIRCHHEIMER
D - FREIBURG.

50554D 67-MERCATOR COURSES.

GIVEN LATITUDE AND LONGITUDE OF DEPARTURE AND DESTINATION CALCULATES COURSES ON MERCATOR PROJECTION BY MERIDIONAL PARTS METHOD; ALSO DISTANCE. PROGRAM ALWAYS TAKES SHORTEST DISTANCE, AND OPERATES OVER DATE LINE. GIVEN AVERAGE SPEED IN KNOTS CALCULATES PASSAGE TIME IN DAYS, HOURS AND MINUTES.

187PROGRAM STEPS
JAMES WOODRUFF
MONACO

50555D 97-PIAL EDITOR.

WITH THIS PROGRAM THE USER CAN ENTER AND EDIT A PIAL-PROGRAM IN THE CALCULATOR. BECAUSE THE EDITOR LEAVES THE PIAL-PROGRAM IN UNCOMPILED FORM, SUCH INSTRUCTIONS AS INSERT, DELETE, SINGLE STEP AND BACK STEP ARE POSSIBLE. THE CODED PROGRAM CAN BE COMPILED USING THE "INDIRECT PIAL COMPILER", WHICH MAKES EXECUTION WITH THE "PIAL EXECUTOR" POSSIBLE.

224PROGRAM STEPS
PETER SCHMALE
NL - DELFT.

50556D 67-ROMBERG INTEGRATION.

THE PROGRAM SOLVES THE INTEGRAL OVER A GIVEN INTERVAL WITH THE ROMBERG METHOD, WHICH MEANS THAT IT CONTINUES HALFE'S THE STEP-WIDE AND EXTRAPOLATES TO THE STEP-WIDE ZERO WITH A RATIONAL AITKEN-NEVILLE METHOD, UNTIL THE DESIRED ACCCURACY IS REACHED. AN ADDITIONAL PROGRAM WITH 66 ADDITIONAL STEPS SOLVES INTEGRALS WITH A SINGULARITY AT ONE END OF THE INTERVAL.

112PROGRAM STEPS
WOLFGANG WILHELM
CH - NUSSBAUMEN.

50557D 67-JOINT ACCOUNT.

THIS PROGRAM KEEPS A JOINT ACCOUNT AND UP TO NINE SEPARATE ACCOUNTS WHICH ADD UP TO THE JOINT ACCOUNT. DAY AND MONTH OF THE BOOKING MAY BE KEPT IF DESIRED. ALL PAYMENTS ARE MADE FROM OR INTO THE JOINT ACCOUNT. FOR CORRECT ACCOUNTING IN THE SEPARATE ACCOUNTS SIMPLY THE NUMBERS OF THE AFFECTED ACCOUNTS ARE TO ENTER WITH THE BOOKING.

192PROGRAM STEPS
DIETRICH ENSS
D - BARSBUETTEL.

50558D 97-PRIMES UP TO 10193.

PROGRAM PRINTS ALL PRIMES UP TO 10193. MINIMUM COMPUTING TIME.

075PROGRAM STEPS
ATTILIO FARINA
I - TORINO.

50559D 67-TWO VARIABLES LINEAR REGRESSION WITH USER DEFINED SCALES.

IN THIS PROGRAM THE USER MAY KEY IN ARBITRARY FUNCTIONS TO CHANGE SCALES OF X AND/OR Y AXIS.

112PROGRAM STEPS
PIERRE GRANIER
F - VANVES.

50560D 67-MARGIN ACCOUNT - ADJUSTING TO SPECIFIED LOAN RATIO.

GIVEN THE TOTAL VALUE OF THE ACCOUNT, THE AMOUNT OF THE OVERDRAFT AND THE ACCEPTED RATIO OF LOAN TO COLLATERAL. THE PROGRAM

50560D (CONTD)

COMPUTES THE CHANGES THAT CAN OR MUST BE MADE TO SATISFY CONDITION. ALSO COMPUTES NEW RATIO RESULTING FROM ANY CHANGE SUCH AS SELLING SECURITIES, WITHDRAWING CASH OR ALTERING THE VALUE OF THE COLLATERAL.

112PROGRAM STEPS
JEAN-CLAUDE HENTSCH
CH - CORSIER.

50561D 97-ERROR CONSTANTS FROM CLOSED LOOP POLES AND ZEROS.

GIVEN A LINEAR, SINGLE LOOP, UNITY FEEDBACK, STABLE CONTROL SYSTEM, THE ERROR CONSTANTS KP (POSITION), KV (VELOCITY), AND KA (ACCELERATION) ARE COMPUTED FROM THE CLOSED LOOP POLES AND ZEROS. INPUT DATA ARE THE NUMBER OF POLES AND ZEROS, THE GAIN CONSTANT, AND THE REAL AND IMAGINARY PARTS OF UP TO EIGHTEEN SINGULARITIES.

332PROGRAM STEPS
FRANK DORRSCHEIDT
D - PADERBORN.

50562D 97-E TO 100 SIGNIFICANT FIGURES.

THIS PROGRAM CALCULATES THE FIRST 100 DIGITS OF E (THE BASE OF NATURAL LOGARITHMS). IT TAKES ABOUT 2 HOURS.

182PROGRAM STEPS
DAVID PEDLAR
UK - WOKINGHAM/BERK.

50563D 97-GAMMA OF X FOR X AN INTEGRAL MULTIPLE OF HALF.

THIS PROGRAM CALCULATES GAMMA (X) FOR X BEING AN INTEGRAL MULTIPLE OF HALF. WORKS FOR X AN ODD NEGATIVE MULTIPLE OF HALF. FOR ODD MULTIPLES OF HALF, -34<X<35. 15 MUCH QUICKER THAN PROGRAMS DESIGNED FOR ALL REAL X.

055PROGRAM STEPS
DAVID PEDLAR
UK - WOKINGHAM/BERKSHIRE.

50564D 97-EIGENVALUES OF A REAL SYMMETRICAL MATRIX (MAX. 5 X 5).

THE EIGENVALUES OF A REAL SYMMETRICAL MATRIX ARE CALCULATED WITH JACOBIS METHOD, WHICH PERFORMS SERIES OF TWO DIMENSIONAL ROTATIONS UNTIL A DIAGONAL MATRIX IS OBTAINED

223PROGRAM STEPS
KLAAS MUNTENDAM
NL - EINDHOVEN.

50565D 97-PRICE REVISING FORMULA.

THIS PROGRAM IS USED TO CALCULATE PRICE REVISING INDEX K AND NEW PROJECT VALUE ACCORDING TO PRICE INCREASING FIGURES PUBLISHED BY GOVERNMENT ETC., IF VALUE REVISING FORMULAS ARE PART OF PROJECT CONTRACTS.

102PROGRAM STEPS
FRED KNAEPPER
SP - MADRID.

50566D 97-DATA REGISTERS.

THIS PROGRAM IS USED TO STORE A SERIE OF FIX NUMBERS. IT CAN BE USED TO STORE E.G. DATAS OF SPECIFIC WEIGHTS, UNIT WEIGHTS, UNIT PRICES OR EVEN, WITH SOME SMALL CHANGES, TELEPHONE NUMBERS.

104PROGRAM STEPS
FRED KNAEPPER
SP - MADRID.

50567D 97-DATA STORAGE.

THIS PROGRAM IS USED TO STORE DATAS IN THE STORAGE REGISTERS AND TO RECALL THEM, IF NEEDED, ACCORDING TO THEIR IDENTIFYING INDEX. THE INDEX COULD REPRESENT CLIENT, SUBCONTRACTOR, NUMBER OF PROJECT, ETC.

156PROGRAM STEPS
FRED KNAEPPER
SP - MADRID.

50568D 97-AIR QUANTITIES.

INPUTING DIMENSION OF DUCTS, STACKS ETC, AND AIR VELOCITY OR DYNAMIC PRESSURE, THIS PROGRAM IS CALCULATING THE AIR QUANTITY, THE AVERAGE OF THE AIR VELOCITY AND THE DISTANCE FROM WALL, WHERE THE MEASUREMENTS HAVE TO BE TAKEN ACCORDING TO DIN OR COMMITTEE ON INDUSTRIAL VENTILATION.

213PROGRAM STEPS
FRED KNAEPPER
SP - MADRID.

50569D 67-TCHEBYCHEFF LOW-PASS FILTER LOSS, STEEPNESS, AND DEGREE.

TCHEBYCHEFF (AND INVERSE TCHEBYCHEFF) LOW-PASS FILTERS ARE CHARACTERIZED BY FIVE QUANTITIES, PASSBANDLOSS, AP, END PASSBAND FP (OMEGA P), STOPPBANDLOSS, AS, BEGINNING OF STOPPBAND FS (OMEGA S), AND DEGREE N, BUT THESE ARE NOT INDEPENDENT. GIVEN FOUR OF THE FIVE QUANTITIES, THE PROGRAM CALCULATES THE FIFTH.

119PROGRAM STEPS
NILS HAAHEIM
N - TRONDHEIM.

50570D 67-BUTTERWORTH LOW-PASS FILTER LOSS, STEEPNESS, AND DEGREE.

BUTTERWORTH LOW-PASS FILTERS ARE CHARACTERIZED BY FIVE QUANTITIES, PASSBANDLOSS, AP, END OF PASSBAND FP(OMEGA P), STOPPBANDLOSS, AS, BEGINNING OF STOPPBAND FS(OMEGA S), AND DEGREE N, BUT THESE ARE NOT INDEPENDENT. GIVEN FOUR OF THE FIVE QUANTITIES, THE PROGRAM CALCULATES THE FIFTH.

098PROGRAM STEPS
NILS HAAHEIM
N - TRONDHEIM.

50571D 67-NONLINEAR OPTIMIZATION.

PROGRAM MINIMIZES FUNCTIONS OF UP TO 5 VARIABLES BY THE METHOD OF STEEPEST DESCENT. EVEN FUNCTIONS SUBJECT TO CONSTRAINTS CAN BE HANDLED BY REPLACING THE CONSTRAINTS BY A PENALTY FUNCTION.

156PROGRAM STEPS
GUIDO PETZ
S - SOLNA.

50572D 67-CEBYSEV INTEGRATION OF A FUNCTION OF ONE VARIABLE.

WITH THIS PROGRAM ONE CAN FIND THE DEFINITE INTEGRAL OF A FUNCTION OF ONE VARIABLE ON A FINITE INTERVAL. THE PROGRAM USES THE SO CALLED CEBYSEV-METHOD BASED ON THE STABILIZED ALGORITHM OF CLENSHAW.

121PROGRAM STEPS
JEHANGER GRAMI
D - MUNICH.

50573D 67-AUTOMATIC CURVE FIT.

THIS PROGRAM COMPUTES WITH CARD I THE COEFFICIENT OF DETERMINATION OF Y=A*X+B, Y=A*EXP(B*X), Y=A*LN(X) AND Y=A*X**B, IT SELECTS THE CURVE WITH LARGEST COEFFICIENT OF DETER-

50573D (CONTD)

MINATION AND COMPUTES THE REGRESSION COEFFICIENTS A AND B. CARD II COMPUTES Y ON A GIVEN X OR X ON A GIVEN Y. DATA-PAIRS CAN BE CHANGED AT ANY TIME (EVEN AFTER RUNNING THE PROGRAM).

252PROGRAM STEPS
JAN ARNOUD TEN CATE
NL - AMSTERDAM.

50574D 97-GEOCENTRIC POSITION OF A PLANET IN EQUATORIAL SYSTEM.

THIS PROGRAM CALCULATES THE GEOCENTRIC POSITION OF A PLANET IN EQUATORIAL COORDINATES (I.E. RIGHT ASCENSION AND DECLINATION) AND TRUE DISTANCE EARTH - PLANET IN ASTRONOMICAL UNITS (AE). INPUTS REQUIRED ARE: ORBITAL ELEMENTS OF EARTH AND PLANET, OBLIQUITY OF ECLIPTIC.

221PROGRAM STEPS
HEINZ GREULING
D - KOLN.

50575D 67-DIDACTIC SOLVING OF LINEAR PROGRAMMING.

THIS PROGRAM IS USEFUL FOR TEACHERS AND STUDENTS IN OPERATION RESEARCH WHO ARE CONCERNED WITH LINEAR PROGRAMMING, IT PERFORMS THE CALCULATIONS INVOLVED BY EVERY CHANGE OF BASIS AND GIVES AUTOMATICALLY THE NEW DATA OF THE NEXT TABLEAU USING THE DATA OF THE PRECEDING ONE, ONCE THE CHOICE OF A FIRST HAS BEEN MADE.

132PROGRAM STEPS
JEAN-PAUL GROSSAR
B - BRUSSELS.

50576D 97-TRIANGLE-CIRCLE FITTING.

PROGRAM CALCULATES THE RADIUS AND AREA OF TWO CIRCLES WHICH FIT A GIVEN TRIANGLE
: INNER - ALL SIDES TANGENTIAL TO CIRCLE
: OUTER - ALL VERTICES ON CIRCUMFERENCE OF CIRCLE.
THE AREA OF THE TRIANGLE IS ALSO COMPUTED.

193PROGRAM STEPS
KLAUS-BODO MAIER
D - WILNSDORF-ANZHAUSEN.

50577D 97-COMPUTATION OF CENTRE OF GRAVITY AND AREA OF A TRIANGLE.

THIS PROGRAM ALLOWS TO COMPUTE THE AREA AND THE CENTRE OF GRAVITY OF A TRIANGLE WHEN THE COORDINATES (P1 (X1/Y1); (P2(X2/Y2); (P3(X3/Y3) OF THE THREE ANGLE POINTS ARE GIVEN.

071PROGRAM STEPS
KLAUS-BODO MAIER
D - WILNSDORF-ANZHAUSEN.

50578D 67-TRAVERSE TABLES COMPUTATION.

THIS PROGRAM SOLVES TWO IMPORTANT MARINE PROBLEMS,
1. GIVEN TWO POINTS COMPUTE DISTANCE AND COURSE
2. GIVEN ONE POINT DISTANCE AND COURSE COMPUTE THE SECOND POINT
THE PROGRAM SOLVES ALSO SUCCESSIVE COURSE PROBLEMS. YOU CAN ALSO INPUT SPEED AND NAVIGATION DURATION.

200PROGRAM STEPS
STEPHANE WINNEPENNINCKX
B - TERVUREN.

50579D 67-TUNGSTEN INERT GAS WELDING PARAMETERS PROGRAM.

THIS PROGRAM FULFILLS THE NECESSARY REQUIREMENTS IN THE FIELD OF TIG WELDING. THE OPERATORS CAN MAKE USE OF THIS PROGRAM TO DETERMINE

50579D (CONTD)

THE FOLLOWING VALUES:
POWER CONSUMED BY THE ARC.
THIKNESS OF THE PIECE TO BE WELDED.
ARC TENSION.
ARC INTENSITY.
SPEED OF WELDING JOINT.
DIAMETER OF TUNGSTEN ELECTRODE.
OPTIMAL LENGTH OF ARC CONSUMABLE
GAS DEBIT, ETC.

171PROGRAM STEPS
FELIPE PAZ
SP - MADRID.

50580D 67-SEQUENTIAL FILES BLOCKING - PROCESSING-TIME OPTIMISATION.

MOST OF DATA-PROCESSING SYSTEMS PROCESS SEVERAL FILES SEQUENTIALLLY AND A COMMON PROBLEM IS THE CHOICE OF BLOCK SIZES FOR THESE FILES. THIS PROGRAM OFFERS A NEAR OPTIMUM SOLUTION, REDUCING PROCESSING-TIME TO A MINIMUM.

145PROGRAM STEPS
AVIGDOR LUTTINGER
F - LYON.

50581D 67-HP-GALLUP.

WITH THIS PROGRAM YOU CAN COMPUTE:
A) HOW LARGE A SAMPLE (N) OF VOTERS MUST BE BY A GIVEN LEVEL OF CONFIDENCE SO THAT A GIVEN CANDIDATE WILL BE ELECTED FROM TWO CANDIDATES.
B) GIVEN THE RESULT OF THE GALLUP, THE CONFIDENCE LIMITS
C) THE CONFIDENCE LIMITS OF OTHER SAMPLES OR OTHER PROBLEMS
D) THE REAL CONFIDENCE-LIMITS OF THE TOTAL POPULATION OF VOTERS.

190PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50582D 67-ARMORED HP IS COMING.

YOU HAVE ONLY ONE SECOND TO LOCATE THE TANK THAT TRIES TO ENTER IN "FORT CALCULATOR", YOU ARE DEFENDING, AND TO FIRE A MISSILE AT IT, IT IS NOT EASY BECAUSE THE MACHINE CAN MAKE EVASIVE MANOEUVRES WITH VARIABLE SPEED. THERE ARE ALSO 3 DIFFICULTY FACTORS AND SPECIAL RESULT DISPLAY CONTROL.

223PROGRAM STEPS
SPOLJARIC BRANKO
YU - ZAGREB.

50583D 67-MAX DEGREE 24 POLYNOMIUM. REAL ROOTS AND EVALUATION.

A POLYNOMIUM IN X: P(X) IS CONSIDERED. NEWTON-RAPHSON ITERATION AND HORNER-SCHEME FOR CALCULATION OF P(X) AND P'(X) ARE USED. ALTHOUGH THE METHOD IS HIGHLY SOPHISTICATED, IT FITS SO WELL TO THE OPERATIONAL STACK OF THE CALCULATOR THAT THE PROGRAM IS RATHER SHORT. IT EVEN HOLDS ROUTINES FOR ENTERING COEFFICIENTS AND FOR CALCULATING P(X) AND P'(X) FOR X GIVEN, BESIDES THE CAPABILITY OF FINDING REAL ROOTS. NO SPLIT-NUMBERS ARE USED, SO ALL COEFFICIENTS HAVE FULL PRECISION.

061PROGRAM STEPS
STENVEJ 3 HUMLUM
DK - STRUER.

50584D 67-MULTIPLE LINEAR REGRESSION ANALYSIS.

A RECURSIVE LEAST-SQUARES PROCEDURE IS USED TO ESTIMATE THE PARAMETERS IN A LINEAR MODEL WITH THREE INDEPENDENT VARIABLES AND FOUR PARAMETERS OR LESS. UNLINEAR FUNCTIONS FOR THE INDEPENDENT VARIABLES CAN DIRECTLY BE USED BY ADDING SOME PROGRAMSTEPS TO THE GIVEN PROGRAM.

50584D (CONTD)

THERE IS NO LIMITS FOR THE NUMBER OF OBSERVATIONS AND DUE TO THE RECURSIVE PROCEDURE PARAMETERESTIMATES CAN BE ACHIEVED AFTER EACH OBSERVATION. FOR STATISTICAL ANALYSIS OF THE OBTAINED MODEL THE PROGRAM 50585D CAN DIRECTLY BE USED.

208PROGRAM STEPS
KARL TAPIO WESTERLUND
F - ABO 74.

50585D 67-STATISTICS FOR MULTIPLE LINEAR REGRESSION ANALYSIS.

THE PROGRAM IS A DIRECT CONTINUATION OF THE PROGRAM 50584D. THE PROGRAM GIVES A TOTAL STATISTICAL ANALYSIS TO THE OBTAINED REGRESSION MODEL CONTAINING: DEGREES OF FREEDOM, MULTIPLE CORRELATION COEFFICIENT, RESIDUAL VARIANCE, TOTAL F-VALUE, STANDARD DEVIATIONS FOR THE ESTIMATED REGRESSION PARAMETERS AND CORRESPONDING PARTIAL F-VALUES.

210PROGRAM STEPS
KARL TAPIO WESTERLUND
F - ABO 74.

50586D 97-SEASON ANALYSIS.

PROGRAM WILL CALCULATE AVERAGE SEASONAL VARIATION FROM A - LINEAR OR EXPONENTIAL - TREND LINE, GIVEN A SET OF DATA. CYCLE LENGTH IS MAX. 12, NUMBER OF CYCLES IS UNLIMITED. FORECASTS, CORRECTED FOR SEASON, AND IF REQUIRED, FOR BOOM/RECESSION FACTOR CAN BE PRINTED OUT.

202PROGRAM STEPS
BART ONKENHOUT
NL - BLARICUM.

50587D 67-6TH ORDER DIFFERENTIAL EQUATIONS

PROGRAM SOLVES UP TO 6TH ORDER DIFFERENTIAL EQUATIONS OR SYSTEMS OF UP TO 6 1ST ORDER DIFFERENTIAL EQUATIONS BY THE TRAPEZOIDAL RULE.

121PROGRAM STEPS
GUIDO PETZ
S - SOLNA.

50588D 67-GAUGING ROD FOR CYLINDRIC TANK.

CALCULATES CONTENTS IN LITRES OF CYLINDRICAL TANK FOR N INCREMENTAL HEIGHTS OF LIQUID, GIVEN DIAM. AND LENGTH OF TANK. ALSO, FOR A GIVEN HEIGHT OF LIQUID CALCULATES REMAINING CONTENT IN LITRES AND, AS A NEGATIVE NUMBER, THE REFILL VALUE.

065PROGRAM STEPS
A. VAN EGTEN
B - DRONGEN.

50589D 67-LIGHT SCATTERING BY THIN FILMS.

PROGRAM COMPUTES CONSTANTS FOR THIN SCATTERING FILMS ON THE BASIS OF KUBELKA MUNK EQUATIONS FROM REFLECTANCE MEASUREMENTS.

132PROGRAM STEPS
JOHN DUNDERDALE
UK - GRIMSBY/SOUTH HUMBERSIDE.

50590D 67-SEMITONE-FREQUENCY CONVERSIONS.

THIS PROGRAM CONVERTS DISTANCES BETWEEN OR RATIOS OF FREQUENCIES EXPRESSED IN CYCLES PER SECOND TO SEMITONES AND VICE VERSA. IT ALSO ACCEPTS AS INPUT RATE AND DIRECTION OF A CHANGE IN FUNDAMENTAL FREQUENCY, AND DURATION OF THAT CHANGE.

151PROGRAM STEPS
JAN ROELOF DE PIJPER
NL - EINDHOVEN.

50591D 67-REGRESSION PARABOLIC CURVES

50591D (CONTD)

OOOOOD OF DEGREE 2,3 OR 4.

THE PROGRAM COMPUTES THE COEFFICIENTS OF THE REGRESSION PARABOLA (OF DEGREE 2,3 OR 4), FOR A GIVEN SET OF POINTS, AND ALSO THE PREDICTED VALUE Y(X). THE/LEAST SQUARES METHOD, TOGETHER WITH CHEBICHEFF'S ORTHOGONAL POLYNOMIALS, IS USED. THE PROGRAM HAS THE SAME PURPOSE AS THE ST1-14A (STAT PAC 1), BUT HERE THE POINTS ARE NOT NECESSARILY EQUALLY SPACED; SO THE PRESENT PROGRAM IS OF A MORE GENERAL USE.

443PROGRAM STEPS
JEAN BARFETY
F - LE RAINCY.

50592D 67-CUMULATIVE BINOMIAL AND POISSON DISTRIBUTION.

THIS PROGRAM COMPUTES THE CUMULATIVE BINOMIAL OR POISSON DISTRIBUTION. THE PROGRAM DOES NOT USE N! THEREFORE, VALUES LARGER THAN 69 MAY BE USED.

087PROGRAM STEPS
ARNOUD TEN CATE
NL - AMSTERDAM.

50593D 67-EXTENDED CALENDAR FUNCTIONS.

THIS PROGRAM PERFORMS ALL CALENDAR FUNCTIONS LIKE PROGRAM SD-04A. ADDITIONALLY IT OFFERS THE FOLLOWING FEATURES:
A) FACILITATED DATA ENTRY,
B) A BUILTIN FUNCTION FOR THE DATE OF EASTER,
C) ENTRY/DISPLAY OF DATES IN THE FORM "MM.DDYYYY" OR "DD.MMYYYY".

224PROGRAM STEPS
ROLAND KOESTRING
D - MUNICH.

50594D 67-6 X 6 TRIDIAGONAL LINEAR SYSTEMS

PROGRAM SOLVES SYSTEMS FOR WHICH THE COEFFICIENT MATRIX A(I,J) IS "TRIDIAGONAL". THIS MEANS THAT A(I,J)=0 IF J>I+1 OR I>J+1. THOSE ZERO-COEFFICIENTS MUST NOT BE ENTERED, AND SO SOLUTION IS VERY FAST THE PROGRAM WORKS FOR 4 X 4, 5 X 5 AND 6 X 6 SUCH SYSTEMS, WHICH APPEAR IN MANY PROBLEMS (CUBIC INTERPOLATING SPLINE, FINITE DIFFERENCES,...).

089PROGRAM STEPS
JACQUES GODET
B - BRUSSELS

50595D 97-TWO WAY ANALYSIS OF VARIANCE (WITH REPLICATIONS).

THIS PROGRAM ANALYSES THE VARIABILITY OF A SET OF DATA. IT TESTS ROW EFFECTS, COLUMN EFFECTS AND INTERACTION EFFECTS AND GENERATES THE COMPLETE ANOVA TABLE. IF THE LOSS OF OBSERVATIONS IN AN EXPERIMENTAL DESIGN LEADS TO A DATA TABLE WITH UNEQUAL CELL FREQUENCIES THIS PROGRAM ALLOWS FOR AN ANALYSIS BY THE METHOD OF UNWEIGHTED MEANS. BUT IF CELL FREQUENCIES WERE EQUAL THE COMPUTATIONAL PROCEDURE JUST AS WELL LEADS TO ALGEBRAICALLY CORRECT RESULTS.

224PROGRAM STEPS
WOLFGANG SCHOENRADE
D - HAMBURG.

50596D 67-LIFE-TABLE OF BELGIAN WOMEN (1968-1972).

WITH THIS PROGRAM YOU CAN COMPUTE THE EXPECTED NUMBER OF YEARS OF LIFE BEFORE DEATH AND THE EXPECTED AGE OF DEATH OF A BELGIAN WOMAN, GIVEN THE ACTUAL AGE.

220PROGRAM STEPS

50596D (CONTD)

JOHN VAN THIELEN
B - STABROEK.

50597D 67-LIFE-TABLE OF BELGIAN MEN (1968-1972).

WITH THIS PROGRAM YOU CAN COMPUTE THE EXPECTED NUMBER OF YEARS OF LIFE BEFORE DEATH AND THE EXPECTED AGE OF DEATH OF A BELGIAN MAN, GIVEN THE ACTUAL AGE.

204PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50598D 67-DEAD RECKONING AND SEXTANT ALTITUDE CORRECTION (3 OBJECTS).

PROGRAM COMPUTES DR-POSITION, CORRECTED SEXTANT ALTITUDE (HC) AND REGISTERS DR-POSITION, TIME, AND HC FOR 3 CELESTIAL OBJECTS FOR FURTHER OPERATIONS. (ARIES ALMANAC, SUN AND STAR CARDS, "LOCAL HOUR ANGLE,SIGHT REDUCTION TABLE AND MOST PROBABLE POSITION"-CARD AND "2 AND 3 FIX"-CARD).

224PROGRAM STEPS
CHRISTIAN VERMEULEN
B - KORTRIJK.

00268D 97-VOYAGE PLANNING.

THIS PROGRAM COMPUTES E.T.A.'S, TIMES AND SPEEDS OF TRANSITS.

115PROGRAM STEPS
CAPTAIN K.R. ORCUTT
USA - ESCONDIDO CALIF.

00269D 67-GREAT CIRCLE NAVIGATION

THIS PROGRAM SOLVES THE GREAT CIRCLE SAILING PROBLEM, FOR SURFACE NAVIGATION.INPUT IS: INITIAL LATITUDE AND LONGITUDE, AND DESTINATION LATITUDE AND LONGITUDE. OUTPUT IS: INITIAL COURSE, DISTANCE, LATITUDE CROSSING OF ANY LONGITUDE, DISTANCE TO GO AND DISTANCE GONE AT THIS POINT, LATITUDE OF THE VERTEX, LONGITUDE OF THE VERTEX.

184PROGRAM STEPS
CAPTAIN KENNETH R. ORCUTT
USA ESCONDIDO CALIF.

00270D 67-RHUMB LINE SAILING

THIS PROGRAM COMPUTES RHUMB LINE COURSES AND DISTANCES FROM ANY POINT ON EARTH TO ANY OTHER POINT. IT IS BASED ON THE ASSUMPTION THAT THE EARTH IS A SPHERE, THE SAME AS IS DONE IN GREAT CIRCLE SAILING. THE FORMULA IS THE SAME AS A LOXODROMIC CURVE, ON A SPHERE.

090PROGRAM STEPS
CAPTAIN KENNETH R. ORCUTT
USA ESCONDIDO CALIF.

00271D 97-GREAT-CIRCLE NAVIGATION INCLUDING COMPOSITE SAILING

INPUT LATITUDE AND LONGITUDE OF DEPARTURE, AND ARRIVAL OUTPUT; 1, INITAL COURSE; 2, GREAT-CIRCLE DISTANCE; 3, LATITUDE CROSSING OF ANY INPUT LONGITUDE; 4, DISTANCE TO GO FROM THIS CROSSING POINT; 5 DISTANCE GONE FROM THIS POINT; 6, LATITUDE OF THE VERTEX; 7, LONGITUDE OF THE VERTEX; 8, COMPOSITE SAILING BETWEEN THE TWO POSITIONS WITH ANY DESIRED COMPOSITE LATITUDE, GIVES THE LONGITUDE REACHING THIS COMPOSITE LATITUDE; 9, THE LONGITUDE OF LEAVING THIS LATITUDE, 10, THE COMPOSITE TOTAL DISTANCE.

224PROGRAM STEPS
CAPTAIN K. R. ORCUTT
USA VALLEY CENTER CALIF.

00272D 97-MERCATOR SAILING

THIS IS A STANDARD MERCATOR SAILING BASED ON CLARK'S SPHEROID OF 1866. IT IS THE SAME BASIS AS TABLE #5 BOWDITCH, AND THE SAME ANSWERS WILL BE OBTAINED. IF YOU WISH TO CHANGE IT TO EITHER CLARK 1880 OR THE INTERNATIONAL SPHEROID, THE CHANGES ARE SHOWN ON THE LISTING SHEET.

199PROGRAM STEPS
CAPTAIN K. R. ORCUTT
USA VALLEY CENTER CALIF.

00273D MERCATOR TRAVERSE SAILING

GIVEN AN INITAL POSITION LATITUDE AND LONGITUDE, TIME DATE AND A COURSE AND SPEED, THIS PROGRAM WILL GIVE THE LATITUDE AND LONGITUDE AT ANY GIVEN DATE AND TIME, NEW COURSES AND SPEEDS CAN BE ENTERED AND THE PROGRAM WILL KEEP A RUNING ACCOUNT OF THE VESSELS POSITION. ALSO IF A GIVEN INTERVAL IS GIVEN IT WILL PRINT OUT YOUR POSITION AT THESE GIVEN INTERVALS UNTIL R/S IS PRESSED TO STOP THE PROGRAM.

224PROGRAM STEPS
CAPTAIN K. R. ORCUTT
USA VALLEY CENTER CALIF.

00274D 97- R.P.M.-SPEED-SLIP-FUEL

00274D (CONTD)

CONSUMPTION

BY ENTERING THE PITCH OF THE PROPELLER, AND ANY TWO OF THE FOLLOWING, RPM, SLIP, SPEED, THE REMAINING ONE IS COMPUTED, SECOND, BY ENTERING THE PRESENT RPM AND FUEL CONSUMPTION, FUEL CONSUMPTION AT A NEW R.P.M. IS COMPUTED., OR R.P.M. REQUIRED FOR ANY GIVEN FUEL CONSUMPTION MAY BE COMPUTED.

100PROGRAM STEPS
CAPTAIN K.R. ORCUTT
USA. VALLEY CENTER CALIF.

00275D 97-DISTANCE OFF TWO BEARINGS/DISTANCE RUN/DISTANCE OFF VERTICAL.

BY ENTERING COURSE AND SPEED, TIME AND FIRST BEARING OF AN OBJECT, THEN TIME AND SECOND BEARING THE DISTANCE OFF AT SECOND BEARING, THE DISTANCE OFF WHEN ABEAM, AND THE TIME THE VESSEL WILL BE ABEAM ARE COMPUTED.
THE SECOND PART COMPUTES THE DISTANCE OFF BY VERTICAL ANGLE AS OBSERVED BY SEXTANT.

146PROGRAM STEPS
CAPTAIN K. R. ORCUTT
USA VALLEY CENTER CALIF.

00276D 97-SUN AZIMUTH, FOR COMPASS ADJUSTMENT.

THIS PROGRAM COMPUTES, FOR ANY DATE AND TIME THE TRUE SUN AZIMUTH, THE MAGNETIC AZIMUTH, AND THE SHADOW PIN READING FOR ANY MAGNETIC HEADING ON A PELORIS SET TO 000 ON THE SHIPS LUBBER'S LINE. ON ENTERING THE OBSERVED SHADOW PIN READING, THE DEVIATION OF THE COMPASS IS COMPUTED. ALSO IT WILL CONTINUOUSLY PRINT OUT THE TRUE AZIMUTH, MAGNETIC AZIMUTH, AND THE SHADOW PIN READING FOR EVERY TWO MINUTES FROM THE ORIGINAL TIME ENTERED.

223PROGRAM STEPS
CAPTAIN K. R. ORCUTT
USA. VALLEY CENTER CALIF.

00277D 67-STARS AND PLANETS

THIS IS A COMPLETE SYSTEM FOR SIGHT REDUCTION OF STARS AND PLANETS. IT CONSISTS OF ONE PRELIMINARY CARD, ON WHICH ENTRIES ARE MADE OF DAY-MONTH-YEAR-TIME OF D.R., D.R. LATITUDE AND LONGITUDE, VESSELS COURSE AND SPEED, AND HEIGTH OF EYE. A SECOND CARD ON WHICH ANY STAR OR PLANET CAN BE WORKED BY ENTERING S.H.A. OR G.H.A. AND DECLINATION FROM THE ALMANAC. OR AN EASY SYSTEM FOR MAKING INDIVIDUAL CARDS FOR EACH STAR, SO NO ALMANAC IS REQUIRED.

573PROGRAM STEPS
CAPTAIN KENNETH R. ORCUTT
USA. ESCONDIDO CALIF.

00278D 67-PLANETS SIGHT REDUCTION.

THIS IS A PROGRAM FOR SIGHT REDUCTION OF ANY PLANET. INPUT IS : G.M.T., D.R. LATITUDE AND LONGITUDE G.H.A. FOR THE EVEN HOUR, DELTA DECLINATION, AND SEXTANT ALTITUDE. OUPUT IS: AZIMUTH AND INTERCEPT. NO INTERPOLATION IN THE ALMANAC IS NECESSARY. IT WILL ALSO COMPUTE A SEXTANT ALTITUDE AND AZIMUTH FOR LOCATING ANY PLANET.

224PROGRAM STEPS
CAPTAIN KENNETH R. ORCUTT
USA. ESCONDIDO CALIF.

00279D 97-MOON SIGHT REDUCTION.

MOON SIGHT REDUCTION IS A ONE CARD PROGRAM TO WORK MOON SIGHTS. INPUT IS: G.M.T., LATITUDE, LONGITUDE,

00279D (CONTD)

G.H.A., AND DELTA, DECLINATION AND DELTA, AND SEXTANT ALTITUDE. OUTPUT IS: AZIMUTH AND INTERCEPT. THE G.H.A. AND DECLINATION ARE ENTERED FOR THE EVEN HOUR. NO INTERPOLATION IS NECESSARY. A MOON SIGHT CAN BE WORKED IN ABOUT THIRTY SECONDS WITH THIS PROGRAM.

218PROGRAM STEPS
CAPTAIN K. R. ORCUTT
USA. ESCONDIDO CALIF.

00280D 67-SUN LOP SIGHT REDUCTION

THIS IS A COMPLETE SIGHT REDUCTION OF THE SUN, INPUT IS: DAY, MONTH, YEAR, D.R. LATITUDE AND LONGITUDE, HEIGTH OF EYE, G.M.T. OF SIGHT, OBSERVED SEXTANT ALTITUDE. OUTPUT IS: AZIMUTH AND INTERCEPT.

224PROGRAM STEPS
CAPTAIN KENNETH R. ORCUTT
USA. ESCONDIDO CALIF.

00281D 97-TIME OF MERIDIAN TRANSIT OF SUN AND MERIDIAN ALTITUDE.

THIS PROGRAM COMPUTES THE LOCAL ZONE TIME OF THE MERIDIAN TRANSIT OF THE SUN, AND BY ENTERING THE SEXTANT ALTITUDE THE LATITUDE OF THE OBSERVER IS COMPUTED. INPUT DATA IS DAY, MONTH, YEAR, TIME ZONE LATITUDE, LONG. OUTPUT IS LOCAL ZONE TIME OF TRANSIT AND LATITUDE OF THE OBSERVER.

224PROGRAM STEPS
CAPTAIN K.R. ORCUTT
USA. VALLEY CENTER CALIF.

00282D 97-TIME OF SUNRISE AND SUNSET.

THIS PROGRAM COMPUTES THE LOCAL ZONE TIME OF SUNRISE OR SUNSET. INPUT DATA IS; DAY, MONTH, YEAR, LAT. LONG., TIME ZONE.

207PROGRAM STEPS
CAPTAIN K.R. ORCUTT
USA. VALLEY CENTER CALF.

00283D 97-RADAR PLOTTING TWO TARGETS.

THIS IS A COMPLETE RADAR PLOTTING SYSTEM. IT WILL TRACK TWO TARGETS SIMULTANEOUSLY AND GIVE A COURSE CHANGE TO AVOID EITHER TARGET. INPUT IS: TIME, BEARING AND DISTANCE. OUTPUT IS: CPA, BEARING OF CPA, TIME OF CPA, TRUE COURSE OF TARGET AND TRUE SPEED OF TARGET, AND REQUIRED CHANGE IN COURSE.

221PROGRAM STEPS
CAPTAIN K.R. ORCUTT
USA, VALLEY CENTER CALIF.

00284D 67-MERCHANT SHIP STABILITY.

THIS PROGRAM WILL COMPUTE ALL REQUIRED DATA TO PREPLAN LOADING OF A MERCHANT SHIP AND COMPUTE BOTH DEPARTURE AND ARRIVAL "GM", DRAFT, FORE, AFT AND MEAN, DISPLACEMENT AND MOMENTS.

544PROGRAM STEPS
CAPTAIN K.R. ORCUTT
USA. VALLEY CENTER CALIF.

00285D 97-OIL CONVERSION.

THIS PROGRAM CONVERTS BETWEEN GROSS BARRELS, NET BARRELS AND TONS OF OIL. ENTRY'S ARE: TEMPERATURE, API, AND BY ENTERING EITHER GROSS, NET OR TONS, THE OTHER TWO ARE COMPUTED

088PROGRAM STEPS
CAPTAIN K.R. ORCUTT
USA. VALLEY CENTER CALIF.

00286D 97-VOLUMES/LOCATION OF CENTROID OF

00286D (CONTD)

SHIPS TANKS/HULL COMPART.

COMPUTES THE VOLUME AND LOCATION OF THE CENTROID OF WING TANKS OR ANY COMPARTMENT OF A VESSEL, BOUNDED, AT EACH END BY A TRANSVERSE BULKHEAD, AT ONE SIDE BY A LONGITUDINAL BULKHEAD, AT THE TOP BY A DECK, AND AT THE BOTTOM BY A FLAT. AND THE OTHER SIDE BY THE CURVED SIDE OF THE VESSEL. FOR ANY EVEN NUMBER OF SUBDIVISIONS SIMPSON FIRST RULE IS USED, AND FOR ANY MULTIPLE OF THREE SUBDIVISIONS SIMPSONS SECOND RULE IS USED.

224PROGRAM STEPS
CAPTAIN K.R. ORCUTT
USA. VALLEY CENTER CALIF.

00287D 67-GRAT CIRCLE AND RHUMBLINE NAVIGATION.

THIS PROGRAM CALCULATES THE GREAT CIRCLE DISTANCE AND INITIAL HEADING AND THE RHUMBLINE DISTANCE AND HEADING GIVEN THE LATITUDE AND LONGITUTE OF THE SOURCE AND DESTINATION. INTERMEDIATE POINTS CAN ALSO BE CALCULATED AND THE COURSES FOR THEM ARE ALSO CALCULATED WITH A MINIMUM OF DATA ENTRY.

222PROGRAM STEPS
GEOFFREY PROBERT JR.
USA. BROOMFIELD CO.

00288D 67-MERCATOR SAILING COURSE AND DISTANCE.

GIVEN THE COORDINATES OF DEPARTURE (LATITUDE 1 AND LONGITUDE 1) AND THE COORDINATES OF DESTINATION (LATITUDE 2 AND LONGITUDE 2). CALCULATE THE COURSE (CN) AND THE DISTANCE (DIST.) RUN IN NAUTICAL MILES, USING THE MERCATOR SAILING FORMULAE WITH MERIDIONAL PARTS. SOLVES EQUATOR, GREENWICH AND DATE LINE CROSSINGS. PROGRAM ACCEPTS THE COORDINATES IN THE FORMAT OF DEGREES, MINUTES AND TENTHS OF MINUTES (DD MM . M). OUTPUT DATA IS IN TRUE COURSE AND NAUTICAL MILES.

116PROGRAM STEPS
JACK REHBERG
USA. CLEVELAND CHIO.

00289D 67-MERCATOR SAILING DESTINATION COORDINATES.

GIVEN THE COORDINATES OF THE POINT OF DEPARTURE (LATITUDE 1 AND LONGITUDE 1), THE COURSE (CN) AND THE DISTANCE RUN. CALCULATE THE COORDINATES OF THE POINT OF DESTINATION (LATITUDE 2 AND LONGITUDE 2), USING THE MERCATOR SAILING FORMULAE WITH MERIDIONAL PARTS. SOLVES EQUATOR, GREENWICH AND DATE LINE CROSSINGS. PROGRAM ACCEPTS AND DISPLAYS DATA IN THE FORMAT DEGREES, MINUTES AND TENTHS OF MINUTES (DD MM . M).

112PROGRAM STEPS
JACK T. REHBERG
USA. CLEVELAND OHIO.

00290D 67-GREAT CIRCLE NAVIGATION.

PROGRAM COMPUTES GREAT CIRCLE DISTANCE AND TRUE COURSE BETWEEN ANY TWO POINTS IN THE WORLD BY THE USE OF THE TERRESTIAL SPHERICAL TRIANGLE. AS AN OPTIONAL FEATURE, RHUMB LINE APPROXIMATIONS TO THE GREAT CIRCLE PATH MAY BE COMPUTED BY THE USE OF WAYPOINTS. FOR EACH WAYPOINT THE LATITUDE, LONGITUDE AND TRUE COURSE FOR THE ENSUING LEG ARE CALCULATED. USER MAY SELECT THE INCREMENT OF PATH LENGTH TO BE USED FOR THE RHUMB LINE APPROXIMATION.

179PROGRAM STEPS
CDR BRUCE W. CHURCHILL USN
USA. SAN DIEGO CALIF.

00291D 67-SIGHT REDUCTION AND ESTIMATED POSITION.

CALCULATE THE ALTITUDE (HC) AND AZIMUTH (ZN) OF A CELESTIAL BODY. GIVEN THE CORRECTED SEXTANT OBSERVED ALTITUDE (HO), CALCULATE THE ALTITUDE INTERCEPT, THE LATITUDE AND LONGITUDE OF THE ESTIMATED POSITION FROM A SINGLE CELESTIAL OBSERVATION. PROGRAM ACCEPTS AND DISPLAYS DATA IN THE FORMAT DEGREES, MINUTES AND TENTHS OF MINUTES, DEGREES AND TENTHS OF DEGREES OF ZN, NAUTICAL MILES AND TENTHS OF MILES OF ALTITUDE INTERCEPT. PROGRAM ALSO CAN BE USED FOR STAR IDENTIFICATION.

135PROGRAM STEPS
JACK T. REHBERG
USA. CLEVELAND OHIO.

00292D 67-GREAT CIRCLE LATITUDE AND LONGITUDE POSITION.

PROGRAM COMPUTES THE DISTANCE AND INITIAL BEARING BETWEEN TWO POSITIONS GIVEN THEIR LATITUDES AND LONGITUDES OR ESTIMATES THE LATITUDE AND LONGITUDE OF THE SECOND POSITION GIVEN THE DISTANCE AND INITIAL BEARING FROM THE FIRST. A SECOND MODE ALLOWS ESTIMATE OF LATITUDE AND LONGITUDE OF A POINT FROM A KNOWN POINT USING CHANGES IN LATITUDE AND LONGITUDE SCALED FROM A MAP.

167PROGRAM STEPS
W. ALAN DAY
USA. RESTON VA.

50599D 67-COMPOSTIE SAILING.

THE COMPOSITE TRACK CONSISTS OF A GREAT CIRCLE FROM THE POINT OF DEPARTURE AND TANGENT TO THE LIMITING PARALLEL, A COURSE LINE ALONG THE PARALLEL, AND A GREAT CIRCLE TANGENT TO THE LIMITING PARALLEL AND THROUGH THE DESTINATION. THIS PROGRAM COMPUTES, FOR EACH OF TWO POINTS,THE LONGITUDE AT WHICH A GREAT CIRCLE THROUGH THE POINTS IS TANGENT TO SOME LIMITING PARALLEL; THE DIFFERENT DISTANCES AND THE INITIAL HEADING FROM THE FIRST POINT.

145PROGRAM STEPS
GILLES SAUVAGNAT
F - BRON.

50600D 67-HANSEN PROBLEM. TWO UNKNOWN POINTS SOLVED BY TWO KNOWN PTS.

GIVEN RECTANGULAR CO-ORDINATES OF TWO POINTS AND ANGULAR OBSERVATIONS FROM TWO UNKNOWN POINTS, THIS PROGRAM CALCULATES: THE UNKNOWN DISTANCES, ANGLES AND CO-ORDINATES OF NEW POINTS. DEGREES OR GRADES ARE ALLOWED.

221PROGRAM STEPS
BRUNO ROMANO
I - GENOVA.

50601D 67-COURBON COEFFICIENTS FOR TRANSVERSAL DISTRIBUTION OF LOAD.

WITH A FOLLOWING DATAS: NUMBER OF BEAMS, THEIR DISTANCE, THEIR MOMENT OF INERTIA AND ECCENTRICITY OF LOAD THIS PROGRAN COMPUTES THE COEFF. KI FOR TRANSVERSAL DISTRIBUTION OF LOAD IN EACH BEAM. NOT MORE THAN 8 BEAMS ALLOWED IF INERTIA AND/OR DISTANCES BETWEEN BEAMS ARE/IS VARIABLE; OTHERWISE NUMBER OF BEAMS ARE UNLIMITED.

096PROGRAM STEPS
BRUNO ROMANO
I - GENOVA.

50602D 67-TEN-POINT GAUSSIAN QUADRATURE.

THIS PROGRAM FINDS THE INTEGRALS OF FUNCTIONS KNOWN EXPLICITLY USING THE TEN-POINT GAUSS-LEGENDRE QUADRATURE METHOD.
THE CARD IS RECORDED WITH THE DATA OF THE SECONDARY REGISTERS ON SIDE ONE AND WITH THE PROGRAM ON SIDE TWO.

106PROGRAM STEPS
JOSE REYES ESTEBAN
SPAIN - AVILES.

50603D 97-2D PIPE FLEXIBILITY.

THIS PROGRAM IS RECORDED ON TWO CARDS, AND IT CALCULATES THE FORCES AND MOMENTS IN A TWO-DIMENSIONAL, RECTANGULAR PIPE SYSTEM DUE TO THERMAL EXPANSION.
THE THERMAL EXPANSION IS CALCULATED AND COMBINED WITH EVENTUAL INITIAL MOVEMENTS, LATERAL AND ANGULAR, BEFORE THE RESULTING FORCES AND MOMENTS ARE FOUND.

387PROGRAM STEPS
OVE VILSTRUP
DK - SONDERBORG.

50604D 97-SIGHT ALTITUDE CORRECTION FOR THREE STARS / SAC.

THIS PROGRAM COMPUTES THE CORRECTED ALTITUDE IN FUNCTION OF REFRACTION, AIR TEMPERATURE, SEA TEMP. AIR PRESSURE, SEMI-DIAMETER, HEIGHT OF EYE, HORINZONTAL PARALLAX, INDEX CORRECTION. IT MAKES THE AVERAGE VALUE FOR DIFFERENT OBSERVATIONS. THREE DIFFERENT OBSERVATIONS CAN SIMULTANEOUSLY BE MADE. THIS PROGRAM IS NECESSARY TO USE WITH PROGRAM NUMBERS 50531D, 50532D,

50604D (CONTD)

50533D, 50534D, 50535D.

218PROGRAM STEPS
CHRISTIAN R. VERMEULEN
B - KORTRYK.

50605D 97-DEAD RECKONING AND LOXODROMIC COURSE AND DISTANCE.

THIS PROGRAM FIX YOUR NEW POSITION IN FUNCTION OF YOUR COURSE AND LOG-READING AND CURRENT, IT GIVES YOU THE (NEW) DISTANCE COURSE OF A POINT (DESTINATION), IT EXTRAPOLATES IN FUNCTION OF THE LAST LOG-READING, COURSE AND SPEED THE POSITION WHERE A CELESTIAL (UP TO THREEE) OBSERVATION IS MADE, IT CAN BE USED ALONE OR IN CONJUNCTON WITH PROGRAM NUMBERS: 50604D, 50531D, 50532D, 50533D, 50534D, 50535D.

229PROGRAM STEPS
CHRISTIAN R. VERMEULEN
B - KORTRYK.

50606D 97-COINAGE ANALYSIS.

PROGRAM THAT ANALYSES INDIVIDUAL NETT PAY AMOUNTS INTO UK CURRENCY DENOMINATIONS, LISTS, TOTALS AND COUNTS ENTRIES; FINALLY PRINTING OUT COINAGE LIST SUITABLE FOR SUBMISSION TO BANK WITH WAGES CHEQUE. EASILY ADAPTABLE TO ANY DECIMAL CURRENCY SYSTEM.

188PROGRAM STEPS
GEORGE BRITTAIN
UK - BELFAST.

50607D 67-EKG-PARAMETER.

PROGRAM COMPUTES THE MAIN EKG-PARAMETERS:
A) VECTOR (YOU MAY USE ONLY 2 OF THE FOLLOWING EKG-CURVES: I,II,III,AVR,AVL,AVF)
B) RR MEAN IN SEC, FREQUENCY
C) CONVERSION MM IN SEC
D) PQ MEAN: ACTUAL PQ MEAN (SEC), LOWER AND UPPER LIMIT, ACTUAL PQ MEAN IN % OF THE UPPER LIMIT
E) QT MEAN: INPUT RR MEAN AND QT MEAN IN MM, OUTPUT ESTIMATED QT MEAN, ACTUAL QT MEAN, ACTUAL QT MEAN IN % OF THE ESTIMATED QT MEAN.

224PROGRAM STEPS
LUDWIG STRAUSS
D - BUERSTADT.

50608D 67-MOHRS CIRCLE RESOLUTION OF STRESS, STRAIN, AREA MOMENTS.

PROGRAM DEFINES MOHRS CIRCLE FOR PLANE STRESS OR STRAIN OR SECOND MOMENTS OF AREA ETC., ON BASIS OF ANY VALID TRIO OF COMPONENTS (NOT JUST EQUIANGULAR OR COMPLEMENTARY) OR FROM PRINCIPALS. STRAIN CIRCLE MAY BE CONVERTED INTO STRESS OR VICE VERSA. COMPONENTS ARE THEREAFTER OUTPUT AT DESIRED RESOLUTION ANGLES, WHICH MAY BE INCREMENTED AUTOMATICALLY.

224PROGRAM STEPS
DOUGLAS CEDRIC WRIGHT
UK - GLASGOW.

50609D 67-CONVEYING EQUATIONS.

WHEN THE SITUATION AT THE END OF THE TRANSMISSION LINE IS KNOWN, AND IMPEDANCE AND ADMITTANCE OF LINE IS KNOWN, WITH THIS PROGRAM IT CAN COME TO KNOW THE SITUATION AT THE BEGINNING OF THE TRANSMISSION LINE.

223PROGRAM STEPS
VELIMIR ILIJANIC
YU - ZAGREB.

50610D 67-UNSYMMETRICAL COMPONENTS.

50610D (CONTD)

WHEN WE FINISHED FAULT ANALYSIS OF NETWORK IN VERY TOP OF NETWORK WE HAVE SITUATION EXPRESS IN SYMMETRICAL COMPONENTS, THAT WE COULD KNOW REAL PHASE VALUE, WE MUST TRANSFORM SYMMETRICAL COMPONENTS IN UNSYMMETRICAL COMPONENTS (PHSE VALUE), AND THIS PROGRAM CAN DO IT FOR US.

109PROGRAM STEPS
VELIMIR ILIJANIC
YU - ZAGREB.

50611D 67-SYMMETRICAL COMPOENENTS.

IN FAULT ANALYSIS WE USE METHOD OF SYMMETRICAL COMPONENTS. THIS METHOD FORMULATES A SYSTEM OF THREE SEPARATE PHASOR SYSTEMS WHICH WHEN SUPERPOSED GIVE THE TRUE UNBALANCED CONDITIONS IN THE CIRCUIT. IT SHOULD BE STRESSED THAT THE SYSTEM TO BE DISCUSSED ARE ESSENTIALLY ARTIFICIAL AND USED MERELY AS AN AID TO CALCULATION.

183PROGRAM STEPS
VELIMIR ILIJANIC
YU - ZAGREB.

50612D 67-DELTA-WYE & WYE-DELTA TRANSFORMATION.

THIS PROGRAM WE CAN USE IN NETWORK ANALYSIS, THAT SOME COMPLICATED NETWORK TAKE IN SIMPLE NETWORK WITH THIS TRANSFORMATION.

184PROGRAM STEPS
VELIMIR ILIJANIC
YU - ZAGREB.

50613D 67-PARALLEL IMPEDANCES.

IN NETWORK ANALYSIS WE CAN HAVE TWO OR THREE IMPEDANCES PARALLEL CONECTION, SO THAT, WE COULD QUICKLY CALCULATE. WE USE THIS PROGRAM. FOR THIS PROGRAM IMPEDANCE CAN BE IN ANY OF TWO FORMS; ANGLE - ABSOLUTE VALUE OR REAL PART - IMAGINARY PART.

160PROGRAM STEPS
VELIMIR ILIJANIC
YU - ZAGREB.

50614D 67-EXPONENTIAL RESIDUES.

GIVEN ANY TRIPLET OF INTEGERS: A<10**10; B<10**10; M<10**5, FINDS THE RESIDUE OF DIVIDING A**B BY M; TIME NOT MORE THAN 80 SECONDS USUALY ABOUT 40.

071PROGRAM STEPS
ISMAEL GONZALEZ ROLDAN
SPAIN- ALBACETE

50615D 97-TIDAL SAILING AND VOYAGE PLANNING.

UNDER CONDITIONS OF VARYING TIDAL CURRENTS THIS PROGRAM CALCULATES CORRECT HEADING, THE RESULTING INTERMEDIATE HOURLY POSITIONS, THE TOTAL TIME FOR THE VOYAGE AND THE ESTIMATED TIME OF ARRIVAL.

224PROGRAM STEPS
GERALD A. BAYNE
F - CANNES.

50616D 97-CASH ORDER.

WHERE A NUMBER OF SALARIES OR ACCOUNTS HAVE TO BE PAID IN CASH, THIS PROGRAM SORTS THE AMOUNTS OF THE VARIOUS DENOMINATIONS REQUIRED TO ORDER FROM THE BANK, AND PERMITS THE ROUNDING-UP OF THE CHEQUE. IT WORKS IN MOST DECIMAL CURRENCIES.

112PROGRAM STEPS
GERALD A. BAYNE

50616D (CONTD)

F - CANNES.

50617D 97-NOON SIGHT.

PROGRAM ESTABLISHES LOCAL TIME OF LOCAL APPARENT NOON AND REDUCES A MERIDIAN ALTITUDE SIGHT TO FIND THE LATITUDE.

210PROGRAM STEPS
GERALD A. BAYNE
F - CANNES.

50618D 67-THE WINEGLASS PROBLEM.

GIVEN A FULL CONICAL WINEGLASS WITH A DEPTH (HEIGHT) OF H AND A DIAMETER OF D. WE CASE INTO IT A BALL OF RADIUS R. NOW YOU CAN COMPUTE THE OVERFLOW.
YOU CAN COMPUTE THE MAXIMUM OVERFLOW AND THE RADIUS OF THE BALL WHICH PRODUCES THIS OVERFLOW.

155PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50619D 67-CYLINDRICAL TUBE PROBLEMS.

IF YOU MUST BRING TOGETHER TWO CYLINDRICAL TUBES OR 1 CYLINDRICAL TUBE ON A WALL, THIS PROGRAM COMPUTES DIFFERENT POINTS OF THE ELLIPTICAL SECTION. YOU MUST PUT IN THE DIAMETER, THE ANGLE AND THE NUMBER OF PAIRS THAT YOU WANT.

112PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50620D 67-BELGIAN TAXATION PROBLEMS.

WITH THIS PROGRAM YOU CAN COMPUTE THE DEDUCTIONS OF TAXATION OF THE SALARY OF YOU OR/AND YOUR WIFE, THE SPECIAL DEDUCTION OF 10.000 FRANCS AND THE LIMIT OF THE DEDUCTION OF THE PREMIUM OF THE LIFE-POLICY. (TAX-YEAR 1977/78).

145PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50621D 67-PROTECTED OPERATIONAL STACK OF 4 COMPLEX NBS. 18 FUNCTIONS.

2NDARY REGISTERS GREATE A PROTECTED STACK OF 4 CPLX.NBS. WITH LAST X CAPABILITY.NO CPLX.NB. REHAINS IN THE STACK,WHICH EVEN SAVES PREVIOUS CONTENTS OF ITS REGISTERS X,Y THROUGH ALL CPLX. OPERATIONS THUS ENABLING TO PERFORM MIXED EVALUATIONS, CPLX OR NOT BY RPN. AN ADDRESSABLE CPLX.MEMORY IS ALSO PROVIDED. FUNCT.ARE: ENTER, ROLL UP/DOWN,EXCH.X,Y,LASTX,STO,RCL,CHS, 1/X,X,:,+,-, X BY CONST.FACTOR, RECIPROCAL OF SUM OR DIFFCE OF THE RECIPR. OF 2 CPLX,NBS.SCAL.PROD. & RCL OF CPLX.NBR.X INTO NORM. STACK.

222PROGRAM STEPS
RUDOLF SEYSEN
D - FRANKFURT.

50622D 97-EVALUATON OF GIBBS FREE ENERGY FROM DIFFERENT DATA .

THE PURPOSE OF THE PROGRAM IS TO CALCULATE THE COEFFICIENTS OF THE FOLLOWING EXPRESSON G=GO+GI*T+ G2*T**2+G3*T**3+GAMMA*T*LN(T) PROVIDING GIBBS FREE ENERGY AS A FUNCTION OF TEMPERATURE.A 2ND ORDER POLYNOMIAL FOR THE HEAT CAPACITY PLUS A VARIETY OF OTHER THERMODYNAMIC DATA ARE ACCEPTED AS INPUT. VALUES OF G CAN BE CALCULATED.

224PROGRAM STEPS
KNUD ANDERSEN
DK - VEDBAEK.

50623D 67-COMPUTATION OF PROBABLE FLOODS WITH PRECIPITATION DATA.

THIS PROGRAM COMPUTES THE MIN. MED AND MAX. PROBABLE FLOOD FOR A GIVEN RECURRENCE AND CONFIDENCE INTERVAL FOR A GIVEN SHORT FLOODS SAMPLE IN A CATCHMENT AREA, UNDER THE APPLICATION OF A LONGER SAMPLE OF PRECIPITATION DATA. ALSO COMPUTES MIN., MED AND MAX. PROBABLE PRECIPITATION.

160PROGRAM STEPS
GABRIEL MONCAYO
D - FRANKFURT.

50624D 67-AGE OF THE MOON-SUN-MOON.

PROGRAM COMPUTES, FOR A GIVEN DATE BETWEEN 15 OCTOBER 1582 AND 31 DECEMBER 999999, THE AGE OF THE MOON, THE POSITION OF THE SUN, THE POSITION OF THE MOON, ON THE ECLIPTIC (ASTROLOGICAL OR ASTRONOMICAL/MODE). IN ASTL.MODE, IT TELLS YOU IN WHICH SIGN YOU WERE BORN IF YOU INPUT YOUR BIRTHDAY DATE (SUN).

224PROGRAM STEPS
PIERRE PIRAUX
B - MARCINELLE.

50625D 67-GREGORIAN CALENDAR.

IT GIVES THE YEARDAY OF A DATE; INCREMENTING OR DECREMENTING BY A NUMBER OF DAYS, GIVES THE NEW DATE AND THE WEEKDAY OF BOTH DATES; COMPUTES THE DIFFERENCE BETWEEN 2 DATES IN DAYS AND IN YEARS-AND-DAYS GIVES THE WEEKDAY OF BOTH DATES. TO SPARE PROGRAM STEPS, APPARENTLY ABSURD FORMULAS ARE USED, INCLUDING LOG, SEN, COS, PARTICULARLY INTERESTING TO HP-67 AMATEURS. DATE IN DAY-MONTH-YEAR FORM. NO DATA CARD REQUIRED.

223PROGRAM STEPS
PAOLO PELLICIARDI
I - BOLOGNA.

50626D 67-MEASUREMENTS OF HEMODYNAMIC AND OXYGEN TRANSPORT.

USING SYSTEM AND PULMONARY PRESSURES, CAPILLARY "WEDGE" PRESSURE, CENTRAL VENOUS PRESSURE, HEART RATE, HEMOGLOBIN, ARTERIAL AND VENOUS OXYGEN AND CO2 PARTIAL PRESSURE AND SATURATION, CARDIAC OUTPUT, BODY SURFACE AREA AND ATMOSPHERIC PRESSURE, THIS PROGRAM COMPUTE HEMODYNAMIC PARAMETERS (LEFT AND RIGHT HEART) AND OXYGEN TRANSPORT PARAMETERS. RIGHT TO LEFT SHUNT CAN BE COMPUTED ALONE.

223PROGRAM STEPS
MARIUS LAURENT
B - LA LOUVIERE.

50627D 97-POLYNOM 2=<ORDER=<24.

CALCULATE VALUE OF ANY POLYNOM WITH ORDER BETWEEN 2 AND 24. AUTOMATIC INPUT OF COEFFICIENTS.

047PROGRAM STEPS
LARS-ERIK SVAHN
S - FARSTA.

50628D 97-VISCOSITY OF SODA-LIME-SILICA TYPE GLASSES.

CALCULATES THE VISCOSITY - TEMPERATURE RELATION OF GLASS MELTS IN THE SODA-POTASH-LIME-MAGNESIA-ALUMINA-SILICA SYSTEM FROM THEIR COMPOSITIONS. COMPOSITIONS MAY BE IN WEIGHT OR MOLAR PERCENTAGES IF DIFFERENT DATA CARDS ARE USED. (ONE PROGRAM CARD AND ONE DATA CARD ARE NEEDED).

185PROGRAM STEPS
MICHAEL CABLE
UK - SHEFFIELD.

50629D 67-VECTOR OPERATIONS.

THIS PROGRAM COMPUTES:
1. PLANE-EQUATION (NORMAL FORM)
2. THE DISTANCE FROM THE PLANE TO COORDINATE REFERENCE POINT (0/0/0)
3. THE DISTANCE FROM THE PLANE TO A POINT (X/Y/Z)
4. POINT OF INTERSECTION BETWEEN A PLANE AND A STRAIGHT LINE
5. VECTOR AND SCALARPRODUCT (RECTANGULAR INPUT).

220PROGRAM STEPS
PETER BAUMANN
CH - ZUERICH.

50630D 67-LINEAR PROGRAMMING.

THIS PROGRAM CAN SOLUTE, BY THE WAY OF SIMPLEX ALGORITHM, LINEAR PROGRAMMING PROBLEMS OF THREE LINEAR INEQUALITIES AND TWO VARIABLES.

224PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50631D 67-APPLICATION IN THERMODINAMIC AND HEAT TRANSFER EQUATIONS.

THIS PROGRAM IT IS DEVELOPED TO RESOLVE HEAT TRANSFER PROBLEMS PRESENTED IN HEATING EQUIPMENT AND TO MAKE POSSIBLE COMPUTE MORE IMPORTANT KNOWNS.

203PROGRAM STEPS
FELIPE PAZ
SPAIN - MADRID.

50632D 67-UPPER WIND.

THIS PROGRAM COMPUTES THE WIND DIRECTION AND SPEED AT THE END OF EACH MINUTE OF A METEOROLOGICAL SOUNDING FROM THE DATA PROVIDED BY RADIOSONDE AND RADIOTHEODOLITE OR BY RADAR. IT MAY ALSO CALCULATE THE AVERAGE WIND IN THE INTERVAL OF ONE MINUTE. BESIDES, IT COMPUTES THE BALLOON'S SPEED OF ASCENT, WHICH CAN BE DISPLAYED AS WELL AS THE BALLOON'S HORIZONTAL DISTANCE, CORRECTED FOR THE EARTH CURVATURE EFECT.

222PROGRAM STEPS
EUGENIO OLIVA
SPAIN - MADRID.

50633D 67-PARALLEL AND SERIAL RESISTOR CONNECTIONS.

THE PROGRAM CALCULATES 2 OR 3 STANDARD-RESISTORS, WHICH CONNECTED IN PARALLEL OR SERIAL GIVES ANY PARTICULAR WANTED RESISTOR. STANDARD-RESISTORS CAN ACCORD TO IEC E3, E6, E12, E24, E48, E96, OR E192. FOR A GIVEN TOTAL POWER DISSIPATION THE PROGRAM ALSO FINDS THE POWER DISSIPATED IN EACH RESISTOR. CALCULATIONS OF CAPACITORS CAN BE HANDLED TOO.

222PROGRAM STEPS
BJOERN ENGSIG.
DK - ALLERODED.

50634D 67-HYPERBOLICS TRIGONOMETRIC & INVERSE FUNCTIONS COMPLEX VAR.

PROGRAM COMPUTES ALL HYPERBOLICAL, TRIGONOMETRICAL AND THEIR INVERSE FUNCTIONS FOR COMPLEX VARIABLES. IT ALSO PROVIDES THE FUNCTIONS LN(Z), EXP(Z), Z**1/2, Z**2 AND 1/Z.

212PROGRAM STEPS
MARTIN HERREN
CH - RIEHEN.

50635D 67-MAXIMA AND MINIMA OF A FUNCTION

50635D (CONTD)

00800D OF TWO VARIABLES.

WITH THIS PROGRAM YOU CAN COMPUTE THE STATIONARY POINTS (X,Y) OF THE BASIC-FUNCTION AX**4+BX**2 Y**2+ CX**2+DY**2+C. IF IT EXIST, THE SADDLE POINT IS ALSO GIVEN. THEN YOU SEE A CODE-NUMBER BEFORE THE COORDINATES OF THE POINT.

196PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50636D 67-BIOLOGICAL AGE OF THE AORTA AND BODY SURFACE AREA.

PROGRAM CALCULATES THE BIOLOGICAL AGE OF THE AORTA AND THE BODY SURFACE AREA. THE DUBOIS AND THE BOYD FORMULA ARE USED. PARAMETERS ARE HEIGHT, WEIGHT OF THE PATIENT AND THE DIAMETER OF THE AORTA, MEASURED BY A STANDARD THORAX ROENT = GENOGRAM (2 M DISTANCE).

134PROGRAM STEPS
LUDWIG STRAUSS
D - BUERSTADT.

50637D 67-CLASSICAL CONDITIONING SIMULATOR.

PROGRAM SIMULATES CLASSICAL CONDITIONING, WITH UP TO 9 CONDITIONAL STIMULI AND ONE ABSOLUTE (UNCONDITIONAL) STIMULUS. SIMULATED ASPECTS ARE ACQUISITION, EXTINCTION, GENERALIZATION AND DISCRIMINATION. IN SIMPLER TERMS, PROGRAM LEARNS TO RECOGNIZE AND RESPOND TO ONE OR MORE STIMULI, JUST LIKE PAVLOV'S DOG LEARNED TO RESPOND (SALIVATE) TO LIGHT AFTER IT HAS BEEN ASSOCIATED REPEATEDLY WITH FOOD. "PERSONALITY" PARAMETERS MAY BE RESET BY THE USER.

190PROGRAM STEPS
AVIGDOR LUTTINGER
F - LYON.

50638D 67-CURVE FITTING FOR GENERAL EXPONENTIAL AND POWER FUNCTION.

PROGRAM FITS A SET OF DATA POINTS TO: GENERAL EXPONENTIAL CURVES AND GENERAL POWER CURVES:
Y=A*EXP (B*X)+C AND Y=A*X**B+C
THE PROGRAM SD03A OF THE STANDARD PAC ONLY CAN BE APPLIED IN THIS SPECIAL CASE, IF THE TERM C=0.

224PROGRAM STEPS
ANDRAS ILLYES
H - PAKS.

50639D 67-REGISTER DOUBLING.

THIS PROGRAM UTILIZES THE DIGIT CAPACITY OF THE STORAGE-REGISTERS OF THE HP-67 TO KEEP TWO INDEPENDENT NUMBERS IN ONE REGISTER. THE NUMBERS WILL BE STORED (AND RECALLED) WITH THREE SIGNIFICANT DIGITS AND CAN BE IN THE FULL RANGE OF THE CALCULATOR. ADDRESSING THE "NEW" REGISTERS IS DONE BY USING THE COMMON REGISTER-NUMBERS FOLLOWED BY 0 OR 1.

192PROGRAM STEPS
BO JENSEN
DK - KLAMPENBORG.

50640D 67-LAPLACE TRANSFORM OF THIRD ORDER STATE TRANSITION MATRIX.

THIS PROGRAM CALCULATES THE INVERSE OF (S*I-A) FOR A THIRD ORDER "A" MATRIX. THIS MATRIX IS THE LAPLACE TRANSFORM OF THE STATE TRANSITION MATRIX. YOU CAN THEN SOLVE THE THREE UNKNOWS DIFFERENTIAL SYSTEM DEFINED BY "A".

214PROGRAM STEPS
PHILIPPE LEMAIRE

50640D (CONTD)

B - CHENEE.

50641D 97-BERNSTEIN POLYNOMIALS AND FORWARD DIFFERENCES.

PROGRAM CALCULATES BERNSTEIN POLYNOMIALS UP TO DEGREE EIGHT AND THEIR FIRST DERIVATIVES BY A RECURSIVE ALGORITHM WHICH MAY ALSO BE USED TO CALCULATE FORWARD DIFFERENCES OF UP TO NINE NUMBERS. THE PROGRAM USES BEZIER POLYNOMIALS A GENERALISATION OF BERNSTEIN POLYNOMIALS.

166PROGRAM STEPS
GERALD FARIN
D - BRAUNSCHWEIG.

50642D 67-TRIANGLE SOLUTIONS.

BE A,B,C, THE ANGLES, AND THE SAME SMALL LETTERS THE SIDES. ALL WE HAVE TO DO TO SOLVE THE TRIANGLE IS TO PRESS, IN ANY ORDER, THE LABEL KEYS OF THE SAME NAME AS THE PIECES WE WANT EITHER TO PUT IN, AS GIVEN VALUES, OR TO GET OUT, AS CALCULATED UNKNOWNS. TO GET THE AREA WE PRESS D. ANY THREE OF THE SIX LETTERS CAN REPRESENT GIVEN DATA.

223PROGRAM STEPS
ISMAEL GONZALEZ ROLDAN
SPAIN - ALBACETE.

50643D 67-TRILATERATION SU 14.

YOU HAVE TO KNOW AT LEAST TWO COORDINATED POINTS AND THEIR DISTANCES TO THE NEW-POINT. FOR A CALCULATION WITH 3 AND MORE POINTS, THE PROGRAM USES AN ADJUSTMENT WITH A REGOROUS SOLUTION AND CALCULATES THE COORDINATES OF THE NEW-POINT. THIS RESULT DEVIATES FROM A RIGOROUS ADJUSTMENT ONLY FOR MM'S. USABLE ONLY FOR ELECTRONIC DISTANCE MEASUREMENT, BECAUSE WEIGHT OF ALL DISTANCES IS 1.

224PROGRAM STEPS
JOHANNES GRUSS
D - WIESBADEN.

50644D 67-EDM REDUCTION SU 15.

THE PROGRAM REDUCES DISTANCES MEASURED WITH AN ELECTRONIC DISTANCE MEASURING INSTRUMENT. (1) LONG DIST. REDUCT. WITH REFRACTION INDEX (K), HEIGHT OF STANDPOINT (H1), HEIGHT OF ENDPOINT (H2) AND MEASURED DISTANCE (D'). (2) EDM REDUCTION WITH ZENITH ANGLE (Z), WITH ZENITH INDEX ERROR CORRECTION (VZ), MEDIUM HEIGHT (HM) AND D'. (3) GAUSS REDUCTION, (4) EDM/GAUSS REDUCTION WITH K, DEVIATION FROM MAIN MERIDIAN (YM),H1,H2 AND D'. (5) EDM/ZENITH ANGLE/GAUSS REDUCTION WITH YM,VZ,HM,Z AND D'.

195PROGRAM STEPS
JOHANNES GRUSS
D - WIESBADEN.

50645D 67-TACHYMETER-REDUCTION SU16.

THE PROGRAM (1) REDUCES SLOPE DISTANCES MEASURED WITH A NORMAL TACHYMETER AND CALCULATES HEIGHT OF ENDPOINT, (2) ONLY HEIGHT OF ENDPOINT, MEASURED WITH A SELF-REDUCTION TACHYMETER. IT DIGESTS ZENITH INDEX ERROR CORRECTION, HEIGHT OF TARGET, HEIGHT OF INSTRUMENT. THE PROGRAM DO NOT PAY REGARD TO TACHYMETER CONSTANTS LIKE C & K.

111PROGRAM STEPS
JOHANNES GRUSS
D - WIESBADEN.

50646D 67-ADJUSTMENT OF SINGLE POINTS SU17

50646D (CONTD)

THE PROGRAM ADJUSTS RESECTIONS, INTERSECTIONS AND BOTH. FOR INTERSECTIONS YOU HAVE TO KNOW AT LEAST 3 AND MAX. 5 DIRECTIONS, FOR RESECTIONS AT LEAST 4 & MAX 5. THE PROGRAM CALCULATES DY, DX, THE NEW POINT COORDINATES, ERROR OF AN OBSERVED DIRECTION, STANDARD ERROR OF Y AND X. IT ORIENTATES THE OBSERVED DIRECTIONS, IT DO NOT CALCULATES THE DIFFERENT SECTIONS. ADJUSTMENT WITH THE METHOD OF LEAST SQUARES.

830PROGRAM STEPS
JOHANNES GRUSS
D - WIESBADEN.

50647D 67-COMPLEX TRIGONOMETRIC.

THIS PROGRAM COMPUTES THE SIX OF COMPLEX TRIGONOMETRIC FUNCTIONS: SIN/Z/, CSZ/Z/, COS/Z/, SEC/Z/, TAN/Z/, COT/Z/, /E/-USE FOR ENTERING COMPLEX NUMBER, PROGRAM CALCULATES ALL OF COMPLEX TRIGONOMETRIC FUNCTIONS FOR ONE ENTER OPERATION OF ONE COMPLEX NUMBER.

110PROGRAM STEPS
KONSTANTY BOUFAL
PL / WARSAW.

50648D 67-BOUNDED VOLUME OR AREA OF TWO SPHERES OR TWO CIRCLES.

WITH THIS PROGRAM YOU CAN COMPUTE
A) THE BOUNDED VOLUME OF 2 SPHERES
B) THE BOUNDED AREA OF 2 CIRCLES, GIVEN BY THEIR COORDINATES X,Y OR Z AND THE RADIUS.
THE FIVE POSSIBLITIES ARE GIVEN BY A CODE. ALSO YOU CAN FIND THE DISTANCE OF THE CENTRES IN SPACE OR PLANE.

202PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50649D 67-TELEPHONE CALL UNIT-COUNT AND CHARGES.

FOR TELEPHONE SUBSCRIBERS CONNECTED TO AUTOMATIC EXCHANGES THE NUMBER OF UNITS AND THE COST ARE CALCULATED FOR THE CURRENT CALL AND ADDITIONALLY FOR ANY NUMBER OF CONSECUTIVE CALLS. THIS PROGRAM RELATES TO THE SCALE OF CHARGES VALID SINCE OCT.75 IN THE U.K. ACCOMMODATED ARE NINE INTERNAL TIME-OF-DAY AND DISTANCE CHARGE RATES AS WELL AS TWO INTERNATIONAL ONES. ADDITIONAL RATES CAN BE INSERTED AND ALL CONSTANTS CAN BE EASILY CHANGED.

110PROGRAM STEPS
JOACHIM J.A. GRABAU
UK - LIVERPOOL.

50650D 67-COLEBROOK'S FORMULA (VISCOUS FLOW THROUGH CYLINDRICAL PIPE).

PROGRAM CALCULATES ANY COUPLE OF THE 4 VARIABLES H (HEAD LOSS), V (VELOCITY), D (DIAMETER), Q (CAPACITY), THE OTHER COUPLE BEING GIVEN THE TWO EQUATIONS USED INCLUDE COLEBROOK'S FORMULA. PROGRAM MAY WORK IN METRIC, US OR UK UNITS. FLUID VISCOSITY AND INSIDE WALL PIPE ROUGHNESS MAY BE ENTERED. IF NOT, USUAL VALUES ARE FIXED (STEEL WELDED PIPE, WATER AT 32 DEGREES F)

217PROGRAM STEPS
MICHEL DE VALS
F - AIX EN PROVENCE.

50651D 67-STAR-DELTA DELTA-STAR TRANSFORMATION.

PROGRAM CONVERTS FROM STAR TO DELTA FORMED CIRCUITS AND VICE VERSA. IT WORKS FOR LINEAR AC/DC CIRCUITS. COMPLEX IMPEDANCES CAN BE GIVEN IN

50651D (CONTD)

POLAR OR RECTANGULAR FORM.

176PROGRAM STEPS
BRANKO SPOLJARIC
YU - ZAGREB.

50652D 67-GERMAN NUMBERS POOL 6/49
HOW MANY HITS ?

6 FROM 49 WILL BE DRAWN AND AN ADDITIONAL NUMBER. 6 NUMBERS IN ONE TIP WILL BE CHOSEN...
6 TIPS ARE ALLOWED ON ONE TIP FORM, AND TO PAY FOR 6.

175PROGRAM STEPS
ALFRED ANTONIK
D - BERLIN.

50653D 67-N-TH DEGREE POLYNOMIAL <=18 BAIRSTOW METHOD.

THIS PROGRAM CALCULATES ALL THE REAL AND/OR COMPLEX ROOTS OF POLYNOMIAL UP TO 18TH DEGREE (REAL COEFFICIENTS) WITH BAIRSTOW METHOD WHICH IS THE MOST EFFICIENT FOR THIS PROGRAM. THE WHOLE PROGRAM RUNS WITHOUT MANUAL INTERVENTION THIS PROGRAM IS DESIGNED FOR HP-97 PRINTER TOO.

311PROGRAM STEPS
MARCHAL ERIC
B - BRUSSELS.

50654D 67-IDENTIFICATION OF AN UNKNOWN CELESTIAL BODY.

PROGRAM IDENTIFICATES ANY UNKNOWN CELESTIAL BODY WHEN GIVEN APPROX. POSITION (LATITUDE AND LONGITUDE) OF OBSERVER AND ALTITUDE AND AZIMUTH OF STAR OR PLANET.

118PROGRAM STEPS
HANS PETER VON DER BEY
D - BREMERHAVEN.

50655D 67-ULTIMATE STRESS METHOD FOR RECTANGULAR R.C. BENDED SECTION.

THIS PROGRAM FIND A LIMIT OF BENDING ACTION FOR RECTANGULAR R.C. SECTION, ACCORDING WITH ITALIAN AND/OR FIP-CEB RULES. IT IS ALSO FOUND THE COEFFICIENT K, THAT MEANS THE NEUTRAL AXIS LOCATION AND, CONSEQUENTLY, A CLASSIFICATION OF THE SECTION IN A WEAK OR HARD RE-INFORCEMENT FIELD.

224PROGRAM STEPS
BRUNO ROMANO
I - GENOVA.

50656D 67-PULMONARY FUNCTION: VITAL CAPACITY, FORCED EXPIRATORY VOL.

PROGRAM CALCULATES SOME PULMONARY FUNCTION PARAMETERS BY NONLINEAR EQUATIONS:
1) VITAL CAPACITY (MEAN,LOWER LIMIT): VC
2) FORCED EXPIRATORY VOLUME (MEAN, LOWER LIMIT):FEV
3) FEV/VC IN % (LOWER LIMIT)
VARIABLES ARE HEIGHT (IN M), AGE, SEX. FOR CHILDREN DIFFERENT FORMULAS ARE USED.

224PROGRAM STEPS
LUDWIG STRAUSS
D - BUERSTADT.

50657D 67-COMPLEX OPERATIONS PROGRAMMABLE 45.

THIS PROGRAM CREATES AN OPERATIONAL STACK OF FOUR COMPLEX NUMBERS, SO THAT RPN CAN BE USED. THERE ARE THE FUNCT. +, -, MEMORY 1, MEM.2, MEM.3 OR STACK ROTATION, CHANGE SIGN, CONJUGATE COMPLEX NUMBER, (SWITCH), X, DIVIDE, INVERSE, RCL 1,2,3, EXCHANGE, ENTER, NORM. THE OPERATION STACK AUTOMAT. DROPS AFTER ANY TWO

50657D (CONTD)

NUMBER OPERATION AND LIFTS BEFORE ANY RCL OPERATION. THERE IS A POSSIBILITY OF QUICKLY CREATING A LINEAR PROGRAM OF MAXIMUM 45 STEPS.

222PROGRAM STEPS
HENNING LEGELL
D - EUTIN.

50658D 67-COLOUR COPYING.

GIVEN THE EXPOSURE TIMES AND COLOUR AND/OR DENSITY STITCH PROGRAM CALCULATES THE NEW EXPOSURE TIMES IN RED, GREEN AND BLUE LIGHT.

138PROGRAM STEPS
HANS EMLID
S - KIL.

50659D 97-AREA AND MOMENTS OF 2 ORDER OF POLYGONAL SECTIONS.

THIS PROGRAM CALCULATES AREA,CENTRE OF GRAVITY AND MOMENTS OF 2 ORDER OF POLYGONAL SECTIONS. COORDINATES OF THE VERTICES OF THE POLYGON ARE INPUT SEQUENTIALLY FOR A COMPLETE COUNTER CLOCKWISE PATH AROUND THE POLYGON. HOLES IN THE SECTION MAY BE DELETED BY FOLLOWING A CLOCKWISE PATH. DELETION OF CIRCULAR AREAS IS POSSIBLE.

224PROGRAM STEPS
GUSTAV GERKE
D - ESSLINGEN.

50660D 97-LOAD TERMS (CROSS-LINE DISTANCES) PART 1.

PROGRAM CAN BE USED FOR SIMPLE OR COMPLICATED LOAD COMBINATIONS. IT ADDS UP THE LOAD TERMS OF PART LOADS. SO IT IS POSSIBLE TO CALCULATE FIRST THE LOAD TERM FOR D.L., CALL THE RESULT AND CONTINUE WITH L.L., CALL THE RESULT FOR T.L.. BY STARTING WITH (A) ALL REGISTERS ARE CLEARED.

222PROGRAM STEPS
ERWIN QUINT
I - NEMI (ROMA).

50661D 97-CARTESIAN PLOTTER / UNLIMITED FORMAT.

ENTERING (UNLIMITED) FORMAT MXN AND POSITION OF X-AXIS THE PROGRAM PRINTS A CARTESIAN GRAPH OF A FUNCTION F IN A GIVEN RANGE OF X BY MEANS OF SEVERAL STRIPS. 2 DISPLAY-MODES CHOOSEABLE. PROGRAM CALCULATES UNITS OF AXES, STEP WIDTHS AND POSITION OF Y-AXIS F IS DEFINABLE BY 58 STEPS.

166PROGRAM STEPS
MANOGG DR. PETER
I - CASCIAGO.

50662D 97-"NICE" GRAPH - PLOTTER UNLIMITED FORMATING.

ENTERING UNLIMITED FORMAT M X N THE PROGRAM GIVES A MAXIMUM - MINIMUM CONFINED GRAPH OF A 54 STEP-DEFINABLE FUNCTION IN A GIVEN INTERVAL A,B BY MEANS OF SEVERAL STRIPS. TWO MODES OF GRAPHING POSSIBLE. PROGRAM PRINTS MAXIMUM AND MINIMUM OF F, POSITION OF AXIS, UNITS AND STEP WIDTHS OF THE GRAPH.

170PROGRAM STEPS
MANOGG PETER
I - CASCIAGO.

50663D 67-UP TO THE PRESIDENCY.

AT THE STARTING OF THE GAME YOU ARE 21 YEARS OLD, JUST LEAVING WEST POINT. AS A SECOND-LIEUTENANT. NOW IT IS POSSIBLE TO MAKE A MILITARY CAREER AND AT LAST YOU CAN BE THE

50663D (CONTD)

PRESIDENT.
THERE ARE THREE WAYS TO MAKE IT: CLOSE TO YOUR HOME (CAREER WILL DEVELOP VERY SLOWLY), ON THE FRONT (PROMOTIONS WILL BE FASTER) AND DIRECTLY ON THE FRONT-LINE (VERY QUICKLY PROMOTION IS POSSIBLE) BUT IF YOU ARE ON THE BATTLE-FRONT, YOU CAN BE KILLED...

222PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50664D 67-FOOTBALL GAME.

WITH THIS PROGRAM, YOU CAN PLAY A FOOTBALL-GAME AGAINST THE H.P. THE H.P. IS THE HOME CLUB AND YOU ARE THE VISITOR. THE EVOLUTION OF THE GAME, THE RESULTS AND THE TIME CAN BE SEEN IN THE DISPLAY.

129PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50665D 67-MAXIMUM DISTANCE FROM THE ORIGIN TO THE CURVE.

THE PROGRAM COMPUTES THE MAXIMUM DISTANCE FROM THE ORIGIN (0,0) TO THE BASIC CURVE AX**2+AY**2+BX+BY+CXY=0 THE METHOD OF THE LAGRANGE MULTIPLIERS IS USED.
YOU CAN ALSO COMPUTE THE POINTS OF THE CURVE TO AMKE A SKETCH OF IT.

196PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50666D 67-DEZIMAL TO FRACTION.

THIS PROGRAM ANALYSES EVERY DEZIMAL NUMBER IN NUMERATOR AND DENOMERATOR

114PROGRAM STEPS
JOACHIM WELTERS
D - LAUBACH.

50667D 67-RESECTION FINAL POINT.

THIS PROGRAM PROVIDES FROM AN APPROXIMATED LOCATION, THE FINAL PLANE COORDINATES OF A RESECTION POINT. ANY AIMING NUMBER IS AVAILABLE.
THE PROGRAM USES THE LEAST SQUARE ADJUSTMENT METHOD. THE FINAL VO OF THE STATION IS ALSO GIVEN.

224PROGRAM STEPS
PATRICE GEIGER
ALGERIE - ARZEW.

50668D 67-CALCULATIONS WITH TONE INTEVALS.

THIS PROGRAM IS ABOUT MUSIC. IT CALCULATES: THE INTERVAL BETWEEN 2 GIVEN TONE'S IN AN ARBITRARY KEY, THE TONE ACHIEVED BY ADDING A CERTAIN INTERVAL TO A CERTAIN TONE IN AN ARBITRARY KEY.
TE OUTPUT AND INPUT ARE ALWAYS IN CONFORMITY TO THE APPROPRIATE KEY.

224PROGRAM STEPS
KAREL VAN SCHOOR
B - TEMSE.

50669D 67-PRIME NUMBER THEOREM.

THIS PROGRAM PERMITS TO VERIFY THE PRIME NUMBER THEOREM, STATING THAT THE NUMBER OF PRIMES IN (1, N), MULTIPLIED BY LN N & DIVIDED BY N, HAS LIMIT 1. THIS INVESTIGATION OF COURSE ONLY REFERS TO RATHER SMALL VALUES OF N, BUT PROVISIONS ARE MADE TO INTERRUPT WORK AND TO CONTINUE ON SOME LATER DATE.

112PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50670D 67-LIST OF VALUES OF LN N WITH MORE THAN TEN DECIMALS.

THIS PROGRAM CALCULATES VALUES OF LN N, WHERE N IS A POSITIVE INTEGER WITH A NUMBER OF DECIMALS FROM 13 UP TO 71. USER DECIDES ON THIS NUMBER OF DECIMALS AND AT THE SAME TIME ON THE NUMBER OF MINUTES HE IS WILLING TO WAIT FOR AN ANSWER.

224PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50671D 67-TWENTY THREE TRIPLETS OF PRIMES.

THIS PROGRAM CALCULATES 23 CONSECUTIVE TRIPLETS OF PRIMES, EITHER OF THE KIND (P,P+2, P+6) OR OF THE KIND (P, P+4, P+6) WITHOUT REQUIRING YOUR PRECENSE. TO BE USED BY PERSONS WANTING TO FIND OR TO VERIFY LISTS OF SUCH TRIPLETS. PLACE OF TRIPLETS IN SEQUENCE OF INTEGERS CAN BE CHOSEN BY USER.

163PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50672D 67-TWENTY-THREE QUADRUPLETS OF PRIMES.

THIS PROGRAM CALCULATES 23 CONSECUTIVE QUADRUPLETS (P, P+2, P+6, P+8) OF PRIMES WITHOUT REQUIRING YOUR PRECENSE. TO BE USED BY PERSONS, WANTING TO FIND OR TO VERIFY LISTS OF SUCH QUADRUPLETS. PLACE OF QUADRUPLETS IN SEQUENCE OF INTEGERS CAN BE CHOSEN BY USER.

172PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50673D 67-MANY PRIMES AT ONCE.

STARTING FROM A POSITIVE INTEGER 11+210K, THIS PROGRAM CALCULATES A COLLECTION OF CONSECUTIVE PRIMES, A LOT MORE THAN THE NUMBER OF STORAGE PLACES, WITHOUT REQUIRING YOUR PRESENCE. THIS IS MADE POSSIBLE BY STORING UP TO 5 PRIMES IN ONE STORAGE-PLACE, IN CODE. DECODING IS AFTERWARDS MADE POSSIBLE BY A SUBROUTINE. THE PROGRAM IS USEFUL TO USERS, WHO ARE TRYING TO FIND OR VERIFY A LONG LIST OF PRIMES.

219PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50674D 67-MANY PAIRS OF PRIMES.

STARTING FROM A POSITIVE INTEGER 11+210K, THIS PROGRAM CALCULATES A COLLECTION OF CONSECUTIVE PAIRS OF PRIMES, A LOT MORE THAN THE NUMBER OF STORAGE-PLACES,WITHOUT REQUIRING YOUR PRESENCE. THS IS MADE POSSIBLE BY STORING UP TO 5 PAIRS OF PRIMES IN ONE STORAGE-PLACE, IN CODE. DECODING IS AFTERWARDS MADE POSSIBLE BY A SUBROUTINE. USEFUL FOR WHO IS TRYING TO FIND OR TO VERIFY A LONG LIST OF SUCH PAIRS.

206PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50675D 67-LONG PRODUCTS AND SQUARES.

THIS PROGRAM CALCULATES PRODUCTS OF TWO POSITIVE INTEGERS, EACH HAVING UP TO 40 DIGITS. IT ALSO FINDS THE SQUARE OF SUCH AN INTEGER.

107PROGRAM STEPS
RAYMOND BROECKX
B- WILRIJK.

50676D 67-SQUARE ROOT WITH UP TO 76 DECIMALS.

USING THE BINOMIAL SERIES, THIS PROGRAM CALCULATES THE POSITIVE SQUARE ROOT OF A NUMBER N WITH UP TO 76 DECIMALS. THE NUMBER N BELONGS TO THE INTERVAL]1, 2500[AND MAY HAVE UP TO 4 DECIMALS.

201PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50677D 67-BUCCANEER HUNT.

SIX BUCCANEER-SHIPS, THEIR HARBOUR AND YOUR WARSHIP ARE PLACED RANDOMLY ON A 20-20 PLAYING BOARD. BY MOVING THE WARSHIP YOU MUST TRY TO PREVENT THE BUCCANEERS TO REACH THE HARBOUR. BEING FAR SUPERIOR IN FIRING POWER, YOUR SHIP CAN DESTROY THE BUCCANEER SHIPS, IF IT CAN GET CLOSE ENOUGH, WHICH THEY WILL TRY TO AVOID HOWEVER, BY SAILING AWAY IN UMPREDICTABLE DIRECTIONS.

224PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50678D 67-REVERSION OF SERIES.

GIVEN THE FIRST 7 COEFFICIENTS OF A SERIES WITHOUT CONSTANT TERM, EXPANDING Y IN X, THIS PROGRAM CALCULATES THE FIRST 7 COEFFICIENTS OF THE REVERSED SERIES, EXPANDING X IN Y.

208PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50679D 67-ELLIPSES AND HYPERBOLAS.

GIVEN THE EQUATION IN AN ORTHONORMAL BASE OF A CONIC, NOT OF THE PARABOLIC TYPE, THIS ONE-CARD PROG. CALCULATES THE QUADRATIC AND CUBIC DISCRIMINANTS THE COORDINATES OF THE CENTER, THE GRADIENT OF THE PRINCIPAL AXIS OF SYMMETRY, THE LENGTHS OF EACH SEMI-AXIS, THE FOCI AND VERTICES OF THE CONIC, ANY NUMBER OF POINTS ON THE CONIC, THE POLAR LINE OF A GIVEN POINT, TANGENTS, ETC...

221PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50680D 67-PARABOLA.

GIVEN THE EQUATION IN AN ORTHONORMAL BASE OF A PARABOLA, THIS PROG. CALCULATES THE GRADIENT OF THE TANGENT IN THE SUMMIT POINT, THE DISTANCE OF THE FOCUS TO ITS POLAR LINE, AND THE COORDINATES OF THE SUMMIT. FURTHERMORE, SUBROUTINES ALLOW YOU TO FIND ANY NUMBER OF POINTS OF THE CURVE, TANGENTS IN THOSE POINTS, POLAR LINES OF GIVEN POINTS, AND THE COORDINATES OF THE FOCUS POINT.

151PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50681D 67-FROM LN N TO LOG N.

KNOWING LN N, THIS PROGRAM FINDS LOG N. THE NUMBER OF DECIMALS DEPENDS ON THE SAME NUMBER IN LN N, AND CAN RUN UP TO 40.

145PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50682D 67-SINES FOR DECIMAL DEGREES.

THIS PROGRAM CALCULATES SINES OF ANGLES IN DECIMAL DEGREES WITH 20 DECIMALS.

50682D (CONTD)

224PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50683D 67-LINEAR SYSTEMS WITH COMPLEX COEFFICIENTS.

THIS PROGRAM SOLVES ANY LINEAR SYSTEM OF M EQUATIONS WITH M UNKNOWNS (M<5) AND WITH COMPLEX COEFFICIENTS, IF THIS SYSTEM HAS ONE SOLUTION. COEFFICIENTS MUST BE ENTERED ONLY ONCE.

224PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50684D 67-LINEAR SYSTEMS.

THIS PROGRAM IS AN EXAMPLE OF THE POSSIBILITIES OF YOUR HP-67. IT SOLVES ANY LINEAR SYSTEM OF K EQUATIONS AND K UNKNOWNS (K<8), IF THIS SYSTEM HAS ONE SOLUTION. COEFFICIENTS MUST BE ENTERED ONLY ONCE. FURTHERMORE, YOU CAN FIND OUT HOW GOOD YOUR SOLUTION ACTUALLY IS, USING A SUBROUTINE, THAT CALCULATES THE RIGHT MEMBERS OF THE EQUATIONS, WHEN THE SOLUTION IS ENTERED IN THE LEFT MEMBERS.

224PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50685D 67-DETERMINANTS.

THIS PROGRAM CALCULATES DETERMINANTS OF DEGREE 2,3,...,8. THE ELEMENTS EACH HAVE TO BE ENTERED ONLY ONCE, AFTER WHICH YOU ONLY HAVE TO WAIT FOR THE RESULT, LESS THAN 30 MINUTES FOR DEGREE 8.

223PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50686D 67-POLYNOMIAL EQUATIONS WITH COMPLEX COEFFICIENTS.

THIS PROGRAM CALCULATES ALL ROOTS OF ANY POLYNOMIAL EQUATION WITH DEGREE N=1,2,...,10, AND WITH COMPLEX COEFFICIENTS, THE LEADING COEFFICIENT BEING UNITY. FURTHERMORE, STUDYING THE PATHS OF THE MOVING APPROXIMATIONS OF A ROOT IN THE COMPLEX PLANE WILL KEEP YOU ABSORBED FOR HOURS, MORE SO PERHAPS THAN ANY OTHER MATHEMATICAL PROGRAM ONLY ONE EXCEPTION: THE EQUATION SHOULD NOT HAVE EQUAL ROOTS.

133PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50687D 67-REGRESSION OF DEGREE 4.

THIS PROGRAM FINDS THE BEST FOURTH DEGREE POLYNOMIAL, THE GRAPHIC REPRESENTATION OF WHICH PASSES THROUGH ANY NUMBER OF GIVEN POINTS, EITHER WITH EQUIDISTANT ABSCISSAS, OR NOT.

223PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50688D 67-LINEAR, QUADRATIC AND CUBIC REGRESSION.

GIVEN ANY NUMBER OF POINTS (X,Y), EITHER WITH EQUIDISTANT ABSCISSAS OR NOT, THIS PROGRAM FINDS THE CORRESPONDING LINEAR, QUADRATIC AND CUBIC REGRESSION LINES.

178PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50689D 67-DOUBLE HOMOGRAPHIC CURVEFIT.

GIVEN ANY NUMBER OF POINTS (X,Y), EITHER WITH EQUIDISTANT ABSCISSAS OR NOT, THIS PROGRAM FINDS THE BEST CURVE Y=AX/(1+CX)+BX/(1+DX),PASSING THROUGH THESE POINTS.

212PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50690D 67-BEST CIRCLE THROUGH GIVEN POINTS

GIVEN ANY NUMBER OF POINTS OF A PLANE, THIS PROGRAM FINDS THE CENTRE, THE RADIUS AND ANY NUMBER OF POINTS OF THE "BEST" CIRCLE, PASSING THROUGH THE GIVEN POINTS.

193PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50691D 67-FRIDAYS 13TH.

GIVEN ANY DAY D OF THE WEEK, ANY DAY D OF THE MONTH AND ANY YEAR J FROM 1 TO 20000, THIS PROGRAM FURNISHES A LIST OF DATES, STARTING FROM YEAR J, FALLING ON A D-DAY AND WITH D AS DAY OF THE MONTH. IN PARTICULAR, A LIST OF FRIDAYS 13TH CAN BE OBTAINED THAT WAY.

193PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50692D 67-CALENDAR.

GIVEN ANY DATE OF THE YEARS 1-20000 THIS PROGRAM CALCULATES ITS DAY OF THE WEEK AND ITS NUMBER AD. FOR A GIVEN NUMBER AD, IT FINDS THE CORRESPONDING DATE. FOR ANY TWO DATES OF THE YEARS 1-20000, IT FINDS THE NUMBER OF DAYS BETWEEN THEM. FOR ANY DATE OF THE YEARS 1-20000 AND ANY NUMBER OF DAYS, IT FINDS THE DATE THAT COMES THIS NUMBER OF DAYS AFTER THE GIVEN DATE.

223PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50693D 67-EASTER-ASH WEDNESDAY, ASCENSION DAY-PENTECOST.

GIVEN ANY YEAR J ANNO DEI, THIS PROGRAM GIVES THE DATES OF FOUR MOVABLE FEASTS OF THE CHURCH YEAR, EASTER, ASH WEDNESDAY, ASCENCION DAY AND PENTECOST. THE GIVEN YEAR HAS TO BELONG TO THE INTERVAL (1-20000).

191PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50694D 67-FRENCH CALENDAR.

GIVEN ANY DATE, EITHER OF THE GREGORIAN, OR OF THE FRENCH REPUBLICAN STYLE, THIS PROGRAM CALCULATES THE OTHER ONE. FURTHERMORE, IT GIVES THE NUMBER OF DAYS SINCE THE BEGINNING OF THE FRENCH CALENDAR AND THE DAY OF THE WEEK OF THE GIVEN DATE.

222PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50695D 67-JEWISH CALENDAR.

GIVEN ANY YEAR J AD BETWEEN 0 AND 20000, THIS PROGRAM CALCULATES THE JEWISH YEAR J, BEGINNING IN J, THE SUN-CYCLE AND PLACE OF J IN THIS CYCLE, THE MOON-CYCLE AND PLACE OF J IN THIS CYCLE, THE NUMBER OF MONTHS OF BOTH J-1 AND J, THE SEPTEMBER-DATE OF ROSH HASHANAH

50695D (CONTD)

(JEWISH NEW-YEAR) OF J, AND THE MARCH-DATE OF PESACH (EASTER) OF J-1.

219PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50696D 67-CHESS-END GAME 1.

IN THIS PROGRAM HP-97 PLAYS CHESS WITH KING AND TWO BISHOPS AGAINST YOUR KING ONLY, AND WINS THE GAME.

220PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50697D 67-CHESS-END GAME 2.

IN THIS PROGRAM HP-67 PLAYS CHESS WITH KING AND ONE PAWN, NOT IN COLUMN 1 OR 8, AGAINST YOUR KING ONLY, AND WINS THE GAME BY PROMOTING PAWN.

223PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50698D 67-CHESS-END GAME 3.

IN THIS PROGRAM HP-67 PLAYS CHESS WITH ONLY A KING (WHITE) AGAINST YOUR (BLACK) KING AND PAWN IN COLUMN 8, AND GETS A DRAWN.

171PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50699D 67-FOUR AGAINST ONE.

ON A CHESS-BOARD 4 WHITE PAWNS ARE PLACED ON THE 4 BLACK FIELDS OF THE FIRST ROW. 1 BLACK PAWN IS PLACED ON AN EMPTY FIELD OF THE SAME COLOR WHITE PAWNS CAN ONLY MOVE FORWARDS, BUT THE BLACK PAWN CAN MOVE IN ANY DIAGONAL DIRECTION. THE OBJECT OF WHITE (HP) IS TO ENCIRCLE YOUR BLACK PAWN OR TO DRIVE IT AGAINST A BOARDER, SO THAT IT CANNOT MOVE.THE BLACK MUST TRY TO BREAK THROUGH THE ADVANCING LINE OF WHITES OR TO PASS AROUND IT IN WHICH CASE YOU WIN. THERE IS A SMALL CHANCE FOR YOU TO WIN THE GAME.

217PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50700D 67-SILVER DOLLAR GAME.

THIS PROG. ALLOWS YOU TO PLAY THE SILVER DOLLAR GAME AGAINST HP. IN THIS GAME A NUMBER OF COINS, ONE OF THEM A SILVER DOLLAR, ARE PLACED ON SOME OF THE SQUARES OF A LONG RIBBON OF SQUARES, FASTENED WITH ONE END TO AN OPEN PURSE. THE PLAYERS ALTERNATIVELY MOVE ONE COIN A NUMBER OF SQUARES IN THE DIRECTION OF THE PURSE. TWO COINS CANNOT OCCUPY THE SAME SQUARE AND NO COIN CAN JUMP OVER ANOTHER ONE. THE PLAYER, WHO IS OBLIGED TO DROP THE SILVER DOLLAR IN THE PURSE, LOSES THE GAME.

224PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50701D 67-WYTHOFF GAME.

TWO PLAYERS (YOU AND HP) ALTERNATIVELY TAKE OBJECTS FROM 2 PILES.THIS MAY BE DONE, EITHER BY TAKING ANY NUMBER OF OBJECTS FROM 1 PILE ONLY OR BY TAKING THE SAME NUMBER OF OBJECTS FROM THE 2 PILES. PLAYER, TAKING LAST OBJECT WINS IN THE POSITIVE VERSION OF THE GAME, AND LOSES IN THE NEGATIVE VERSION. BOTH GAMES ARE POSSIBLE. UNLESS YOU

50701D (CONTD)

KNOW THE SECRET OF THIS GAME, YOU CANNOT WIN. HP WILL NOT ALLOW YOU ANY FALSE MOVES, AND WILL REFUSE TO PLAY OUT OF TURN.

210PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50702D 67-GOOSE GAME.

THIS PROGRAM ALLOWS 2 TO 9 PLAYERS TO PLAY THE VERY OLD GOOSE-GAME, IN WHICH BY THROWING A PAIR OF DICE, PLAYERS MOVE ON A SPIRAL PLAYING-BOARD, FROM CASE 0 TO CASE 63, MEETING ALL KINDS OF HANDICAPS ON THE WAY. THE FIRST PLAYER ARRIVING ON CASE 63 WINS THE POOL, WHICH IS FORMED BY THE PLAYERS PAYING FINES ON CASES, CALLED BRIDGE, INN, PIT, MAZE, JAIL, DEATH.

220PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50703D 67-WEIGHT WATCHER - DIETETICS.

COMPUTES THE DAILY INTAKE OF THE MAJOR NUTRIENTS OF A DIET (PROTEINS FATS, CARBOHYDRATES) AND ITS CALORIC VALUE, AND INDICATE IF AN UNBALANCE OCCURS, WITH REGARD TO THE DAILY REQUIREMENTS OF CALORIES, PROTEINS, AND % OF CALORIC REQUIREMENTS COVERED BY FATS.

166PROGRAM STEPS
ROBERT F. MENZI
CH - GENEVA.

50704D 67-RADIO BEARINGS CORRECTION (GIVRY CORRECTION).

COMPUTES THE RADIO BEACON BEARING MERIDIAN CONVERGENCY CORRECTION (GIVRY CORRECTION). THE BEARING, TRUE BEARING FROM NORTH OR BEARING FROM SHIPS HEAD, IS TRANSFORMED IN LOXODROMIC BEARING.

089PROGRAM STEPS
ROBERT F. MENZI
CH - GENEVA.

50705D 67-SIDEREAL TIME.

PROGRAM COMPUTES, FOR A GIVEN CORRESPONDING DATE (FOUND BY USING THE LONGITUDE) AND FOR A GIVEN DIFFERENCE BETWEEN LOCAL TIME AND UNIVERSAL TIME, THE SIDEREAL TIME (ANY MONTH, ANY DAY) AND RE-CONVERTS IT INTO LOCAL TIME (OPTIONAL).

202PROGRAM STEPS
PIERRE PIRAUX
B - MARCINELLE.

50706D 67-REDUCING BOOLEAN MINTERMS (QUASI-KARNAUGH MAP).

AS WITH A KARNAUGH MAP A SET OF BOOLEAN MINTERMS COVERING UP TO 9 VARIABLES IS REDUCED - IN NEARLY ALL CASES TO ITS DISJUNCTIVE NORMAL DATA INPUT VIA KEYBOARD OR PRE-PREPARED DATA CARDS (DATA-MERGE) IS RATHER UNRESTRICTED. 'DON'T CARE' TERMS FEATURE IS PROVIDED.

198PROGRAM STEPS
JIM R. KUTSCHERA
D - FRANKFURT.

50707D 67-HIGHWAY LEVEL REFERENCE LINE.

THE LONGITUDINAL PROFILE OF THE HIGHWAY IS SET INTO THE FLAT-LAND CO-ORDINATING SYSTEM. WITH THE PROGRAM WE GET AFTER STORING OF DATA, FOR ANY STATIONING (KILO-METRAGE) X, THE LEVEL REFERENCE LINE (ABOVE SEA-LEVEL HEIGHT) Y, AND OTHER DATA (RESULTS) WHICH

50707D (CONTD)

DESIRED.

213PROGRAM STEPS
JANEZ MRAK
YU - LJUBLJANA.

50708D 67-NEWTON'S INTERPOLATION FORMULA BASED ON DIVIDED DIFFERENCES.

THIS PROGRAM APPROXIMATES THE FUNCTION F(X) BY A POLYNOMIAL OF DEGREE M, WHERE 1<=M<=9. DATA FROM BOTH EQUALLY AND UNEQUALLY SPACED POINTS CAN BE USED.

200PROGRAM STEPS
RUDOLF KOSTER
D - ALTOMUENSTER.

50709D 97-SEXTANT SIGHT AVERAGING.

PROGRAMME AVERAGES A SERIES OF SEXTANT SIGHTS BY SELECTING THOSE THAT LIE CLOSE TO AN ALTITUDE VS. TIME CURVE AND ELIMINATING THE OTHERS. A MAXIMUM OF SEVEN OBSERVATIONS MAY BE TREATED, AND SPECIFIC ALTITUDES OR TIMES MAY ALSO BE EXTRACTED.

224PROGRAM STEPS
GERALD A. BAYNE
F - CANNES.

50710D 97-LONGITUDE WITHOUT TIME A LUNAR METHOD.

A LUNAR METHOD FOR DETERMINING THE LONGITUDE WITHOUT ACCURATE TIME, THIS PROGRAM WILL ALSO ESTIMATE THE ERROR OF THE WATCH USED. REQUIRING NO SPECIAL SEXTANT TECHNIQUES OR SIMULTANEOUS SIGHTS THIS METHOD PROVIDES A USEFUL AND REASONABLY ACCURATE EMERGENCY STAND-BY TO FIND THE POSITION, AND IS A ROUGH CHECK OF THE SHIP'S TIME.

219PROGRAM STEPS
GERALD A. BAYNE
F - CANNES.

50711D 67-SELF ADAPTIVE NUMERICAL INTEGRATION.

PROGRAM COMPUTES WITH THE PRECISION SPECIFIED BY THE USER ANY DEFINITE INTEGRAL PROVIDED THE INTEGRAND DOES NOT HAVE SINGULARITIES. WHEN USING FULL PRECISION THE RELATIVE ERROR IS 0.5**-10. THE ALGORITHM IS SAID SELF-ADAPTIVE BECAUSE GENERATION OF LOCAL INTEGRATION SUBINTERVALS IS CONTROLLED BY A FEEDBACK LOOP WHICH GUARANTEES ON AN ANALYTICAL BASIS ACCURACY WITHIN ASSIGNED BOUNDS.

200PROGRAM STEPS
RICCARDO P BALOSSI
I - MILANO.

50712D 67-MATRIX MULTIPLICATION. ORDER

THIS PROGRAM CALCULATES THE PRODUCT MATRIX /C/ ACCORDING THE FORMULAE: /A/./B/=/C/. THE MAXIMUM ORDER OF THE MATRICES /A/ AND /B/ IS FOUR. /B/ CAN BE EITHER A MATRIX OR A VECTOR.

129PROGRAM STEPS
LUIGI ZAMBOTTI
I - MILANO.

50713D 67-NUMBERED MORRA.

YOU ENTER A NUMBER 1 OR 1 OR 3, THE MACHINE PUTS A NUMBER 1 CR 2 OR 3; THE MACHINE COMPARES THE 2 NUMBERS THIS IS THE RULE: 3 BEATS 2;2 BEATS 1; 1 BEATS 3; TWO EQUAL NUMBERS ? NO WINNER. A SET IS COMPOSED BY TEN GAMES. GOOD LUCK...

50713D (CONTD)

106PROGRAM STEPS
ANDREA SCHILKE
I - MILANO.

50714D 67-RATE OF CHANGE - MOVING LINEAR REGRESSION.

IF THE SUCCESSIVE VALUES OF A MONTHLY, QUARTERLY OR YEARLY SERIES ARE ENTERED THE PROGRAM WORKS OUT A LINEAR REGRESSION ON THE NATURAL LOGS OF THE LATEST N VALUES WITH N FROM 3 TO 13. OUTPUT IS THE SLOPE OF THE TRENDLINE EXPRESSED AS A YEARLY PERCENTAGE CHANGE. VALUES ARE NUMBERED BY YEAR AND PERIOD WITHIN YEAR.

112PROGRAM STEPS
JEAN-CLAUDE HENTSCH
CH - GENEVA.

50715D 67-LENGTH WEIGHT CENTER OF GRAVITY OF A CURVE.

COMPUTES THE LENGTH, WEIGHT AND ORDINATES OF THE CENTER OF GRAVITY OF A CURVE DEFINED BY THE X AND Y ORDINATES OF AT LEAST THREE POINTS.

090PROGRAM STEPS
ROBERT F. MENZI
CH - GENEVA.

50716D 67-DOUBLE INTEGRALS.

THE PROGRAM COMPUTES INTEGRALS OF FUNCTIONS OF 2 VARIABLES OVER TRIANGULAR REGIONS IN THE PLANE.

116PROGRAM STEPS
GUIDO PETZ
S - SOLNA.

50717D 97-VISCOSITY OF MULTICOMPONENT SILICATE GLASSES.

CALCULATES THE VISCOSITY-TEMPERATURE RELATION OF SODA-LIME-SILICA TYPE GLASSES WHICH ALSO CONTAIN POTASH, MAGNESIA, ALUMINA, LITHIA, ZINC OXIDE, BARIUM OXIDE, LEAD OXIDE AND BORIC OXIDE. THE CONSTANTS (A,B AND TO) IN THE VOGEL-TAMMANN-FULCHER EQUATION ARE CALCULATED FROM THE WEIGHT PERCENT COMPOSITION OF THE GLASS. VISCOSITY MAY THEN BE CALCULATED FOR A GIVEN TEMPERATURE OR VICE VERSA. ONE PROGRAM CARD AND TWO DATA CARDS ARE USED.

224PROGRAM STEPS
MICHAEL CABLE
UK - SHEFFIELD.

50718D 97-COMPOUND INTEREST WITH FRACTIONAL PERIODS.

THIS PROGRAM COMPUTES PRESENT VALUE PV AND/OR INTEREST RATE I OF A SERIES OF CONSTANT PAYMENTS AND A FUTURE (RESIDUAL) VALUE FV, IF TOTAL NUMBER OF COMPOUNDING PERIODS IS NOT AN INTEGER NUMBER. FOR PRACTICAL REASONS THE PROGRAM SOLVES ONLY FOR TWO OF THE FIVE VARIABLES, PRICE AND YIELD.

204PROGRAM STEPS
KLAUS BASLAU
CH - GENEVA.

50719D 67-COLOR TEMPERATURE AND CORRECTION FILTERS.

PROGRAM COMPUTES DEKAMIRED DIFFERENCE OF SHIFT BETWEEN 2 COLOR TEMPERATURES AND HENCE REQUIRED FILTER CORRECTION WHEN PHOTOGRAPHING ON COLOR FILM BY LIGHTING OTHER THAN THAT FOR WHICH THE FILM IS BALANCED. ALSO COMPUTES NEW COLOR TEMPERATURE FROM GIVEN COLOR TEMPERATURE AND DEKAMIRED SHIFT, AND CONVERTS COLOR TEMPERATURES INTO DEKAMIRED EQUI-

50719D (CONTD)

VALENTS AND VICE VERSA.

078PROGRAM STEPS
L. ANDREW MANNHEIM
UK - RICHMOND.

50720D 67-CALCULATION OF SOUND VELOCITY IN SEA WATER.

THIS PROGRAM DERIVES THE PROPAGATION VELOCITY OF SOUND IN SEAWATER, AND GIVES AN APPROXIMATION FOR THE ERROR DX IN A CALCULATED RANGE X, FOUND BY A MEASURED RANGE OF T(SEC) ONE-WAY TRAVEL TIME, ASSUMING A CONSTANT DEPTH AND AVERAGE VALUES. TEMPERATURE, SALINITY AND DEPTH ARE USED AS INPUT DATA.

112PROGRAM STEPS
M. HOOIJBERG
NL - DRUNEN.

50721D 67-CALCULATION INDEX OF REFRACTION (IOR) EDM (RADIO).

THIS PROGRAM CALCULATES THE INDEX OF REFRACTION FOR ELECTRONIC DISTANCE MEASUREMENT (BY RADIO), AND REDUCES A SLOPE DISTANCE CORRECTED FOR ATMOSPHERIC CONDITIONS. INPUT DATA ARE THE DRY AND WET BULB TEMPERATURE IN DEGREE CENTRIGRADE OR IN DEGREE FARENHEIT, AND THE BAROMETRIC PRESSURE IN MM HG OR MILLIBARS.

205PROGRAM STEPS
M. HOOIJBERG
NL - DRUNEN.

50722D 67-COMPLEX HYPERBOLIC.

THIS PROGRAM COMPUTES THE SIX OF HYPERBOLIC FUNCTIONS OF A COMPLEX VARIABLES. THE FUNCTIONS ARE:
1) HYPERBOLIC SINE
2) HYPERBOLIC COSECANT
3) HYPERBOLIC COSINE
4) HYPERBOLIC SECANT
5) HYPERBOLIC TANGENT
6) HYPERBOLIC COTANGENT.
IT IS ALSO POSSIBLE TO CALCULATE ALL OF THESE FUNCTIONS USEING ONLY THE ONE ENTER OPERATION OF THE ONE COMPLEX NUMBER SPECIFIED BY THE USER.

105PROGRAM STEPS
KONSTANTY BOUFAL
POLAND - WARSAW.

50723D 67-COMPLEX INVERSE TRIGONOMETRIC.

THIS PROGRAM COMPUTES THE SIX OF INVERSE TRIGONOMETRIC FUNCTIONS OF A COMPLEX VARIABLE. THE FUNCTIONS ARE:
1) ARC SINE 2) ARC COSECANT
3) ARC COSINE 4) ARC SECANT
5) ARC TANGENT 6) ARC COTANGENT.
IT IS ALSO POSSIBLE TO CALCULATE ALL OF THESE FUNCTIONS USEING ONLY THE ONE ENTER OPERATION OF THE ONE COMPLEX NUMBER SPECIFIED BY THE USER.

132PROGRAM STEPS
KONSTANTY BOUFAL
POLAND - WARSAW.

50724D 67-MAXIMUM LIKELIHOOD ESTIMATOR OF FUNCTIONAL SLOPE.

PROGRAM COMPUTES THE SLOPE AND INTERCEPT OF A FUNCTIONAL RELATION BETWEEN TWO VARIABLES BOTH OF WHICH ARE OBSERVED OR MEASURED WITH (RANDOM) ERROR, USING A MAXIMUM LIKELIHOOD ESTIMATOR.

208PROGRAM STEPS
A.J.C. BALFOUR
UK - RAF HALTON.

50725D 97-ORIENTEERING PRACTICE.

50725D (CONTD)

COMPETITION IN DISTANCE-JUDGING AND COMPASS-USE.
COMPETITORS ARE GIVEN A LIST OF BEARINGS AND DISTANCES TO FOLLOW OUT ON THE GROUND.
CALCULATOR COMPARES COMPETITOR'S MEASURED FINISHING POINT WITH COURSE-DATA FROM STORE AND PRINTS OUT HIS ERROR.
DATA OF FIFTEEN COURSES MAY BE STORED ON ONE SIDE OF A CARD.

112PROGRAM STEPS
ARTHUR MORTON
UK - KENDAL.

50726D 67-THERMAL INSULATION OF CYLINDRICAL BODIES.

PROGRAM COMPUTES HEAT TRANSITION COEFFICIENT, SPECIFIC HEAT FLUX, SURFACE AND BOUNDARY TEMPERATURES FOR A MAXIMUM OF 4 LAYERS. ALSO THICKNESS OF LAST LAYER MAY BE COMPUTED TO MAINTAIN A PREDETERMINED SURFACE TEMPERATURE OR PREDETERMINED TEMPERATURE OF LAST BOUNDARY. FOR THIS CALCULATION SECOND MAGNETIC CARD NECESSARY.

417PROGRAM STEPS
WERNER CLAESSENS
D - NEUSS-HECKHOVEN.

50727D 67-TEMPERATURES, CONDENSATION INSIDE MULTI-LAYER CONSTRUCTION.

FOR CONSTRUCTION OF UP TO 9 LAYERS PROGRAM CALCULATES SURFACE AND INTERFACIAL TEMPERATURES AND PARTIAL PRESSURES OF VAPOUR. IF NO CONDENSATION OCCURS VAPOUR TRANSMITTANCE (G/M**2H) MAY BE CALCULATED. IN CASE OF CONDENSATION THE INTERFACE IN QUESTION IS IDENTIFIED.

221PROGRAM STEPS
WOLF MEYER-CHRISTIAN
D - DUESSELDORF.

50728D 67-E-6 COLOR AND DENSITY CORRECTION PROGRAM.

A NEW FILTRATION AND APERTURE IS GIVEN FROM THE COMPARATIVE DENSITY READING OF ORIGINAL AND COPY. OUTPUT IS GIVEN IN CC AND NEW STOP-NUMBER. THIS PROGRAM USES TWO DIFFERENT SLOOPS (ONE FOR THE LOW AND ONE FOR THE HIGH DENSITIES). THE SLOOPS ARE E-6-SLOOPS USED BY "AMERICAN COLOR LABORATORY" - BRUSSEL - OTHER SLOOPS FOR OTHER FILMS CAN BE USED.

132PROGRAM STEPS
CHRISTIAN VERMEULEN
B - KORTRIJK.

50729D 67-THE MONOPOLY CASE IN ECONOMICS.

THIS PROGRAM COMPUTES THE NUMBER OF UNITS OF A PRODUCT, THE PRICE PER UNIT AND THE MAXIMUM PROFIT GIVEN OR:
1)THE NUMBER OF UNITS AND THE PRICE IN A BASIC-PERIOD, THE OVERHEAD COSTS AND THE COST PER UNIT OR:
2)THE COEFFICIENTS OF THE 'DEMAND FUNCTION' AND THE 'PRODUCTION-COST FUNCTION'.

094PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50730D 67-REVERSION OF SERIES.

GIVEN THE SERIES Y=SUM P*X**N (0<N<7) (N=INTEGER) THIS PROGRAM COMPUTES THE COEFFICIENTS OF THE REVERSE AND X=F(Y).

223PROGRAM STEPS
JOHN VAN THIELEN

50730D (CONTD)

B - STABROEK.

50731D 67-QUADRATIC CURVE PROBLEMS.

GIVEN THE QUADRATIC CURVE A*X**2+B*X+C, THIS PROGRAM COMPUTES:
A) THE ROOTS OF THE EQUATION A*X**2+B*X+C=0.
B) THE AREA BETWEEN THE CURVE AND THE X-AXIS.
C) THE AREA BETWEEN THE CURVE, THE X-AXIS AND TWO OTHER INTERVALS.
D) THE COORDINATES OF THE TOP OF THE CURVE
E) Y OR F(X) FOR ANY X-VALUE (TO MAKE A SKETCH OF THE CURVE).

128PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50732D 67-GRADIENT COMPUTATIONS.

THIS PROGRAM COMPUTES THE MAXIMUM DIRECTIONAL DERIVATIVE OF F AT P OCCURS IN THE DIRECTION OF THE GRADIENT T AND THE MAGNITUDE OF THIS MAXIMUM DIRECTIONAL DIRIVATE /T/ OF THE GENERAL QUADRATIC CURVE F(X,Y,Z) IN P(X,Y,Z) IDENTIC TO P(P,Q,R).

099PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50733D 67-AREA BOUNDED BY TWO QUADRATIC CURVES.

GIVEN TWO QUADRATIC CURVES AX**2+BC+C AND DX**2+EX+F (A.D<0)
THE PROGRAM COMPUTES:
A) THE AREA BOUNDED BY THESE TWO CURVES
B) THE COORDINATES OF THE POINTS OF INTERSECTION OF BOTH THE CURVES
C) THE DISTANCE BETWEEN THIS POINTS
D) THE AREA OF A QUADRATIC CURVE AND THE X-AXIS, OR THE AREA BETWEEN TWO X-INTERVALS
E) DIFFERENT Y-VALUES FOR X-VALUES TO MAKE A GRAPH.

180PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50734D 67-TRIANGLES IN A PLANE.

GIVEN: OR THREE STRAIGHT LINES: AX+B; CX+D; EX+F (CASE 1)
OR THREE POINTS P(A,B); Q(C,D); R(E,F) (CASE 2)
THE PROGRAM COMPUTES:
A) THE COORDINATES OF THE POINTS OF INTERSECTION (CASE 1)
B) THE DISTANCE BETWEEN THESE POINTS (=SIDES OF THE TRIANGLE)
C) THE AREA BOUNDED BY THIS LINES (=AREA OF THE TRIANGLE)
D) THE SUM OF THE LINES (=SIDES).

166PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50735D 67-AN ECOLOGICAL MODEL.

WHEN ONE SPECIES OF ANIMALS LIVES AS A PREDATOR UPON ANOTHER, THE POPULATION OF THE PREDATOR AND THAT OF THE PREY ARE RELATED IN A WAY THAT CAN BE DESCRIBED, UNDER REASONABLE ASSUMPTIONS, BY THE SOLUTION OF A DIFFERENTIAL EQUATION.
THIS PROGRAM SOLVES THIS EQUATION BY WAY OF A HOMOGENEOUS SYSTEM OF LINEAR EQUATIONS AND CORRECTS THE FOUNDED VALUES BY AN ESTIMATED RESULT, USING THE NEWTON-METHOD OF APPROXIMATION.

224PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50736D 67-OPERATIONAL STACK OF FOUR 2X2 MATRICES.

THIS PROGRAM CREATES AN OPERATIONAL STACK OF FOUR 2X2 MATRICES SO THAT RPN CAN BE USED. FUNCTIONS ARE:
1) ENTER, 2) ROLL DOWN, 3) EXCHANGE X AND Y, 4) MULTIPLY, 5)ADD, 6) INVERT, 7) MULTIPLY MATRIX BY A CONSTANT. SPECIAL FUNCTIONS WHICH DO NOT AFFECT THE MATRIX-STACK ARE:
1) DETERMINANT OF MATRIX, 2) MULTIPLICATION OF A MATRIX BY A COLUMN VECTOR.

218PROGRAM STEPS
BJOERN ENGSIG
DK - ALLERØED.

50737D 67-COLOUR PRINTING CALCULATOR WITH KODAK CP-FILTERS.

THIS PROGRAM RALATES THE THREE VARIABLES: EXPOSURE TIME, LENS APERTURE, AND EXPOSURE CHANGES FOR FILTERS. THE EXPOSURE-TIME AND LENS APERTURE PROGRAM INCLUDES RECIPROCITY EFFECT FOR KODAK RC-74 PAPER. FURTHERMORE, THE PROGRAM CALCULATES THE EXPOSURE-TIME FOR ANY FILTER COMBINATION.

222PROGRAM STEPS
M. HOOIJBERG
NL - DRUNEN.

50738D 67-CONVERGENCE, SCALE FACTOR AND (T-T) CORRECTION, UTM-SYSTEM.

THE PROGRAM CALCULATES 3 GEODETIC VALUES, VIZ. THE CONVERGENCE, SCALE FACTOR AND (T-T)" CORRECTION VERY ACCURATE. GEOGRAPHICALS, UTM GRID CO-ORDINATES AND THE DATA OF THE APPROPRIATE SPHEROID ARE USED AS INPUT DATA.

224PROGRAM STEPS
M. HOOIJBERG
NL - DRUNEN.

50739D 67-RATIONAL APPROXIMATION OF ANY GIVEN REAL NUMBER.

PROGRAM FINDS TO ANY (POSITIVE) REAL NUMBER X A RATIONAL NUMBER R=P/Q INTEGERS), SO THAT THE PERCENTUAL ERROR E=/100-(R/X)-100/ IS SMALLER THAN A GIVEN LIMIT E*0. AFTER HAVING FOUND AN APPROXIMATION FOR THE LIMIT E*0, THE PROGRAM IS ABLE TO FIND THE NEXT BETTER SOLUTION OR A SOLUTION ACCORDING TO ANY GIVEN E*1 < E*0.

056PROGRAM STEPS
FRANZ JOSEF KALL
D-AACHEN-BRAND.

50740D 97-WINDTURBINE POWER OUTPUT VERSUS WINDSPEED.

PROGRAM CALCULATES WIND TURBINE (WINDMILL) POWER OUTPUT IN WATT FOR THE FOLLOWING INPUT DATA:
1. TURBINE DIAMETER IN M OR FT (OR TURBINE SWEPT AREA IN M**2 OR FT**2) AND 2. EFFICIENCY.
CALCULATION IS CONTINOUSLY WITH AUTOMATIC INCREASE OF WIND SPEED, OUTPUT IS P IN WATT AND SIMULTANEOUSLY WINDSPEED.

077PROGRAM STEPS
ROLAND REICHEL
TANZANIA - DAR ES SALAAM.

50741D 67-FRESNEL FORMULAS.

BASED ON THE FRESNEL-FORMULAS THIS PROGRAM COMPUTES THE REFLECTIVITY AND TRANSMITTIVITY OF S-AND P-POLARISED LIGHT. IT ALSO COMPUTES THE DEGREE OF POLARISATION FOR THE REFLECTED AND TRANSMITTED LIGHT. FURTHER YOU CAN CALCULATE THE REFLECTION- AND TRANSMISSION COEFF. AS WELL AS THE NEW POLARISATION ANGLE OF LINEARLY POLARIZED LIGHT

50741D (CONTD)

PASSING FROM ONE MEDIUM INTO AN OTHER ONE.

123PROGRAM STEPS
PETER LAEDRACH
CH - WORB.

50742D 67-SPECTRUM BY PRISM.

PROGRAM COMPUTES THE DEFLECTION OF A LIGHT BEAM BY A PRISM. THE PRISM CONSISTS OF BK-7 OPTICAL GLASS WITH A WELL KNOWN DISPERSION RELATION FOR THE WAVELENGTH DEPENDANT REFRACTIVE INDEX. THE COEFFICIENTS OF THE DISPERSION RELATION ARE STORED ON THE SECOND SIDE OF THE MAGNETIC CARD.

085PROGRAM STEPS
PETER LAEDRACH
CH - WORB.

50743D 67-ELLIPTIC POLARISATION.

FOR AN INCIDENT ELLIPTICAL POLARIZED LIGHT BEAM THIS PROGRAM DETERMINES THE NEW ELLIPTICAL POLARIZING PROPERTIES OF THE REFLECTED AND TRANSMITTED BEAM. THE PROGRAM EVEN WORKS IN THE CASE OF TOTAL REFLECTION. YOU ALSO GET THE REFLECTION-AND TRANSMISSION COEFFICIENT.

223PROGRAM STEPS
PETER LAEDRACH
CH - WORB

50744D 67-BASE ELEVEN.

IN BASE ELEVEN, BY INPUTTING NUMBERS BETWEEN ONE AND TEN, THE COMPUTER OR THE HUMAN PLAYER MUST HIT 100 THE FIRST. TAKE CARE, THE COMPUTER HAS BEEN PROGRAMMED TO WIN....

187PROGRAM STEPS
PIERRE PIRAUX
B - MARCINELLE.

50745D 67-COBB-DOUGLAS PRODUCTION CURVE SK1/2.

GIVEN A SET OF LABOUR (L) AND CAPITAL (K) UNITS FROM WHICH A SPECIFIED LEVEL OF PRODUCTION (P) WAS RESULTED, THE PROGRAM COMPUTES PARAMETERS OF ESTIMATED CURVE (LIN. OR EXP.), MULTIPLE CORRELATION COEFFICIENTS, ESTIMATED PRODUCTION LEVEL STANDARD ERROR OF ESTIMATE. PROGRAM USES TWO CARDS.

375PROGRAM STEPS
ILIO GALLETTA
I - GENOVA.

50746D 67-TRAVERSES & TP-TRAVERSES POLYGONZUEGE & TP-ZUEGE SU 18.

THE PROG. CALCULATES TRAVERSES FOR POINTS AS MANY AS YOU LIKE. IT STORES PROVISIONAL RESULTS AT DATA CARDS, FOR N NEW-POINTS M CARDS. IT DISTINGUISHES BETWEEN TRAVERSES (SO,N<1000M) & TP-TRAVERSES (SO,N> 1000M), WITH SPECIALLY MAXI.ERRORS. USABLE ONLY FOR STRECHED TRAVERSES WITH CONNECTION/CLOSING DIRECTION. CALCULATION OF ALL ERRORS & MAXI. ERRORS. IT CORRESPONDS TO RVP-ERLASS, RD.ERL.D.HESS.MIN.F. WIRTSHAFT & TECHNIK V.3.4.70 GETR. FEHLER-KLASSEN FUER BEIDE ZUGARTEN NUR GESTRECKTE MIT AN/ABSCHLUSS.

575PROGRAM STEPS
JOHANNES GRUSS
D - WIESBADEN.

50747D 67-PERMANENT BANK SITUATION.

THIS PROGRAM ENABLES YOU TO HAVE AT ANY TIME THE STATE OF YOUR BANK ACCOUNT. THE CARD HAS THE PROG. ON

50747D (CONTD)

ONE SIDE AND VARIABLE DATA ON THE OTHER. IT ALSO KEEPS TRACK OF LAST EXPENSE, LAST RECEIPT, ACCOUNT NUMBER, LAST CHEQUE NUMBER PROGRAM ALSO PROVIDES EASY ERROR RECOVERY. IT PREVENTS YOU FROM WRITING DOWN YOUR BANK OPERATIONS.

071PROGRAM STEPS
PHILIPPE ALLIAUME
F - TOURS.

50748D 67-TEMPERATURE FROM EMF OF A PT/PT 10 PCT RH THERMOCOUPLE.

GIVEN THE EMF OF A PLATINUM / PLATINUM 10 PERCENT RHODIUM THERMOCOUPLE WITH A REFERENCE JUNCTION AT A KNOWN TEMPERATURE, THIS PROGRAM FINDS THE TEMPERATURE (IPTS 68). THE PROGRAM CAN ALSO CALCULATE THE EMF CORRESPONDING TO A GIVEN TEMPERATURE.

210PROGRAM STEPS
MARCUS W. RICHARDSON
S - UPPSALA.

50749D 67-F DISTRIBUTION.

THE PROGRAM EVALUATES:
1. THE DENSITY FUNCTION F(X) FOR A GIVEN VALUE OF X.
2. THE CUMULATIVE DISTRIBUTION F(X) FOR A GIVEN VALUE OF X.
3. THE VALUE OF X FOR A GIVEN CUMULATIVE DISTRIBUTION F(X).
AS AGAINST PROGRAM 00112D, THIS PROGRAM OFFERS THE FACILITIES 1 AND 3 AND THE RESTRICTION TO AT LEAST ONE EVEN DEGREE OF FREEDOM IS ELIMINATED.

224PROGRAM STEPS
DIETER SOINE
D - HANNOVER.

50750D 97-CONSTANT BEARING COURSE FOR TWO AND THREE DIMENSIONS.

THE PROGRAM COMPUTES THE DATA OF THE CONSTANT BEARING COURSE (COLLINSON COURSE) A PURSUER P MUST FOLLOW TO INTERCEPT A CONSTANT VELOCITY NONMANOUVRING EVADER E. INPUT DATA ARE THE DISTANCE AND BEARING ANGLES BETWEEN P AND E, THE VELOCITY AND HEADING ANGLES OF E, AND THE VELOCITY OF P. IN ADDITION TO THE LEAD ANGLES THE PROGRAM COMPUTES VELOCITY RATIO, CLOSE-IN RATE, TIME TO GO, AND DISTANCE TO GO.

207PROGRAM STEPS
FRANK DORRSCHEIDT
D - PADERBORN.

50751D 67-CAMERA AND ENLARGER SETTING.

ROUTINES CONCERNING DEPTH OF FIELD, DISTANCE (SUBJECT TO PICTURE), FARTHEST AND NEAREST SHARP DISTANCE FOCAL LENGTH, CIRCLE OF CONCLUSION, APERTURE, HYPERFOCAL DISTANCE, EXPOSURE EXTENSION AND SUBJECT/ PICTURE RATIO ARE CARRIED OUT. ALL REAL POSSIBILITIES (INCLUDING MACRO-PHOTO) MAY BE TREATED. EXACT FORMULARS ARE USED TO ACCURACY DEPENDS ONLY ON ROUNDING ERRORS INSIDE THE CALCULATOR. THE UNIT FOR LENGTH IS CHOSEN FREELY (SAY MILIMETERS). ALL OTHER VALUES ARE RATIOS, I.E. UNITLESS.

218PROGRAM STEPS
SOREN VIDEBAEK NIELSEN
DK - STRUER.

50752D 67-TRIANGLES IN THE SPACE.

GIVEN THE POINTS P(X,Y,Z); Q(X,Y,Z) AND R(X,Y,Z) IN THE SPACE, THE PROGRAM COMPUTES THE DISTANCES BETWEEN THIS POINTS, THE SUM OF THIS LINES AND THE AREA BOUNDED BY THE THREE LINES. SETTING PZ,QZ

50752D (CONTD)

AND RZ=0 YOU CAN ALSO COMPUTE THE SAME PROBLEM IN THE PLANE.

110PROGRAM STEPS
JOHN VAN THIELEN
B - STRABROEK.

50753D 67-TRIPLE - INTEGRAL I.

THE PROGRAM COMPUTES THE TRIPPLE INTEGRAL (ENCLOSED BY A BOX AS CLOSED SURFACE) OVER THE DOMAINS A<X<B, C<Y<D, E<Z<F, OF THE GENERAL QUADRATIC EQUATION F(X,Y,Z).

194PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50754D 67-TRIPLE INTEGRAL II

THE PROGRAM COMPUTES THE TRIPLE INTEGRAL (ENCLOSED BY A BOX AS CLOSED SURFACE) OVER THE DOMAINS A<X<B; C<Y<D; E<Z<F, OF THE FUNCTION (A* X**P*Y**Q*Z**R); EXPONENTS P, Q AND R CAN BE ANY INTEGER, EVEN ZERO.

173PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50755D 67-FISHERIAN DISCRIMINATION FUNCTION, 3 VARIABLES.

STARTING FROM THE OBSERVATIONS MADE ON TWO SAMPLES THIS PROGRAM CALCULATES AND SETS IN MATRICIAL FORM, THE NECESSARY INPUTS FOR ENTERING IN PROGRAM "3X3 MATRIX OPERATIONS" (CARD SD 10A). IT ALSO CALCULATES, AND SETS IN THE PROPER REGISTERS, THE ELEMENTS OF COLUMN D, IN SUCH A MANNER THAT, LOADING THE SAID CARD, THE USER OBTAIN, WITHOUT TRANSCRIPTION, THE COEFFICIENTS OF THE DISCRIMINATION FUNCTION.

193PROGRAM STEPS
GUY RABELLE
F - BEAUVAIS.

50756D 67-BIVARIATE INTERPOLATION.

THE PROGRAM INTERPOLATES LINEARLY OR QUADRATICALLY IN A TRIANGULAR GRID IN THE PLANE.

185PROGRAM STEPS
GUIDO PETZ
S - SOLNA.

50757D 67-6J-SYMBOL.

THIS PROGRAM EVLUATES THE 6J-SYMBOL AND THE RACAH-TRIANGLE-COEFFICIENT WHICH ARE USED IN QUANTUM MECHANICS WHEN 3 ANGULAR-MOMENTA ARE ADDED.

205PROGRAM STEPS
WOLFGANG WILHELM
CH - NUSSBAUMEN.

50758D 67-CLEBSCH-GORDAN-COEFFICIENTS.

THE PROGRAM EVALUATES THE CLEBSCH-GORDAN-COEFFICIENT, THE WIGNER-3J-SYMBOL AND THE RACAH-TRIANGLE-COEFFICIENT USED FOR ANGULAR-MOMENTUM ALGEBRA IN QUANTUM MECHANICS.

215PROGRAM STEPS
WOLFGANG WILHELM
CH - NUSSBAUMEN.

50759D 97-BRIDGE MATCHPOINT CALCULATION AND FOUR PERSON SCOREKEEP.

IT CALCULATES MATCHPOINT SCORES FOR EVERY DIFFERENT BRIDGE BID AND ITS RESULT. BID TRICK VALUE AND NUMBER OF VULNERABILITY, DOUBLES,REDOUBLES AND SUIT OR NOTRUMPH ARE UNDER DIFFERENT LABELS. FROM THIS DATA IS THE MATCHPOINT SCORE CALCULATED; + FOR CONTRACT MADE AND - FOR CON-

50759D (CONTD)

TRACT DOWN. NUMBER OF NORTH PLAYER IS ENTERED AND A LABEL PRESSED TO INDICATE IF THE BID WAS BY EW OR NS. THE RUNNING SCORE IS THEN PRINTED FOR EVERY PALYER. ONLY POSITIVE FINAL SCORE VALUES ARE USED.

220PROGRAM STEPS
KAJ G. BACKAS
FINLAND - HELSINKI.

50760D 97-BRIDGE PAIR CONTEST RESULT SORTING AND SCORES CALCULATION.

IT CALCULATES SCORES FOR A DEAL IN A BRIDGE PAIR CONTEST. IF ONE RESULT OF THAT DEAL IS XXXX AND THE NUMBER OF TABLES WITH THAT RESULT IS YY, THE RESULT IS ENTERED AS XXX.YY. AVERAGE RESULTS ARE ENTERED AS 9000.YY. THE PROGRAM SORTS THE RESULTS IN ORDER FROM THE LARGEST TO THE SMALLEST AND ADDS EQUAL RESULTS THAT ACCIDENTALLY HAS BEEN ENTERED SEPARATELY. CORRECTING OF WRONGLY INPUTTED RESULTS IS VERY EASY. SCORES ARE OUTPUTTED AS XXXX. YYOZZZ WHERE ZZZ IS THE SCORE FOR RESULT XXXX.

196PROGRAM STEPS
KAJ G. BACKAS
FINLAND - HELSINKI.

50761D 67-FRACTIONAL PART OF "E"

MPT (METHOD OF PROGRESSIVE TERMS) IS EMPLOYED IN A SERIES OF REPEATED SUMMATIONS OF INVERSE FACTORIALS TO COMPUTE THE FRACTIONAL PART OF "E"; PRGM LIMIT IS 1/999|. - NO DATACARD REQUIRED UP TO THE 171ST DIGIT; THEREAFTER 2-PLUS DATACARDS SERVE AS EXTERNAL DATA STORAGE.

178PROGRAM STEPS
JIM R. KUTSCHERA
D - FRANKFURT.

50762D 97-PROPERTIES OF WATER IN STATE OF SATURATION (SI-UNITS).

GIVEN TEMPERATURE OR PRESSURE OF WATER IN STATE OF SATURATION, THE PROGRAM COMPUTES PRESSURE OR TEMPERATURE, DENSITY, SPECIFIC ISOABRIC HEAT CAPACITY, THERMAL CONDUCTIVITY DYNAMIC VISCOSITY AND PRANDTL-NUMB. THE EMPIRICAL EQUATIONS OF THIS PROGRAM MIGHT ALSO BE USEFUL AS SUBROUTINES FOR INDUSTRIAL CALCULATIONS OF HEAT TRANSFER. ACCURACY IS BETTER THAN 0,5 PER CENT FOR PRESSURES FROM 0,01 BAR ABS TO 20 BAR ABS OR FOR TEMPERATURES BETWEEN 7 DEG.C AND 210 DEG.C.

159PROGRAM STEPS
PETER KOENIG
CH - ABRON.

50763D 67-HEMOGLOBIN SATURATION AND CARDIAC OUTPUT (FICK PRINCIPLE).

FROM PH, OXYGEN AND CO2 PARTIAL PRESSURES OF ARTERIAL AND MIXED VENOUS BLOOD, HEMOGLOBIN CONCENTRATION, TEMPERATURE AND OXYGEN CONSUMPTION, THE PROGRAM COMPUTES ARTERIAL AND VENOUS HEMOGLOBIN SATURATIONS AND O2 BLOOD CONTENTS. CARDIAC OUTPUT IS COMPUTED USING FICK PRINCIPLE. OPTION: IF CARDIAC OUTPUT IS KNOWN, THE PROGRAM WILL DERIVE O2 CONSUMPTION.

223PROGRAM STEPS
MARIUS LAURENT
B - LA LOUVIERE.

50764D 67-WEIGHT CALCULATION.

THIS PROGRAM CALCULATES THE WEIGHT OF PIECES WITH ROUND, SQUARE, RECTANGULAR, TUBULAR AND EXAGONAL CROSS SECTION. IT OPERATES WITH METRIC AND BRITISH UNITS. THE RESULTS CAN BE CONVERTED FROM

50764D (CONTD)

KGS INTO LBS AND VICE-VERSA. MOREOVER, THEY CAN BE ADDED UP PARTIALLY OR TOTALLY. UP TO NINE DIFFERENT SPECIFIC GRAVITIES CAN BE REGISTERED BY THE MAGNETIC CARD AND OTHER ONES CAN BE REGISTERED MANUALLY. A SINGLE MAGNETIC CARD REQUIRED.

106PROGRAM STEPS
PAOLO PELLICIARDI
I - BOLOGNA.

50765D 67-BEAMS CALCULATION.

THIS PROGRAM CALCULATES: THE SUPPORT PRESSURES, THE BENDING MOMENTS AND THE MIN. MOMENTS OF RESISTANCE (FOR A GIVEN MAX. ADMITTED BENDING STRESS) OF A SIMPLY SUPPORTED BEAM LOADED BY CONCENTRATED LOADS (UP TO 7). THE BENDING MOMENTS AND THE MIN. MOMENTS CAN BE CALCULATED INDEPENDENTLY EACH OTHER.

220PROGRAM STEPS
PAOLO PELLICIARDI
I - BOLOGNA.

50766D 67-BEECHTREE CONVERSIONS.

PROGRAM CONVERTS QUINTALS OF BEECHTREE INTO CUBES-METRES, AND VICE-VERSA.

172PROGRAM STEPS
RENZO GRANZOTTO
I - S.GIOVANNI AL NATISONE.

50767D 67-EXCESS INSURANCE CLAIMS.

THE PROGRAM APPLIES A SEPARATE EXCESS TO TWO CATEGORIES OF LOSSES AND ACCEPTS A THIRD CATEGORY OF LOSS NOT SUBJECT TO ANY EXCESS. A CHOICE OF UP TO 4 EXCESSES MAY BE APPLIED TO EACH OF THE FIRST 2 CATEGORIES OF LOSS. AS EACH LOSS IS ENTERED THE PROGRAM COMPUTES THE TOTAL OF ALL LOSSES, THE SUB-TOTAL OF EACH CATEGORY OF LOSS, AND THE TOTAL CLAIMS AFTER APPLYING THE CHOICE OF EXCESSES.

207PROGRAM STEPS
IAN NAPIER REYNARD
UK - RHU.

50768D 67-POINT SHOOTING.

THIS IS A PROGRAM OF A MOVING POINT IN A 2- OR 3-DIMENSIONAL SPACE. YOU GET THE POSITION (B), THE COURSE (C) OF IT AND YOU CAN SHOT AT IT (A). EACH TIME YOU PRESS C,B OR A THE POINT MOVE.

173PROGRAM STEPS
EGON JENSEN
DK - SONDERBORG.

50769D 67-SIMPLEX INITIAL SOLUTION.

IT COMPUTES AN INITIAL SOLUTION OF A BASE PROGRAM, AND CONSTRUCTS THE CORRESPONDING Y MATRIX (INVERTED BASE MATRIX MULTIPLIED BY THE EXTRA-BASE MATRIX). PROBLEMS WITH UP TO 3 CONSTRAINTS AND 6 UNKNOWNS ARE TREATED. THIS PROGRAM ALSO CONTAINS THE LOADER OF THE TWO CARDS OVERLAY EXTENTION (SIMPLEX OPTIMAL SOLUTION).

224PROGRAM STEPS
AVIGDOR LUTTINGER
F - LYON.

50770D 67-SIMPLEX-OPTIMAL SOLUTION.

THIS PROGRAM IS AN OVERLAY EXTENTION TO PROGRAM NUMBER 50769D. IT IS COMPOSED OF TWO CARDS:'SIMPLEX 2 -ITERATE' & 'SIMPLEX 3-COMPUTE'. AFTER OBTAINING AN INITIAL SOLUTION PROGRAM CONTRUCTS THE SIMPLEX TABLE AND CARRIES OUT ITERATIONS. CARDS

50770D (CONTD)

ARE LOADED WITHOUT STOPPING EXECUTION, AND MAY BE READ AUTOMATICALLY. THE SIMPLEX TABLE MAY BE PRINTED AFTER EACH ITERATION.

428PROGRAM STEPS
AVIGDOR LUTTINGER
F - LYON.

50771D 67-COMPLEX OPERATIONS.

THIS PROGRAM EXTENDS 00067D TO EXP (Z) LN(Z) Z..W Z..1/W WHEN Z & W ARE COMPLEX NUMBERS OPERATIONS CAN BE CHAINED.

165PROGRAM STEPS
FELIPE LANCA R. ERENCHUN
SP - CORDOBA.

50772D 67-BESSEL FUNCTIONS OF ORDER INTEGER AND COMPLEX VARIABLE.

THIS PROGRAM IS ABSOLUTELY UNLIKE OF SIMILAR PUBLISHED ITEMS BECAUSE 1ST. IT WORKS ON COMPLEX VARIABLES 2ND. ONE CAN OBTAIN BESSEL'S FUNCTIONS UNPUBLISHED, LIKE KN, KELVIN'S KER & KEI &... 3RD. A SINGLE HANDLING GIVES KELVIN'S BER/BEI & KER/KEI.

224PROGRAM STEPS
FELIPE LANCA
SPAIN - CORDOBA.

50773D 67-MATRIX-TRANSFORMATIONS.

GIVEN A 2X2 MATRIX, THE PROGRAM FINDS: A) THE DIAGONAL-MATRIX; B) ALL THE EIGENVALUES AS CORRESPONDING EIGENVECTORS; C) THE INVERSE OF THE EIGENVECTORMATRIX; D) THE DETERMINANT OF THE DIAGONAL-MATRIX (= SCALARVALUE).

134PROGRAM STEPS
JOHN VAN THIELEN
BELGIUM. STABROEK.

50774D 67-SQUARE ROOT OF A 2.2 MATRIX.

ONE OF THE MOST FRUSTRATING PROBLEMS IN LINEAR ALGEBRA IS TO COMPUTE THE SQUARE ROOT OF A MATRIX. THIS PROGRAM FINDS THIS ROOT OF 2X2 MATRICES BY A SYSTEM OF SUCCESSIVE APPROXIMATIONS.

094PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50775D 67-LINEAR MATRIX COMBINATIONS.

GIVEN A 2X2 MATRIX E, AND THREE OTHER 2X2 MATRICES A,B AND C, THE PROGRAM FINDS THE UNKNOWNS X,Y AND Z OF THE LINEAR COMBINATION E=AX+BY+CZ, IF SUCH COMBINATION EXIST. IF THIS COMBINATION DO NOT EXIST WITH THE GIVEN VALUES, YOU CAN FIND THE VALUES SATISFYING THE COMBINATION.

183PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50776D 67-INPUT IMPEDANCE & A-MATRIX OF LC-IMPEDANCE LADDER NETWORK.

PROGRAM COMPUTES THE INPUT IMPEDANCE OF A LADDER NETWORK WITH MAXI. FIVE L-REACTANCES X1,X3 THROUGH X9 AND FOUR C-SUSCEPTANCES Y2,Y4 THROUGH Y8, LOADED WITH AN UNIT RESISTANCE AT THE OUTPUT. THE REACTANCS AND SUSCEPTANCES ARE RELATIVE TO UNIT AT THE RESONANCE FREQUENCY F0=1. FOR THE REAL FREQUENCY F=N.F0 INPUT-VALUES AND THE 4 A-MATRIX-VALUES MAY ALSO BE COMPUTED.

222PROGRAM STEPS
WALTER BAUER

50776D (CONTD)

D - BERLIN.

50777D 67-POLYNOMIAL EVALUATION.

THIS PROGRAM COMPUTES THE VALUE AND THE FIRST N DIFFERENTIAL QUOTIENTS OF A POLYNOMIAL UP TO DEGREE 20.

187PROGRAM STEPS
JOHANNES SCHU
D - SAARBRUECKEN.

50778D 67-VISUAL 4-STACK REGISTER SIMULATOR WITH RPN LOGIC.

THE PROGRAM SIMULATES THE STACK REGISTER LOGIC OF HP CALCULATORS. THE CONTENTS OF THE FOUR X,Y,Z,T REGISTERS ARE PRESENTED SIMULTANEOUSLY IN THE DISPLAY. USER MAY PERFORM ARITHMETICS ROLL OR CHANGE REGISTERS, ENTER, CLEAR X-REG AND HE HAS THE ABILITY OF USING ONE EXTERNAL DATA STORAGE REGISTER. ALL CONDITIONS ARE EQUAL TO HP-RPN LOGIC EXCEPT THAT EACH REG. COULD ONLY HOLD A TWO-DIGIT POSITIVE INTEGER.

138PROGRAM STEPS
JENS SUCKSDORFF
S - STOCKHLOM.

50779D 67-1D ANNULAR HEAT TRANSFER.

PROGRAM PERFORMS ONE DIMENSIONAL HEAT TRANSFER CONDUCTION CALCULATION ACROSS ANNULAR SOLID WITH HEAT PASSING THROUGH AND HEAT GENERATED WITHIN. ALSO ITERATES ACROS ANNULAR GAS GAP BY RADIATION AND CONDUCTION IT CONSIDERS DIFFERENTIAL EXPANSION AT BOTH SURFACES AND UPDATES GAS CONDUCTIVITY FROM A QUADRATIC TEMPERATURE DEPENDANT RELATIONSHIP. USEFUL FOR NUCLEAR INPILE EXPERIMENT DESIGN.

221PROGRAM STEPS
ROY HOLT
UK - WILTSHIRE.

50780D 67-BEAMS AND SUPPORTS CALCULATIONS: BENDING TENSION BUCKLING.

SOLVING OF TENSION AND BEARING CASES FOR BEAMS AS WELL AS BUCKLING OF SUPPORTS OR RESTRAINTS FOR BENDING IN PLANE OF SYMMETRY. IT HAS A SPECIALY DESIGNED INPUT DATA FOR THE AVAILABLE STEEL SECTIONS, WHICH ALLOW STORAGE UP TO 21 DIFFERENT SECTIONS IN ONLY ONE DATA CARD.

215PROGRAM STEPS
EDUARDO SALETE DIAZ
SPAIN - MADRID.

50781D 67-MAGIC SQUARES OF ODD ORDER.

THIS PROGRAM FINDS MAGIC SQUARES OF ANY ODD ORDER N<100000. FURTHERMORE, IT CAN GIVE YOU THE NUMBER, OCCUPYING A GIVEN PLACE, OR, VICE VERSA, FIND THE PLACE OF A GIVEN NUMBER.

179PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50782D 67-NIM-GAME.

THIS PROGRAM PERMITS YOU TO PLAY NIM AGAINST HP, WITH 1 TO 20 HEAPS OF OBJECTS, EACH HEAP CONTAINING 1 TO 100000000 OBJECTS. THE TWO PLAYERS ALTERNATIVELY TAKE ANY NUMBER OF OBJECTS FROM ONE HEAP. THE PLAYER, TAKING THE LAST OBJECT WINS THE GAME. HP DOES NOT ALLOW ANY FALSE MOVES AND GENERALLY WINS THE GAME. FOR LARGE NUMBERS OF OBJECTS, THIS PROGRAM IS FASTER THAN OTHER PROGRAMS OF THE SAME KIND.

50782D (CONTD)

185PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50783D 67-CALCULATING PI.

THIS PROGRAM COMPUTES 7N+11 DIGITS OF PI, WHERE N CAN BE CHOSEN FROM THE INTERVAL (1,11).

211PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

50784D 67-FOURIER COEFFICIENTS.

FIRST PROGRAM COMPUTES FOURIER COEFFICIENTS OF GIVEN FUNCTION ON AN INTERVAL. FUNCTION MAY NOT BE CONTINUAL IN GIVEN INTERVAL. IT MAY BE DEFINED BY UP TO 3 FUNCTIONS. SECOND PROGRAM GENERATES ORDERED PAIRS OF POINTS FOR PLOTTING APPROXIMATION. CHOOSE BETWEEN AUTO MANUAL PLOTTING FOR GREATER FLEXIBILITY.

275PROGRAM STEPS
BRANKO SPOLJARIC
YU - ZAGREB.

50785D 67-LEUKOCYTES DIFFERENTIATION.

PROGRAM IS USEFUL IN LEUKOCYTES DIFFERENTIATION. IT SUBSTITUTES SPECIAL LEUKOCYTES CALCULATORS. UP TO TEN VARIOUS CELLS MAY BE DISCRIMINATED. THE MAXIMUM NUMBER OF CELLS IS NORMALLY 100, BUT IT IS POSSIBLE TO CHOOSE ANOTHER MAXIMUM.

090PROGRAM STEPS
LUDWIG STRAUSS
D - 6842 BUERSTADT.

50786D 67-UNIVERSAL PROGRAM FOR VAN DER WAALS' EQUATION.

THIS PROGRAM IMPLICATES A VAN DER WAALS' RELATION BETWEEN: PRESSURE, VOLUME (PER UNIT OF MASS), ABSOLUTE TEMPERATURE AND THE CRITICAL CORRESPONDING COEFFICIENTS OF A FLUID. FIVE OF THE VALUES HAVING BEEN INTRODUCED OR PREVIOUSLY COMPUTED, THE PROGRAM GIVES THE SIXTH ONE AND STORES IT. THREE SOLUTIONS CASE IS RESOLVED (REF. RAY KOLKER'S ALGORITHM).

218PROGRAM STEPS
ANDRE LONGATTE
F - CHATENAY MALABRY.

50787D 67-3X3 GRECO-LATIN EXPERIMENT.

A GRECO-LATIN SQUARE OF 3 PARAMETERS, EACH ONE HAVING 3 VALUES, BEING GIVEN, THIS PROGRAM GIVES THE 9 MEANS OF THE PERFORMANCE INDEX AND THE 3 VARIANCES CORRESPONDING TO THE 3 PARAMETERS. IT GIVES ALSO THE RESIDUAL VARIANCE AND THE GENERAL MEAN VALUE. IT CONTAINS THE F 2/2 DEGREES OF FREDOM LAW GIVING THE VALIDITY OF DIFFERENCES BETWEEN THE MEANS.

109PROGRAM STEPS
ANDRE LONGATTE
F - CHATENAY MALABRY.

50788D 97-IMPEDANCE MATCHING USING A SINGLE TRANSMISSION LINE

THIS PROGRAM IS AN USEFUL HELP IN DESIGNING STRIPLINE CIRCUITS. A SINGLE TRANSMISSION LINE IS ONE OF THE SIMPLEST IMPEDANCE MATCHING NET WORKS IN MICROWAVE TECHNIQUES. THE PROGRAM CALCULATES THE CHARACTERISTIC IMPEDANCE AND THE LENGTH, NORMALIZED TO WAVELENGTH OF THE TRANSMISSION LINE WHICH TRANSFORMS A GIVEN COMPLEX IMPEDANCE Z1 TO THE

50788D (CONTD)

COMPLEX CONJUGATE OF A SECOND GIVEN IMPEDANCE. THE CALCULATION Z TO ADMITTANCE Y AND REVERSE IS INCLUDED IN PROGRAM.

162PROGRAM STEPS
WALTER SCHUMACHER
D - PFINZTAL-SOELLINGEN.

50789D 67-OPTIMAL STOP GAMES (FOUR DIFFERENT VERSIONS)

THIS PROGRAM CONTENTS FOUR GAMES ON OPTIMAL STOP'S STRATEGY (ONE TO SIX PLAYERS): TEN NUMBERS (RANDOMLY GENERATED) COME ON THE DISPLAY ONE BY ONE. WHEN X IS DISPLAYED, YOU MUST DECIDE "I CHOOSE THIS NUMBER" OR "GO TO THE NEXT NUMBER" (NEVER PREVIOUS) THE FOUR VERSIONS OF THIS GAME ARE IN CONNECTION WITH THE SCORE AND THE INTERVAL WHERE THE NUMBERS ARE CHOSEN.

222PROGRAM STEPS
PHILIPPE TAYMANS
B - BRUSSELS.

50790D 67-GAUSS-SEIDEL ITERATION METHOD

IN GAUSS-SEIDEL METHOD THE UNKNOWN QUANTITIES ARE INITIALLY ASSUMED AND THE VALUE OBTAINED FROM THE FIRST EQUATION FOR SAY X1 IS THEN USED WHEN OBTAINING X2 FROM THE SECOND EQUATION AND SO ON. EACH EQUATION IS CONSIDERED IN TURN AND THE COMPLETE SET SOLVED AGAIN UNTIL THE VALUES OBTAINED FOR THE UNKNOWNS CONVERGE TO WITHIN REQUIRED LIMITS.

223PROGRAM STEPS
VELIMIR ILIJANIC
YU - ZAGREB.

50791D 67-UNIVERSAL DATA ENTRY.

WHEN YOU IN ONE PROGRAM HAVE MANY INPUT DATA WITH THIS PROGRAM YOU CAN WRITE IN QUICKLY.

015PROGRAM STEPS
VELIMIR ILIJANIC
YU - ZAGREB.

50792D 67-STAR POLYGON TRANSFORMATION.

IN NETWORK ANALYSIS, IT MUST BE NEEDED ALL NETWORK DEDUCE TO ONE ADMITTANCE BETWEEN TWO TIES. THE NETWORK IS CONSIST FROM MANY TIES. IT MUST BE NEEDED DECREASE THE NUMBER OF THE TIES, AND THAT WILL BE GAIN SO THAT THE STAR WITH ONE CENTRAL TIE TRANSFORM IN THE POLYGON WITHOUT THIS CENTRAL TIE. IN THIS PROGRAM, IT CAN DO IT FOR STAR WITH 18 SHANKS.

064PROGRAM STEPS
VELIMIR ILIJANIC
YU - ZAGREB.

50793D 67-DUAL DATA STORAGE LOADER.

UP TO 20 PAIRS OF NUMBERS (>=1), INCLUDING THEIR SIGNS, CAN BE STORED IN 1 REGISTER EACH (WITHOUT EXPONENT). THE MAGNITUDE CODES FOR EACH COLUMN CAN BE SELECTED AND RE-ADJUSTED AUTOMATICALLY. REVERSAL MODE, VARIABLE PRECISION, DECODING SUBROUTINE (21 STEPS) AND OTHER OPTIONS. ALL DECODING INFORMATION STORED IN 3 REGISTERS.

222PROGRAM STEPS
PETER VAN DEN HAMER
NL - THE HAGUE.

50794D 67-EXPONENTIAL CONSTANTS ESTIMATION

THIS PROGRAM ESTIMATES THE BEST (IN LEAST SQUARES SENSE) VALUES FOR A,B AND C IN THE EXPONENTIAL FIT Y=A+B* EXP (C*X) BY A SIMPLE ITERATIVE ME-

50794D (CONTD)

THOD. PROGRAM "DUAL DATA STORAGE LOADER" (NO. 50793) MUST BE USED.

209PROGRAM STEPS
PETER VAN DEN HAMER
NL - THE HAGUE.

50795D 97-POWER FACTOR COMPENSATION.

THE PROGRAM CALCULATES THE CAPACITOR REQUIRED TO IMPROVE AN INDUCTIVE POWER FACTOR, INPUT DATA ARE P, POWER FACTOR 1, POWER FACTOR 2, VOLTAGE AND FREQUENCY. OUTPUT IS FOR SINGLE OR THREE PHASE LOAD.

088PROGRAM STEPS
ROLAND REICHEL
TANZANIA - DAR EL SALAAM.

50796D 67-TRUE WIND DIRECTION ON MOVING VESSELS.

PROGRAM CALCULATES TRUE WIND DIRECTION IN DEGREE AND TRUE WIND FORCE ACCORDING TO INTERNATIONAL BEAUFORT SCALA 1.1.1949 WHEN GIVEN VESSEL'S COURSE IN DEGREE, SPEED IN KNOTS AND RELATIVE WIND IN DEGREES AND KNOTS. RCL E GIVES AT LAST THE TRUE WIND SPEED.

199PROGRAM STEPS
HANS PETER VONDERBEY
D - BREMENHAVEN.

50797D 97-MAGNETIC COMPASS SWING BY AZIMUTH OF THE SUN.

PROGRAM COMPARES OBSERVATIONS OF THE SUN'S AZIMUTH WITH ITS THEORITICAL MAGNETIC AZIMUTH TO GIVE THE COMPASS DEVIATION AT 45 DEGREE INTERVALS. IT ESTABLISHES THE ERROR COEFFICIENTS A,B,C,D AND E FOR SUBSEQUENT ANALYSIS, AND WILL CALCULATE THE DEVIATION FOR ANY COMPASS HEADING.

224PROGRAM STEPS
GERALD A. BAYNE
F - CANNES.

50798D 97-NAPIERS DIAGRAM.

PROGRAM EMULATES NAPIERS DIAGRAM FOR CONVERTING COMPASS HEADINGS EASILY AND ACCURATELY TO MAGNETIC HEADINGS AND VICE VERSA. IT IS DESIGNED FOR THE PREPARATION OF DEVIATION CURVES, AND WILL PLOT AT ANY SPECIFIED INCREMENTS.

102PROGRAM STEPS
GERALD A. BAYNE
F - CANNES.

50799D 67-DOGFIGHT

TWO PLAYERS IN A TWO-DEMENSIONAL DOGFIGHT. POSITION, SPEED AND DIRECTION, FUEL LEFT CALCULATED AND DISPLAYED. DIRECTION AND DISTANCE OF ENEMY PLANE IN REGARDS TO PLAYER'S POSITION ARE DISPLAYED. SPEED AND ANGLE VARIATION ARE CHOSEN WITHIN CALCULATED LIMITS (MAX. CENTRIFUGAL FORCE ALLOWED IS FIXED) FUEL BURNED ACCORDING TO SPEED. MIN. AND MAX. SPEED, MAX. FIRING DISTANCE AND ANGLE ARE FIXED AT THE BEGINNING. CONSTANTS MAY BE CHANGED AND RESULTS SAVED ON CARD.

224PROGRAM STEPS
OLIVIER FREIMAN
F - PARIS.

50800D 67-OPERATIONAL STACK FOR ARBITRARY BASE

THE PROGRAM PROVIDES TWO OPERATIONAL STACKS FOR EACH UP TO FIVE INTEGERS IN TWO DIFFERENT NUMBER REPRESENTATIONS, I.E. NUMBERS TO BASE UP TO 100 AND OPTIONALLY NORMAL OR TWO'S COMPLEMENT REPRESENTATION FOR NEGATIVE NUMBERS. OPERATIONS ARE: ENTER,ADD,SUB,MUL, DIV, ROLL STACK, CONVERSION FROM DECIMAL TO BASE AND INVERSE AND FROM BASE TO BASE.

112PROGRAM STEPS
ERICH EHSES
D - BONN.

50801D 67-DIAGONAL OF A 3X3 MATRIX.

THIS PROGRAM COMPUTES THE DIAGONAL OF A 3X3 MATRIX AND ALSO THE DETERMINANT. OF COURSE YOU HAVE ALSO THE EIGENVALUES OF THIS MATRIX EVEN WHEN THEY ARE COMPLEX.

224PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50802D 67-INPUT-OUTPUT ANALYSIS.

WITH THIS PROGRAM YOU CAN DEVELOP AN INPUT-OUTPUT ANALYSIS ON THE LEONTIEF-WAY AND CONSTRUCT A 4 SECTORS ECONOMY, EACH PRODUCING A SINGLE COMMODITY.
THE PROGRAM CAN BE USEFUL IN ECONOMIC EDUCATION OF THE SECONDARY LEVEL.

212PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50803D 67-EQUATION OF A PLANE THROUGH THREE POINTS.

GIVEN THREE POINTS IN THE SPACE, PROGRAM COMPUTES THE EQUATION OF THE PLANE THROUGH THIS THREE POINTS THE DISTANCE OF ANOTHER POINT TO THIS PLANE AND EXAMINE THAT A POINT BELONGS TO THIS PLANE.

164PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50804D 67-INTERSECTION PROBLEMS OF TWO DISTINCT PLANES

THE PROGRAM COMPUTES,
A) THE SYMMETRIC FORM OF THE EQUATION OF THE INTERSECTION OF TWO NON PARALLEL DISTINCT PLANES.
B) THE COORDINATES OF THE POINT OF INTERSECTION BETWEEN A LINE (IN GENERAL FORM) AND A PLANE.

215PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50805D 67-RANDOMGENERATOR-TESTER

THIS PROGRAM CAN TEST ANY RANDOM-NUMBER GENERATOR WICH PRODUCES NUMBERS BETWEEN 0 AND 9 ON A SYMMETRICAL DISTRIBUTION
FURTHERMORE, YOU CAN TEST THE RESULTS WITH THE CHI-SQUARE TEST, CORRECTED BY YATES.

074PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50806D 67-RANDOMNUMBER-CIRCLE

PROGRAM COMPUTES PAIRS OF RANDOM-NUMBERS AND AFTER THAT, THE COORDINATES OF THE CENTER AND THE RADIUS OF THE BEST FITTING CIRCLE THAT BELONGS TO THE RANDOM-PAIRS.

208PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50807D 67-CALCULATING ALL COILS INDUCTANCES WAVELENGTH

50807D (CONTD)

THIS PROGRAM IS INTENDED TO AMATEUR RADIO WHO MUST KNOW THE INDUCTANCE OF COILS AND THEIR POSSIBILITIES WITH DIFFERENT CAPACITORS.
THE LAST STEPS (141 TO 146) ALLOW THE CALCULATION OF INDUCTANCE KNOWING WAVELENGTH AND CAPACITANCE OR THE COMPUTATION OF CAPACITOR KNOWING WAVELENGTH AND INDUCTANCE.

146PROGRAM STEPS
ROGER THOMASSE
F - RANVILLE.

50808D 97-SOLVING FIVE SIMULTANEOUS EQUATIONS WITH FIVE UNKNOWNS

THIS PROGRAM SOLVES A SYSTEM OF FIVE SIMULTANEOUS, LINEAR EQUATIONS IN FIVE UNKNOWNS. THE COEFFICIENTS FOR EACH EQUATION ARE ENTERED IN SUCCESSION. AFTER THE LAST ENTRY, THE VALUES OF THE FIVE UNKNOWNS ARE PRINTED IN ABOUT 45 SECONDS.

218PROGRAM STEPS
FIN K.L. UTNE
N - ASKIM.

50809D 67-PSYCROMETER/RELATIVE HUMIDITY

GIVEN THE TEMPERATURES OF DRY AND WET BULB THERMOMETERS, THIS PROGRAM CALCULATES:
1) THE REAL VAPOUR TENSION IN MILLIBAR
2) THE VAPOUR TENSION AT SATURATION
3) THE RELATIVE HUMIDITY IN PERCENT
4) THE GRAMS OF WATER CONTAINED IN 1 M 3 OF AIR AT TEST CONDITIONS
5) THE DEW POINT IN DEGREE CELSIUS.

053PROGRAM STEPS
ARRIGO BOHM
I - TORINO.

50810D 67-LATITUDE BY POLARIS WITHOUT TABLES

PROGRAM DESIGNED FOR SMALL BOAT NAVIGATORS, REQUIRING MAXIMUM EASE OF USE AND SIMPLICITY. LATITUDE OF OBSEVER CALCULATED FROM ONE OR MORE POLARIS ALTITUDE OBSERVATIONS REFERENCE TO TABLES NOT REQUIRED AT SEA AS DATA IS PRELOADED ONTO MAGNETIC CARD. NAVIGATOR HAS ONLY TO ENTER DR LONGITUDE, GMT, DATE AND READINGS OFF SEXTANT.

209PROGRAM STEPS
JAMES WOODRUFF
M - MONACO.

50811D 97-RELATIONSHIP BETWEEN POINT AND STRAIGHT

GIVEN EQUATION OF STRAIGHT Y=AX+B AND COORDINATES OF POINT, PROGRAM FINDS EQUATION OF PERPENDICULAR TO STRAIGHT THROUGH GIVEN POINT, ALSO POINT OF INTERSECT AND DISTANCE.

037PROGRAM STEPS
SANDRO ROCCI
S - MADRID.

50812D 67-5X5, 4X4, 3X3 MATRICES OR UNKNOWN EQUATIONS

CALCULATES DETERMINANT AND INVERSE VALUES FOR 5X5, 4X4, 3X3 MATRICES. DURING CALCULATION SKIPS ZERO VALUE DIAGONALS UNTIL OTHER DIAGONALS ARE USED, THEN RETURNS AUTOMATICALLY EFFECTIVELY AVOIDING REORDERING OF DIFFICULT MATRICES. ALSO PERMITS SOLUTION OF UNKNOWN EQUATIONS OF UP TO AND INCLUDING 5 UNKNOWNS.

224PROGRAM STEPS
EARLE ROBINSON
F - PARIS.

50813D 67-CONVERSION OF LEGENDRE POLYNOMIALS INTO POWER SERIES

50813D (CONTD)

THIS PROGRAM IS AN OPTIONAL COMPLEMENT TO PROGRAM NR. 50520D; WHICH GIVES THE COEFFICIENTS OF A SERIES OF LEGENDRE POLYNOMIALS UP TO DEGREE 7. THIS PROGRAM CONVERTS THOSE COEFFICIENTS INTO THE COEFFICIENTS OF AN ORDINARY POWER SERIES WITH ARGUMENT X.

217PROGRAM STEPS
DR. HENRIQUE E. ADLER
P - OPORTO.

50814D 67-REDUCTION OF PRESSURE. QFE, QNH, QNE

THIS PROGRAM IS USED TO DETERMINE THE BAROMETRIC PRESSURE AND TO REDUCE IT TO SEA LEVEL OR TO NEAREST REFERENCE LEVEL. IT ALSO COMPUTES FOR THE AVIATION THE QFE, QNH AND QNE AT THE METEOROLOGICAL STATION OF AN AERODROME.

224PROGRAM STEPS
EUGENIO OLIVA
S - MADRID.

50815D 67-ATMOSPHERICAL AND SUBMARINE PRESSURE

THE PROGRAM COMPUTES:
1) PRESSURE OVER (OR UNDER) THE SEA LEVEL IN FUNCTION OF THE HEIGHT (OR DEPTH)
2) CONVERSION BETWEEN SEVERAL PRESSURE UNITS
3) ROUTINE FOR THE AUTOMATICAL LISTED OF THE VARIATIONS OF PRESSURE IN FUNCTION OF A INCREMENT OF HEIGHT (OR DEPTH) ESTABLISHED.
4 LABELS REMAIN FREE FOR PARTICULAR USE SO AS MOST OF REGISTERS.

054PROGRAM STEPS
MARTIN PEREZ
S - MADRID.

50816D 67-UNIVERSAL POLYNOMIAL FITTING

GIVEN N(N<=19) DATA-PAIRS (X,Y), THE PROGRAM COMPUTES THE LINEAR ESTIMATE WHEN X IS GIVEN.

093PROGRAM STEPS
RONNIE VAN THIELEN
B - STABROEK.

50817D 67-FOOTBALL-GAME

WITH THIS PROGRAM YOU CAN FOLLOW A FOOTBALL-GAME, PLAYED BY YOUR H.P. YOU SEE THE SCORE AFTER EVERY 5 MINUTES AND AFTER 90 MINUTES THE GAME IS OVER AND THE PROGRAM STOPS WITH THE FINAL SCORE. THE MORE POINTS A CLUB HAS WON THE MORE CHANCE TO MAKE A GOAL.
A SPECIAL RANDOMNUMBERGENERATOR IS USED.

086PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50818D 67-BISECTLINE OF AN ANGLE FORMED BY THREE POINTS

GIVEN THREE POINTS IN A PLANE (A,B, C) THE PROGRAM COMPUTES THE EQUATION AY+BX+C=0 OF THE BISECTOR-LINE AND THE ANGLE ABC.

111PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50819D 67-MATRIX FORM OF CONIC SECTIONS

GIVEN THE GENERAL EQUATION OF THE SECOND DEGREE IN TWO VARIABLES, THE PROGRAM COMPUTES:
A) THE MATRIX OF THE CONIC SECTION,
B) THE QUADRATIC-MATRIX AND
C) THE SOLUTIONS OF THE CARACTERISTIC EQUATION OF THESE QUADRATIC

50819D (CONTD)

MATRIX (=EIGENVALUES).

103PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50820D 67-4-EQUATION SYSTEM WITH REGULAR OR SINGULAR MATRIX

PROGRAM SOLVES ANY SYSTEM OF 4 EQUATIONS WITH 4 UNKNOWNS. IF THE DETERMINANT OF THE 4X4 MATRIX IS ZERO, PROGRAM GIVES THE ENTIRE INFINITY OF SOLUTIONS. SYSTEMS WITH FEWER UNKNOWNS AND/OR FEWER EQUATIONS CAN BE SOLVED TOO.

340PROGRAM STEPS
BJORN ENGSIG
DK - ALLEROD.

50821D 97-EL ALAMEIN BATTLE

PROGRAM SIMULATES A BATTLE BETWEEN AN ASSAILANT, WHO COMMANDS THREE TANKS AND TWO AIRPLANES, AND A DEFENDER, WHO COMMANDS THREE TANKS, ONE AIRPLANE AND ONE MISSILISTIC POSITION ON A GRID MAP 100X100. YOU CAN PLAY ALONE OR WITH A FRIEND.

197PROGRAM STEPS
ANDREA SCHILKE
I - MILAN.

50822D 97-SHADOW TRACE OF A PLUMB-LINE-MERIDIAN PLANE-COMPASS DIAL

THE SHADOW TRACE OF A PLUMB-LINE ON A HORIZONTAL PLANE CAN CONDUCT TO COMPUTE:
-THE ANGLE OF THE NORMAL DIRECTION TO VERTICAL WALL REFERED TO LOCAL MERIDIAN PLANE,
-THE DIRECTION OF 4 CARDINAL POINTS ON A HORIZONTAL PLANE(COMPASS DIAL) IT IS NECESSARY TO KNOW:
-LONGITUDE-LATITUDE-SUN DECLINATION AND EQUATION OF TIME AT/AND MEASUREMENT TIME (UNIVERSAL TIME+1 HOUR ORG.M.T.+1) -SHADOW TRACE PROJECTIONS ON THE WALL AND ON THE PERPENDICULAR TO THE WALL.

206PROGRAM STEPS
RAYMOND ROBERT,PIERRE
F - MEUDON.

50823D 97-VERTICAL SUNDIAL-PRELIMINARY COMPUTATIONS

THIS PROGRAM COMPUTES:-THE SUNSHINE LIMIT HOURS OF A VERTICAL SUNDIAL, FIRST THE FIXED SUNSHINE LIMITHOUR, NEXT THE VARIABLE SUNSHINE LIMITHOURS IN RELATION WITH THE SUN DECLINATION-THE PROJECTIONS AND THE ANGLES OF THE INDICATING NEEDLE (GNOMON)WITH SUNDIAL AXES. IT IS NECESSARY TO KNOW:-TIME WHEN THE SUN IS IN LOCAL MERIDIAN PLANE IF THE EQUATION OF TIME IS ZERO(HOUR IN UNIVERSAL TIME+1 HOUR OR G.M.T+1)-LOCAL LATITUDE-ANGLE BETWEEN THE VERTICAL SUNDIAL PLANE AND THE HORIZONTAL EAST-WEST DIRECTION.

219PROGRAM STEPS
RAYMOND ROBERT, PIERRE
F - MEUDON.

50824D 97-VERTICAL SUNDIAL-HORARY GRADUATIONS IN G.M.T+1

THIS PROGRAM COMPUTES:-THE INTERSECTION POINTS OF HORARY GRADUATIONS WITH AXES PLOTTED ON A VERTICAL SUNDIAL-THE INTERSECTION POINT OF DECLINATION HYPERBOLES FOCAL AXIS WITH AXES PLOTTED ON A SUNDIAL IT IS NECESSARY TO KNOW:-TIME WHEN THE SUN IS IN LOCAL MERIDIAN PLANE IF THE EQUATION OF TIME IS ZERO (TIME IN G.M.T+1)-LATITUDE-ANGLE BEDTWEEN THE VERTICAL SUNDIAL PLANE AND THE EAST-WEST HORIZONTAL DIRECTION-COORDINATES OF THE INDICATING NEEDLE ORIGIN REFERRED AXES PLOTTED

50824D (CONTD)

ON THE VERTICAL SUNDIAL.

191PROGRAM STEPS
RAYMOND ROBERT, PIERRE
F - MEUDON.

50825D 97-VERTICAL SUNDIAL DECLINATION HYPERBOLES CHARACTERISTICS

THIS PROGRAM COMPUTES THE CHARACTERISTICS OF HYPERBOLES DESCRIBED BY THE SHADOW TRACE OF A MARK (A BALL FOR EXAMPLE) LOCATED ON THE INDICATING NEEDLE OF A VERTICAL SUNDIAL. FOR A GIVEN SUN DECLINATION THE COMPUTED CHARACTERISTICS ARE:
-HALF FOCAL DISTANCE -HALF TRANSVERSE AXIS -HALF NOT TRANSVERSE AXIS -DISTANCE BETWEEN HYPERBOLE CENTER AND INDICATING NEEDLE ORIGIN -HYPERBOLE CENTER COORDINATES REFERRED AXES PLOTTED ON SUNDIAL.

200PROGRAM STEPS
RAYMOND ROBERT, PIERRE
F - MEUDON.

50826D 97-VERTICAL SUNDIAL DECLINATION HYPERBOLES PLOTTING

THIS PROGRAM FOLLOWS THE PROGRAM ENTITLED "VERTICAL SUNDIAL-DECLINATION HYPERBOLES CHARACTERISTICS" AFTER COMPUTATION OF THE CHARACTERISTICS OF HYPERBOLE, BY MEANS OF THE PREVIOUS PROGRAM, THIS PROGRAM ENABLES TO PLOT THE HYPERBOLE POINT BY POINT IN A SYSTEM OF AXES DIFFERENT FROM THAT OF THE HYPERBOLE.

223PROGRAM STEPS
RAYMOND ROBERT, PIERRE
F - MEUDON.

50827D 67-RIEMANN ZETA FUNCTION

THIS PROGRAM COMPUTES THE RIEMANN ZETA FUNCTION ZETA(S) FOR REAL ARGUMENTS. EULER'S SUMMATION FORMULA IS USED FOR S>0. FOR S<0 ZETA(S) IS COMPUTED BY MEANS OF A REFLECTION FORMULA.

166PROGRAM STEPS
WOLFGANG EHRHARDT
D - GOETTINGEN.

50828D 67-EQUATION OF A PLANE THROUGH THREE POINTS II

GIVEN THREE POINTS IN THE SPACE, THE PROGRAM COMPUTES THE EQUATION OF THE PLANE THROUGH THESE POINTS, EXAMINE IF A POINT BELONGS TO THE PLANE AND IF NOT, COMPUTES THE DISTANCE OF THIS POINT TO THE PLANE. THE PROGRAM IS DEFFERENT OF PROGRAM NR 50803, RUNS FASTER AND IS SHORTER. (I MEAN IT IS A GOOD EXAMPLE OF INPUT-METHOD).

107PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50829D 67-IQ-TEST IN MATHEMATICS

THE PROGRAM COMPUTES YOUR I.Q. IN MATHEMATICS. THE TEST CONTAINS 10 ITEMS. YOU HAVE A LIMITED TIME TO WORK EACH ITEM OUT. THE ITEMS TEND TO GET MORE DIFFICULT LATER ON IN THE TEST. BUT THEN YOU HAVE MORE TIME TO FIND A SOLUTION.

196PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50830D 67-HP-BALANCE FOR WOMEN

THIS PROGRAM COMPUTES THE NORMAL WEIGHT OF A WOMAN, GIVEN THE LENGTH THE AGE AND THE KIND OF THE BONES (LIGHT-WEIGHT, NORMAL OR HEAVY). THE AGE MUST BE MORE THAN 15 YEARS.

50830D (CONTD)

205PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50831D 67-HP-BALANCE FOR MEN

THIS PROGRAM COMPUTES THE NORMAL WEIGHT OF A MAN, GIVEN THE LENGTH, THE AGE AND THE KIND OF THE BONES (LIGHT-WEIGHT, NORMAL OR HEAVY). THE AGE MUST BE MORE THAN 15 YEARS.

191PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50832D 67-GENERAL EQUATION OF SECOND DEGREE

THIS PROGRAM FURNISHES, ONCE FOR EVER,
1) JUST CLASSIFICATION OF A CURVE LINE REPRESENTED BY A GENERAL EQUATION OF SECOND DEGREE IN TWO VARIABLES, WITH A NUMBER KEY THAT APPEARS IN "USERS INSTRUCTIONS".
2) REDUCED CANONIC EQUATION OF EACH CONSULTED EQUATION OF SECOND DEGREE.

223PROGRAM STEPS
FELIPE LANDA
S - CORDOBA.

50833D 67-TREND CURVES FOR LONG-RANGE FORECASTING BY 3-POINTS METHOD

FITS SIMPLE MODIFIED EXPONENTIAL, GOMPERTZ AND LOGISTIC CURVES TO UP TO 19 DATA POINTS. (DATA ENTERED ONCE ONLY FOR ALL THREE CURVES). "THREE POINTS" METHOD GIVES ONLY APPROXIMATE FIT, BUT IS RELATIVELY FAST TO EXECUTE. PROGRAM ALSO ALLOWS "FIT" TO BE EXAMINED, CALCULATES ERROR SUM OF SQUARES, AND ALLOWS FORECASTS TO BE MADE. MANUAL OR CARD DATA ENTRY.

224PROGRAM STEPS
MARTIN HUMPHRIES
UK - BROMSGROVE/WORCESTERSHIRE.

50834D 97-MAGNETIC COMPASS SWING AND ANALYSIS OF DEVIATION ERROR

PROGRAM SUMS EIGHT OBSERVATIONS - AT 45 DEGREE INTERVALS - IN EITHER DIRECTION, TO GIVE A MAGNETIC COMPASS DEVIATION CURVE. MAGNETIC BEARINGS OF A DISTANT FIXED OBJECT ARE USED, OR PELORUS RELATIVE BEARINGS PLUS SHIP'S HEAD BY COMPASS. ERROR COEFFICIENTS B;C;D SIGMA E ARE DERIVED AND STORED FOR SUBSEQUENT ANALYSIS AND CORRECTION, AND COEFFICIENT A IF THE MAGNETIC BEARING IS SPECIFIED.

212PROGRAM STEPS
GERALD A. BAYNE
F - CANNES.

50835D 97-NAUTICAL TABLES

THE PROGRAM WILL CALCULATE THE LOG SIN, COSEC. TAN, COTAN. COS,SEC.+ LOG SIGMA NATURAL HAVERSINES OF ANGLES SIGMA CHANGE ANY OF THE ABOVE LOGS BACK TO ANGULAR FORM. AS LAID OUT IN NORRIE'S NAUTICAL TABLES. THIS PROGRAM WAS DEVELOPED TO CHECK THE LONGHAND WORK OF STUDENTS AT NAUTICAL COLLEGE.

193PROGRAM STEPS
NEVILLE A. MORRIS
UK - LINCOLN.

50836D 67-FAST SORTING PROGRAM

PROGRAM SORTS A SET OF UP TO 24 FIGURES FROM THE LOWEST TO THE HIGHEST. INPUT INTO THE STACK OR BY DATA CARD.

50836D (CONTD)

172PROGRAM STEPS
DR. HEINZ RECHMANN
D - LEVERKUSEN.

50837D 67-SI-MKS CONVERSIONS (CARD I)

THIS PROGRAM COMPUTES CONVERSIONS FROM SI TO MKS-SYSTEM (WORK, FORCE AND TEMPERATURE). INVERSES OF THESE CONVERSIONS ARE OBTAINED BY PRESSING THE SECOND FUNCTIONS.

181PROGRAM STEPS
JOACHIM DOLIFF
D - HANNOVER.

50838D 67-SI-MKS CONVERSIONS (CARD II)

THIS PORGRAM COMPUTES CONVERSIONS FROM SI TO MKS-SYSTEM (PRESSURE AND "LEISTUNG"). INVERSE OF THESE CONVERSIONS ARE OBTAINED BY PRESSING THE SECOND FUNCTIONS.

161PROGRAM STEPS
JOACHIM DOLIFF
D - HANNOVER.

50839D 67-GEOGRAPHIC-GEOMAGNETIC COORDINATE SYSTEM CONVERSION

USING A CENTERED DIPOLE APPROXIMATION OF THE EARTH'S MAGNETIC FIELD, THE PROGRAM CONVERTS GEOGRAPHIC INTO GEOMAGNETIC COORDINATES AND VICE VERSA.

107PROGRAM STEPS
KLAUS WILHELM
D - NORTHEIM.

50840D 97-SHORT-TERM CD'S EUROBONDS (UNDER ONE YEAR)

THE PROGRAM COMPUTES NET PROCEEDS OR ANNUALIZED YIELD OF SHORT-TERM CERTIFICATES OF DEPOSIT (EUROBONDS) GIVEN THE ISSUE, SETTLEMENT AND MATURITY DATES, THE FACE VALUE AND THE NOMINAL INTEREST RATE.

150PROGRAM STEPS
KLAUS BASLAU
CH - MEYRIN/GE.

50841D 97-PRICE & YIELD OF MEDIUM TERM CD'S & EUROBONDS (YEAR)

THE PROGRAM COMPUTES NET PROCEEDS OR ANNUALIZED YIELD OF MEDIUM-TERM (OVER ONE YEAR) CERTIFICATES OF DEPOSIT AND EUROBONDS GIVEN THE SETTLEMENT DATE, MATURITY DATE, FACE VALUE AND NOMINAL INTEREST RATE.

218PROGRAM STEPS
KLAUS BASLAU
CH - MEYRIN/GE.

50842D 67-GERMAN INCOMETAX SINCE 1975

PROGRAM CALCULATES GERMAN INCOMETAX FOR GROUND AND SPLITTARIFF IN AMOUNT AND % OF THE INCOME AND ALSO % ON TOP OF THE INCOME. (LAW VALID SINCE 1975).

199PROGRAM STEPS
DR. HEINZ RECHMANN
D - LEVERKUSEN.

50843D 67-ACIDC CIRCUIT ANALYSIS

PROGRAM CALCULATES OHM'S LAW, SERIAL AND PARALLEL CONNECTIONS OF IMPEDANCES, AVERAGE, APPARENT AND REACTIVE POWER AND MULTIPLY OR DIVIDE COMPLEX NUMBERS. IT IS VERY USEFUL FOR QUICKLY CALCULATING OF THOSE NETWORK PARAMETERS. IT ALSO INCORPORATES SPECIAL PRINT/PAUSE CONTROL TO ECONOMIZE PAPER USE WHEN WORKING WITH HP-97. PROGRAM IS APPLICABLE FOR AC AND DC NETWORKS.

50843D (CONTD)

196PROGRAM STEPS
BRANKO SPOLJARIC
YU - ZAGREB.

50844D 67-AN ECONOMETRICAL MODEL OF THE BELGIAN ECONOMY

THE PROGRAM COMPUTES THE INFLUENCE (IN PERCENT) OF THE RISE OR FALL (IN PERCENT) OF A PART-INDUSTRY ON THE GROSS INTERIOR PRODUCE OF THE BELGIAN ECONOMY.

142PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50845D 67-THE MIN/MAX POLYNOMIAL

GIVEN FOUR POINTS WITH THEIR COORDINATES (X,Y) THE PROGRAM COMPUTES THE COEFFICIENTS A,B AND C OF THE EQUAL ERROR PARABOLA AX**2+BX+C, AND THE MINIMUM ERROR E. YOU CAN ALSO FIND Y'S FOR GIVEN X'S TO MAKE A DRAWN OF THIS PARABOLA.

212PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50846D 67-FAST PRIME TESTER

THIS PROGRAM EXAMINES IF A NUMBER IS A PRIME OR NOT. IF IT IS A PRIME YOU SEE THE NUMBER AGAIN, IF NOT, A ZERO WILL COME ON THE DISPLAY. PROGRAM RUNS MAXIMUM 50 SECONDS.

224PROGRAM STEPS
RONNIE VAN THIELEN
B - STABROEK.

50847D 67-H-P MAGICIAN

THIS PROGRAM FINDS YOUR SECRET NUMBER. IT ASKS YOU 5 QUESTIONS AND TELLS THEN THIS NUMBER.

130PROGRAM STEPS
RONNIE VAN THIELEN
B - STABROEK.

50848D 67-MAGIC-SQUARE AND HIS DETERMINANT

THIS PROGRAM COMPUTES A MAGIC SQUARE WITH 3 GIVEN NUMBERS. A,B AND C (A UNEQUAL TO B UNEQUAL TO C) THE PROGRAM FINDS ALSO THE DETERMINANT OF THE MAGIC-SQUARE AND THE INVERSE MATRIX.

190PROGRAM STEPS
RONNIE VAN THIELEN
B - STABROEK.

50849D 67-CONTINGENCY TABLE AND TEST FOR TREND

THE DATES FOR TWO VARIABLES ARE ARRANGED IN A CONTINGENCY TABLE UNDER CONSIDERATION OF A RANGE PLACE. THE PROGRAM TESTS IF THERE IS A TREND IN THE RANGING LIST WITH PROBABILITY OF ERROR <5% OR <1% FOR ONE-SIDED OR TWO-SIDED QUESTION. THE REAL PROBABILITY OF ERROR CAN BE CALCULATED TOO.

219PROGRAM STEPS
INGOLF SEELEMANN
D - BOTTROP.

50850D 67-SUPER PERISCOPE

PROGRAM SIMULATES A SUBMARINE AND A "N" NUMBER OF SHIPS. YOU MUST SINK THEM WITH TORPEDOES. THREE MODES ARE AVAILABLE, 1ST CONSTANT VELOCITY (QUITE EASY), 2ND VARIABLE SPEED (MORE DIFFICULT) 3RD UNFORSEEABLE SPEED (VERY HARD). EVERY SHIP YOU SINK COMES BACK, IT'S A SOLITAIRE GAME (BECAUSE NUMBER OF SHIPS AND OF TORPEDOES IS UNLIMI-

50850D (CONTD)

TED). YOUR TASK IS TO HAVE A VERY HIGH TONNAGE.

177PROGRAM STEPS
PIERRE PIRAUX
B - MARCINELLE.

50851D 97-EXPANDED STACK WITH AUTOMATIC LIFT

PROGRAM SIMULATES A REVERSE POLISH NOTATION STACK WITH TWELVE REGISTERS. FEATURES INCLUDE THE ABILITY TO AUTOMATICALLY LIFT NUMBERS IN THE STACK.

162PROGRAM STEPS
JOHN DOE
UK - REDHILL/SURREY.

50852D 97-LISTING OF COMBINATIONS, NO REPLACEMENT I

GIVEN N ELEMENTS K OF WHICH ARE TO BE SAMPLED WITHOUT REPLACEMENT AND WITHOUT ORDER, N AND K BEING LESS THAN 10 THE PROGRAM CALCULATES THE NUMBER OF COMBINATIONS AND COMPLETELY DISPLAYS THE COMBINATIONS ONE AFTER THE OTHER OPTIONALLY PRINTING THE LIST.

099PROGRAM STEPS
JOACHIM GERLACH
D - MODAUTAL.

50853D 97-LISTING OF COMBINATIONS, NO REPLACEMENT II

GIVEN N ELEMENTS K OF WHICH ARE TO BE SAMPLED WITHOUT REPLACEMENT AND WITHOUT ORDER N BEING LESS THAN 70 AND K LESS THAN 10 THE PROGRAM CALCULATES THE NUMBER OF COMBINATIONS AND COMPLETELY LISTS THEM DISPLAYING ONE ELEMENT AFTER THE OTHER OF EACH COMBINATION.

095PROGRAM STEPS
JOACHIM GERLACH
D - MODAUTAL.

50854D 97-LISTING OF COMBINATIONS WITH REPLACEMENT I

GIVEN N ELEMENTS K OF WHICH ARE TO BE SAMPLED WITH REPLACEMENT BUT WITHOUT ORDER, N AND K BEING LESS THAN 10 THE PROGRAM CALCULATES THE NUMBER OF COMBINATIONS AND COMPLETELY DISPLAYS THE COMBINATIONS ONE AFTER THE OTHER OPTIONALLY PRINTING THE LIST.

114PROGRAM STEPS
JOACHIM GERLACH
D - MODAUTAL.

50855D 67-SHIFT REGISTER

THE SHIFT REGISTER MIGHT BE USEFUL AS MODULE IN OTHER PROGRAMS. IT CAN HOLD UP TO 19 VALUES (A LONG VERSION UP TO 38 FIVE-DIGIT-INTEGERS), DEPENDENT OF HOW MANY MEMORY LOCATIONS THE APPLICATION PROGRAM NEEDS. LET L BE THE LENGTH OF THE SHIFT REGISTER, THEN THE N-TH ENTRY PROMPTS THE (U-L)-TH ENTRY TO BE DISPLAYED IN THE X-REG (20 PROGRAM STEPS; LONG VERSION:45 PROGRAM STEPS).-IF REQUIRED, THE CONTENT OF ANY REGISTER LOCATION CAN BE RECALLED OR THE WHOLE REGISTER CONTENT CAN BE READ OUT SEQUENTIALLY.

118PROGRAM STEPS
DIETER SOINE
D - HANNOVER.

50856D 97-EQUATION OF TIME SUN DECLINATION ACCORDING TO DATE

THIS PROGRAM COMPUTES:- FIRST THE ORDER NUMBER IN THE YEAR OF A DAY FROM ITS DATE MM.JJ (MM=MONTH AND JJ=DAY NUMBER IN THE MONTH)- NEXT

50856D (CONTD)

THE EQUATION OF TIME OR THE SUN DECLINATION FROM THE ORDER NUMBER IN THE YEAR AND HOUR H (0<H<24) IN UNIVERSAL TIME (G.M.T.) BY MEANS OF 2X2 POLYNOMIALS OF 8TH DEGREE. FOR YEAR 1978 THE COEFFICIENTS OF THESE POLYNOMIALS ARE GIVEN AND CAN BE WRITTEN ON Z MAGNETIC CARDS. THIS PROGRAM CAN BE USED FOR DATA COMPUTATION OF THE PROGRAM ENTITLED "SHADOW TRACE OF A PLUMBLINE,ETC...

131PROGRAM STEPS
RAYMOND ROBERT,PIERRE
F - MEUDON.

50857D 67-AUTOMATIC ADDING-MACHINE

THIS PROGRAM IS SPECIALY DESIGNED FOR H.P.67, COMPENSATE FOR ABSENCE OF PRINT. YOU CAN ADD UP TO 24 NUMBERS WITHOUT PRESSING KEY +. PROGRAM RECALLS ONE BY ONE ALL THE NUMBERS AND PERMITS CHECKING THEM. IN ADDITION PROGRAM GIVES THE RATIO OF EACH INPUT DATUM, AND RECALLS ALL THE NUMBERS AND THE TOTAL MULTIPLIED BY A COMMON FACTOR.

104PROGRAM STEPS
FRANCIS PARENT
F - STRASBOURG.

50858D 67-GENERATION OF UP TO 46 RANGED PSEUDO RANDOM INTEGERS

THIS PROGRAM GENERATES UP TO 46 PSEUDO RANDOM INTEGERS XI SUCH THAT 0<XI<10**5 AND PUTS THEM INTO GOOD ORDER. REPETITION OF A NUMBER IS AVOIDED.

219PROGRAM STEPS
FRANZ-JOSEF KALL
D - AACHEN-BRAND.

50859D 67-BOOKIES SETTLER

WRITTEN FOR THE BOOKMAKER OR THE MAN WHO WANTS TO TAKE HIS H.P.67 TO THE RACES. THE PROGRAM WILL SOLVE 4 SINGLE BETS, 6 DOUBLES, 4 TREBLES AN ACCUMULATOR OR A YANKIE BET GIVEN 4 WINNERS AND THE RATE OF BETTING TAX. ALSO SOLVES 3 DOUBLES AND/OR A TREBLE ON THREE WINNERS ALSO SOLVES INDIVIDUAL SINGLES AND DOUBLES.

133PROGRAM STEPS
WILLIAM F.A. STEELE
UK - FROME/SOM.

50860D 97-THIRTEEN MANAGEMENT INDICATORIES

THE PROGRAM COMPUTES THIRTEEN DIFFERENT COEFFICIENTS OF (1) TECHNICAL ANALYSIS, (2) TECHNICAL OUTPUT, (3) LABOUR ANALYSIS. THEY GIVE A DASHBOARD OF BUSINESS.

183PROGRAM STEPS
PIERRE MAIRE
F - FONTAINE.

50861D 67-PENETRABILITY OF A RECTANGULAR POTENTIAL BARRIER

THIS PROGRAM CALCULATES THE PENETRABILITY (TRANSMISSION COEFFICIENT)T OF A RECTANGULAR POTENTIAL BARRIER. THE VARIABLES USED IN THE PROGRAM ARE M,V,A,E WHERE M IS THE MASS OF THE PARTICLE,V THE "HEIGHT" OF THE BARRIER, A THE BARRIER WIDTH E THE PARTICLE KINETIC ENERGY. TWO CASES ARE POSSIBLE,E>V AND E<V (TUNNEL EFFECT). E,V CAN BE INPUT IN JOULES OR ELECTRONVOLTS. ALSO, THE PARTICLE VELOCITY CAN BE INPUT INSTEAD OF E.

138PROGRAM STEPS
FARRAN SHAW
UK - DERBY.

50862D 67-BUTTERWORTH BANDPASS-FILTER,

50862D (CONTD)

NARROWBAND, COUPLED RES.CIRC.

GIVEN DEGREE, CUTOFF FREQUENCIES, MAX. PASSBAND ATT. AND IMPEDANCE LEVEL, THE COMPONENT VALUES OF NODE OR MESH COUPLED RESONANT CIRCUIT NARROWBAND BANDPASS-FILTERS ARE FOUND. OPTIONAL CAPASITY IMPEDANCE LEVEL TRANSFORMATION IS INCLUDED.

194PROGRAM STEPS
NILS HAAHEIM
N - TRONDHEIM.

50863D 67-PARACHUTE-DROP

PROGRAM PROPOSES TO BALE OUT OF AN AIRPLANE. DROP POSITION AND ALTITUDE ARE KNOWN IN RELATION TO THE TARGET YOU WILL TRY TO HIT AT THE END OF YOUR FALL. CHOOSE THE MOMENT OF PARACHUTE OPENING DURING YOUR FREE-FALL. THEN TRY TO MOVE YOUR PARACHUTE BY TAKING WIND INTO CONSIDERATION. PENALISATIONS ARE TOTALIZED IF YOU DON'T HIT THE TARGET.

216PROGRAM STEPS
FRANCIS PARENT
F - STRASBOURG.

50864D 67-CLASSES SUMS AND PERCENTAGES FROM ORDERED-OR NOT-DATAS

INFERIOR LIMITS AND EFFECTIVES OF EQUAL WIDTH CLASSES BEING KNOWN FOR EACH INDIVIDUAL SAMPLE OF A COLLECTION-ORDERED OR NOT- FAST COMPUTATION OF CLASSES EFFECTIVES AND PERCENTAGES FOR THE TOTAL COLLECTION. ISOLATED DATAS CAN BE SIMULTANEOUSLY ENTERED.
FORTY CLASSES AVAILABLE USING P AND S REGISTERS.

073PROGRAM STEPS
ANDRE RIVIERE
F - BOURG-LA-REINE.

50865D 67-MOMENT OF INERTIA

INPUT: COORDINATES OF A SECTIONAL EREA (NEUTRAL AXIS UNKNOWN) COMPUTES THE AREA, THE CENTER OF GRAVITY AND THE MOMENTS OF INERTIA.

164PROGRAM STEPS
KURT HAGER
CH - UZNACH.

50866D 67-GUESSING COMBAT

WHO WILL FIND THE HIDDEN NUMBER IN LESS NUMBER OF GUESSES, YOU OR THE CALCULATOR? FIND THE ANSWER BY PLAYING THIS SIMPLY BUT INTERESTING GAME AGAINST THE COMPUTER. AFTER EACH GAME BOTH RESULTS ARE PRINTED AND NEW GAME IS SET UP AUTOMATICALLY BY THE CALCULATOR.

090PROGRAM STEPS
BRANKO SPOLJARIC
YU - ZAGREB.

50867D 97-REINFORCED CONCRETE RECTANGULAR SECTION UNDER PURE BENDING

GIVEN FOUR OF FIVE VARIABLES (DEPTH AND WIDTH OF SECTION, STRENGTH OF CONCRETE, TENSIVE REINFORCEMENT AND DESIGN MOMENT) PROGRAM COMPUTES FIFTH VARIABLE ACCORDING TO SOANISH LODE OF PRACTICE BASED ON ULTIMATE STRENGTH THEORY. EVENTUALLY COMPRESSIVE REINFORCEMENT IS COMPUTED.

218PROGRAM STEPS
SANDRO ROCCI
S - MADRID.

50868D 67-SPHERICAL TRIGONOMETRY

INPUT 3 ELEMENTS FROM SPHERICAL TRIANGLE WITH CORRESPONDING LABELS. ASK ANOTHER ELEMENT WITH CORRESPON-

50868D (CONTD)

DING LABELS.
PROGRAM GIVES THIS ELEMENT AND YOU CAN REPEAT THIS OPERATION 3 TIMES WITH THE SAME TRIANGLE.

222PROGRAM STEPS
PATRICE GEIGER
A - ARZEW.

50869D 67-HYPERBOLICS

THIS PROGRAM COMPUTES THE HYPERBOLIC FUNCTIONS AND THEIR INVERSES.

051PROGRAM STEPS
IVAN DE MARSANO
CH - LAUSANNE.

50870D 67-NUMBER TO NAME

PROGRAM STORES A NUMBER UP TO 12 FIGURES TO A NAME, CHARACTERIZED BY ITS FIRST 10 LETTRES AND RECALLS THE NUMBER ON REQUEST.
UP TO 12 PAIRS "NUMBER TO NAME" MAY BE STORED ON ONE DATA CARD.

075PROGRAM STEPS
DR. HEINZ RECHMANN
D - LEVERKUSEN.

50871D 67-HEAT OF FORMATION AND/OR COMBUSTION OF ORG. COMPOUNDS

THIS PROGRAM COMPUTES THE HEAT OF FORMATION AND/OR COMBUSTION OF ORGANIC COMPOUNDS (AT 298K), APPLYING THE BORN-HABER CYCLE. OF EACH BOND THE AVERAGE BOND-STRENGTHS WILL BE USED THROUGHOUT THE CALCULATIONS.

105PROGRAM STEPS
ARIE VAN ERK
NL-EINDHOVEN.

50872D 67-FOURIER COEFFICIENTS 5

THIS PROGRAM COMPUTES FOURIER COEFFICIENTS FOR FUNCTION WHICH HAS N PARTS (N <=5). YOU CAN GET K HARMONICS (K <= 10**09) FUNCTION OR PARTS OF FUNCTION ARE SET TASK WITH MATHEMATICAL SHEEP.

187PROGRAM STEPS
VELIMIR ILIJANIC
YU - ZAGREB.

50873D 67-PLOTTING FOURIER'S FUNCTION

YOU GET FOURIER COEFFICIENTS WITH PROGRAM (67-FOURIER COEFFICIENTS) AND YOU CAN PLOTTING FOURIER'S FUNCTION WHICH IS APPROXIMATIVELY YOUR FUNCTION. (MAX. FOR 7 HARMONICS).

131PROGRAM STEPS
VELIMIR ILIJANIC
YU - ZAGREB.

50874D 97-GUIDANCE BY PURE PURSUIT

THE PROGRAM COMPUTES THE FLIGHT-PATH OF A PURSUER P WHICH IS GUIDED BY THE GUIDANCE LAW OF PURE PURSUIT AND CHASES A CONSTANT VELOCITY NON-MANOEUVRING EVADER E. THE FOLLOWING DATA ARE EVALUATED FOR A SPECIFIED NUMBER OF POINTS OF THE TRAJECTORY: BEARING AND DISTANCE BETWEEN P AND E, TIME OF FLIGHT, (OPTIONAL:) RECTANGULAR COORDINATES OF P AND E, AND (OPTIONAL) TURNING RATE, CLOSE-IN RATE, TIME TO GO, AND DISTANCE TO GO.

218PROGRAM STEPS
PROF.DR.ING. FRANK DORRSCHEIDT
D - PADERBORN.

50875D 67-GEOMETRIC CURVE FITTING

PROGRAM COMPUTES THE COEFFICIENTS OF THE BEST CURVE A+B SIN X AFTER INPUTTING DATA PAIRS (X,Y). YOU

50875D (CONTD)

FIND ALSO THE CORRELATION COEFFICIENT R AND FOR GIVEN X'S, THE ESTIMATED Y'S.

083PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50876D 67-WALDS'CRITERION IN AGRICULTURE

THE PROGRAM SOLVES THE PROBLEM OF A FARMER WHO MUST TAKE A CHOICE BETWEEN TWO SEEDS WITH DIFFERENT YIELDS, DEPENDING THE TYPE OF THE EXPECTED SUMMER (DRY, NORMAL OR WET), TO WIN A MINIMUM PROFIT. THE CRITERION OF WALD IS USED.

173PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50877D 67-HP-MARRIAGE-BROKER

BOTH SUITORS OR CANDIDATES MUST ANSWER FOUR QUESTIONS ABOUT THE NECESSARY DEMAND IN EDUCATION, HEALTHINESS, FINANCIAL POSITION AND LOOK OF THE OTHER.
HP COMPUTES IN % THE CHANCE OF A GOOD MARRIAGE OR RELATIONSHIP.

112PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50878D 67-GEOMETRIC CURVE FITTING II

PROGRAM COMPUTES THE COEFFICIENTS A, B AND C OF THE BEST CURVE Y= A+B SIN X+C COS X AFTER INPUT OF N DATA PAIRS (Y,X).
YOU CAN ALSO COMPUTE THE EXPECTED Y FOR A GIVEN X.

155PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50879D 97-VISCOSITY-TEMPERATURE CURVE FITTING

FINDS THE BEST FIT, BY LEAST SQUARES, OF THE VOGEL-TAMMANN-FULCHER EQUATION TO A SET OF (VISCOSITY, TEMPERATURE) DATA. THE CONSTANTS IN THE EQUATION ARE CALCULATED AND THE REGRESSION COEFFICIENT INDICATING GOODNESS OF FIT MAY BE CALCULATED. EITHER TEMPERATURE OR LOG VISCOSITY MAY THEN BE ENTERED AND FURTHER VALUES LYING ON THE BEST FIT CURVE GENERATED.

221PROGRAM STEPS
MICHAEL CABLE
UK - SHEFFIELD.

50880D 67-EPHEMERIS CALCULATION FOR THE PLANETARY SYSTEM

BY INPUTTING THE ORBITAL DATA OF THE PLANET AND OF THE EARTH AT THE EPOCH, THE PROGRAM WILL CALCULATE THE ECLIPTICAL COORDINATES OF PLANET AND EARTH FOR A GIVEN DATE. THE OUTPUT INCLUDES THE EQUATORIAL COORDINATES OF THE PLANET AND SUN, THEIR DISTANCES FROM EARTH AND FURTHER,(SINCE THE MEAN-SUN POSITION IS ALSO CALCULATED)THE SIDEREAL TIME, CULMINATION TIME, AND TIME EQUATION. (ARISE AND SET DATA CAN BE EASILY COMPUTED FROM THE OUTPUT DATA).

309PROGRAM STEPS
CONSTANTIN CARPETIS
D - WOLFSCHLUGEN.

50881D 67-QD-ALGORITHM

THIS PROGRAM CAN BE USED FOR FINDING STARTING VALUES FOR THE NEWTON AND BAIRSTOWS METHODS.
PROGRAM COMPUTES SIMULTANEOUSLY APPROXIMATIONS FOR ALL ZEROES, REAL

50881D (CONTD)

OR COMPLEX, OF A POLYNOMIAL (N MAX=10).

202PROGRAM STEPS
MARTIN KAWALETZ
D - SALZGITTER.

50882D 67-MOLECULAR-WEIGHT AND PERCENTAGE DISTRIBUTION

THIS PROGRAM CALCULATES THE MULTIPLE ATOMIC WEIGHTS, THE TOTAL MW OF A COMPOUND AND THE PERCENTAGE DISTRIBUTION OF THE SINGLE ELEMENTS.

145PROGRAM STEPS
URS MARTI
CH - ZURICH.

50883D 67-LATTICE RECIPROCITY AND DIFFRACTION ANGLES

CALCULATES RECIPROCAL LATTICE PARAMETERS FROM DIRECT LATTICE PARAMETERS AND VICE VERSA FOR ANY CRYSTALLOGRAPHIC LATTICE TYPE (TRICLINIC SYSTEM). ALSO CALCULATES LATTICE PLANE SPACINGS, D, DIFFRACTION ANGLE, THETA, AND (SIN (THETA) **2) FOR PLANES WITH GIVEN INDICES H, K, L.

223PROGRAM STEPS
LARS KIHLBORG
S - STOCKHOLM.

50884D 67-LATTICE ANGLES: ANGLES BETWEEN DIRECTIONS AND PLANES

CALCULATES THE ANGLE BETWEEN TWO DIRECTIONS IN A GENERAL LATTICE (TRICLINIC SYSTEM) DEFINED BY THE UNIT CELL PARAMETERS A, B, C, ALPHA BETA, GAMMA, AND THE ANGLE BETWEEN TWO PLANES DEFINED BY THREE VECTORS IN THE SAME LATTICE. IF LATTICE IS RECIPROCAL AND THE TWO DIRECTIONS DEFINED BY MILLER INDICES THE ANGLE BETWEEN THEM IS THE SAME AS THE ANGLE BETWEEN THE CORRESPONDING PLANES IN THE DIRECT LATTICE.

223PROGRAM STEPS
LARS KIHLBORG
S - STOCKHOLM.

50885D 97-CONTINUOUS BEAM OF 2 TO 8 CONTINUOUS BEAM

THIS PROGRAM CALCULATES THE SUPPORT MOMENTS OF CONTINUOUS BEAM RESTING ON 3 TO 9 SUPPORTS WITH DIFFERENT SPANS. MOMENT OF INERTIA CAN BE DIFFERENT FROM SPAN TO SPAN. THE PROGRAM ACCEPTS DISTRIBUTED LOADS, TRAPEZIUM LOAD ON PART OF SPAN, POINT LOADS, MOMENTS, TEMPERATURE OR ANY COMBINATION OF ALL.

224PROGRAM STEPS
HANNES ROP
A - GRAZ.

50886D 67-VECTOR PROBLEMS

THIS PROGRAM CALCULATES THE FOLLOWING VECTOR PROBLEMS:
-POINT OF INTERSECTION OF A STRAIGHT LINE AND A PLANE -ANGLE BETWEEN A STRAIGHT LINE AND A PLANE -LINE OF INTERSECTION OF TWO PLANES -MINIMUM DISTANCE BETWEEN A POINT AND A PLANE -MINIMUM DISTANCE BETWEEN A POINT AND A STRAIGHT LINE - MINIMUM DISTANCE BETWEEN TWO STRAIGHT LINES.
ALL VECTORS MUST BE GIVEN IN RECTANGULAR COORDINATES.

432PROGRAM STEPS
ALEXANDER WEIGELT
CH - ST GALLEN.

50887D 97-DECLINING BALANCE METHOD

THIS PROGRAM CALCULATES THE DEPRECIATION WITH DECLINING BALANCE ME-

50887D (CONTD)

THOD FOR A GIVEN INVESTMENT, DEPRECIATION PERCENTAGE AND LIFETIME. THE PROGRAM PRINTS THE DEPRECIATION VALUE AS WELL AS THE NUMBER OF THE PERIOD (YEAR).

090PROGRAM STEPS
HANS-JOERG BLOY
D - MUENSTER.

50888D 67-BASE ROD MEASUREMENT SU 19 BASISLATTENMESSUNG

THE PROGRAM CALCULATES 4 DIFFERENT CASES:
1) BASE AT THE END OF DISTANCE,
2) BASE IN THE MID,
3) ASSISTANCE BASE AT THE END,
4) ASISTANCE BASE IN THE MID.
WITH THE MEAN SQUARE ERRORS OF THE MEASURED ANGLES IT IS POSSIBLE TO CALCULATE THE DIFFERET MEAN SQUARE ERRORS OF THE DISTANCES.

156PROGRAM STEPS
JOHANNES GRUSS
D - WIESBADEN.

50889D 67-TAPE RECORDER CONVERSIONS

THIS PROGRAM CONVERTS THE COUNTER DISPLAY (#) OF AN OPEN REEL TAPE RECORDER TO ELAPSED TIME (USEFUL FOR FITTING IN RECORDINGS AND FOR EDITING). INPUT DATA ARE SPEED, INNER AND OUTER DIAMETER OF REEL AND #-MAX. A TAPE'S CHARACTERISTIC MEASUREMENTS CAN BE RECALLED BY ENTERING ITS NUMBER (10 TAPES ON HALF DATACARD). THE PROGRAM ASSUMES THAT # IS PROPORTIONAL TO THE NUMBER OF REVOLUTIONS OF A REEL SINCE THREADING OF TAPE. SEVERAL RELATED CONVERSIONS.

112PROGRAM STEPS
PETER VAN DEN HAMER
NL - THE HAGUE.

50890D 67-NETWORK ANALYSIS DATA INPUT

THE PROGRAM STORAGES THE INPUT DATA REQUIRED FOR THE PROGRAM "NETWORK ANALYSIS" (50105D). THE INPUT DATA (BRANCH IMPEDANCES AND INPUT VOLTAGE) ARE AUTOMATICALLY CALLED FROM THE PROGRAM.
ADDITIONALLY IT HAS A CORRECTION KEY AND EVERY BRANCH IS ADDRESSABLE

220PROGRAM STEPS
MARIO CA'ZORZI
D - MUNICH.

50891D 67-CONVERSION OF SI-UNITS AND NON-METRIC UNITS

THE PROGRAM CONVERTS DATA INTERCHANGEABLY BETWEEN SI AND NON-METRIC UNITS: SQ.MM, SQ.CM, SQ.M, SQ.INCH, SQ.FT, SQ.YD, SQ. CHAIN, SQ.PERCH, ARE AND ACRES.
ADDITIONAL FACTORS ARE LISTED IN LENGTH, MASS, TIME, ANGLE, PRESSURE VOLUME AND VELOCITY FOR THE MOST COMMONLY REQUIRED CONVERSIONS.

094PROGRAM STEPS
M. HOOIJBERG
NL - DRUNEN.

50892D 97-FORM TOOL CORRECTION

PROGRAM GIVES DIMENSIONS FOR THE GRINDING OF FORM TOOLS WHEN TURNING TWO OR MORE DIAMETERS.
DATA ON HEIGHTS OF TOOL ABOVE WORKPIECE CENTRE AND CLEARANCE ANGLES ALSO CALCULATED.

134PROGRAM STEPS
PETER FREDERICK CRAWLEY
UK - PORTSMOUTH.

50893D 97-B 6000/B 7000 NUMBER CONVERSION

THIS PROGRAM CONVERTS A BURROUGHS

50893D (CONTD)

(B 6000/B 7000 SERIES) INTERNAL REPRESENTATION OF A NUMBER (FIXED POINT OR FLOATING POINT, INPUTTED AS 12 HEXADECIMAL DIGITS) INTO ITS DECIMAL EQUIVALENT.

143PROGRAM STEPS
A.J.S. DELCROIX
B - MONS.

50894D 97-IBM/370 FLOATING POINT CONVERSION

THIS PROGRAM CONVERTS AN IBM/370 INTERNAL REPRESENTATION OF A FLOATING POINT (INPUTTED AS 8 HEXADECIMAL DIGITS) INTO ITS DECIMAL EQUIVALENTS.

120PROGRAM STEPS
A.J.S. DELCROIX
B - MONS.

50895D 67-REGULAR POLYGON AND CIRCLE APPROXIMATION

PROGRAM CALCULATED ANGLE (DEG,RAD, GRD) SIDE LENGTH, PERIMETER AND AREA, INTERIOR AND EXTERIOR RADIUS AND DIFFERENCES TO A CIRCLE IN PERCENT.

110PROGRAM STEPS
RAINER JUNGE
D - RODERMARK-URBERACH.

50896D 67-ANALYSIS OF FACTORIAL EXPERIMENTS (2 OR 3 FACTORS)

THIS PROGRAM COMPUTES THE EFFECTS AND INTERACTIONS OF 2 OR 3 FACTORS IN A 2**2- OR 2**3- DESIGN AND TESTS THE SIGNIFICANCE OF THE EFFECTS.

195PROGRAM STEPS
MANFRED DR. SOFFTGE
D - WEINHEIM.

50897D 67-ESP TESTER

DO YOU THINK YOU HAVE THE "EYE" FOR THE FUTURE. HAVE YOU ESP (EXTRASENSORY PERCEPTION). SEE IT FOR YOURSELF WITH THIS TEST PROGRAM. AFTER EACH TEST CALCULATOR WILL PRINT (PAUSE) THE QUALITY OF YOUR ESP AND IT WILL PREPARE NEW TEST AUTOMATICALLY.

084PROGRAM STEPS
BRANCO SPOLJARIC
YU - ZAGREB.

50898D 67-COIL MEASUREMENTS-BRIDGE METHODS

PROGRAM CALCULATES RX AND LX OF A COIL BY USING ANY OF 4 BRIDGE METHODS.
1. MAXWELL BRIDGE
2. OWEN BRIDGE
3. HAY BRIDGE
4. ANDERSON BRIDGE

125PROGRAM STEPS
BRANCO SPOLJARIC
YU - ZAGREB.

50899D 67-CHESS TIMER

CALL YOUR FRIENDS TO SURPRISING CHESS PARTY. SURPRISE THEM WITH YOUR ELECTRONIC CHESS TIMER. NO ADJUSTING NEEDED. ACCURACY OF +/- 0.5 SECONDS IN 15 MINUTES. PROGRAM IS NOT ONLY TWO PLAYER APPLICABLE. YOU CAN SIMPLY CHANGE IT FOR UP TO 5 PLAYERS.

044PROGRAM STEPS
BRANCO SPOLJARIC
YU - ZAGREB.

50900D 97-INFLUENCE LINES OF SUPPORT-MOMENTS OF CONTINUOUS BEAMS(7SP)

50900D (CONTD)

THE PROGRAM COMPUTES THE INFLUENCE-LINES OF SUPPORT-MOMENTS, CONSOLES INCLUDED, UP TO 7 SPANS AND LISTS THEM UP. AFTER THE INPUT OF NUMBER OF SPANS, NUMBER OF COMPUTED POINTS AND LENGTHS OF SPANS THE PROGRAM DOES ALL AUTOMATICALLY.

224PROGRAM STEPS
HANSPETER BERNET
CH - BERN.

50901D 97-STOCK DEMAND SIMULATOR

USING MONTECARLO TECHNIQUE INVOLVING RANDOM NUMBERS GENERATION, PROGRAM SIMULATES DEMAND WITHIN SUPPLY PERIOD (I.E. NECESSARY STOCK) GIVEN PROBABILITIES OF SUPPLY PERIOD DURATION (3 LEVELS) AND DEMAND PER TIME UNIT (9 LEVELS) PRINTOUT OF SIMULATION RESULTS IS OBTAINED, AND ALSO DATA FOR A 10-CELL FREQUENCY HYSTOGRAM OF SAID RESULTS.

102PROGRAM STEPS
SANDRO ROCCI
SP - MADRID.

50902D 67-RIGID CIRCULAR FOUNDATION

PROGRAM ANALYZES A RIGID CIRCULAR FOUNDATION UNDER VERTICAL AND HORIZONTAL FORCES AND BENDING MOMENT APPLIED AT THE UPPER SURFACE INCLUDING THE WEIGHT OF THE MAT ITSELF. RESULTS ARE MAXIMUM AND MINIMUM STRESSES (IN THE CASE OF NO SOIL-MAT SEPARATION), MAXIMUM STRESS AND SEPARATION LENGTH OR INDICATION OF OVERTURNING, DATA ARE VERIFIED BY THE PROGRAM FOR ACCEPTABILITY.

184PROGRAM STEPS
JESUS FIERRO
SP - MADRID.

50903D 67-MAX MOMENT IN SIMPLE SUPPORTED BEAM UNDER TRAIN OF LOADS

THIS PROGRAM COMPUTES, FOR A SIMPLE SUPPORTED BEAM, A POSITION WHERE A TRAIN OF PUNCTUAL LOADS CAUSE THE MAX BENDING MOMENT.

100PROGRAM STEPS
ROMANO BRUNO
I - GENOVA.

50904D 67-GEO-LOG CURVE-FIT 1

PROGRAM COMPUTES THE COEFFICIENTS A, B, C AND D OF THE BEST FITTING CURVE Y= A+B SIN X+C COS X+D LN X AFTER THE INPUT OF N DATA-PAIRS (X,Y) YOU CAN ALSO COMPUTE THE EXPECTED Y FOR A GIVEN X.

216PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50905D 67-GEO-LOG CURVE-FIT 2

THIS PROGRAM COMPUTES THE COEFFICIENTS A, B, C AND D OF THE BEST FITTING CURVE Y= A+B SIN X+C TAN X+D LN X AFTER THE INPUT OF N DATA-PAIRS (X,Y) YOU CAN ALSO COMPUTE THE EXPECTED Y FOR A GIVEN X.

216PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50906D 67-GEOMETRIC CURVE FITTING - 3

PROGRAM COMPUTES THE COEFFICIENTS A, B AND C OF THE BEST FITTING-CURVE Y= A*X+B SIN X+C COS X AFTER THE INPUT OF N DATA PAIRS (X,Y) YOU CAN ALSO COMPUTE THE EXPECTED Y FOR A GIVEN X.

164PROGRAM STEPS
JOHN VAN THIELEN

50906D (CONTD)

B - STABROEK.

50907D 67-GEOMETRIC CURVE FITTING - 4

PROGRAM COMPUTES THE COEFFICIENTS A, B, C AND D OF THE BEST FITTING CURVE Y= A+B SIN X+C COS X+D TG X, AFTER THE INPUT OF N DATA PAIRS. YOU CAN ALSO COMPUTE THE EXPECTED Y FOR A GIVEN X.

224PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50908D 67-GEOMETRIC CURVE FITTING - 5

PROGRAM COMPUTES THE COEFFICIENTS A, B AND C OF THE BEST FITTING CURVE Y= A SIN X+B SIN 2X+C SIN 3X, AFTER THE INPUT OF N DATA PAIRS (X, Y) YOU CAN ALSO COMPUTE THE EXPECTED Y'S FOR A GIVEN X'S.

173PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50909D 67-GEOMETRIC CURVE FIT - 6

THE PROGRAM COMPUTES THE COEFFICIENTS A, B, C AND D OF THE BEST FITTING CURVE Y= A SIN X+B SIN 2X+ C SIN 3X+D SIN 4X, AFTER INPUT OF N DATA PAIRS (X,Y).

223PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50910D 67-GAUSSIAN DISTRIBUTION

AFTER THE INPUT OF N DATA PAIRS (X,Y), THE PROGRAM COMPUTES THE Y MAX (X=0) OF THE GAUSSIAN DISTRIBUTION CURVE YOU CAN ALSO COMPUTE EXPECTED Y'S WITH GIVEN X'S.

111PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50911D 67-ROOTS OF A PROBABILITY

THE PROGRAM FORMS FIRST A RANDOM NUMBER FIELD (MATRIX 4X4) WITH NUMBERS OF 1, 2 OR 3 FIGURES AND AFTER THAT FOUR EQUATIONS IN FOUR UNKNOWNS AND COMPUTES AT LEAST SOLUTION OF THIS SYSTEM.

223PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50912D 67-ANGLE BETWEEN TWO SURFACES

PROGRAM COMPUTES THE ANGLE BETWEEN TWO SURFACES AX2+BY2+CZ2=D AND EX2+FY2+GZ2=H IN A POINT (P)(P,Q,2) THAT BELONGS TO BOTH SURFACES.

224PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50913D 67-SUPER RADAR FOR SUPER PERISCOPE

PROGRAM IS A SUPPLEMENT TO PROGRAM # 50850D (SUPER PERISCOPE). IT WILL TELL YOU THE RIGHT MOMENT TO FIRE A TORPEDO(IT WILL NEVER MISS!) AND THE TONNAGE YOU WILL SINK. THIS IS AVAILABLE FOR ANY OF THE THREE MODES IN S.P. GAME. PROGRAM HAS THE THREE MODES OF SPEED, EXACTLY AS IN THE MAIN "GAME" PROGRAM.

130PROGRAM STEPS
PIERRE PIRAUX
B - MARCINELLE.

50914D 67-WEIGHTED CURVE FITTING

PROGRAM ALLOWS FOR FITTING LINEAR, EXPONENTIAL, LOGARITHMIC AND POWER FUNCTIONS. ALTHOUGH ITS HANDLING IS QUITE SIMILAR TO STANDARD PAC SD-0317, IT'S QUITE ANOTHER PROGRAM BESIDES XI AND YI, YOU INPUT THE STANDARD ERRORS OF YI. THE PROGRAM WILL WEIGHT THE DATA POINTS BY THESE ERRORS, AND WILL COMPUTE THE STANDARD ERRORS FOR THE COEFFICIENTS A AND B.

222PROGRAM STEPS
ERICH EHSES
D - BONN.

50915D 67-PHOTO FUNCTIONS 1: DENSITY, APERTURE, COSINE LAW LIGHTLOSS

THREE PROGRAMS:
1) FOR QUANTITATIVE PHOTOGRAPHY AND DENSITOMETRY CONVERTS ANY ONE OF DENSITY, EXPOSURE FACTOR, % ABSORPTION, EXPOSURE VALUE (EV) DIFFERENCE AND % TRANSMISSION INTO ANY OR ALL OF THE OTHERS;
2) CONVERTS F-STOP APERTURE OF A LENS INTO NUMERICAL APERTURE AND VICE VERSA;
3) CALCULATES COSINE LAW REDUCTION OF BRIGHTNESS IN MARGINS OF AN IMAGE FORMED BY A LENS.

165PROGRAM STEPS
L. ANDREW MANNHEIM
UK - RICHMOND/SURREY.

50916D 67-CURRENCY EXCHANGE CONVERSION - I

INTENDED PRIMARILY FOR INTERNATIONAL MONEY DEALS, THE PROGRAM CONVERTS ANY ONE OF EIGHT CURRENCIES INTO ANY OR ALL OF THE OTHER, AUTOMATICALLY ALLOWING FOR BUYING/ SELLING RATE DIFFERENCE AND BANK COMMISSION. CONVERSIONS GO VIA A BANK CURRENCY (E.G. STERLING IN BRITAIN) AGAINST WHICH EXCHANGE RATES ARE QUOTED LOCALLY. RATES ARE READ INTO REGISTERS FROM UPDATABLE DATA CARDS. ANY NUMBER OF ADDITIONAL CURRENCIES CAN BE HANDLED WITH FURTHER DATA CARDS, AND CARDS CHANGED DURING CALCULATION.

204PROGRAM STEPS
L. ANDREW MANNHEIM
UK - RICHMOND/SURREY.

50917D 67-CURRENCY EXCHANGE CONVERSION -II

PROGRAM CONVERTS ANY ONE OF 10 CURRENCIES INTO ANY OTHER, WITH CONVERSION RATES ENTERED ON UPDATABLE DATA CARDS. SIMILAR TO CURRENCY EXCHANGE CONVERSION I PROGRAM, BUT DESIGNED MAINLY FOR STATISTICAL AND ECONOMIC CONVERSIONS RATHER THAN MONEY BUSINESS DEALS. DIFFERS FROM CEC I PROGRAM IN PROVIDING 10 CURRENCIES PER DATA CARD, SIMPLER DATA ENTRY (MEAN RATES, NOT BUYING/ SELLING), NO COMMISSION, NO SPECIAL PRINTOUT. PERMITS DATA CARD CHANGE DURING CALCULATION.

222PROGRAM STEPS
L. ANDREW MANNHEIM
UK - RICHMOND/SURREY.

50918D 67-PHOTO FUNCTIONS 2: EXPOSURE,ETC.

THE PROGRAM COVERS CAMERA SETTINGS OF PHOTOGRAPHIC EXPOSURE AND COMPUTES:
1) ANY ONE OF EXPOSURE VALUE (EV), LENS STOP AND EXPOSURE TIME FROM THE OTHER TWO;
2) ANY ONE OF EV, FILM SPEED IN ASA AND SUBJECT LUMINANCE IN CANDELAS PER SQ. METRE FROM THE OTHER TWO;
3) EV AND F-STOP FROM ANOTHER F-STOP AND EXPOSURE FACTOR AND VICE VERSA;
4) EV FROM EXPOSURE FACTOR AND VICE VERSA.

163PROGRAM STEPS
L. ANDREW MANNHEIM
UK - RICHMOND/SURREY.

50919D 67-PHOTO PROJECTION FUNCTIONS

FOR SLIDE AND FILM PROJECTION, THE PROGRAM COMPUTES ANY ONE OF TRANSPARENCY FORMAT, FOCAL LENGTH OF PROJECTION LENS, PROJECTION DISTANCE AND SCREEN SIZE FROM ANY COMBINATION OF THE OTHER THREE PARAMETERS. OPTIONALLY, DIMENSIONS OF MOST STANDARD SLIDE AND NARROW-GAUGE MOTION PICTURE FORMATS CAN BE CALLED UP FOR CALCULATIONS BY INPUT CODES. PROGRAM FURTHER GENERATES TABULATIONS OF PROJECTION DATA WITH VARIOUS AUTOMATIC INCREMENTATION OPTIONS.

210PROGRAM STEPS
L. ANDREW MANNHEIM
UK - RICHMOND/SURREY.

50920D 67-TCHEBYCHEFF BANDPASS-FILTER, NARROWBAND, NODE-COUPLED

GIVEN DEGREE, CUTOFF FREQUENCIES, MAX. PASSBAND ATT. AND IMPEDANCE LEVEL, THE COMPONENT VALUES OF NODE COUPLED RESONANT CIRCUIT NARROWBAND BANDPASS-FILTERS OF THE TCHEBYCHEFF TYPE ARE FOUND. OPTIONAL CAPCITIVE IMPEDANCE LEVEL TRANSFORMATION IS INCLUDED.

164PROGRAM STEPS
NILS HAAHEIM
N - TRONDHEIM.

50921D 67-TCHEBYCHEFF BANDPASS-FILTER, NARROWBAND, MESH-COUPLED

GIVEN DEGREE, CUTOFF FREQUENCIES, MAX. PASSBAND ATT. AND IMPEDANCE LEVEL, THE COMPONENT VALUES OF MESH COUPLED RESONANT CIRCUIT NARROWBAND BANDPASS-FILTERS OF THE TCHEBYCHEFF TYPE ARE FOUND. OPTIONAL CAPACITIVE IMPEDANCE LEVEL TRANSFORMATION IS INCLUDED.

164PROGRAM STEPS
NILS HAAHEIM
N - TRONDHEIM.

50922D 67-LOTTERY: M INTEGERS OUT OF N INTEGERS

CALCULATES 21 OR LESS DIFFERENT NUMBERS OUT OF N NUMBERS FROM 1 TO N. WHEN MORE NUMBERS (UNLIMITED) ARE NEEDED, THE CHANCE FOR HAVING A NUMBER TWICE IS REDUCED (YOU NEED DATA CARDS).
MAY BE INTERESTING FOR A CRITICAL STATISTICAL STUDY.

137PROGRAM STEPS
PASCAL DEBOECK
B - VILVOORDE.

50923D 67-TWO POINT PROBLEM (360 DEGREES OR 400 G SYSTEM)

THIS TWO-POINT RE-SECTION PROGRAM USES THE COTANGENT FORMULA AND THE ANGLES OBSERVED. P1 AND P2 ARE FIXED POINTS, THE COORDINATES OF WHICH ARE KNOWN. THESE POINTS ARE INACCESSIBLE, BUT VISIBLE FROM P3, THE POSITION OF WHICH IS REQUIRED IN COORDINATES. THE PROBLEM MAY BE SOLVED BY INTRODUCING AN AUXILIARY POINT P4, VISIBLE FROM P3 AND FROM WHICH P1, P2 AND P 3 ARE VISIBLE. THE ANGLES AT P1 AND P2 MAY BE DEDUCED, AND P3 (AND P4) ARE COORDINATED BY MEANS OF THE PROGRAM (INTERSECTION).

201PROGRAM STEPS
M. HOOIJBERG
NL - DRUNEN.

50924D 67-MOON LINE OF POSITION

THIS SELF CONTAINED, LONG TERM PROGRAM COMPUTES A LINE OF POSITION (INTERCEPT AND AZIMUTH) FROM DEAD RECKONING POSITION, SEXTANT ALTITU-

50924D (CONTD)

DE OF THE MOON (LOWER OR UPPER LIMB), HEIGHT OF THE OBSERVER AND GREENWICH MEAN TIME OF THE OBSERVATION. PRECISION FOR THE NEXT CENTURY IS BETTER THAN A NAUTICAL MILE EXECUTION TAKE LESS THAN FOUR MINUTES. SIX CARDS WITH AUTOMATIC CALL. INCORPORATE REFRACTION, HEIGHT, PARALLAX AND SEMI-DIAMETER CORRECTIONS.

999PROGRAM STEPS
WIGET FRIDOLIN JUNIOR
CH - NEUCHATEL.

50925D 97-LINEAR SECOND ORDER BOUNDARY VALUE PROBLEM

THIS PROGRAM SOLVES BY FOURTH-ORDER RUNGE-KUTTA INTEGRATION BOUNDARY VALUE PROBLEMS (FIRST, SECOND AND THIRD KIND) OF LINEAR SECOND ORDER DIFFERENTIAL EQUATIONS. COMPUTING METHOD IS NON-ITERATIVE AND THEREFORE FASTER THAN SOLUTIONS BY ITERATION. 90 PROGRAM STEPS AND 7 REGISTERS ARE AVAILABLE FOR DEFINING THE DIFFERENTIAL EQUATION.

134PROGRAM STEPS
GERHARD SCHWESINGER
D - HEIDENHEIM.

50926D 67-RCL-CIRCUITS

PROGRAM OPERATES WITH 13 FUNCTIONS: RC- OR RL- OR LC-CIRCUITS, HIGH- OR LOWPAS FILTERS, RC- OR PHOSE-SHIFTING GENERATORS, RESONANT CIRCUITS AND ALL EQUATIONS: A=L*(B**M)*(C**N), WHERE ONE OF THE VARIABLES A, B OR C MAY BE UNKNOWN AND L, M, N ANY CONSTANTS.

107PROGRAM STEPS
HORST VOELZ
D - BERLIN.

50927D 67-SPHERE CIRCLE

PROGRAM CALCULATE RADIUS,DIAMETER, CIRCUMFERENCE,CIRCULAR AREA, SURFACE AND VOLUME BY ONLY ONE INPUT OF IT.

079PROGRAM STEPS
HORST VOELZ
D - BERLIN.

50928D 97-EIGHT-FIELD-BEAM

THE PROGRAM COMPUTES THE SUPPORT AND FIELD MOMENTS, SUPPORT REACTIONS AND TRANSVERS FORCES AT THE SUPPORTS FOR UNIFORMLY DISTRIBUTED LOAD. LOAD, SPAN LENGTH AND MOMENT OF INERTIA CAN BE DIFFERENT FROM SPAN TO SPAN.

375PROGRAM STEPS
SVEN-AKE BLOMGREN
S - GOTEBORG.

50929D 67-ACROBATIC DIGITS

PROGRAM FIRST OUTPUTS RANDOM 9-DIGIT NUMBER MADE UP OF DIGITS 1 TO 9. LOGICIAN AIMS TO OBTAIN 1234 56789(BY "ASKING" CALCULATOR TO REVERSE A GIVEN NUMBER OF DIGITS FROM LEFT-OR RIGHT-HAND END) IN THE LEAST NUMBER OF REVERSALS. ONCE SUCCESSFUL, PROGRAM OUTPUTS NEW NUMBER WITH DIGITS 1-9 IN ANOTHER RANDOM ORDER.

224PROGRAM STEPS
ROBERT LESLIE MACEY
UK - HULL/YORKSHIRE.

50930D 67-ARITHMETIC PRACTICE

THE PROGRAM PROVIDES 8 ROUTINES IN THE FOUR RULES OF ELEMENTARY POSITIVE-INTEGER ARITHMETIC. IN ADDITION TO THE ROUTINES AVAILABLE ON THE STANDARD PAC PROGRAM (ARITHMETIC TEACHER) THIS PROGRAM GIVES PRACTICE IN SPECIFIED (BY THE USER) MULTIPLICATION AND DIVISION TABLES, ADDITION NUMBER BONDS, AND ALSO SUPPLIES A GENERAL FOUR-OPERATION ARITHMETIC QUIZ.

217PROGRAM STEPS
JOHN PHELAN
UK - CHESSINGTON/SURREY.

50931D 97-MATRIX MULTIPLICATION

GIVEN MATRIX A AND MATRIX B THE PROGRAM CALCULATES MATRIX C = A BY B. TWO OPTIONS ARE AVAILABLE: IN NORMAL MODE A MAXIMUM OF 20 ELEMENTS CAN BE HANDLED; IN INTEGER MODE THIS MAXIMUM IS 60, IN EXCHANGE OF SOMEWHAT SLOWER EXECUTION. PROGRAM HANDLES ANY TWO MATRICES, PROVIDED THE NUMBER OF COLUMNS OF A EQUALS THE NUMBER OF ROWS OF B.

221PROGRAM STEPS
HEIN J. ONKENHOUT
NL - LEIDEN.

50932D 67-STAR MAGNITUDES

GIVEN THE APPARENT MAGNITUDE AND DISTANCE (IN PARSECS), THE ABSOLUTE MAGNITUDE OF A STAR IS CALCULATED. FOR A GROUP OF STARS THE ABSOLUTE MAGNITUDES ARE OUTPUT IN ORDER, BEGINNING WITH THE SMALLEST ABSOLUTE MAGNITUDE (BRIGHTEST STAR). CORRESPONDING APPARENT MAGNITUDES AND DISTANCES ARE ALSO OUTPUT. PARALLAX CAN BE INPUT INSTEAD OF DISTANCE. INTERSTELLAR DUST IS NOT TAKEN INTO ACCOUNT.

220PROGRAM STEPS
FARRAN SHAW
UK - DERBY.

50933D 67-KLINGON'S CAPTURE

IN THIS ONE PERSON GAME, YOU HAVE TO CAPTURE A KLINGON VESSEL MOVING AT RANDOM THROUGH A 8 BY 8 GALAXY BY SURROUNDING HIM WITH MINES. THE KLINGON CANNOT PASS THROUGH A MINE. IT CAN FIRE BACK BUT YOU MAY ALSO BE HELPED BY RANDOM SUPERNOVAE. YOU MIGHT BE SURPRISED BY THE KLINGON'S "6TH SENSE" IN ESCAPING YOUR MINES. BUT DO NOT FORGET THAT YOU MUST NOT DESTROY IT

224PROGRAM STEPS
PHILIPPE ALLIAUME
F - DESCARTES.

50934D 67-PAIR-COUPLED 3-VARIABLE INTERCH. SOLUTION CONTROL LOGIC

THIS SKELETON PROGRAM CONTAINS ALL THE CONTROL LOGIC FOR TWO COUPLED 3-VARIABLE INTERCHANGEABLE SOLUTION PROGRAMS OF THE KIND C=FUNCTION, (A,B)=FUNCTION (D,E). USER ONLY HAS TO INSERT ACTUAL FUNCTION KEYSTROKES TO COMPLETE PROGRAM. A FLAG ROUTINE SELECTS THE APPROPRIATE CALCULATION ROUTINE FOR C ACCORDING TO WHETHER A, B OR D, E ARE INPUT. TWO PROGRAM VERSIONS FOR FUNCTIONS INSERTED AS LABELS OR ADDED AS MERGED SUBROUTINES.
EACH ACCOMODATES SIX FUNCTIONS.

054PROGRAM STEPS
L. ANDREW MANNHEIM
UK - RICHMOND/SURREY.

50935D 67-MOTION PICTURE FRAMING RATES

PROGRAM CALCULATES RUNNING PARAMETERS INVOLVED IN EXPOSING AND PROJECTING MOTION PICTURE FILM OF STANDARD AND NARROW GAUGES: RUNNING TIME, SPEED IN FRAMES/SECOND OR TIME/FRAME, FILM LENGTH IN FEET OR METERS, NUMBER OF FRAMES, FROM ANY TWO OF THESE PARAMETERS. FILM GAUGES ARE CALLED UP BY FORMAT CODES. PROGRAM ALSO COMPUTES FRAMING TIME INTERVALS FOR TIME LAPSE FILMING AND HIGH SPEED/SLOW MOTION.

127PROGRAM STEPS
L. ANDREW MANNHEIM
UK - RICHMOND/SURREY.

50936D 67-COLEBROOK'S FORMULA (VISCOUS FLOW THROUGH CYLINDRICAL PIPE)

PROGRAM CALCULATES ANY COUPLE OF THE 4 VARIABLES H (HEAD LOSS),V (VELOCITY),D (DIAMETER),Q (CAPACITY THE OTHER COUPLE BEING GIVEN. METRIX, US OR UK UNITS MAY BE SELECTED. PIPE LENGTH AND RESISTANCE COEFFICIENTS OF FITTINGS (VALVES, ELBOWS,ETC.) ARE TO BE ENTERED. FLUID VISCOSITY AND DENSITY, INSIDE PIPE WALL ROUGHNESS, MAY BE ENTERED IF DIFFERENT FROM DEFAULT DATAS, CORRESPONDING TO AN USUAL CASE (WATER AT 20 DEGREES CENTIGRADE, CONCRETE PIPE).

224PROGRAM STEPS
MICHEL DE VALS
F - AIS-EN-PROVENCE.

50937D 97-HISTOGRAM-PLOTTER

THE PROGRAM ALLOWS THE STORAGE OF UP TO 38 DIFFERENT FREQUENCY VALUES THEIR LISTING AND THE LISTING OF THEIR SUMS, THE CALCULATION OF THE TOTAL SUM, MEDIUM VALUE AND STANDARD DEVIATION, THE LISTING OF THE RELATIVE VALUES AND THEIR SUMS, AND THE GRAPHICAL REPRESENTATION IN A HISTOGRAM OF VIRTUALLY UNLIMITED FORMAT USING A SCANNING METHOD.
A GROUPING OF INTERVALS IS POSSIBLE AS WELL AS A SCALE ADJUSTMENT. THE STORED VALUES ARE NOT CHANGED BY THE PROGRAM.

224PROGRAM STEPS
DR. PETER MANOGG
I - CASCIAGO.

50938D 97-HYDROPOWER CALCULATIONS

PROGRAM PERFORMS BASIC CALCULATIONS CONCERNING HYDRO-POWER STATIONS. FROM THE FOUR VALUES HEAD (H), WATER-FLOW (Q), EFFICIENCY, AND POWER (P), THE MISSING ONE IS CALCULATED IF THREE VALUES ARE KNOWN. EITHER METRIC VALUES (M-1/S-KW) OR IMPERIAL VALUES (FT-CUFT/SEC-HP) MIGHT BE USED.

087PROGRAM STEPS
ROLAND REICHEL
DAR ES SALAAM / TANZANIA.

50939D 67-RIEMANN FUNCTIONS

THIS PROGRAM COMPUTES THE BETA, ETA LAMBDA AND ZETA RIEMANN FUNCTIONS. THE PROGRAM ALLOWS THE CONTROL OF THE PRECISION.

106PROGRAM STEPS
A.J.S. BELCROIX
B - MONS.

50940D 97-EULER TRANSFORMATION

GIVEN A FUNCTION F, THIS PROGRAM COMPUTES THE SUM OF F(I) FOR I FROM ZERO UP TO INFINITY BY MEANS OF A SUITABLY REFINED EULER TRANSFORMATION.
THE SUMMATION IS STOPPED AS SOON AS 2 TIMES IN SUCCESSION THE ABSOLUTE VALUE OF THE TERMS OF THE TRANSFORMED SERIES ARE FOUND TO BE LESS THEN 10**-6. THE PROGRAM IS PARTICULARLY EFFICIENT IN THE CASE OF A SLOWLY CONVERGENT OR DIVERGENT ALTERNATING SERIES.

099PROGRAM STEPS
T.J. DEKKER
NL - AMSTERDAM.

50941D 97-SHIPS FOR TWO

YOU CAN PLAY IN SEVERAL WAYS. LIMITED ONLY FOR YOUR IMAGINATION. A WAY: HUMAN KEY THE NUMBERS (1,2, 3,4,5) IN A 4X4 MATRIX. EACH PLAYER MAY FIND + IF MEMORY IS EMPTY?1 POINT. +IF THE NUMBER IS EQUAL OR INEQUAL?2 POINTS +WHAT NUMBER IS?4 POINTS.

167PROGRAM STEPS
PEDRO DE LA SERNA
SP - UTRERA(SEVILLA).

50942D 97-SLALOM-RESULTS

DURING FIRST RACE INPUT THE RACE-TIMES. THE PROGRAM DISPLAYS THE RANK OF THE RUNNER.THE RANKING LIST CAN BE PRINTED AT EVERY MOMENT. RUNNERS THAT ARE ELIMINATED AFTER THE FIRST RACE, CAN BE ELIMINATED FROM THE RANKING-LIST. HIGH START-NUMBERS WITH GOOD RESULTS CAN BE INTRODUCED IN THE RANKING-LIST. THE START-LIST FOR THE SECOND RACE IS PRINTED (WORLD-CUP-FORMULA). THE TIME FOR WINNING AND THE MOMENTARY RANK IS DISPLAYED.

202PROGRAM STEPS
HANSPETER BERNET
CH - BERN.

50943D 67-NORMAL DISTRIBUTION

THE PROGRAM EVALUATES: -THE CUMULATIVE DISTRIBUTION FUNCTION F BELOW A GIVEN LOWER VARIATE,BETWEEN TWO VARIATES AND ABOVE AN UPPER VARIATE -THE SYMMETRICAL VARIATES BETWEEN WHICH A GIVEN VALUE OF F LIES.-THE DENSITY FUNCTION F FOR A GIVEN VARIATE.-THE STANDARD DEVIATION.-THE MEAN, IF THE STANDARD DEVIATION, A LOWER VARIATE AND THE VALUE OF F BELOW THE LOWER VARIATE ARE GIVEN. -THE MEAN, IF THE STANDARD DEVIATION,AN UPPER VARIATE AND THE VALUE OF F ABOVE THE UPPER VARIATE ARE GIVEN.

224PROGRAM STEPS
DIETER SOINE
D HANNOVER.

50944D 67-FASTER FACTORING AND STORING OF PRIMES AND THEIR EXPONENTS

GIVEN A POSITIVE INTEGER N<10**9 FINDS AND STORES ITS PRIME FACTORS AND THEIR EXPONENTS AND DISPLAYS THEM. SPEED HAS BEEN NOTABLY INCREASED IN RELATION TO SOME OTHER SIMILAR PROGRAMS.

133PROGRAM STEPS
ISMAEL GONZALEZ ROLDAN
SP - ALBACETE.

50945D 97-SEQUENTIAL ANALYSIS

GIVEN INPUT OF ACCEPTABLE/NON ACCEPTABLE QUALITY, CONSUMERS AND PRODUCERS RISK OR ADDS RATIO STANDARD/EXPERIMENTAL PROCESS AND ACCEPT/REJECT RISKS, PROGRAM WILL CALCULATE A SEQUENTIAL ANALYSIS SCHEME.
OPERATING CHARACTERISTIC AND AOQ CEN BE CALCULATED.

193PROGRAM STEPS
BART ONKENOUT
NL - BLARICUM.

50946D 97-TARGET FINANCE STRUCTURE

PROGRAM CALCULATES OPTIMAL THEORETICAL FINANCE STURCTURE OF A COMPANY. CERTAIN ASSUMPTIONS ARE MADE AS TO PERCENTAGE TO BE FINANCED BY EQUITY, LONG TERM DEBT AND SHORT TERM DEBT FOR EACH CATEGORY OF ASSESTS.
FROM THE IDEAL FINANCE STRUCTURE THE REQUIRED PROFIT CAN BE CALCULATED.

50946D (CONTD)

224PROGRAM STEPS
BART ONKENHOUT
NL - BLARICUM.

50947D 67-HEAT OF REACTION AND K FOR ANY TEMPERATURE

PROGRAM COMPUTES "DELTA H DEGREE T" (HEAT OF REACTION) AT A PARTICULAR TEMPERATURE BY USING KIRCHHOFF EQUATION AND THE CONSTANT OF EQUILIBRIUM "K" BY USING 'VAN'T' HOFF'S ONE. NEW "AUTO DATA ENTRY" FOR THE REQUIRED CALORIMETRIC DATA; THE CHEMICAL EQUATION IS "LEARNED" BY HP-67 THAT KNOWS EXACTLY THE NUMBER OF DATAS WE MUST INTRODUCE EVERY-TIME. UP TO 8 COMPONENTS.

224PROGRAM STEPS
CLAUDIO VIGHI
I - BOLOGNA.

50948D 67-PI-T RESISTOR NET,CONVERSIONS PI-T RESISTOR

THIS PRGR, CONVERTS AN ELECTRICAL PI-(TRIANGLE-) RESISTOR NETWORK INTO A T-(STAR-) RESISTOR NETWORK AND VICE VERSA.

072PROGRAM STEPS
HANS MARBET
CH - MATTSTETTEN.

50949D 67-4X4 MATRIX: EIGENVALUES

PROGRAM COMPUTES ALL EIGENVALUES, REAL AND COMPLEX, OF A 4X4 MATRIX BY AN ITERATIVE PROCESS, THE SO CALLED LR-ALGORITHM OF RUTISHAUSER.

224PROGRAM STEPS
MARTIN KAWALETZ
D - SALZGITTER.

50950D 67-INDEX NUMBER WITH THE CHOICE OF THE BASE FROM 1 TO 24 TIMES

GIVEN A SET UP TO 24 DIFFERENT VALUES THIS PROGRAM COMPUTES A NEW SET OF INDEX NUMBERS ON THE BASE, THAT IS IN PERCENT TERM OF FIRST OR EACH OTHER VALUE STORED. FURTHER SET OF INDEX NUMBER IS GIVEN BY CHOOSING NEW VALUE OF REFERENCE (1ST OR UP TO 24TH).

049PROGRAM STEPS
ILIO GALLETTA
I - GENOVA.

50951D 67-ENTROPY INDEX OF CONCENTRATION

GIVEN QUANTITY X (I.E. NUMBER OF WORKERS IN AN INDUSTRIAL SECTOR) DIVIDED IN PARTS (I.E. NUMBER OF WORKERS IN A SINGLE FACTORY) AND SINGLE PARTS PROGRAM COMPUTES 1) NUMBER OF PARTS, 2) ARITHMETIC MEAN OF WEIGHT OF PARTS, 3) THE NEW "EQUIVALENT NUMBER" OF PARTS AND MEAN WEIGHT ACCORDING TO "ENTROPY MEAN" THAT FOLLOWS TO CALCULUS OF ENTROPY OF TOTAL QUANTITY X DIVIDED IN PARTS. PROGRAM PROVIDES GOOD METHOD IN PROBLEMS CONCERNING INDUSTRIAL CONCENTRATION MEASURE.

112PROGRAM STEPS
ILIO GALLETTA
I - GENOVA.

50952D 97-LISTING OF COMBINATIONS WITH REPLACEMENT II

GIVEN N ELEMENTS K OF WHICH ARE TO BE SAMPLED WITH REPLACEMENT WITHOUT ORDER N+ K BEING LESS THAN 69 AND K BEING LESS THAN 19 THE PROGRAM CALCULATES THE NUMBER OF COMBINATIONS AND COMPLETELY LISTS THE COMBINATIONS OPTIONALLY PRINTING THE LIST. ANY SINGLE COMBINATION MAY BE DISPLAYED ENTERING ITS ORDER NUMBER.

50952D (CONTD)

119PROGRAM STEPS
JOACHIM GERLACH
D - MODAUTAL.

50953D 97-LISTING OF PERMUTATIONS AND VARIATIONS WITHOUT REPLACEMENT

K OUT OF N DIFFERENT ELEMENTS ARE TO BE SAMPLED WITH ORDER AND WITHOUT REPLACEMENT, K BEING LESS THAN 8 AND N BEING LESS THAN 10. THE PROGRAM CALCULATES THE NUMBER OF VARIATIONS AND PERMUTATIONS (VARIATIONS N=K) AND COMPLETELY DISPLAYS THE VARIATIONS OR PERMUTATIONS ONE AFTER THE OTHER. ANY SINGLE VARIATION OR PERMUTATION MAY BE DISPLAYED FIRST OR WITHOUT LISTING ENTERING THE ORDER-NUMBER.

224PROGRAM STEPS
JOACHIM GERLACH
D - MODAUTAL.

50954D 97-LISTING OF VARIATIONS WITH REPLACEMENT

GIVEN N ELEMENTS K OF WHICH ARE TO BE SAMPLED WITH REPLACEMENT AND WITH ORDER N AND K BEING LESS THAN 10 THIS PROGRAM CALCULATES THE NUMBER OF VARIATIONS AND COMPLETELY DISPLAYS THE VARIATIONS ONE AFTER THE OTHER OPTIONALLY PRINTING THE LIST. ONE SINGLE VARIATION MAY BE DISPLAYED THE NUMBER OF WHICH IS ENTERED.

216PROGRAM STEPS
JOACHIM GERLACH
D - MODAUTAL.

50955D 67-MAXIMUM MATRIX

GIVEN A 3X3 MATRIX, THE PROGRAM COMPUTES THE MAXIMUM DETERMINANT OF NINE 3X3 MATRICES FORMED BY THE BASIC MATRIX WHOSE ELEMENTS MOVES AROUND.

103PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50956D 67-PROBABILITY CURVE FIT

GIVEN N DATA PAIRS (COORDINATES X,Y OF POINTS), THE PROGRAM COMPUTES THE COEFFICIENTS H, S AND MEAN OF THE GAUSSIAN PROBABILITY CURVE FIT Y=H/2 PI**1/2*S EXP-1/2S**2(X-MEAN) **2.
YOU CAN ALSO COMPUTE EXPECTED Y'S FOR GIVEN X'S TO MAKE A SKETCH.

087PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50957D 67-A SINUSOIDAL MODEL

PROGRAM COMPUTES THE COEFFICIENTS A, B, C AND D OF THE SINUSOIDAL CURVE FIT Y=A+B**C COS 2 PI X DIVIDED BY 10+D SIN 2 PI X DIVIDED BY 10, AFTER THE INPUT OF N DATA-PAIRS YOU CAN ALSO COMPUTE EXPECTED Y'S FOR GIVEN X'S TO MAKE A SKETCH.

221PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50958D 67-LINEAR COMBINATION VECTOR

PROGRAM COMPUTES A GIVEN VECTOR P(P,Q,R) AS A LINEAR COMBINATION OF THREE OTHER VECTORS A(A,B,C); B(D, E,F); C(G,H,I): V(X,Y,Z).

111PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50959D 67-SPHERICAL PROBABILITY DIFFUSION

50959D (CONTD)

GIVEN A RANDOMNUMBER GENERATOR, PROGRAM COMPUTES SUCCESSIVELY TRIPLETS (X, Y AND Z COORDINATES) OF POINTS IN THE SPACE, THE MEAN OF THE RADIUS OF THE SPHERE, THE AREA AND THE VOLUME OF THIS SPHERE.

059PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50960D 67-MULTIPLE CURVE FITTING

PROGRAM COMPUTES THE LINEAR REGRESSION OF THREE PAIRED VALUES OF DATA. THE THREE COEFFICIENTS A AND B OF Y=AX+B AND THE THREE DETERMINATION-COEFFICIENTS R ARE COMPUTED AND THE EXPECTED VALUES LINEAR ESTIMATE 1,2 AND 3 FOR A GIVEN X ALSO.

176PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50961D 67-ELLIPTIC LOW-PASS FILTERS TYPE B AND C. STEEPNESS.

THE HYPOTETICAL STEEPNESS OF EVEN ORDER ELLIPTIC LOW-PASS FILTER OF TYPE B AND TYPE C ARE PARAMETERS WHICH ARE USED IN THE CALCULATION OP POLES AND ZEROS FOR THESE TYPES OF TRANSFER FUNCTIONS.

187PROGRAM STEPS
NILS HAAHEIM
N - TRONDHEIM.

50962D 97-IMPEDANCE MATCHING WITH TRANSMISSION LINE AND ADMITTANCE

THIS PROGRAM IS AN USEFUL HELP IN DESIGNING STRIPLINE CIRCUITS. THE PROGRAM CALCULATES THE FOUR POSSIBLE MATCHING CIRCUITS(CONSISTING OF ONE TRANSMISSION LINE WITH GIVEN CHARACTERISTIC IMPEDANCE Z0 AND ONE PARALLEL ADMITTANCE) WHICH TRANSFORM A GIVEN COMPLEX IMPEDANCE Z1 OR ADMITTANCE TO THE CONJUGATE COMPLEX OF A SECOND GIVEN IMPEDANCE Z2. PRINTED OUTPUTS ARE THE INPUT-ADMITTANCES, NORMALIZED TO Z0, THE NORMALIZED LENGTHS AND PARALLEL ADMITTANCES IN THE SEQUENCE OF THEIR APPLICATIONS.

218PROGRAM STEPS
WALTER SCHUMACHER
D - PFINZTAL-SOELLINGEN.

50963D 67-NEWTON ITERATION FOR SYSTEM OF 4 EQUATIONS IN 4 VAR.

PROGRAM SOLVES F(X)=0, WHERE X=(X1, X2,X3,X4) AND F=(F1,F2,F3,F4). I.E. A SYSTEM IN 4 EQU. AND 4 VAR., BY THE SIMPLIFIED NEWTON METHOD: X(K+1)=XK-INV(F'(X0)*F(XK).

126PROGRAM STEPS
JOHANNES SCHU
D - SAARBRUCKEN.

50964D 67-NEWTON ITERATION FOR A SYSTEM OF 3 EQUATIONS IN 3 VAR.

PROGRAM SOVES F(X)=0, WHERE X=(X1, X2,X3) AND F=(F1,F2,F3). I.E. A SYSTEM IN 3 EQU. AND 3 VAR., BY THE SIMPLIFIED NEWTON METHOD: X(K+1)= XK-INV(F'(X0))*.

127PROGRAM STEPS
JOHANNES SCHU
D - SAARBRUCKEN.

50965D 67-BELOTE SCORE KEEPER

THE PROGRAM CALCULATES AND KEEPS THE SCORES FOR 2 TEAMS OF BELOTE, A FRENCH GAME.
FOR AN ENTRANCE SCORE IT CALCULATES THE 2 SCORES, WRITES THEM UP, AND

50965D (CONTD)

INDICATES WHO WINS AND BY HOW MUCH. A CORRECTING SWITCH GIVES THE POSSIBILITY OF ERACING THE MISTAKES AND TO COME BACK TO THE ORIGINAL SCORE.

150PROGRAM STEPS
CHRISTIAN COURNUT
F - BORDEAUX-CAUDERAN.

50966D 67-RESEARCH OF MEAN INTERSECTION POINT OF TWO FUNCTIONS FA(X) FB(X)

PROGRAM HELPS TO FIND THE INTERSECTION INTERVAL OF TWO FUNCTIONS FA(X) AND FB(X) (ANY KIND OF FUNCTIONS); FOUND IT, PROGRAM CALCULATES THE VALUE OF MEAN (INTERSECTION POINT) WITH A PRECISION THAT THE USER LIKES TO FIX.

110PROGRAM STEPS
LUIGI POMINI
I - CASTELLANZA.

50967D 67-HORIZONTALLY LOADED PILES

PROGRAM CALCULATES DEFLECTION, SLOPE, SHEAR FORCE AND BENDING MOMENT OF VERTICAL PILES BEDDED IN THE SOIL. THE PILE MAY BE LOADED BY A HORIZONTAL FORCE AND/OR BY A BENDING MOMENT ON TOP. IT IS ASSUMED THAT THE CROSS SECTION OF THE PILE AS WELL AS THE COEFFICIENT OF HORIZONTAL SUBGRADE REACTION ARE CONSTANT ALONG THE PILE.

188PROGRAM STEPS
MARTIN BUETIKOFER
CH - THUN.

50968D 67-SCHALU FOR 2 FOR UP TO 11 C*RDS

SCHALU IS A GAME TO TEST YOUR REMEMBRANCE. YOU HAVE TO KEEP UP TO 11 CARDS IN YOUR MIND. YOU PLAY AGAINST THE COMPUTER. THE COMPUTER KNOWS YOUR CARDS AS GOOD AS HIS CARDS.

156PROGRAM STEPS
JURGEN BAUERMEISTER
D - GOSLAR.

50969D 67-DETERMINATION OF ROOTS

THE PROGRAM DETERMINES THE ROOT Y**1/X WITH THE FOUR ARITHMETIC FUNCTIONS.

076PROGRAM STEPS
JURGEN BAUERMEISTER
D - GOSLAR.

50970D 97-LINEAR REGRESSION EXPONENTIAL REGR. TDEP, ORTOGONAL REGR.

CALCULATES LINEAR AND EXPONENTIAL REGRESSION WITH VARIATIONS IN EITHER X OR BOTH X AND Y (ORTOTONAL), R(CORRELATION COEFFICIENT)T FOR R, T FOR DIFFERENCE BETWEEN X AND Y, SD FOR EITHER LINE, SIGNIFICANCE LIMITS FOR Y-INTERCEPT+AND-RESPECTIVELY, AND ESTIMATES Y FROM X ACCORDING TO CHOSEN MODEL. ALL POSSIBLE CORRECTIONS OF INPUT, CALCULATION OF PARTIAL RESULTS AND OPTION FOR PRINTOUT OF INPUT.

223PROGRAM STEPS
ANDERS KALLNER
S - HUDDINGE.

50971D 67-ISOLATION RESISTANCE-FRISCH METHOD

PROGRAM WILL CALCULATE ISOLATION RESISTANCE TOWARDS GROUND IN DC NETWORK WITH TWO UNGROUNDED CONDUCTORS BY FRISCH METHOD.

107PROGRAM STEPS
BRANKO SPOLJARIC
YU - ZAGREB.

50972D 67-RESISTANCE MEASUREMENTS-COMPARISON METHOD

PROGRAM WILL CALCULATE VALUE OF UNKNOWN RESISTANCE BY COMPARISON METHOD. (COMPARISON OF VOLTAGE DROPS OR CURRENTS ON UNKNOWN AND KNOWN RESISTOR).

066PROGRAM STEPS
BRANKO SPOLJARIC
YU - ZAGREB.

50973D 67-DIVE BOMBER

IN THIS GAME THE GOAL IS TO SHOOT DOWN A DIVE BOMBER WITH ANTIAIRCRAFT FIRE BEFORE IT CAN BOMB YOUR SHIP. THE INITIAL RANGE IS KNOWN TO BE 1000, 2000 OR 700 M BUT ITS SPEED CAN ONLY BE GUESSED. INSTRUMENTS TELLS YOU HOW CLOSE YOU MISS THE BOMBER BUT WITH AN ERROR OF +/- 10 M. THIS INCREASES DIFFICULTY OF THE GAME.

109PROGRAM STEPS
BRANKO SPOLJARIC
YU - ZAGREB.

50974D 67-DC-DC SWITCHING POWER SUPPLY SIMULATION

PROGRAM COMPUTES THE TIME DEPENDENT OUTPUT VOLTAGE (AND) SWITCH CURRENT OF A SWITCHING POWER SUPPLY WITH GIVEN PARAMETERS, CLOCK FREQUENCY, INPUT AND REFERENCE VOLTAGES AND LOAD VOLTAGE AND CURRENT. STATE VARIABLE EQUATIONS ARE ITERATIVELY INTEGRATED USING FORWARD EULER ALGORITHM.

091PROGRAM STEPS
IKLIL KAYIHAN
T - ISTANBUL.

50975D 67-LOOSE-TYPE FLANGE-DESIGN TO BS5500, ASME VIII, SNCT ET AL

THIS PROGRAM CALCULATES STRESSES AND A THICKNESS OF A LOOSE-TYPE FLANGE IN ACCORDANCE WITH THE METHOD GIVEN IN BS 5500-1976. PROGRAM ACCEPTS DIMENSIONS IN EITHER MM; CM; OR INCHES AND PRESSURE AND STRESSES IN ANY CONSISTENT UNITS. PROGRAM WILL ALSO CALCULATE FOR PRESSURE IN BARS WITH STRESSES IN NEWTONS PER MM SQUARED.

478PROGRAM STEPS
LESLIE A. TIMPERLEY
UK - FAILSWORTH, MANCHESTER.

50976D 67-REINFORCED CONCRETE CHIMNEYS

PROGRAM COMPUTES THE STRESSES AND LOCATION OF THE NEUTRAL FIBER FOR A HOLLOW CIRCULAR SECTION, WITH OR WITHOUT 2 FLUE OPENINGS UNDER AN AXIAL COMPRESSIVE FORCE AND BENDING MOMENT AFTER ACI 307-69.
ALL CHIMNEY-LIKE STRUCTURES MAY BE ANALYZED WITH THIS PROGRAM FOR THEIR BEAM-TYPE BENDING. DATA ARE CHECKED BY THE PROGRAM FOR ACCEPTABILITY. THERMAL STRESSES AND LOCAL BENDING ARE NOT INCLUDED.

224PROGRAM STEPS
JESUS FIERRO
SP - MADRID.

50977D 97-WHAT IS NEXT? (WIN)

ONE PLAYER. A SEQUENCE OF NUMBERS IS PRINTED, EACH NUMBER IS THE RESULT OF AN ALGEBRAIC COMBINATION OF THE LAST TWO NUMBERS AND A CONSTANT NUMBER. YOU MUST FIND THE NEXT NUMBER OF THE SEQUENCE. IF YOU ARE WRONG, CORRECT NUMBER IS PRINTED AND YOU MUST THEN FIND THE NEXT ONE IF YOU ARE RIGHT, YOUR SCORE IS PRINTED (NUMBER OF ANSWERS AND TIME SPENT).

50977D (CONTD)

224PROGRAM STEPS
FRANCOIS GAUCHENOT
F - BOIS COLOMBES.

50978D 97-CURVE PLOTTER

THE PROGRAM GIVES A GRAPHICAL REPRESENTATION OF A FUNCTION F(X) FROM THE POSITION OF THE DECIMAL POINT IN THE PRINT OUT. THE MAXIMUM VALUE OF F(X) IS REPRESENTED BY 100 DIGITS. THE PROGRAM SCANS F(X) IN 10 STRIPS, FOR EACH VALUE OF X BETWEEN GIVEN LIMITS, AND PRINTS F(X) WHERE F(X) EQUALS THE NORMALISED VALUE OF F(X) MULTIPLIED BY 100. THE GRAPH IS OBTAINED BY PLACING THE 10 STRIPS ABOVE EACH OTHER

198PROGRAM STEPS
IAN V. HANSFORD
UK - ALDERSHOT/HANTS.

50979D 67-EXPENSES ALLOTMENT

PROGRAM PARTICULARLY PLANNED FOR THE ALLOTMENT OF CONDOMINIUM EXPENSES. THESE ARE SUPPOSED OF 4 CATEGORIES, THE RATES PER THOUSAND DUE BY EACH OWNER ARE FORMED BY 3 OR 5 DIGITS. DATA CARDS REQUIRED. EACH DATA CARD CAN CONTAIN 52 RATES OF 3 DIGITS OR 36 RATES OF 5 DIGITS THE PROGRAM ENABLES UNTRAINED PERSONS TO RECORD DATA CARDS AND TO PERFORM THE CALCULATION EASILY. INDEXES ARE DISPLAYED AT EVERY OPERATION, AVOIDING CONFUSION AND MISTAKES.

224PROGRAM STEPS
PAOLO PELLICIARDI
I - BOLOGNA.

50980D 67-HP ARTIST

HP BECOMES A REAL ARTIST. A RANDOM-NUMBER GENERATOR FORMS NUMBERS (ONE BY ONE) BETWEEN 0 AND 9 IN A 10X10 MATRIX-FIELD. IF YOU GIVE EVERY OF THESE NUMBERS A COLOUR-VALUE, YOU OBTAIN AN ABSTRACT PICTURE, A"REMARKABLE EXAMPLE OF COMPUTER-ART".

083PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50981D 67-BINARY PROBABILITY FIELD

A RANDOM GENERATOR ONLY 1 AND 0 IN A (N BY N) FIELD (N<=10).
AFTER THAT YOU CAN SEE THE ROWS FROM BOTTOM TO TOP.
IF YOU GIVE COLOUR-VALUES TO THE 1'S AND 0'S (I.E. 0=EMPTY OR WHITE, 1=BLACK) YOU CAN MAKE STRANGE AND REMARKABLE PICTURES.

145PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50982D 67-PROPORTIONAL RANDOM SIMULATION

GIVEN THE EXPECTED RESULTS OF AN EXPERIMENT (IN %), THE PROGRAM COMPUTES RANDOMNUMBERS ACCORDING TO THE EXPECTED DISTRIBUTION, THE NUMBER OF THEM AND THE % RESULTS.

148PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50983D 67-REAL TO RANDOM

GIVEN N RESULTS OF AN EXPERIMENT, THIS PROGRAM COMPUTES RANDOM NUMBERS ACCORDING TO THE MEAN AND THE STANDARD-DEVIATION OF THE REAL RESULTS.

100PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50984D 67-GENOTYPE PROBABILITY MATRIX

PROGRAM COMPUTES THE PROBABILITIES P(N)IK THAT A DESCENDANT OF THE N-TH GENERATION IS OF GENOTYPE K IF A SPECIFIED ANCESTOR WAS OF GENOTYPE I AS THE ELEMENTS OF A 3X3 MATRIX.

191PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50985D 67-ARC SIN DISTRIBUTION

PROGRAM COMPUTES FOR A GIVEN XO THE YO OF Y= 2/PI ARC SIN X**1/2 AND THE AREA 2/PI INTEGRAL ARC SIN X**1/2. THE 5 POINT GAUSS-LEGENDRE METHOD PROGRAM 50427 ARE USED.

183PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50986D 67-REDUCTION OF A 5X5 MATRIX TO ALMOST TRIANGULAR FORM

A GENERAL REAL 5X5 MATRIX IS REDUCED TO ALMOST TRIANGULAR FORM, THAT IS A MATRIX FOR WHICH A(I,J)=0 IF J<=I+2, BY MEANS OF SIMILARITY TRANSFORMATIONS, SO THAT THE EIGENVALUES OF THE ORIGINAL MATRIX AND OF THE TRANSFORMED MATRIX ARE THE SAME.

223PROGRAM STEPS
MARTIN KAWALETZ
D - SALZGITTER.

50987D 67-CAPACITOR MEASUREMENTS-BRIDGE METHODS

PROGRAM CALCULATES CAPACITY, LOSS ANGLE AND RESISTANCE OF A CAPACITOR BY USING ANY OF NEXT BRIDGE METHODS
1) WIEN BRIDGE
2) SCHERING BRIDGE (NORMAL AND HIGH CAPACITANCE)
3) GLYNN BRIDGE.

181PROGRAM STEPS
BRANKO SPOLJARIC
YU - ZAGREB.

50988D 67-MULTINOMIAL DISTRIBUTION

PROGRAM COMPUTES THE MULTINOMIAL DISTRIBUTION OF A JOINT DISTRIBUTION SITUATION OF I RANDOM VARIABLES (I UP TO 10) FOR DIFFERENT SAMPLES N.

112PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50989D 67-CONIC-PROBLEMS

GIVEN THE COORDINATES X,Y AND Z OF THE CENTER P AND THE RADIUS R OF THIS SPHERE AND ANOTHER POINT Q (X, Y,Z) OUTSIDE THIS SPHERE THE PROGRAM COMPUTES:
A) THE VOLUME BETWEEN CONIC Q AND SPHERE P
B) THE AREA OF THE SEGMENT P(S)
C) THE AREA OF THE SMALL CIRCLE P/Q

100PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

50990D 67-50 DATA STORAGE

YOU CAN STORE AND RECALL IN YOUR CALCULATOR UP TO 50 DATA WITH THE OPERATING LIMIT FOR EACH DATA X:
10**-4 <=/X/< 10**4.

088PROGRAM STEPS
LUIGI POMINI
I - CASTELLANZA.

50991D 97-DEPTH OF FIELD OF PHOTOGRAPHIC LENSES

50991D (CONTD)

WHEN THE FOCAL LENGTH, CLOSEST DISTANCE, APERTURE AND SMALLEST AVAILABLE DIAPHRAGM ARE GIVEN, THE PROGRAM CALCULATES AND PRINTS A COMPLETE DEPTH OF FIELD TABLE FOR DISTANCES ADAPTED TO THE GIVEN LENS. IF THE CIRCLE OF CONFUSION IS NOT SPECIFIED, THE PROGRAM WILL ASSUME IT AS ONE THOUSANDTH OF THE FOCAL LENGTH. THE PROGRAM GIVES ALSO THE "PROXIMITY INFINITY SETTING" AND THE CORRESPONDING DISTANCE FROM WHICH THE SHARPNESS WILL REACH TO THE INFINITY.

223PROGRAM STEPS
PETER DE WILDE
B - MELLE.

50992D 67-CONSTANT FRANCS AND INDEX-NUMBER FROM 1.1955 IN BELGIUM

THIS PROGRAM ALLOWS TO ASK A DATA BASE STORED ON MAGNETIC CARDS (ONE CARD FOR 4 YEARS) ABOUT WHAT WAS THE INDEX-NUMBER IN BELGIUM IN A MONTH OF ANY YEAR FROM 1955 AND THIS FOR SEVERAL INDEX-NUMBER TYPES IT ALSO PERMITS CALCULUS IN CONSTANT FRANCS AND INCLUSION OF NEW INDEX-NUMBERS IN THE DATA BASE.

223PROGRAM STEPS
PHILIPPE LEMAIRE
B - CHENEE.

50993D 97-THERMAL EXPANSION OF SODA-LIME-SILICA GLASSES

CALCULATES THE LINEAR THERMAL EXPANSION COEFFICIENT, TRANSFORMATION TEMPERATURE AND DILATOMETRIC SOFTENING POINT FROM THE COMPOSITION FOR SODA-POTASH-LIME-MAGNESIA-ALUMINA-SILICA GLASSES. GLASS COMPOSITION MUST BE IN MOLAR PERCENTAGES BUT WEIGHT PERCENT COMPOSITIONS MAY BE CONVERTED BY PROGRAM 50439D. ONE DATA CARD IS NEEDED.

148PROGRAM STEPS
MICHAEL CABLE
UK - SHEFFIELD.

50994D 67-DEATH-TIME FOR GEIGER-COUNTER

WITH THE COUNTER YOU TAKE OF THE IMPULS RATE BY PREPARATION I AND THEN BY PREPARATION II. AT LAST YOU TAKE OF THE IMPULS-RATE BY PREPARATION I AND II TOGETHER. WITH THESE 3 INPULS-RATES YOU WILL GET THE "DEATH-TIME" FOR A GEIGER-COUNTER, WHICH IS THE SHORTEST TIME 2 SEPARATE RADIOACTIVE PARTICLES WILL BE ENTERED AS 2 IMPULSES.

095PROGRAM STEPS
HORST HENKEL
D - DUSSELDORF.

50995D 67-BESSEL, NEUMAN AND MAC DONALD FUNCTIONS OF INTEGER ORDER

PROGRAM CALCULATES THE ORDINARY AND THE MODIFIED BESSEL FUNCTIONS OF INTEGER ORDER. NEUMAN AND MAC DONALD FUNCTIONS ARE INCLUDED. CANONICAL EQUATIONS WERE USED.

224PROGRAM STEPS
GASPARE ALBANO
I - PALERMO.

50996D 67-INTERSECTION WITH TRILATERATION

TO DETERMINE THE COORDINATES OF STATION P, DISTANCE HAVE BEEN MEASURED TOWARDS SURROUNDING STATIONS, THE COORDINATES OF WHICH ARE KNOWN. THIS PROGRAM GIVES THE APPROX. COORDINATES OF P, A LEAST SQUARE ADJUSTMENT AND CALCULATES THE STANDARD ERROWS.

223PROGRAM STEPS
JOACHIM DOLIFF

50996D (CONTD)

D - HANNOVER.

50997D 97-GAS CHROMATOGRAPHY

THIS PROGRAM WILL ACCEPT DATA FROM CALIBRATION RUNS OF UP TO TEN DIFFERENT SUBSTANCES.
PEAK-DIMENSIONS FROM CHROMATOGRAMS OF UNKNOWN MIXTURES ARE NOW ENTERED PROPORTIONS OF THE SUBSTANCES PRESENT ARE THEN PRINTED OUT (PERCENTAGE OR DECIMAL OPTION). KNOWN AMOUNT OF ONE SUBSTANCE MAY BE ADDED AS INTERNAL STANDARD. ABSOLUTE ABUNDANCES OF OTHER COMPONENTS THEN COMPUTED. CALIBRATION DATA NEED NOT ALL RELATE TO SAME EXPERIMENT.

112PROGRAM STEPS
E. ARTHUR MORTON
UK - KENDAL/WESTMORLAND.

50998D 97-COMPANY ANALYSIS

THIS PROGRAM CALCULATES THE VARIOUS RATIO'S NORMALLY USED FOR AN ANALYSIS OF A COMPANY'S BALANCE SHEET AND PROFIT AND LOSS ACCONT PROGRAM CAN BE FOLLOWED BY PROGRAM "COMPANY GROWTH".

222PROGRAM STEPS
BART ONKENHOUT
NL - BLARICUM.

50999D 97-COMPANY GROWTH

THIS PROGRAM IS DESIGNED TO RUN AFTER "COMPANY ANALYSIS".
IT EVALUATES THE EFFECT OF TURNOVER AND/OR WAGE INCREASES ON BALANCE SHEET AND PROFIT AND LOSS ACCOUNT. THE EFFECT OF RATIO CHANGES (DAYS STOCK ETC) CAN ALSO BE CALCULATED, AS CAN THE TURNOVER INCREASE REQUIRED TO REACH A SPECIFIED NET PROFIT

224PROGRAM STEPS
BART ONKENHOUT
NL - BLARICUM.

51000D 67-OPTIMAL FERTILIZATION IN AGRONOMY

ACCORDING TO THE HOMES-VAN SCHOOR METHOD, 1) PROGRAMS 1 TO 4 GIVE THE OPTIMAL PERCENTAGES, CURVES AND TOLERANCES WITH TEST OF DIRECT SYSTEMATIC VARIATIONS.
2) PROGRAMS 5 AND 6 THE SAME RESULTS WITH INVERSE TESTS.
3) PROGRAM 7 CALCULATES THE NUTRITIONAL EQUIVALENT OF A SOIL AND ITS COMPONENTS, WITH AN AUXILIARY FUNCTION OF TRANSLATION FROM AGRICULTURAL TO SCIENTIFIC SOLUTION.
4) PROGRAM 8 ESTIMATES FUTURE YIELDS ACCORDING TO NES AND THE ABSOLUTE QUANTITY.

999PROGRAM STEPS
GEORGES NEUMANN
B - BRUXELLES.

51001D 67-MULTIPLICATION OF POLYNOMIALS

THE MULTIPLICATION OF POLYNOMIALS IS NOT SO TIRESOME AS DIVISION IF THE COEFFICIENTS ARE VERY SIMPLE. IF NOT, YOU HAD BETTER TAKE YOUR WONDERFUL CALCULATOR. THIS PROGRAM IS THE TWIN OF "DIVISION OF POLYNOMIALS" AND IS USED IN THE SAME WAY. THE COEFFICIENT OF A TERM OF DEGREE M IS ALWAYS ENTERED IN A REGISTER M. THE TERMS OF THE PRODUCT ARE DISPLAYED IN DESCENDING POWERS: FIRST THE DEGREE, THEN THE COEFFICIENT. YOU CAN MULTIPLY POLYNOMIALS OF DEGREE 1 THROUGH 9 BY POLYNOMIALS OF DEGREE 1 THROUGH 4.

222PROGRAM STEPS
JEAN HORVILLE
F - GENTILLY.

51002D 67-INVERSE TCHEBYCHEFF LP-FILTER

51002D (CONTD)

TYPE C. N=4. POLES AND ZEROS

INVERSE TCHEBYCHEFF LP-FILTERS HAVE MAXIMALLY FLAT APPROXIMATION IN THE PASSBAND AND TCHEBYCHEFF APPROXIMATION IN THE STOPPBAND. EVEN ORDER FILTERS OF TYPE C HAVE A ZERO OF TRANSMISSION AT INFINITY. THE PROGRAM CALCULATES THE POLES AND ZEROS AND/OR COEFFICIENTS OF A FOURTH ORDER TRANSFER FUNCTION, AND THE HYPOTHETICAL STEEPNESS FROM THE ACTUAL OR VICE VERSA.

222PROGRAM STEPS
NILS HAAHEIM
N - TRONDHEIM.

51003D 97-LOAD TERMS (CROSS-LINE DISTANCES) PART #2

PROGRAM CAN BE USED TOGETHER WITH 50660 D FOR SIMPLE OR COMPLICATED LOAD COMBINATIONS. IT ADDS UP THE LOAD TERMS OF PART LOADS. SO IT IS POSSIBLE TO CALCULATE FIRST THE LOAD TERM FOR D.L., CALL THE RESULT AND CONTINUE WITH L.L., CALL THE RESULT FOR T.L.. BY STARTING WITH (A) ALL REGISTERS ARE CLEARED.

198PROGRAM STEPS
ERWIN QUINT
I - NEMI(ROMA).

51004D 67-STABILITY OF GRAVITY DOCK AND RETAINING WALLS

USING 12 VARIABLES PROGRAM CALCULATES 1) DISTANCE FROM THE TOE OF THE WALL OF THE POINT WHERE RESULTANT OF ALL FORCES CUTS LINE OF BASE OF WALL 2) PRESSURE ON FOUNDATION AT TOE OF WALL AND 3) MINIMUM COEFFICIENT OF FRICTION REQD. AT BASE.

212PROGRAM STEPS
MICHAEL J. GERAGHTY
IRELAND/DUBLIN.

51005D 97-SECTION PROPERTIES - OUTPUT

THIS PROGRAM CALCULATES THE PROPERTIES OF POLYGONAL SECTIONS COORDINATES OF THE VERTICES OF THE POLYGON ARE INPUT SEQUENTIALLY FOR A COMPLETE CLOSKWISE PATH AROUND THE POLYGON, HOLES IN THE CROSS SECTION WHICH DO NOT INTERSECT THE BOUNDARY, MAY BE DELEATED BY FOLLOWING A COUNTER CLOCKWISE PATH, A SPECIAL FEATURE ALLOWS ADDITION OR DELETION OF CIRCULAR AREAS.

194PROGRAM STEPS
IVAN DE MARSANO
CH - LAUSANNE.

51006D 67-TANK!

THIS PROGRAM IS A "WAR GAME" YOU MUST DESTROY X OR 9 TARGETS, LOCATED AROUND YOU. YOU ARE IN YOUR TANK, GUESSING THE FIRE ANGLE AND TAKING EVASIVE ACTIONS. THIS PROGRAM MAY BE A SOLITAIRE GAME, OR YOU MAY PLAY WITH AN OPPONENT. YOUR TASK IS TO HAVE THE HIGHEST POINTS, COLLECTED BY FIRING VERY CLOSE TO YOUR TARGET.

224PROGRAM STEPS
PIERRE PIRAUX
B - MARCINELL.

51007D 67-ANNUITIES: 10 PROBLEMS

GIVEN ANY THREE OF THE FOLLOWING FIVE VALUES, THIS PROGRAM CALCULATES THE OTHER TWO (TEN PROBLEMS): PRESENT VALUE, FUTURE VALUE, PERIODICAL PAYMENT, NUMBER OF PERIODS, PERCENTAGE PER PERIOD.

999PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51008D 67-A,B,C, HAVING SAME DECIMALS AND SATISFYING A.B.=C

THIS PROGRAM CALCULATES A LIST OF TRIPLETS (A,B,C) OF POSITIVE NON-INTEGERS WITH THE SAME DECIMALS, SATISFYING AB=C.

083PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51009D 67-TRIPLETS OF PRIMES WITH GIVEN DIFFERENCE 6K

GIVEN A MULTIPLE OF 6, THIS PROGRAM CALCULATES A LIST OF TRIPLETS OF PRIME NUMBERS WITH THIS MULTIPLE AS DIFFERENCE.

131PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51010D 67-QUADRATIC EQUATION AND PERIODIC CONTINUED FRACTION

GIVEN A QUADRATIC EQUATION WITH INTEGER COEFFICIENTS, THIS PROGRAM CALCULATES THE CONTINUED FRACTION AND THE SUCCESSIVE APPROXIMATIONS OF A POSITIVE ROOT OF THIS EQUATION INVERSELY, GIVEN A PERIODIC CONTINUED FRACTION, IT FINDS THE EQUATION OF DEGREE 2 WITH INTEGER COEFFICIENTS, HAVING CORRESPONDING NUMBER AS ROOT, AND THE EXACT REPRESENTATION OF THIS ROOT.

214PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51011D 67-FACTORIZING FACTORIALS

THIS PROGRAM FURNISHES A LIST OF PRIME FACTORS AND CORRESPONDING EXPONENTS FOR ANY GIVEN FACTORIAL, THE BASE OF WHICH CAN BE DISPLAYED.

116PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51012D 67-PELL'S EQUATION

FAST PROGRAM FOR INTEGER SOLUTIONS FOR PELL'S EQUATION X**2 = AY**2+1, UP TO 5 DIGITS.

050PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51013D 67-SUMS OF FOUR SQUARES

THE PRODUCT OF TWO SUMS, EACH OF 4 SQUARES, IS ITSELF A SUM OF 4 SQUARES, MOSTLY IN 24 WAYS. THIS PROGRAM GIVES THE 24 RESULTS FAST.

123PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51014D 67-RATIONAL APPROXIMATIONS OF A REAL NUMBER

GIVEN A POSITIVE REAL NUMBER, THIS PROGRAM WILL FIND RATIONAL APPROXIMATIONS FOR IT, WITH AT LEAST A GIVEN NUMBER OF DECIMALS CORRECT.

052PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51015D 67-AN IMPORTANT SEQUENCE

UP TILL NOW NOBODY KNOWS IF THE SEQUENCE WITH GENERAL TERM 1 + N.N HAS AN INFINITY OF PRIME TERMS. THIS PROGRAM IS INTENDED TO HELP ONE FIND OUT SOMETHING ABOUT THE DISTRIBUTION OF PRIME FACTORS AND TERMS IN THIS SEQUENCE.

51015D (CONTD)

185PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51016D 67-CONIC THROUGH FIVE GIVEN POINTS

GIVEN THE CARTESIAN COORDINATES OF 5 POINTS OF THE PLANE, THIS PROGRAM CALCULATES THE COEFFICIENTS OF THE EQUATION OF THE CONIC TGHROUGH THESE POINTS. A SUBROUTINE ALLOWS YOU TO FIND AS MANY POINTS OF THIS CONIC AS YOU WANT.

224PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51017D 67-COMMON PERPENDICULAR OF TWO LINES IN SPACE

GIVEN ONE POINT AND THE DIRECTION OF TWO LINES IN SPACE, THIS PROGRAM CALCULATES THE DIRECTION AND THE TWO POINTS OF INTERSECTION OF THEIR COMMON PERPENDICULAR.

148PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51018D 67-BEST SPHERE THROUGH GIVEN POINTS

GIVEN A NUMBER OF POINTS OF THREE-DIMENSIONAL SPACE, THIS PROGRAM CALCULATES CENTER AND RADIUS OF BEST SPHERE, THROUGH THESE POINTS.

215PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51019D 67-COMMON TANGENTS OF TWO CIRCLES

GIVEN THE COORDINATES OF THE CENTERS AND THE RADIUS OF TWO CIRCLES, THIS PROGRAM CALCULATES THE COORDINATES OF THE TANGENT POINTS OF EACH COMMON TANGENT LINE.

083PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51020D 67-CIRCLES TANGENT TO THREE GIVEN CIRCLES

GIVEN THREE CIRCLES, THIS PROGRAM CALCULATES CENTER AND RADIUS OF EACH OF THE EIGHT TANGENT CIRCLES, IF THEY EXIST.

214PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51021D 67-CIRCLES THROUGH GIVEN POINT AND TANGENT TO TWO GIVEN CIRCLES

GIVEN A POINT AND TWO CIRCLES, THIS PROGRAM CALCULATES CENTER AND RADIUS OF EACH OF THE FOUR CIRCLES, PASSING THROUGH THE GIVEN POINT AND TANGENT TO THE TWO GIVEN CIRCLES,IF THEY EXIST.

200PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51022D 67-CIRCLES TANGENT TO TWO GIVEN CIRCLES AND TO A LINE

GIVEN TWO CIRCLES AND A STRAIGHT LINE, THIS PROGRAM CALCULATES THE COORDINATES OF THE CENTER AND THE RADIUS OF EACH CIRCLE, TANGENT TO THE GIVEN CIRCLES AND THE GIVEN LINE.

212PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51023D 67-CIRCLES THROUGH GIVEN POINT

51023D (CONTD)

TANGENT TO GIVEN CIRCLE AND LINE

THIS PROGRAM FINDS EACH CIRCLE, GOING THROUGH A GIVEN POINT AND TANGENT, BOTH TO A GIVEN CIRCLE AND A GIVEN STRAIGHT LINE.

213PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51024D 67-SQUARE WITH SIDES THROUGH GIVEN POINTS

GIVEN FOUR POINTS OF A PLANE, THIS PROGRAM FINDS EACH SQUARE WITH SIDES THROUGH THESE POINTS, ONE SIDE PER POINT.

144PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51025D 67-CYCLIC QUADRILATERALS

GIVEN EITHER THE FOUR SIDES, OR THREE SIDES AND THE RADIUS OF THE CIRCUMSCRIBED CIRCLE, THIS PROGRAM CALCULATES THE MISSING ELEMENT, THE SEMIPERIMETER, THE SURFACE AND THE ANGLES OF THE CYCLIC QUADRILATERAL.

179PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51026D 67-CYCLOIDS

A CIRCLE WITH GIVEN RADIUS EXTERNALLY ROLLS ON A SECOND CIRCLE WITH GIVEN RADIUS, WHICH DOES NOT MOVE. ON A RADIUS-LINE OF THE MOVING CIRCLE A POINT MOVES WITH THIS CIRCLE AND DESCRIBES AN EPI- OR HYPOCYCLOID. THE DISTANCE OF THIS POINT TO THE CENTER OF THE MOVING CIRCLE CAN BE CHOSEN. PROGRAM GIVES YOU COORDINATES OF MOVING POINT FOR 5 DEGREE INTERVALS, SO THAT YOU CAN DRAW THE CYCLOID WITH GREAT PERFECTION.

048PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51027D 67-INTEGRATION WITH 5 CLOSED AND 5 OPEN NEWTON-COTES FORMULAE

GIVEN F(X) AND TWO ENDPOINTS A, B, THIS ONE CARD PROGRAM USES 10 DIFFERENT QUADRATURE FORMULAE (5 CLOSED AND 5 OPEN NEWTON-COTES FORMULAE) TO CALCULATE THE CORRESPONDING INTEGRAL. THE 10 RESULTS ARE GIVEN ONE AFTER ANOTHER.

196PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51028D 67-SEVEN UNIFORM COEFFICIENT INTEGRATION FORMULAE

GIVEN F(X) AND TWO ENDPOINTS, THIS ONE CARD PROGRAM CALCULATES THE CORRESPONDING INTEGRAL 7 TIMES, USING UNIFORM COEFFICIENT FORMULAE WITH 2,3,4,5,6,7 AND 9 NODES. THE RESULTS ARE SHOWN ONE BY ONE AND ALLOW FOR AN INTERESTING COMPARISON

212PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51029D 67-PERVERSE MONTHS

GIVEN ANY YEAR FROM 1 TO 20000, THIS PROGRAM WILL FIND ITS PERVERSE MONTHS. A MONTH IS CALLED PERVERSE WHEN ITS CALENDAR NEEDS 6 WEEKS, A WEEK BEGINNING ON A SUNDAY.

127PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51030D 67-HOW FAST ARE YOU?

DEPENDING ON A SEED, THIS PROGRAM FURNISHED A SEQUENCE OF ZERO'S WITH RAPIDLY CHANGING DISPLAYS. YOU HAVE TO GUESS THE DISPLAY STATUS AND KEY IN YOUR ANSWER DURING THE SHORT PAUSES. GUESSING CORRECTLY GIVES ONE GOOD MARK PER GUESS. SCORE IS SHOWN AT REGULAR INTERVALS

055PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51031D 67-TRY FOR EVEN

STARTING WITH AN ODD PILE OF STONES TWO PLAYERS ALTERNATIVELY TAKE AT LEAST ONE AND AT MOST FOUR STONES. WHEN THERE ARE NO MORE STONES TO TAKE, THE PLAYER, WHO HAS TAKEN AN EVEN NUMBER OF STONES, WINS THE GAME. YOU PLAY AGAINST YOUR HP67-97.

089PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51032D 67-ONE-PILE-NIM TEACHER

WITH THIS PROGRAM YOUR HP ORGANISES A SEQUENCE OF BOTH POSITIVE AND NEGATIVE ONE-PILE-NIM GAMES WITH VARIABLE PARAMETERS. IN EACH GAME YOU CAN EITHER PLAY AGAINST MAC YOURSELF, OR YOU CAN HAVE MAC TEACH YOU HOW TO PLAY AND WIN. FALSE MOVES ARE PUNISHED AT ONCE WITH LOSING A GAME. SEQUENCE ENDS WHEN ONE PLAYER ARRIVES AT SCORE 10. SINGLE GAMES ARE ALSO POSSIBLE.

189PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51033D 67-BILLIARDS ON A ROUND TABLE

HAVING KEYED IN A SEED, YOUR HP FURNISHES A SEQUENCE OF GAMES WITH THREE BALLS ON A ROUND BILLIARD TABLE. YOU CAN EITHER PLAY YOURSELF AND TRY TO HIT THE TWO OTHER BALLS WITH YOUR BALL, OR HAVE MAC DO IT FOR YOU.

222PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51034D 67-LADDER PROBLEM

TWO LADDERS WITH GIVEN LENGTH ARE STANDING WITH THEIR FOOT AGAINST HOUSES ON OPPOSITE SIDES OF A STREET, WHILE THEIR TOP RESTS AGAINST A HOUSE ON THE OTHER SIDE OF THIS STREET. GIVEN THE HEIGHT OF THEIR APPARENT POINT OF INTERSECTION, CAN YOU FIND OUT HOW WIDE THIS STREET IS? YOUR HP CAN!

050PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51035D 67-GOLDBACH CONJECTURES

THIS PROGRAM ILLUSTRATES THE GOLDBACH CONJECTURES, STATING THAT A POSITIVE INTEGER (I) IF IT IS EVEN, IS THE SUM OF TWO PRIMES; (II) IF IT IS ODD, IS THE SUM OF THREE PRIMES; (III) IF IT IS ODD, IS THE SUM OF A PRIME AND TWICE A PRIME.

186PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51036D 67-POSITIVE INTEGER AS SUM OF THREE TRIANGULARS

GIVEN A POSITIVE INTEGER, THIS PROGRAM CALCULATES THREE TRIANGULAR

51036D (CONTD)

NUMBERS WITH THIS INTEGER AS SUM, SO ILLUSTRATING FERMAT'S THEOREM, PROVEN (1798) BY LEGENDRE.

084PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51037D 67-PRIMES IN AN INTERVAL

GIVEN A NON-NEGATIVE INTEGER K, THIS PROGRAM CALCULATES ALL PRIMES BETWEEN 100K AND 100K+500, WITHOUT YOUR PRESENCE BEING REQUIRED. ONCE FINISHED, THESE PRIMES CAN BE BROUGHT TO DISPLAY IN FAST TEMPO. THE PROGRAM IS USEFUL FOR OWNERS OF A HP-67 ONLY.

208PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51038D 67-PRIMES WITH SAME LAST DIGITS

STARTING FROM A CHOSEN POSITIVE INTEGER, THIS PROGRAM FURNISHES A LIST OF PRIMES, HAVING THE SAME CHOSEN NUMBER OF LAST DIGITS AS THE STARTING NUMBER.

056PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51039D 67-SIEVE OF ERATOSTHENES

GIVEN TWO POSITIVE INTEGERS A AND B THIS PROGRAM CALCULATES EVERY ODD INTEGER C BETWEEN A AND B, WHICH IS NOT PRIME, AND AT THE SAME TIME GIVES ITS SMALLEST PRIME FACTOR. EACH INTEGER C IS GIVEN EXACTLY ONCE. THE PROGRAM CAN ALSO GIVE YOU A LIST OF ODD INTEGERS BETWEEN A AND B, WITH A CHOSEN PRIME AS THEIR SMALLEST FACTOR. ERATOSTHENE'S SIEVE METHOD BEING THE FASTEST WAY TO MAKE A LIST OF PRIME NUMBERS, THIS PROGRAM MAY BE USEFUL TO MAKE SUCH A LIST.

130PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51040D 67-FIGURATE NUMBERS

THIS PROGRAM FURNISHES A LIST OF FIGURATE NUMBERS OF GIVEN DIMENSION AND KIND AND STARTING FROM A GIVEN SEQUENCE NUMBER.

052PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51041D 67-CANDIDATES FOR PERFECT NUMBERS

THIS PROGRAM FURNISHES A LIST OF 151 POSITIVE INTEGERS WHICH MAY BE PERFECT NUMBERS. LAST CANDIDATE HAS 91 DIGITS.

090PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51042D 67-CONTINUED FRACTIONS

GIVEN A POSITIVE REAL NUMBEDR, THIS PROGRAM CALCULATES THE SUCCESSIVE COMPONENTS OF ITS CONTINUED FRACTION, THE CORRESPONDING BEST APPROXIMATING SIMPLE FRACTIONS AND ABSOLUTE ERROR. INVERSELY, FROM THE COMPONENTS OF A CONTINUED FRACTION THE CORRESPONDING REAL NUMBER CAN BE RECALCULATED.

075PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51043D 67-CHINESE REMAINDER PROBLEM

51043D (CONTD)

THIS PROGRAM FINDS A POSITIVE INTEGER, WHICH, AFTER DIVISION BY A NUMBER OF GIVEN INTEGERS LEAVES GIVEN REMAINDERS. THERE SHOULD BE AT LEAST TWO DIVISORS AND THE PRODUCT OF THEM SHOULD BE SMALLER THAN EXX 9.

107PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51044D 67-FOR FIBONACCI FANS

THIS PROGRAM FURNISHES A LIST OF FIBONACCI-NUMBERS, UP TO 100 DIGITS BACKSIDE OF CARD CAN BE USED AS DATA-CARD.

112PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51045D 67-FINDING FIBONACCI SEQUENCE WITH GIVEN TERM

THIS PROGRAM CALCULATES ALL FIBONACCI SEQUENCES WITH A GIVEN POSITIVE INTEGER AS LAST TERM, AND HAVING AT LEAST FOUR (POSITIVE INTEGER) TERMS.

079PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51046D 67-ARRANGING POSITIVE INTEGERS IN ASCENDING ORDER

GIVEN UP TO 200 POSITIVE INTEGERS BETWEEN 100K AND 100K+200, THIS PROGRAM ARRANGES THEM IN ASCENDING ORDER.

121PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51047D 67-EULER'S CONSTANT AND PARTIAL SUMS OF HARMONIC SERIES

THE FIRST PART OF THIS PROGRAM ACTUALLY CALCULATES EULER'S CONSTANT. IN THE SECOND PART THE PARTIAL SUM OF ANY NUMBER OF TERMS OF THE HARMONIC SERIES IS CALCULATED, PROVIDED ONLY THAT THIS SUM CAUSES NO OVERFLOW. PROGRAM IS VERY FAST.

111PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51048D 67-TRUTH-TABLES

THIS PROGRAM GIVES TRUTH-TABLE OF LOGICAL FUNCTION OF UP TO 9 PROPOSITIONS AND SHOULD BE USEFUL IN SECUNDARY SCHOOLS WHEN GIVING FIRST LESSONS IN LOGIC. IT CAN ALSO SOLVE LOGICAL PUZZLES. 160 STEPS ARE AVAILABLE FOR THE LOGICAL FUNCTION.

064PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51049D 67-MARRIED COUPLES AROUND A TABLE

IN HOW MANY WAYS CAN N MARRIED COUPLES SIT AROUND A TABLE, SO THAT NO TWO NEIGHBOURS HAVE THE SAME SEX OR ARE A MARRIED COUPLE? THIS PROGRAM FURNISHES THE ANSWER (N BETWEEN 2 AND 69).

047PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51050D 67-MONTFORT'S PROBLEM

IF A GIVEN NUMBER OF LETTERS ARE PUT IN THE SAME NUMBER OF BOXES, ONE LETTER PER BOX, AND IF THIS IS DONE ARBITRARILY, THEN WHAT IS THE

51050D (CONTD)

PROBABILITY THAT A GIVEN NUMBER OF THESE LETTERS ARRIVE AT THEIR DESTINATION? THIS PROGRAM GIVES YOU THE ANSWER.

080PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51051D 67-CATALAN NUMBERS

THIS PROGRAM FURNISHES A LIST OF CATALAN-NUMBERS WITH LESS THAN 71 DIGITS.

090PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51052D 67-PRISM-REFRACTION I

GIVEN THE ANGLES OF INCIDENCE AND EMERGENCE OF A RAY, PASSING THROUGH A PRISM WITH GIVEN ANGLE BETWEEN REFRACTING FACES, THIS PROGRAM FINDS THE REFRACTION INDEX AND THE MINIMUM DEVIATION. FURTHERMORE, ONE OF THE ANGLES OF INCIDENCE OR EMERGENCE BEING GIVEN, IT CALCULATES THE OTHER ANGLE, THE DEVIATION AND THE DIFFERENCE BETWEEN DEVIATION AND MINIMUM DEVIATION.

095PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51053D 67-PRISM-REFRACTION II

GIVEN THE REFRACTION INDEX AND THE ANGLE BETWEEN THE REFRACTING FACES OF A PRISM, THIS PROGRAM FIRST CALCULATES MAXIMUM AND MINIMUM VALUES FOR THE INTERNAL AND EXTERNAL ANGLES OF INCIDENCE AND EMERGENCE AND FOR THE DEVIATION. FURTHERMORE, GIVEN ONE OF THESE FIVE ANGLES IT CALCULATES THE OTHER FOUR.

221PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51054D 67-ORBIT OF PLANET

GIVEN THE NECESSARY CONSTANTS FOR A PLANET AND FOR EARTH, THIS ONE-CARD PROGRAM CALCULATES THE ECCENTRIC AND TRUE ANOMALIES AND THE DISTANCE TO THE SUN FOR A GIVEN TIME, BOTH FOR THE PLANET AND FOR THE EARTH, THE HELIOCENTRIC ECCLIPTICAL HELIOCENTRIC EQUATORIAL AND GEOCENTRIC EQUATORIAL CORRESPONDING COORDINATES OF THE PLANET, ITS DISTANCE TO THE EARTH AND ITS EPHEMERIS-VALUES (DECLINATION AND RIGHT ASCENSION).

218PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51055D 67-ORBIT OF PLANET FROM ONE OBSERVATION

GIVEN THE COMPONENTS OF THE RADIUS AND VELOCITY VECTORS (HELIOCENTRIC ECLIPTICAL COORDINATES) FOR A GIVEN TIME, THIS PROGRAM CALCULATES RADIUS AND VELOCITY, MAJOR AXIS, PARAMETER, ECCENTRICITY, INCLINATION OF PLANE, LONGITUDES OF ASCENDING NODE AND PERIHELIUM, PERIOD, TRUE, ECCENTRIC AND MEAN ANOMALIES AND TIME OF PASSAGE IN PERIHELIUM.

224PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51056D 67-TIMES OF ZENITH, SUNRISE AND SUNSET, TWILIGHT LIMITS

GIVEN THE OBSERVER'S LONGITUDE, LATITUDE AND TIME ZONE, AND A DATE, THIS PROGRAM CALCULATES THE TIMES

51056D (CONTD)

(HOURS, MINUTES, SECONDS) OF HIGHEST SUN, SUNRISE, BEGINNING OF TWILIGHT, SUNSET AND END OF TWILIGHT. NO DATA CARD REQUIRED. THE PROGRAM SHOULD BE REGARDED AS A WAY TO THANK GUNTER SCHNELL FOR HIS STIMULATING TWO-CARD PROGRAM 50036 ON THE SAME SUBJECT.

219PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51057D 67-N-QUEENS PROBLEM

GIVEN AN INTEGER FROM 1 TO 9, THIS PROGRAM FINDS ALL SOLUTIONS FOR THE CORRESPONDING N-QUEENS PROBLEM. SUBROUTINES FIND EQUIVALENT SOLUTIONS.

111PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51058D 67-COUNTING-OUT PROBLEM OF JOSEPH

CHILDREN PLAY THIS GAME SINCE THE BEGINNING OF OUR ERA: N PERSONS STAND IN A CIRCLE. STARTING FROM A CHOSEN ORIGIN, THEY ARE COUNTED AND THE PERSON WITH A CHOSEN NUMBER P IS COUNTED OUT AND LEAVES THE GAME. THE NEXT PERSON NOW GETS NUMBER 1 AND THE GAME CONTINUES. THIS PROGRAM EITHER GIVES LIST OF PERSONS AS THEY LEAVE THE GAME, OR FINDS PERSON, LAST REMAINING IN GAME, OR FOR A GIVEN PERSON FINDS HOW LONG IT WILL REMAIN IN GAME, ETC.

144PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51059D 67-KNIGHT'S DISTANCE

GIVEN THE SIZE OF A CHESSBOARD AND TWO OF ITS SQUARES, THIS PROGRAM CALCULATES KNIGHT'S DISTANCE OF THESE SQUARES, I.E. THE MINIMUM NUMBER OF MOVES FOR A KNIGHT, TO GO FROM ONE SQUARE TO THE OTHER.

222PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51060D 67-QUEEN-GAME

HAVING PLACED A CHESS QUEEN ARBITRARILY ON A N.N CHESSBOARD (N=9999 9), TWO PLAYERS (YOU AND MAC) ALTERNATIVELY MOVE THE QUEEN TO THE LEFT OR DOWN OR DIAGONALLY TO THE LEFT AND DOWNWARDS. YOU CAN DECIDE ON THE STARTING PLACE, BUT MAC THEN MAKES FIRST MOVE. WINNER IS HE, WHO FIRST PLACES QUEEN IN LOWER LEFT-HAND CORNER OF THE BOARD (X=Y= 1).
GENERALISED AND FASTER EDITION OF HP'S QUEEN-BOARD GAME FOR A 8.8 BOARD.

101PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51061D 67-MASTERMIND-INVERSE

IN DIRECT MASTERMIND, YOUR HP PLAYS THE ROLE OF MONITOR. IN INVERSE MASTERMIND, YOU ARE THE MONITOR, AND YOUR HP FINDS THE FOUR-DIGIT NUMBER YOU HAVE CHOSEN.

224PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51062D 67-BILLIARDS SIMPLIFIED

A RANDOMNUMBER GENERATOR PUTS THREE BILLIARD-BALLS ON A RECTANGULAR BILLIARD-TABLE. YOU PLAY YOUR BALL

51062D (CONTD)

BY KEYING IN ITS DIRECTION. YOUR BALL CAN HAVE UP TO NINE COLLISIONS WITH A TABLE'S EDGE OR WITH ANOTHER BALL, BEFORE COMING TO A STANDSTILL HITTING THE TWO OTHER BALLS COUNTS FOR TWO POINTS. HITTING ONLY ONE OTHER BALL GIVES NO POINTS. HITTING NO BALL AT ALL MAKES YOU LOSE ONE POINT. AFTER THIS A NEW SITUATION IS GIVEN AUTOMATICALLY, AND SO ON.

223PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51063D 67-SIMPLIFIED DOMINOES

THE 28 STONES OF A NORMAL GAME OF DOMINOES ARE SUPPOSED TO BE PUT FACE UPWARDS ON A TABLE. TWO PLAYERS (YOU AND MAC) ALTERNATIVELY ADD A STONE FROM THE STOCK TO A SUIT, THE FIRST STONE OF WHICH IS CHOSEN BY A RANDOMNUMBER GENERATOR. THE FIRST PLAYER UNABLE TO PLAY LOSES THE GAME.

158PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51064D 67-SQUARE MAZE

DEPENDING ON A SEED, YOUR CALCULATOR CONSTRUCTS A SQUARE MAZE, THE SIZE OF WHICH IS N BY N, WHERE N IS LESS THAN 100000. EACH ROOM HAS 4 DOORS, SOME CLOSED, SOME OPEN. FROM AN INDICATED STARTING PLACE, YOU HAVE TO FIND A TREASURE-ROOM. DOORS CAN BE OPENED, BUT IN DOING SO, YOU LOSE PART OF YOUR KEYS. DO NOT LOSE THEM ALL, SINCE THIS ENDS THE GAME BY DESTRUCTION OF THE MAZE.

214PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51065D 67-GAME OF LIFE-SIMPLIFIED

THIS PROGRAM IS A SIMPLIFIED AND FASTER VERSION OF JOHN RAUSCH' PROGRAM FOR THE SAME GAME (00463D, IN EUROPE 00210D). IT IS TO BE REGARDED AS A WAY TO THANK AUTOR FOR HIS MAGNIFICENT WORK.

112PROGRAM STEPS
RAYMOND BROECKX
B - EILRIJK.

51066D 67-GIVE AND TAKE

STARTING WITH 6-DIGIT NUMBERS, TWO PLAYERS (YOU AND MAC) ALTERNATIVELY TRY TO GUESS SINGLE DIGITS OF OPPONENT'S NUMBER. A CORRECT GUESS, SAY 5 WHEN OPPONENT'S NUMBER IS 215689, DIMINISHES OPPONENT'S NUMBER WITH 5000 AND MAKES OWN NUMBER GROW WITH SAME AMOUNT. PLAYER WINS EITHER WHEN OWN NUMBER OUTGROWS 1000000, OR WHEN OPPONENT'S NUMBER BECOMES ZERO.

201PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51067D 67-THREE JARS PROBLEM

HAVING THREE JARS WITH VOLUMES OF A+B, A AND B UNITS, THE FIRST ONE BEING EMPTY AND THE OTHER TWO BEING FULL OF WINE, WE ARE ASKED TO DIVIDE THE WINE IN TWO EQUAL PARTS BY POURING WINE FROM ONE JAR INTO ANOTHER REPEATEDLY. YOU CAN TRY AND SOLVE THE PROBLEM BY YOURSELF. ON THE OTHER HAND, YOUR HP-67 CAN SHOW YOU THE TWO SHORTEST WAYS TO A SOLUTION.

112PROGRAM STEPS
RAYMOND BROECKX
B - WILRIJK.

51068D 67-LUMINOUS RANGE OF A LIGHT IN REDUCED VISIBILITY

COMPUTES THE LUMINOUS RANGE OF A LIGHT (DISTANCE IN NAUT.MILES AT WHICH A LIGHT CAN BE SEEN) IN CONDITIONS OF IMPAIRED VISIBILITY. INPUT DATA ARE: INTENSITY OF THE LIGHT IN CANDELAS OR NOMINAL RANGE IN MILES, AND , METEOROLOGICAL VISIBILITY.

067PROGRAM STEPS
ROBERT FREDERIC MENZI
CH - GENEVA.

51069D 67-BOAT SPEED AND PROPELLER DIMENSIONING

COMPUTES THE SPEED OF A BOAT AND THE DIMENSIONS OF THE PROPELLER.

181PROGRAM STEPS
HENRI BAUMGARTNER
CH - CAROUGE/GE.

51070D 67-CALCULATION OF SOME HUMIDITY INDICES

THIS PROGRAM COMPUTES FROM THE PSYCHROMETER TEMPERATURES THE FOLLOWING HUMIDITY INDICES OF THE AIR: RELATIVE HUMIDITY, DEW-POINT, MIXING RATIO AND VAPOUR PRESSURE. THE CALCULATION OF THE SATURATION VAPOUR PRESSURE WITH RESPECT TO WATER IS OBTAINED FROM THE FORMULA RECOMMENDED BY WORLD METEOROLOGICAL ORGANIZATION AND IT CAN BE DISPLAYED FOR ANY TEMPERATURE WITH THE GREATEST APPROXIMATION ADMITTED.

224PROGRAM STEPS
EUGENIO OLIVA
SP - MADRID.

51071D 67-PULMONARY FUNCTION: FRC. FRC%, TLC, MMEF (25-75%)

THE PROGRAM: PULMONARY FUNCTION, VITAL CAPACITY, FORCED EXPIRATORY VOLUME IS CONTINUED BY THIS PROGRAM SOME NORMAL SPIROMETRIC VALUES MAY BE CALCULATED:
1) FUNCTIONAL RESIDUAL CAPACITY (FRC) IN 1/SEC AND %;
2) TOTAL LUNG CAPACITY (TLC) IN 1;
3) MAXIMUM MIDEXPIRATORY FLOW (MMEF 25-75%); VARIABLES ARE SEX, HEIGHT, WEIGHT AND AGE.

224PROGRAM STEPS
LUDWIG STRAUSS
D - BURSTADT.

51072D 97-CONVERSION - BAR - COST/UNIT WT. TO COST/UNIT LENGTH

THIS PROGRAM WAS DESIGNED TO CONVERT THE COST PER METRIC TONNE OF RAW BAR IN STEEL, BRASS AND ALIMINIUM ALLOYS TO A COST PER FOOT FOR COSTING PURPOSES. IT DEALS WITH ROUND, SQUARE AND HEXAGON BAR. THE PROGRAM HAS BEEN DESIGNED AVOIDING SOPHISTICATED TECHNIQUES TO ENABLE THE USER TO MODIFY IT EASILY TO USE OTHER MATERIALS, UNIT LENGTHS AND WEIGHTS.

195PROGRAM STEPS
PETER CRAWLEY
UK - PORTSMOUTH.

51073D 67-STAR IDENTIFICATION

IN THE BEGINNING OF TWILIGHT,ONLY SOME BRIGHT STARS ARE APPARENT AND NO CONSTELLATION PERMITS TO IDENTIFIE THEM, BUT IT IS THE BEST TIME TO MAKE A FIX, BECAUSE HORIZON IS STILL CLEAR. SHOOT WITH NO CURE OF IDENTIFICATION, ONLY NOTING CAREFULLY AZIMUTH OF THE BODIES (+-3D.) THIS PROGRAM WILL PERMIT 1-TO IDENTIFIE DIRECTLY STARS BY THEIR NUMBER IN NAUTICAL ALMANAC "SELECTED STARS" 2-TO FIND PLANETS IN THE ALMANAC WITH APPROXIMATE GHA AND D.

51073D (CONTD)

223PROGRAM STEPS
JEAN-FRANCOIS PAILLARD
F - LEVIS-SAINT-NOM.

51074D 97-SPEED TRIAL TAKING MEAN OF MEANS

PROGRAM CALCULATES THE CORRECT MEAN SPEED FROM A NUMBER OF SPEED TRIAL RUNS UNDER TIDAL CONDITIONS BU FINDING THE MEAN OF MEANS. THE MEAN SPEEDOMETER READING MAY ALSO BE FOUND TO CALCULATE THE LOG ERROR. PRINT-OUT COPIES MAY BE PRODUCED FOR TRIAL REPORTS.

107PROGRAM STEPS
CERALD A. BAYNE
F - CANNES.

51075D 97-TIDAL PREDICTION BY HARMONIC CONSTANTS

BASED UPON THE ADMIRALTY METHOD OF TIDAL PREDICTION, THIS PROGRAM PREDICTS THE HEIGHT OF THE TIDE AT ANY PORT FOR WHICH HARMONIC CONSTANTS ARE PUBLISHED IN THE ADMIRALTY TIDE TABLES. SPECIFIC PORT CONSTANTS MAY BE ENTERED BY DATA CARD.

167PROGRAM STEPS
GERALD A. BAYNE
F - CANNES.

51076D 67-DEPTH OF WATER IN A TRAPEZOID CHANNEL

PROGRAM COMPUTES DEPTH OF WATER IN AN OPEN TRAPEZOID SHAPED CHANNEL WHEN FLOW, LONGITUDINAL GRADIENT, WIDTH OF BOTTOM, INCLINE OF LATERAL SLOPES AND THE PARAMETER OF HYDRAULIC SURFACE ROUGHNESS FOR THE CHANNEL BED ARE GIVEN. WHEN THE DEPTH IS GIVEN THE WIDTH OF BOTTOM OF THE CHANNEL CAN BE CALCULATED.

021PROGRAM STEPS
WERNER BRILON
D - ETTLINGEN.

51077D 67-BOOKKEEPING OF SKAT

THE PROGRAM CALCULATES THE SCORE AND KEEPS TRACK OF THE TOTAL RESULT OF THE GAME SKAT USING A SINGLE ENTRY PER ATTEMPT. IT TAKES INTO ACCOUNT CONTRACT, WIN OR LOSS, SPECIAL EVENTS, SUCH AS 'HAND', 'SCHNEIDER'AND'CONTRA'CONTRA'LOSSES LEAD TO 'BLOCK'AND'RAMSCH'ROUNDS. DISPLAY LOOP INCLUDES SCORE OF EACH PLAYER, NEXT DEALER AND 'BOCK'-'RAMSCH'INDICATIONS.
ERROR CORRECTION IS PROVIDED AS WELL AS FINAL COMPUTATION ROUTINE.

218PROGRAM STEPS
KLAUS WILHELM
D - NORTHEIM.

51078D 97-CURVE FITTING BY POLYNOMIAL OF 2ND OR 3RD DEGREE

THIS PROGRAM FITS FOR A SET OF RANDOMLY SPACED DATA POINTS A POLYNOMIAL OF THE 2ND OR 3RD DEGREE BY A LEAST SQUARES PROCEDURE. FAST DATA ENTRY, SIMPLE DATA HANDLING, DELETING AND ADDING DATA PAIRS ARE POSSIBLE AT ANY TIME. PROJECTIONS OF Y-VALUES CAN BE MADE.

224PROGRAM STEPS
WIM DEN HOLLANDER
NL - DELFT.

51079D 67-DIOPHANTINE EQUATION-LINEAR CONGRUENCE-CONTINUED FRACTION

THE PROGRAM SOLVES LINEAR DIOPHANTINE EQUATIONS AND LINEAR CONGRUENCES MODULO M, COMPUTES REMAINDERS, GREATEST COMMON DIVISOR AND LEAST COMMON MULTIPLE, CONVERTS FRACTIONS

51079D (CONTD)

TO CONTINUED FRACTIONS AND CONTINUED FRACTIONS TO FRACTIONS, EVALUATES THE FACTORS S AND T IN GCD (A,B)=A*S+B*T.

224PROGRAM STEPS
MARTIN WEISSENBOECK
A - WIEN.

51080D 67-CHESS QUEENS PROBLEM BOARD SIZE: N*N. N<=20

SOLVES THE PROBLEM, TO PUT N CHESSQUEENS ON A N*N-BOARD, SO THAT NEITHER QUEEN CAN BEAT ANY OTHER (I.E. THERE ARE NO TWO QUEENS IN THE SAME ROW NOR IN THE SAME COLUMN NOR IN THE SAME DIAGONAL). ATTENTION* EXTREMELY LONG COMPUTING TIME (UP TO MANY HOURS OR MANY DAYS, DEPENDING ON N).

126PROGRAM STEPS
MARTIN WEISSENBOECK
A - WIEN.

51081D 67-CANASTA SCOREKEEPER

CANASTA SCORES ARE MEMORIZISED FOR UP TO FIVE PLAYERS. MINIMUM SCORES ARE COMPUTED FOR THE NEXT LAP. THE LIMIT (MAXIMUM SCORES) CAN BE SELECTED: 10000 OR 15000. INPUT IS CHECKED TO BE CORRECT CANASTA SCORES.

111PROGRAM STEPS
MARTIN WEISSENBOECK
A - WIEN.

51082D 97-NETWORK, CRITICAL PATH

PROGRAM FINDS CRITICAL PATH-EITHER MAXIMUM OR MINIMUM- IN AN ACYCLIC NETWORK OF MAXIMUM 23 NODES.
112 STEPS ARE AVAILABLE TO PROGRAM NETWORK FUNCTION.

110PROGRAM STEPS
BART ONKENHOUT
NL - BLARICUM.

51083D 67-RASTER-SCAN GRAPHICS B

GIVEN ANY FUNCTION, THE PROGRAM COMPUTES "RASTER POINTS" OF A THREE DIMENSIONAL PICTURE IN THE X-Y PLANE (LIKE THE HP-1340A), POINT BY POINT, ROW BY ROW.
YOU MUST PUT IN THE ANGLE BETWEEN THE X AND Z AXIS IN THE X-Y PLANE, THE RANGE OF X AND Z BETWEEN THE PICTURE MUST BE FALL, THE INCREASE OF X(DELTA X) AND Z(DELTA Z) AND THE FUNCTION F(XYZ)=0 AS Y=F(X,Z).
IF YOU MAKE THE CONNECTION OF ALL POINTS YOU CAN SEE THE PICTURE IN "RASTER-SCAN" STYLE.

070PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

51084D 67-RASTER SCAN GRAPHICS A

PROGRAM SIMULATES A GRAPHICS TERMINAL LIKE THE HP 2648A OR THE HP 1340A COMPUTING RASTERPOINTS OF A GRAPH INTO THE X-Y-PLANE BUT IN X-Y-Z STYLE.
DIFFERENT RASTERPOINTS(COORDINATES X AN Y) ARE GIVEN, ONE BY ONE, ROW BY ROW, AFTER THE INPUT OF THE COEFFICIENTS AND EXPONENTS OF THE FUNCTION AND THE X AND Z RANGE BETWEEN THE PICTURE MUST BE FALL, AND THE ANGLE BETWEEN THE Z AND X AXIS IN THE X-Y-PLANE. FINALLY YOU SEE A THREEDIMENSIONAL GRAPH IN A X-Y-PLANE.

094PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

51085D 67-GENERAL RASTER GRAPHICS

51085D (CONTD)

GIVEN ANY FUNCTION, THE PROGRAM COMPUTES S.C. RASTER POINTS OF A THREEDIMENSIONAL PICTURE IN A X-Y-PLANE, POINT BY POINT, ROW BY ROW.
YOU MUST PUT IN THE ANGLE BETWEEN X AND Z IN THE X-Y-PLANE, THE RANGE OF X AND Z BETWEEN THE PICTURE MUST BE FALL AND THE FUNCTION.
IF YOU MAKE THE CONNECTION OF ALL POINTS YOU CAN SEE THE PICTURE IN "RASTER-SCAN" STYLE.

068PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

51086D 67-COMPARISON TEST OF TWO POPULATION MEANS

PROGRAM EXAMINES THE COMPARISON OF TWO POPULATION MEANS. GIVEN THE RESULTS OF TWO SAMPLES, THE PROGRAM COMPUTES THE MEANS AND VARIANCES OF THE ESTIMATOR, THE DIFFERENCE BETWEEN THE TWO MEANS, THE POINT ESTIMATE AND THE CONFIDENCE INTERVAL WITH THREE CONFIDENCE COEFFICIENTS.

100PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

51087D 67-PSEUDO CONTROL CHART

WITH THIS PROGRAM YOU CAN MAKE QUICKLY A 'QUALITY CONTROL' AND YOU CAN EXAMINATE THE OBSERVED CHANGES AT ANY LEVEL OF CONFIDENCE. THE CONTROL LIMITS ARE COMPUTED AND ALSO THE SAMPLE MEAN, WHEN MEAN AND T ARE GIVEN OR COMPUTED.

136PROGRAM STEPS
JOHN VAN THIELEN
B - STABREIK.

51088D 67-PROBABILITY MODEL OF ESCAPED PARTICLES

PROGRAM SIMULATES A PROBABILITY SITUATION OF PARTICLES WHO ESCAPE ONLY IF THEIR ENERGY LEVEL IS GREATER THAN OR/AND EQUAL TO THE ENERGY LEVEL OF THE MODEL AT THAT MOMENT.
A SPECIAL RANDOMNUMBER GENERATOR IS USED AND YOU CAN ALSO TEST THE RESULTS WITH THE CHI-SQUARE TEST.

112PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

51089D 67-GRAPHICS TERMINAL SIMULATOR

PROGRAM SIMULATES A GRAPHICS TERMINAL LIKE THE HP 2648A OR THE HP 1340A, COMPUTING THE X-Y COORDINATES OF A GRAPH IN X-Y-Z STYLE.
DIFFERENT RASTER POINTS ARE GIVEN ONE BY ONE. YOU MUST CHOOSE THE RANGE OF THE PLOT AND THE ANGLE BETWEEN THE Z AND X AXIS IN THE X-Y PLANE.
IF YOU MAKE THE CONNECTION OF ALL THE FOUNDED POINTS YOU SEE A THREEDIMENSIONAL GRAPH IN A X-Y-PLANE, A S.C. RASTER SCAN. (RANGE OF X AND Z BETWEEN 0 AND X=Z).

088PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

51090D 67-PROBABILITY DENSITY FIELD

A RANDOMNUMBER GENERATOR COMPUTES ONLY ONES AND ZEROS IN (N BY N) MATRIX FIELDS (N<=10), ADDING THIS FIELDS N TIMES TOGETHER. (N<=9) THEN YOU CAN SEE THE N ROWS FROM BOTTOM TO TOP.
IF YOU GIVE SYMBOLS OR COLOURVALUES DEPENDING THE NUMBER (BETWEEN 0 AND 9) YOU WILL FIND A DENSITY DISTRIBUTION.

51090D (CONTD)

147PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

51091D 97-VISCOSITY-TEMPERATURE-CONVERSION

THIS PROGRAM ENABLES TO CALCULATE THE VISCOSITY OF A NEWTONIAN FLUID AT ANY TEMPERATURE (UP TO ABOUT 200 DEGREES CENTIGRADE) IF TWO VISCOSITIES AT TWO TEMPERATURES OR ONE VISCOSITY AT A GIVEN TEMPERATURE AND THE V-T-SLOPE ARE KNOWN.
BASIS: WALTHER-UBBELOHDE AND UMSTAETTER EQUATIONS.
FURTHERMORE, THE V.I.R. IS OBTAINED

217PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

51092D 67-FIVE HIDDEN PAWNS

ON A 9X9 GRID THE HP OR A HUMAN OPPONENT WILL HIDE FIVE PAWNS. YOUR POINT IS TO LOCATE THEM. BECAUSE EACH PAWN IS SURROUNDED BY FOUR WALLS, YOU CAN DETECT THEM BY SENDING A RAY INTO THE GRID. WHENEVER THE RAY REACHED THE WALLS IT WILL TURN OFF IF IT IS A CORNER OR IT WILL COME BACK TO THE INITIAL POSITION.
THIS GAME IS ALSO KNOWN AS KO CODE.

308PROGRAM STEPS
HERMAN PEETERS
B - BOECHOUT.

51093D 97-SUPER BAGELS

OBJECTIVE IS TO GUESS A TWO TO SIX DIGIT NUMBER CHOSEN AT RANDOM BY THE CALCULATOR. SUCCESSIVE GUESSES ARE RATED BY CUES DISPLAYED TO THE PLAYER. PROGRAM FEATURES AN OPTIONAL FILTER TO PREVENT THE REPETITION OF ANY DIGIT IN THE HIDDEN NUMBER. DELIVERS THE CUES NEARLY TWICE AS FAST AS PROGRAM 180D.

206PROGRAM STEPS
JEAN-CLAUDE HENTSCH
CH - CORSIER.

51094D 67-IQ-TEST

IF YOU WANT TO TEST YOUR NUMERICAL INSIGHT, THIS IS AN IDEAL PROGRAM. THE CALCULATOR DISPLAYS A SEQUENCE OF NUMBERS. IT IS UP TO YOU TO FIND THE REGULARITY IN IT AND TO GIVE THE NEXT THREE NUMBERS OF THE SEQUENCE. THE PROGRAM HAS FIVE DEGREES OF DIFFICULTY: FROM 0 (VERY EASY) TO 4 (ALMOST IMPOSSIBLE TO SOLVE).

224PROGRAM STEPS
ARIE VAN ERK
NL - EINDHOVEN.

51095D 67-N-TH DEGREE POLYNOMIAL SOLUTIONS (N<=17): BAIRSTOW'S METHOD.

THIS PROGRAM CALCULATES REAL AND/OR COMPLEX ROOTS OF POLYNOMIALS UP TO 17TH DEGREE USING BAIRSTOW'S METHOD THIS PROGRAM MAY BE USED WHETHER, INDEPENDENT OF OTHER PROGRAMS, WITH THE DEGREE N AND THE COEFFICIENTS OF THE POLYNOMIAL MEMORIZED BY HAND OR AS A SUBORDINATE PROGRAM OF A MAIN PROGRAM WHERE, AFTER MEMORIZING THE COEFFICIENTS IN THE RIGHT MEMORIES AND N+6 IN R2, WE CAN CALL THIS PROGRAM THROUGH THE LOOP (LBL9,PSE,GTO9).

214PROGRAM STEPS
PIETRO AMORE
I - ALCAMO.

51096D 97-GAMMA FUNCTION

PROGRAM CALCULATES GAMMA OF X (ALSO FOR NEGATIVE X) VERY EFFECTIVELY TO

51096D (CONTD)

8-DIGIT ACCURACY. APPROXIMATION USED IS DESCRIBED BY HENRICI IN "COMPUTATIONAL ANALYSIS WITH THE HP-25 POCKET CALCULATOR".

053PROGRAM STEPS
GUNTER SCHNELL
D - LILIENTHAL.

51097D 67-LEAST-SQUARES SMOOTHING OF EMPIRICAL DATA

PROGRAM IS DESIGNED TO SMOOTH DATA POINTS Y1,...,YN (2<N<25) BY EVALUATING THE LEAST-SQUARES POLYNOMIAL OF DEGREE 1 RELEVANT TO THREE SUCCESSIVE POINTS. THE FUNCTION VALUES YI SHOULD CORRESPOND TO N EQUIDISTANTLY SPACED ARGUMENT VALUES. THE SMOOTHED VALUES ZI HAVE THE SAME STORAGE ALLOCATION AS THE ORIGINAL DATA POINTS.

084PROGRAM STEPS
WOLFGANG EHRHARDT
D - GOETTINGEN.

51098D 67-COORD. OF POINTS ON CIRCLE CONNECTING 2 STRAIGHT LINES

PROGRAM COMPUTES: 1. COORD. OF POINTS ON CIRCLE CONNECTING 2 STRAIGHT LINES. 2. COORDINATES OF CENTER. EXPECTS COORDINATES OF 4 POINTS DEFINING THE LINES, RADIUS, NO. OF POINTS ON CIRCLE, SIDE-INDICATORS.

224PROGRAM STEPS
ROBERT GERUSCHKAT
D - HANNOVER.

51099D 67-DIFF. EQ. SOLVER FOR ABSENT USER PENDULUM

Y'=D(X,Y) IS SOLVED BY MEANS OF THE 4 ORDER, STANDARD RUNGE-KUTTA, METHOD. A SOLVING LIKE THIS MAY TAKE HOURS. THE CALCULATOR CANNOT BE SPEEDED UP,BUT THIS PROGRAM MAKES IT POSSIBLE FOR THE USER TO BE BUSY ELSEWHERE DURING THE SOLVING. SELECTED SOLUTIONSETS: (X,Y, Y') ARE SIMPLY RECORDED ON CARDS AND LATER RETRIEVED. ONE CARD HOLDS 20 SOLUTIONSETS. 115 PROGRAMSTEPS ARE AVAILABLE FOR THE USERFUNCTION: D(X,Y).
PENDULUM EXAMPLE INCLUDED.

109PROGRAM STEPS
NIELSEN SOREN VIDEBEK
DK - STRUER.

51100D 67-ASHTREE CONVERSIONS

PROGRAM CONVERTS QUINTALS OF ASHTREE INTO CUBES-METRES, AND VICE VERSA.

172PROGRAM STEPS
RENZO GRANZOTTO
I - S.GIOVANNI AL NATISONE/UDINE.

51101D 67-MAPLE-TREE CONVERSIONS

PROGRAM CONVERTS QUINTALS OF MAPLETREE INTO CUBES-METRES, AND VICE VERSA.

999PROGRAM STEPS
RENZO GRANZOTTO
I - S.GIOVANNI AL NATISONE/UDINE.

51102D 67-PH BY HYDROLYSIS

PROGRAM COMPUTES ACID/BASIC HYDROLYSIS AND THE CONTEMPORARY HYDROLYSIS OF CATION AND ANION OF A SALT. IT CALCULATES ALSO THE "HYDROLYSIS DEGREE" IN %.
RATHER THAN SOLVING THE SAMPLE FORMULA, PROGRAM SOLVES EVERY TIME A PARTICULAR 2 DEGREE EQUATION TO PROVIDE MORE EXACT VALUES.

136PROGRAM STEPS

51102D (CONTD)

CLAUDIO VIGHI
I - BOLOGNA.

51103D 67-SYMMETRICAL CATENARY

PROGRAMS FITS A SYMMETRICAL CATENARY GIVEN TWO OF THE FOUR FOLLOWING DATA:SPAN, SAG, LENGTH, PARAMETER. THE PROGRAM CAN BE USED FOR HANGING CABLE DEFINITION OR AS A PRELIMINARY BASIS FOR SAG TABLES COMPUTATION BOTH DATA AND RESULTS ARE AVAILABLE FOR FURTHER USE
DATA ARE CHECKED FOR ACCEPTABILITY AND CONSISTENCY.

224PROGRAM STEPS
JESUS FIERRO
SP - MADRID.

51104D 67-CONFIDENCE INTERVALS

GIVEN THE RESULTS OF A SAMPLE AND THE ASKED CONFIDENCE INTERVAL, THE PROGRAM COMPUTES THE UPPER AND LOWER CONFIDENCE LIMITS.

152PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

51105D 67-THE ROUTH-HURINTZ CRITERIA

PROGRAM EXAMINES IF THE ROOTS OF THE POLYNOMIAL P(LAMBDA) (DEGREE 4) ALL LIE IN THE LEFT-HALF OF THE COMPLEX PLANE. IT IS NECESSARY AND SUFFICIENT THAT THE THREE DETERMINANTS ON ARE POSITIVE. THIS SYSTEM IS THE NAMED CRITERIUM OF ROUTH HURINTZ.

088PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

51106D 67-SERUM-TEST

PROGRAM EXAMINES THE RESULTS OF A SERUM TEST UNDER THE NULL-HYPOTHESIS WITH A 0,995 LEVEL. THE CHI-SQUARE TEST, CORRECTED BY YATES, IS USED. THE COEFFICIENT OF CONTINGENCY AND THE TETRACHORIC CORRELATION ARE ALSO COMPUTED. FINALLY YOU CAN TEST THE SIGNIFICANCE OF THE RESULTS AT A 0,005-LEVEL.

083PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

51107D 67-THREE POINTS CIRCLE IN SPACE

GIVEN THREE POINTS IN SPACE, THE PROGRAM COMPUTES THE RADIUS AND THE AREA OF THE CIRCLE THROUGH THESE POINTS.

093PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

51108D 67-VOLUME OF A CONE IN SPACE

GIVEN THREE POINTS A, B AND C IN SPACE AND ANOTHER POINT D IN THAT SPACE PROGRAM COMPUTES THE VOLUME OF THE CONE FORMED BY THE AREA OF THE CIRCLE THROUGH THE POINTS A, B AND C AND THE POINT D.

199PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

51109D 67-INTERSECTION OF A PLANE AND A SPHERE IN SPACE

GIVEN THREE POINTS A, B, C IN SPACE AND THE CENTER AND RADIUS OF A SPHERE IN THAT SPACE, PROGRAM COMPUTES THE AREA OF THE INTERSECTION OF THE PLANE THROUGH THE POINTS A, B, C AND THE SPHERE (A CIRCLE OF COURSE).

51109D (CONTD)

136PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

51110D 67-VOLUME OF A PRISM IN THE SPACE

GIVEN THREE POINTS, A, B AND C IN THE SPACE AND ANOTHER POINT D IN THIS SPACE, THIS PROGRAM COMPUTES THE VOLUME OF THE PRISM (ABC)D.

188PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

51111D 67-POISSON DISTRIBUTION

PROGRAM COMPUTES THE EXPECTED RESULTS OF A POISSON-MODEL WITH REAL VALUES, TEST THESE RESULTS WITH THE CHI-SQUARE TEST AND GIVES THE POISSON-DISTRIBUTION OF ALL SITUATIONS.

092PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

51112D 67-FOUR-DIMENSIONAL CURVE FITTING

GIVEN THE COORDINATES X, Y AND Z OP A POINT P IN A THREE-DIMENSIONAL SPACE AND THE TIME-UNITS T, THE PROGRAM COMPUTES THE BEST CURVE FITTING OF THE EQUATION T=AX+BY+CZ+D IN A FOUR-DIMENSIONAL SPACE.
YOU CAN ALSO COMPUTE THE EXPECTED T FOR A GIVEN P(X,Y,Z).

217PROGRAM STEPS
JOHN VAN THIELEN.
B - STABROEK.

51113D 67-ELLIPTIC LP-FILTERS, EVEN ORDER TYPE B. POLES AND ZEROS

ELLIPTIC LP-FILTERS OF TYPE B HAVE A ZERO OF TRANSMISSION AT INFINITY. THE GAIN AT F=0 IS EQUAL TO THE MINIMUM VALUE IN THE PASSBAND. PROGRAM 50476D IS USED. TO OBTAIN A SPECIFIED STEEPNESS, THE HYPOTHETICAL STEEPNESS, KB, MUST BE CALCULATED, PROGAM 50961D. THE MAXIMUM ORDER IS 8.

349PROGRAM STEPS
NILS HAAHEIM
N - TRONDHEIM.

51114D 67-TWONKY

YOU ARE INSIDE A 15 BY 15 RANDOM-MAZE TO REACH THE UNKNOWN OBJECTIVE HINDERED BY RELOCATION SQUARES, WALLS, THE SUPER SPECIAL NEW MAZE SQUARE-AND TWONKY. THIS MONSTER WALKS ALWAYS TOWARDS YOU TO ABSORBE YOU. YOU PLAY BLIND. ONLY THE DISTANCES FROM TWONKY AND THE OBJECTIVE ARE DISPLAYED. HOWEVER, YOU HAVE A RAY GUN TO SHOOT TWONKY. IF YOU HIT, TWONKY DEMATERIALIZES AND THEN REMATERIALIZES ON ANOTHER SQUARE TO RESUME HIS QUEST AFTER YOU.

224PROGRAM STEPS
HANS-JOACHIM HOEFT
D - GOETTINGEN.

51115D 67-NIM LEARNING PROGRAM

THERE ARE THREE PILES WITH 1,2 AND 3 ITEMS. YOU HAVE THE FIRST MOVE IN THIS SIMPLE GAME. THE CALCULATOR ANSWERS WITH RANDOM MOVES. BUT WHENEVER HE HAS LOST A GAME, HE LEARNS AND NEVER REPEATING A BAD MOVE HE BECOMES A BETTER AND BETTER PLAYER UNTIL HE WINS EVERY GAME. DOUBTS WHETHER HE IS INTELLIGENT?

112PROGRAM STEPS
HANS-JOACHIM HOEFT
D - GOETTINGEN.

51116D 67-AIRY FUNCTIONS

GIVEN THE ARGUMENT PROGRAM COMPUTES THE VALUES OF AIRY FUNCTIONS.

108PROGRAM STEPS
RICCARDO P. BALOSSI
I - MILANO.

51117D 67-EIGENVALUES OF 5X5 HESSENBERG MATRIX

PROGRAM COMPUTES ALL EIGENVALUES OF A 5X5 HESSENBERG MATRIX BY AN ITERATIVE METHOD, THE LR-ALGORITHM OF RUTISHAUSER.
EVERY REAL 5X5 MATRIX CAN BE REDUCED TO HESSENBERG FORM WITH PROGRAM "50986D REDUCTION OF A 5X5 MATRIX TO ALMOST TRIANGULAR FORM".

221PROGRAM STEPS
MARTIN KAWALETZ
D - SALZGITTER.

51118D 67-COEFFICIENTS OF THE CHARACTERISTIC EQUATION OF A 5X5 MAT.

AN UPPER HESSENBERG MATRIX IS REDUCED TO FROBENIUS FORM. THE ELEMENTS OF THE LAST COLUMN OF THE FROBENIUS MATRIX ARE THE COEFFICIENTS OF THE CHARACTERISTIC EQUATION.
EVERY REAL 5X5 MATRIX CAN BE REDUCED TO UPPER HESSENBERG FORM WITH PROGRAM "50986D REDUCTION OF A 5 BY 5 MATRIX TO ALMOST TRIANGULAR FORM"

217PROGRAM STEPS
MARTIN KAWALETZ
D - SALZGITTER.

51119D 67-CHAPEAU

PROGRAM SIMULATES THE (IN BELGIUM) VERY POPULAR GAME OF "CHAPEAU" IT ROLLS 5 DICE, PLAYS WITH THE DICE KEPT "UNDER THE CHAPEAU" OR OUTSIDE AND HOLDS THE REST. IT DISPLAYS THE THROW WITH THE REST OF THE DICE AND KEEPS THE DICE "UNDER THE CHAPEAU" INTERNALY HIDDEN OR DISPLAYS THE ENTIRE THROW TO CONTROL THE THROW FOR FURTHER PLAYING OR TO DO "CHAPEAU".

200PROGRAM STEPS
JOHAN DECAT
B - GENT.

51120D 67-FISHING COMPETITION

THIS ROUTINE (WHICH IS VERY EASY TO USE) SIMULATES A FISHING COMPETITION, WHERE IT IS POSSIBLE TO THROW SOME HANDFULS OF BAIT TO ATTRACT (AND TO CATCH) MORE FISH.
IF EACH ANGLER SELLS HIS FISH BY WEIGHT AND PURCHASES HIS BAIT, IT IS POSSIBLE TO COMPARE THE FINANCIAL RESULTS OBTAINED BY EACH ONE, IN REFERENCE TO A 4TH ANGLER REGULARLY SUPPOSED TO TAKE 35 GR. OF FISH AT EACH THROW OF HIS LINE WITHOUT BAITING.

224PROGRAM STEPS
DENIS WILQUIN
F - NICE.

51121D 67-SPECIAL MASTER MIND AND PRIMES

THIS ROUTINE IS TWO-FOLD; IT ALLOWS TO HAVE A GAME WITH MASTER-MIND, AND IN THE SAME TIME TO SEE IF ANY INTEGER IS A PRIME OR NOT. VERY EASY TO USE, IT IS POSSIBLE TO PRACTICE MASTER-MIND FOR A WHILE, THEN TO TEST IF SOME INTEGERS ARE PRIMES, AND FOR INSTANCE TO GO BACK TO MASTER-MIND WITHOUT ANY PROBLEM, (AND SO ON). THIS PROGRAM COULD HELP STAFF CHARGED TO SELL CALCULATORS.

223PROGRAM STEPS
DENYS WILQUIN

F - NICE.

511060 (CONTD)

PROGRAM EXAMINES THE RESULTS OF A SERUM TEST UNDER THE NULL-HYPOTHESIS WITH A C,995 LEVEL. THE CHI-SQUARE TEST, CORRECTED BY YATES, IS USED. THE COEFFICIENT OF CONTINGENCY AND THE TETRACHORIC CORRELATION ARE ALSO COMPUTED. FINALLY YOU CAN TEST THE SIGNIFICANCE OF THE RESULTS AT A 0,005-LEVEL.

083PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

511070 67-THREE POINTS CIRCLE IN SPACE

GIVEN THREE POINTS IN SPACE, THE PROGRAM COMPUTES THE RADIUS AND THE AREA OF THE CIRCLE THROUGH THESE POINTS.

093PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

511080 67-VOLUME OF A CONE IN SPACE

GIVEN THREE POINTS A, B AND C IN SPACE AND ANOTHER POINT D IN THAT SPACE PROGRAM COMPUTES THE VOLUME OF THE CONE FORMED BY THE AREA OF THE CIRCLE THRCUGH THE POINTS A, B AND C AND THE POINT D.

199PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

511090 67-INTERSECTION OF A PLANE AND A SPHERE IN SPACE

GIVEN THREE POINTS A, B, C IN SPACE AND THE CENTER AND RADIUS OF A SPHERE IN THAT SPACE, PROGRAM COMPUTES THE AREA OF THE INTERSECTION OF THE PLANE THROUGH THE POINTS A, B, C AND THE SPHERE (A CIRCLE OF COURSE).

136PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

511100 67-VOLUME OF A PRISM IN THE SPACE

GIVEN THREE POINTS, A, B AND C IN THE SPACE AND ANOTHER POINT D IN THIS SPACE, THIS PROGRAM COMPUTES THE VOLUME OF THE PRISM (ABC)D.

188PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

511110 67-POISSON DISTRIBUTION

PROGRAM COMPUTES THE EXPECTED RESULTS OF A POISSON-MODEL WITH REAL VALUES, TEST THESE RESULTS WITH THE CHI-SQUARE TEST AND GIVES THE POISSON-DISTRIBUTION OF ALL SITUATIONS.

092PROGRAM STEPS
JOHN VAN THIELEN
B - STABROEK.

511120 67-FOUR-DIMENSIONAL CURVE FITTING

GIVEN THE COORDINATES X, Y AND Z OP A POINT P IN A THREE-DIMENSIONAL SPACE AND THE TIME-UNITS T, THE PROGRAM COMPUTES THE BEST CURVE FITTING OF THE EQUATION T=AX+BY+CZ+D IN A FOUR-DIMENSIONAL SPACE.
YOU CAN ALSO COMPUTE THE EXPECTED T FOR A GIVEN P(X,Y,Z).

217PROGRAM STEPS
JOHN VAN THIELEN.
B - STABROEK.

511130 67-ELLIPTIC LP-FILTERS, EVEN ORDER TYPE B. POLES AND ZEROS

511130 (CONTD)

ELLIPTIC LP-FILTERS OF TYPE B HAVE A ZERO OF TRANSMISSION AT INFINITY. THE GAIN AT F=0 IS EQUAL TO THE MINIMUM VALUE IN THE PASSBAND. PROGRAM 50476D IS USED. TO OBTAIN A SPECIFIED STEEPNESS, THE HYPOTHETICAL STEEPNESS, KB, MUST BE CALCULATED, PROGAM 50961D. THE MAXIMUM ORDER IS 8.

349PROGRAM STEPS
NILS HAAHEIM
N - TRONDHEIM.

511140 67-THONKY

YOU ARE INSIDE A 15 BY 15 RANDOM-MAZE TO REACH THE UNKNOWN OBJECTIVE HINDERED BY RELOCATION SQUARES, WALLS, THE SUPER SPECIAL NEW MAZE SQUARE-AND THONKY. THIS MONSTER WALKS ALWAYS TOWARDS YOU TO ABSORBE YOU. YOU PLAY BLIND. ONLY THE DISTANCES FROM THONKY AND THE OBJECTIVE ARE DISPLAYED. HOWEVER, YOU HAVE A RAY GUN TO SHOOT THONKY. IF YOU HIT, THONKY DEMATERIALIZES AND THEN REMATERIALIZES ON ANOTHER SQUARE TO RESUME HIS QUEST AFTER YOU.

224PROGRAM STEPS
HANS-JOACHIM HOEFT
D - GOETTINGEN.

511150 67-NIM LEARNING PROGRAM

THERE ARE THREE PILES WITH 1,2 AND 3 ITEMS. YOU HAVE THE FIRST MOVE IN THIS SIMPLE GAME. THE CALCULATOR ANSWERS WITH RANDOM MOVES. BUT WHENEVER HE HAS LOST A GAME, HE LEARNS AND NEVER REPEATING A BAD MOVE HE BECOMES A BETTER AND BETTER PLAYER UNTIL HE WINS EVERY GAME. DOUBTS WHETHER HE IS INTELLIGENT?

112PROGRAM STEPS
HANS-JOACHIM HOEFT
D - GOETTINGEN.

511160 67-AIRY FUNCTIONS

GIVEN THE ARGUMENT PROGRAM COMPUTES THE VALUES OF AIRY FUNCTIONS.

108PROGRAM STEPS
RICCARDO P. BALOSSI
I - MILANO.

511170 67-EIGENVALUES OF 5X5 HESSENBERG MATRIX

PROGRAM COMPUTES ALL EIGENVALUES OF A 5X5 HESSENBERG MATRIX BY AN ITERATIVE METHOD, THE LR-ALGORITHM OF RUTISHAUSER.
EVERY REAL 5X5 MATRIX CAN BE REDUCED TO HESSENBERG FORM WITH PROGRAM "50986D REDUCTION OF A 5X5 MATRIX TO ALMOST TRIANGULAR FORM".

221PROGRAM STEPS
MARTIN KAWALETZ
D - SALZGITTER.

511180 67-COEFFICIENTS OF THE CHARACTERISTIC EQUATION OF A 5X5 MAT.

AN UPPER HESSENBERG MATRIX IS REDUCED TO FROBENIUS FORM. THE ELEMENTS OF THE LAST COLUMN OF THE FROBENIUS MATRIX ARE THE COEFFICIENTS OF THE CHARACTERISTIC EQUATION.
EVERY REAL 5X5 MATRIX CAN BE REDUCED TO UPPER HESSENBERG FORM WITH PROGRAM "50986D REDUCTION OF A 5 BY 5 MATRIX TO ALMOST TRIANGULAR FORM"

217PROGRAM STEPS
MARTIN KAWALETZ
D - SALZGITTER.

511190 67-CHAPEAU

PROGRAM SIMULATES THE (IN BELGIUM)

511190 (CONTD)

VERY POPULAR GAME OF "CHAPEAU" IT ROLLS 5 DICE, PLAYS WITH THE DICE KEPT "UNDER THE CHAPEAU" OR OUTSIDE AND HOLDS THE REST. IT DISPLAYS THE THROW WITH THE REST OF THE DICE AND KEEPS THE DICE "UNDER THE CHAPEAU" INTERNALY HIDDEN OR DISPLAYS THE ENTIRE THROW TO CONTROL THE THROW FOR FURTHER PLAYING OR TO DO "CHAPEAU".

200PROGRAM STEPS
JOHAN DECAT
B - GENT.

511200 67-FISHING COMPETITION

THIS ROUTINE (WHICH IS VERY EASY TO USE) SIMULATES A FISHING COMPETITION, WHERE IT IS POSSIBLE TO THROW SOME HANDFULS OF BAIT TO ATTRACT (AND TO CATCH) MORE FISH.
IF EACH ANGLER SELLS HIS FISH BY WEIGHT AND PURCHASES HIS BAIT, IT IS POSSIBLE TO COMPARE THE FINANCIAL RESULTS OBTAINED BY EACH ONE, IN REFERENCE TO A 4TH ANGLER REGULARLY SUPPOSED TO TAKE 35 GR. OF FISH AT EACH THROW OF HIS LINE WITHOUT BAITING.

224PROGRAM STEPS
DENIS WILQUIN
F - NICE.

511210 67-SPECIAL MASTER MIND AND PRIMES

THIS ROUTINE IS TWO-FOLD: IT ALLOWS TO HAVE A GAME WITH MASTER-MIND, AND IN THE SAME TIME TO SEE IF ANY INTEGER IS A PRIME OR NOT. VERY EASY TO USE, IT IS POSSIBLE TO PRACTICE MASTER-MIND FOR A WHILE, THEN TO TEST IF SOME INTEGERS ARE PRIMES, AND FOR INSTANCE TO GO BACK TO MASTER-MIND WITHOUT ANY PROBLEM, (AND SO ON). THIS PROGRAM COULD HELP STAFF CHARGED TO SELL CALCULATORS.

223PROGRAM STEPS
DENYS WILQUIN
F - NICE.

511220 67-HIGHT ACCURACY CHRONOMETER

THIS PROGRAM CHANGES YOUR HP 67/97 INTO A HIGHT ACCURACY CHRONOMETER, WHICH TIMES WITH A MINIMUM INTERVAL OF ABOUT 5/100TH OF SECOND. CALIBRATION CONSTANT IS USED AND MUST BE ADJUSTED TO ACCOMODATE DIFFERENCES BETWEEN CALCULATORS. THIS ASTONISHING PROGRAM RUNS WITH A MORE SURPRISING LISTING: IT DOESN'T USE CLOCK CIRCUITS OF HP 67/97 BUT ITS CALCULATION SPEED. ANOTHER PROGRAM: "TIME-KEEPER" IS DESIGNED FOR BETTER USE OF THIS PROGRAM, AND CONTAINS, BESIDES, INITIALIZATION AND ADJUSTMENT SUBROUTINES.

224PROGRAM STEPS
FRANCIS PARENT
F-STRASBOURG

511230 67-TIME-KEEPER

ALTHOUGH THIS PROGRAM IS ESPECIALLY DESIGNED TO WORK WITH PROGRAM "CHRONOMETER", YOU CAN USE IT WITH ANY TIMER, OR TO STOCK ANY RESULTS OR DATA. THIS PROGRAM STOCKS THE 20 BEST TIMES (THE 20 SMALLEST NUMBERS) AMONG THOSE YOU ENTER, AND GIVES YOU BACK EACH OF THEM WITH ITS ORDER NUMBER AND ITS POSITION. YOU CAN RECALL THE RESULT LIST FROM THE FIRST TO THE 20TH, THE TOTAL NUMBER OF TIME-KEEPING, AND THE AVERAGE TIME. PROGRAM CONTAINS ALSO SUBROUTINES TO CONVERT DISPLAYED TIMES.

215PROGRAM STEPS
FRANCIS PARENT
F-STRASBOURG

511240 67-BINARY ARITHMETICS I

PROGRAM CONVERTS A NUMBER IN DECIMAL-SYSTEM TO A NUMBER IN BINARY-SYSTEM AND REVERSE. ALSO YOU CAN ADD AND SUBTRACT TWO BINARY-NUMBERS WITHOUT CONVERTING INTO DECIMAL-SYSTEM.

183PROGRAM STEPS
REINHARD KLEINHANTZ
A-VIENNA

511250 97-RADIO FIX

PROGRAM DERIVES A FIX POSITION FROM TWO TO SIX RADIO BEACON BEARINGS, THE GEOGRAPHICAL POSTIONS OF THE BEACONS BEING STORED BY GROUPS ON DATA CARDS. EITHER TRUE OR RELATIVE BEARINGS MAY BE USED, AND UNCORRECTED QUADRANTAL ERROR IS REMOVED. MOVEMENT BETWEEN OBSERVATIONS IS AUTOMATICALLY ALLOWED FOR.

224PROGRAM STEPS
GERALD A. BAYNE
F-CANNES

511260 67-VOLUMES

THE PROGRAM CALCULATES THE VOLUMES OF A CYLINDER, A TUBE, A SPHERE, A HOLLOW SPHERE, A CONE, A TRUNK-CONE A PYRAMID, A TRUNK-PYRAMID, A BARREL AND A CYLINDRICAL GUARD.

106PROGRAM STEPS
CHRISTIAN COURNUT
F-BORDEAUX-CAUDERAN

511270 67-MODULE OF YOUNG BY DEADENING

THE PROGRAM CALCULATES THE MODULE OF YOUNG FOR AN ENTRANCE TIME VALUE (PERIOD OF VIBRATIONS).

024PROGRAM STEPS
CHRISTIAN COURNUT
F-BORDEAUX-CAUDERAN

511280 67-CORRECTING CURVE OF TRACTION

THE PROGRAM CALCULATES THE CORRECT VERSION OF: - THE BREAKING STRENGTH
- THE STRETCHING.
THIS PROGRAM ENABLES ONE TO CALCULATE THE INITIAL BREAKING STRENGTH.

045PROGRAM STEPS
CHRISTIAN COURNUT
F-BORDEAUX-CAUDERAN

511290 67-NETWORK CONVERSION WITH IMPEDANCES (LAMBDA DELTA OR DELTA LAMBDA)

PROGRAM CONVERTS A STAR - INTO A PI-NETWORK OR A PI-INTO A STAR-NETWORK.

188PROGRAM STEPS
HELMUT PEUKER
D-BRAUNSCHWEIG

511300 67-SOLVING MASTERMIND WITH HP 67/97

WITH THIS PROGRAM YOUR HP FINDS EVERY NUMBER BETWEEN 1111 AND 6666 IN ABOUT 6 GUESSES. YOU HAVE TO TELL THE CALCULATOR HOW MANY DIGITS OF ITS GUESS ARE IN THE CORRECT POSITION (BLACK KEY PEGS) AND IN THE INCORRECT POSITION (WHITE KEY PEGS)

220PROGRAM STEPS
MARTIN SCHMITT
CH-EMMENBRUECKE

511310 67-TRANSMISSION LINE CAPACITANCE

THIS PROGRAM COMPUTES CHARACTERISTICS CAPACITANCE FOR 4 TYPES OF TRANSMISSION LINE.
1) COAXIAL LINE
2) OPEN TWO WIRE LINE
3) SINGLE WIRE NEAR GROUND
4) WIRES IN PARALLEL NEAR GROUND

511310 (CONTD)

076PROGRAM STEPS
BRANKO SPOYARIC
YU-ZAGREB

511320 67-MILLMAN'S THEOREM AC/DC

IF IMPEDANCES/ADMITTANCES AND VOLTAGE SOURCES OF LINEAR NETWORK WITH TWO PRINCIPAL NODES ARE GIVEN THIS PROGRAM WILL CALCULATE VOLTAGE DROP AND IMPEDANCE/ADMITTANCE BETWEEN THESE NODES. ALSO IF ELEMENTS (E AND Z) OF A LINE ARE GIVEN CURRENT OF THAT LINE WILL BE CALCULATED. PROGRAM IS APPLICABLE FOR AC AND DC LINEAR NETWORKS.

203PROGRAM STEPS
BRANKO SPOYARIC
YU-ZAGREB

511330 67-GRAPH OF QUADRATIC FUNCTION

WHEN YOU WANT QUICKLY TO DRAW A GRAPH OF QUADRATIC FUNCTION THIS PROGRAM WILL HELP YOU BY CALCULATING THE ZERO POINTS AND MINIMUM/MAXIMUM OF THAT FUNCTION. YOU CAN ALSO CALCULATE F(X) AND F'(X) FOR EACH X AND SOLVE QUADRATIC EQUATION SPECIALLY APPLICABLE TO HP-67 OWNERS WHO CANNOT AFFORD HELP OF HP-97 PRINT ROUTINES.

112PROGRAM STEPS
BRANKO SPOYARIC
YU-ZAGREB

511340 67-POWER MEASUREMENTS

PROGRAM CALCULATES POWER OF A LOAD BY 3 VOLTMETERS OR 3 AMPERMETERS METHOD. POWER OF A LOAD AND SOURCE ARE CALCULATED BY WATMETER, VOLTMETER, AMPERMETER METHOD. FULL PRINTOUT PROVIDED.

150PROGRAM STEPS
BRANKO SPOYARIC
YU-ZAGREB

511350 67-NUMBER TRANSFORMATION

THIS PROGRAM CONVERTS DECIMAL NUMBERS TO NUMBERS WITH A BASE SMALLER THAN OR EQUAL TO 100 AND REVERSE.

102PROGRAM STEPS
GUNNAR ALM
S-FARSTA

511360 67-CORRECT AVERAGE AND VARIANCE.

PROGRAM COMPUTES CORRECT AVERAGE, STANDARD DEVIATION AND VARIANCE BETWEEN 13 DATA INPUT MAX.

169PROGRAM STEPS
RENZO GRANZOTTO
I-S.GIOVANNI AL NATISONE (UDINE)

511370 97-CARGO CALCULATION IN TANKERS

THIS PROGRAM SOLVES THE TWO STANDARD CALCULATIONS IN TANKERS FOR ANY LIQUID CARGO I.E. CONVERSION FROM WEIGHT TO VOLUME OR VICE VERSA BY GIVING A.P.I. OR SPECIFIC GRAVITY AND IN CONNECTION WITH PETROLEUM TABLES INPUT DATA CAN BE IN BARRELS OR CUBIC FEET DEPENDING ON VESSELS CALIBRATION.

031PROGRAM STEPS
JOACHIM HEYMUTH
D-WILLINGEN

511380 97-IMPEDANCES TRANSLATION STAR-DELTA AND VICE VERSA

AT THE ORIGIN, THIS PROGAM HAS BEEN ESTABLISHED FOR TRANSFORMATION OF A 3 IMPEDANCES STAR SYSTEM TO A 3 IMPEDANCES DELTA SYSTEM AND VICE VERSA. NEXT THE CLEAR PROGRAM STEPS AND LABELS ARE BEEN USED FOR ADDI-

511380 (CONTD)

TION, MULTIPLICATION OR RATIO OF 2 IMPEDANCES AND COMPUTATION OF THE EQUIVALENT IMPEDANCE OF 2 IN PARALLEL IMPEDANCES.

220PROGRAM STEPS
ROBERT-PIERRE RAYMOND
F-MEUDON

511390 67-BOAT SPEED AND PROPELLER DIMENSIONS

COMPUTES THE SPEED OF A DISPLACEMENT BOAT UNDER MECHANICAL PROPULSION AND THE DIMENSIONS OF THE OPTIMAL PROPELLER. GIVES REASONABLY ACCURATE RESULTS FOR A VERY WIDE RANGE OF HULL DIMENSIONS, PROVIDED THE FROUDE NUMBER DOES NOT EXCEED 0.44.

142PROGRAM STEPS
RENZI BAUMGARTNER
CH-CAROUGE

511400 97-DEPTH CHARGE

AN UNDERWATER MISSILE IS HEADING TOWARDS YOU. ITS DEPTH AND RANGE ARE DISPLAYED. YOU HAVE TEN DEPTH CHARGES WHICH CAN BE SET FOR LAUNCH ELEVATION, DETONATION DEPTH AND LAUNCH POWER. THERE ARE FOUR POSSIBILITES: DIRECT HIT, CLOSE PROXIMITY HIT, NEAR MISS CAUSING DECREASE IN MISSILE VELOCITY - OR A MISS. YOUR DEPTH CHARGE RANGE IS DISPLAYED AND CAN ALSO BE RECALLED FOR ATTACK ADJUSTMENTS. THERE ARE NINE DIFFICULTY OPTIONS AVAILABLE.

216PROGRAM STEPS
PETER CRANLEY
GB-PORTSMOUTH

511410 67- 40 DATA STORAGE

YOU CAN STORE AND RECALL IN YOUR CALCULATOR UP TO 40 DATA WITH THE OPERATING LIMIT FOR EACH DATA X : $10^{**}-5 \leq X < 10^{**}5$

198PROGRAM STEPS
LUIGI POMINI
I-CASTELLANZA

511420 67-CONCRETE SECTION COMPUTING

THIS PROGRAM CALCULATES THE NECESSARY, STEEL AREA FOR CONCRETE (REINFORCED OR PRESTRESSED) SECTIONS.

122PROGRAM STEPS
STELIO VOYATZOPOULOS
CH-LAUSANNE

511430 97-INDIRECT PIAL COMPILER

THIS PROGRAM TRANSFORMS THE ALGEBRAIC PIAL CODE OF THE PIAL-EDITOR INTO RPN-CODE. NOW IT IS POSSIBLE TO CHOOSE BETWEEN PROGRAM 50232D "DIRECT PIAL COMPILER" FOR FAST RPN CODE GENERATION AND THE COMBINATION OF 50555D "PIAL EDITOR" AND THIS PROGRAM FOR FLEXIBLE EDITING OF PIAL-PROGRAMS. IN BOTH CASES EXECUTION IS POSSIBLE WITH PROGRAM 50313D "PIAL EXECUTOR". THESE FOUR PROGRAMS ILLUSTRATE SOME BASIC PROCESSES INVOLVED IN THE USE OF COMPILERS.

224PROGRAM STEPS
PETER SCHKALE
NL-DELFT

511440 67-CHECKING LOTTO-WINNINGS AND RANDOM LOTTO-NUMBERS 1 TO 49

PROGRAM CHECKS WINNINGS OF LOTTO-GROUPS STOPPING FOR OUTPUT IF 3,4,5 OR 6 NUMBERS OF 1 GROUP ARE IN COMPARISON WITH AN OTHER GROUP OF LOTTO-NUMBERS IN PROGRAM. (FOR EXAMPLE 4.00000018 MEANS 4 NUMBERS OF GROUP NO.18 ARE IN COMPARISON WITH 4

511440 (CONTD)

NUMBERS OF THE GROUP IN PROGRAM). BY A TRICK YOU CAN FEED 100 LOTTO-NUMBERS INTO 22 REGISTERS OF CALCULATOR. POSSIBLE IS ALSO OUTPUT OF RANDOM LOTTO-NUMBERS 1 TO 49.

110PROGRAM STEPS
ARMIN WEIGT
D-5840 SCHWERTE 8

511450 97-NUMBER OF COINS

THE PROGRAN GIVES YOU THE NUMBER OF 1000-BILLET, 500-BILLET, 100-BILLET 50-COIN, 25-COIN, 5-COIN, 1-COIN YOU NEED IF YOU WANT TO PAY SEVERAL PEOPLE,DIFFERENT QUANTITY OF MONEY.

100PROGRAM STEPS
PEDRO DE LA SERNA AVELLANA
E-UTRERA (SEVILLA)

511460 67-NAVIGATION SIMULATOR FOR AIRCRAFTS WITH V.O.R. MARKERS

THIS PROGRAN SIMULATES THE NAVIGATION CONDITIONS WITH ONE OR TWO V.O.R. RECEIVERS LOCATED BY THEIR REAL GEOGRAPHICAL POSITION; WITH WIND OR NO.

223PROGRAM STEPS
JEAN CLAUDE NEBOIT
F-AULNAY SOUS BOIS

511470 67-INTEGRATION OF LUMINOUS FLUX

PROGRAM COMPUTES OUT OF A GIVEN (MEASURED) LIGHT DISTRIBUTION IN CANDELAS PER SQUAREMETER AND PER 1000 LUMEN TOTAL FLUX THE AVERAGE CANDLEPOWER FOR EACH INCLINATION ANGLE (STARTING AT 0) GAMMA, THE LUMINOUS FLUX IN LUMEN FOR EACH SOLID ANGLE BETWEEN 2 INCLINATION ANGLES AND SUMS UP THE FLUX UP TO 180 GRADES. THE TOTAL LUMENS PER GAMMA 30,60,90,120,150 AND 180 IS DISPLAYED.

166PROGRAM STEPS
WERNER RIEMENSCHNEIDER
CH-METTINGEN

511480 97-FIRST AND SECOND DERIVATIVE WITH ROMBERG REFINEMENT

PROGRAM CALCULATES FIRST OR SECOND DERIVATIVE OF A FUNCTION F(X) AT A GIVEN X. HIGH ACCURACY IS ACHIEVED BY SUCCESSIVE INTERVAL-HALVING AND EXTRAPOLATING TO THE LIMIT (ROMBERG ALGORITHM). THE METHOD IS VALID IF F(X) ADMITS AN ASYMPTOTIC POWER SERIES EXPANSION, I.E. IF F(X) HAS DERIVATIVES OF ALL ORDERS.

106PROGRAM STEPS
GUNTER SCHNELL
D-LILIENTHAL

511490 97-VAPOR PRESSURE AS FUNCTION OF TEMPERATURE

PROGRAM USES TWO OR THREE COUPLES OF VAPOR PRESSURE AND TEMPERATURE TO EVALUATE THE PARAMETERS OF ANTOINE'S RELATION. THERE AFTER SINGLE VALUES OR LISTINGS OF P=F(T) OR T=F(P) CAN BE COMPUTED.

182PROGRAM STEPS
MARC C. BERGER
F-HUNINGUE

511500 67-MATRIX OPERATIONS UP TO 5TH ORDER

THIS 3 CARDS PROGRAM WITH AUTO-DATA ENTRY AND DISPLAY COMPUTES THE DETERMINANT AND THE INVERSE OF A MATRIX. THE INVERSE IS GIVEN AS A PRODUCT OF TWO TRIANGULAR MATRICES. MAKE USE OF PROGRAM 50712D TO COMPUTE THIS PRODUCT. PART OF THIS PROGRAM CAN BE UTILISED TO INVERT AN UPPER AND/OR A LOWER TRIANGULAR

511500 (CONTD)

MATRIX.

474PROGRAM STEPS
LUIGI ZAMBOTTI
I-MILANO

511510 67-PRIMEFACTORS OF A NUMBER. ROUTINE FOR ABSENT USER.

A CHEKING ROUTINE FINDS ALL PRIMEFACTORS OF A NUMBER. CHEKING IS ONLY PERFORMED FOR POSSIBLE FACTORS IN SPITE OF THAT THE CHEKING MAY TAKE A LONG TIME FOR GREAT PRIMES. THE CALCULATOR CAN NOT BE SPEEDED UP, BUT THIS PROGAM MAKES IT POSSIBLE FOR THE USER TO BE BUSY ELSEWHERE WHILE THE PROGRAM IS RUNING. THE PRIMEFACTORS ARE SIMPLY SAVED IN THE REGISTERS AND IF THEIR NUMBER EXCEED 10, THEY ARE RECORDED AS WELL.

051PROGRAM STEPS
SOREN VIDEBEK NIELSEN
DK-STRUER

511520 67-ICAO STANDARD ATMOSPHERE

THIS PROGRAM COMPUTES THE GEOPOTENTIAL ALTITUDE, THE PRESSURE, THE TEMPERATURE AND THE DENSITY OF THE AIR AT ANY LEVEL OF THE STANDARD ATMOSPHERE. STARTING WITH THE PRESSURE OR WITH THE GEOPOTENTIAL ALTITUDE IT COMPUTES THE OTHER VARIABLES TO THE SUITABLE NUMBER OF DECIMALS. THIS AVOIDS THE USE THE FULL TABLES AS LINEAR INTERPOLATION IS NOT PRACTICABLE IN THE SHORT TABLES.

219PROGRAM STEPS
EUGENIO OLIVA
E-MADRID

511530 67-BREAKING-POINT PROBLEM

PROGRAN FINDS THE BREAKING-POINT DISTANCE OF AN ANTENNA ON A HOUSE SO THAT THIS ANTENNA TOUCHES THE HOUSE ON THE CORNER AND ON THE GROUND, WHEN IS GIVEN THE LENGHT OF THE ANTENNA FROM THE GROUND AND THE MEASUREMENTS OF THE HOUSE.

171PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK

511540 97-SIMULTANEOUS RAYTRACE OF SIX RAYS PER SURFACE.

THE PROGRAM ALLOWS THE TRACING OF SIX MERIDIONAL RAYS SIMULTANEOUSLY THROUGH AN OPTICAL SYSTEM SURFACE BY SURFACE. THE MARGINAL AND ZONAL SPHERICAL ABERRATION, FULL APERTURE TANGENTIAL COMA AND FULL APERTURE TANGENTIAL FIELD CURVATURE CAN BE DETERMINED IF REQUIRED. THE OPTICAL SYSTEM MUST HAVE SPHERICAL AND PLANE SURFACES ONLY. ALL RAYS MUST BE TRACED IN ONE COLOUR.

172PROGRAM STEPS
JAMES HOUGHTON
GB-TETBURY, GLOS.

511550 67-MEAN CENTRE AND STANDARD DISTANCE (GROUPED DATA)

THIS PROGRAM COMPUTES AND DISPLAYS THE COORDINATES OF THE MEAN CENTRE (OR THE CENTRE OF GRAVITY) AND THE STANDARD DISTANCE WHICH IS THE RADIUS OF A CIRCLE CENTERED ON THE MEAN CENTER AND ENCOMPASSING 68.27 OF THE POPULATION (NORMALLY DISTRIBUTED).

134PROGRAM STEPS
ERIK GJOE GELEFF
DK-RUNGSTED

511560 67-NEAREST NEIGHBOUR INDEX AND Z - SCORE

511560 (CONTD)

THE IMPORTANCE OF THE INDEX IS THAT IT PROVIDES A TEST FOR "HOW RANDOMNESS" AND ALLOWS, ON A CONTINUOUS SCALE, COMPOARISONS TO BE MADE OF TWO OR MORE TWO-DEMENSIONAL DISTRIBUTIONS. FURTHER THE Z-SCORE ENABLES THE GEOGRAPHER TO TEST THE PROBABILITY THAT THE ACTUAL DISTRIBUTION IS THE RESULT OF CHANCE

095PROGRAM STEPS
ERIK GJOE GELEFF
DK-RUNGSTED

511570 97-TRIGONOMETRIC AND HYPERBOLIC FUNCT. OF COMPLEX VARIABLES

CALCULATES COMPLEX VALUES OF COMPLEX VARIABLES FOR THE FOLLOWING FUNCTIONS : SIN SINH COS COSH TAN TANH COT COTH ARCSIN ARSINH ARCCOS ARCOSH ARCTAN ARTANH ARCCOT ARCCTH GUDERMANN, ARGGUDERMANN, 1/(X + JY)

224PROGRAM STEPS
GEORGE H. EPPRECHT
CH-ZUERICH

511580 97-NORMAL-TANGENTIAL ACCELERATION

COMPUTES NORMAL AND TANGENTIAL ACCELERATION GIVING THE VELOCITY AND ACCELERATION IN RECTANGLLAR COORDINATES. ALSO COMPUTES THE RADIUS OF CURVATURE.

108PROGRAM STEPS
JOSE GINJAUME CULELL
S-BARCELONA

511590 67-DIVING TABLE

THIS PROGRAM COMPUTES DEPTH AND DURATION OF DECOMPRESSION STOPS NEEDED AFTER A SCUBA DIVING OF T MINUTES AT A DEPTH GIVEN IN METERS. IT CALCULATES ALSO C COEFFICIENT FOR A SUCCCESSIVE DIVING. IT IS A THEORIC BIOLOGICAL PROGRAN, NOT INTENDED FOR REAL SCUBA DIVING, SINCE OPERATING TABLE IS CORRECTED BY EXPERIMENTAL STATISTICAL DATA.

327PROGRAM STEPS
NICKEL SIQUET
B-PLANCENOIT

511600 67-CLAY-PIGEON SHOOTING

WITH THIS PROGRAM YOUR HP BECOMES AN AREA TO SHOOT AT CLAY-PIGEONS. YOU CAN CHOOSE THE DIFFICULTY AND ALSO THE NUMBER OF PIGEONS IN ONE SERIE. AFTER THE GAME YOUR HP SHOWS YOU HOW MUCH PIGEONS OF THE SERIE YOU GOT WITH HOW MUCH SHOTS.

100PROGRAM STEPS
JEAN SCHANNES
L-BETTEMBOURG

511610 67-QUATERNION ALGEBRA

PROGRAM ADDS, SUBTRACTS, MULTIPLIES TWO QUATERNIONS; IT DIVIDES ONE QUATERNION BY ANOTHER ON THE LEFT AND ON THE RIGHT; IT CONJUGATES ONE QUATERNION BY ANOTHER; IT RAISES A QUATERNION TO THE NTH POWER; IT ALLOWS CHAIN OPERATIONS, VIA A SPECIAL "SET UP" ROUTINE.

224PROGRAM STEPS
ALEXANDER GRUZA
GB-LONDON

511620 67-POWERFACTOR COMPENSATION

THE PROGRAM COMPUTES THE NECESSARY CAPACITOR VALUE TO COMPENSATE INDUCTIVE LOADS LIKE MOTORS, TRANSFORMERS ON THE POWER LINE. IT ALSO CALCULATES THE POWER FACTOR WHICH WILL BE ACHIEVED WITH A CERTAIN CAPACITOR.

62D (CONTD)

065PROGRAM STEPS
HELMUT G. VOGEL
D-BRACHTTAL 5

1163D 67-EXPOSURE COMPUTER

THE PROGRAM COMPUTES EXPOSURE TIMES TO SCREEN HALFTONES ON REPROGRAPHIC CAMERAS OR ENLARGERS

102PROGRAM STEPS
HELMUT G. VOGEL
D-BRACHTTAL 5

1164D 97-OPTICS TRANS & REFL COEFFS. OPTOI

CALCULATES THE FOUR REFLEXION AND TRANSMISSION COEFFICIENTS, THE POLARIZATION RATIO FOR A GIVEN INCIDENCE ANGLE.

137PROGRAM STEPS
BERNARD SIRET
F-SAINT-CLOUD

1165D 97-CALCULATION OF GLASS COMPOSITION FROM BATCH

CALCULATES THE WEIGHT PERCENTAGE COMPOSITION OF A GLASS FROM THE QUANTITIES OF BATCH MATERIALS AND THE FACTORS FOR EITHER THE WEIGHT OF RAW MATERIAL NEEDED TO SUPPLY UNIT WEIGHT OF THE CONSTITUENT OR THE WEIGHT OF CONSTITUENT PROVIDED BY UNIT WEIGHT OF BATCH MATERIAL. DIFFERENT SUBROUTINES DEAL WITH MATERIALS SUPPLYING ONE, TWO OR THREE CONSTITUENTS OR THOSE FOR WHICH THE FACTOR IS UNITY.

146PROGRAM STEPS
MICHAEL CABLE
GB-SHEFFIELD

1166D 67-CALCULATION OF PH VALUES

THIS PROGRAM CALCULATES THE PH VALUES OF WEAK BASES AND ACIDS, MIDDLESTRONG BASES AND ACIDS, SALTS OF A WEAK BASE AND A WEAK ACID, SALTS OF STRONG ACIDS AND WEAK BASES, SALTS OF WEAK ACIDS AND STRONG BASES, ACID-BUFFERS, BASE-BUFFERS AND WEAK AND STRONG ACIDS BY HIGH DILUTION.

209PROGRAM STEPS
FRED SCHEUER
A-VIENNA

7D 97-SHEET METAL DEVELOPMENT

COMPUTS THE DEVELOPED LENGTH OF A SHEET METAL COMPONENT THAT IS FORMED IN A POWER PRESS, BREAK PRESS, FOLDING MACHINE ETC.

089PROGRAM STEPS
GEOFFREY A. BARTON
IRAN-TEHRAN

1168D 67-CAR PARAMETERS

PROGRAM CALCULATES D KM*, # KM, # PRICE, PRICE/KM, PRICE/KM (MEAN), DL, # LITER, L/100 KM, L/100 KM (MEAN), PRICE INDEX. IT WARNS YOU WHEN IT IS TIME TO CHANGE YOUR OIL & PROMPTS YOU TO RECORD DATA FOR NEXT CASE (*TIME). THE PROGRAM WORKS FOR AS MANY CARS YOU WANT PROVIDED YOU LOAD THE DATA ON HALF A DATA CARD.
(* D = INCREASE # = SUM) YOU ONLY HAVE TO INPUT KM PRES, PRICE PAYE, PRICE/LITER, KM TO CHANGE YOUR OIL. IT ALSO ACCEPTS MILES AND GALLONS.

105PROGRAM STEPS
JOHAN DECAT
B-GENT

9D 67-MCNEMAR TEST FOR SIGNIFICANCE OF CHANGES

51169D (CONTD)

THE MCNEMAR TEST IS PARTICULARLY APPLICABLE TO THOSE "BEFORE AND AFTER" DESIGNS IN WHICH EACH PERSON IS USED AS HIS OWN CONTROL AND IN WHICH MEASUREMENT IS IN THE STRENGTH OF EITHER A NOMINAL OR ORDINAL SCALE. PROGRAM CONSISTS OF MCNEMAR TEST AND BINOMIAL TEST, TO BE USED IF THE EXPECTED FREQUENCIES ARE LESS THAN 5.

131PROGRAM STEPS
HARM P. MILLAARD
NL-CAPELLE A/D IJSSEL

51170D 67-COCHRAN Q-TEST

THE COCHRAN Q-TEST FOR K RELATED SAMPLES PROVIDES A METHOD FOR TESTING WHETHER THREE OR MORE MATCHED SETS OF FREQUENCIES OR PROPORTIONS DIFFER SIGNIFICANTLY AMONG THEMSELVES.
THE COCHRAN TEST IS PARTICULARLY SUITABLE WHEN THE DATA ARE IN A NOMINAL SCALE OR ARE DICHOTOMIZED ORDINAL INFORMATION.

083PROGRAM STEPS
HARM P. MILLAARD
NL-CAPELLE A/D IJSSEL.

51171D 67-FRIEDMAN TWO-WAY ANALYSIS OF VARIANCE BY RANKS

FOR THE FRIEDMAN TEST, THE DATA ARE CAST IN A TWO-WAY TABLE HAVING N ROWS AND K COLUMNS(REPRESENTING VARIOUS CONDITIONS). THE DATA OF THE TEST ARE RANKS. THE SCORES IN EACH ROW ARE RANKED SEPARATELY. THE FRIEDMAN TEST DETERMINES WHETHER IT IS LIKELY THAT THE DIFFERENT COLUMNS OF RANKS (SAMPLES) CAME FROM THE SAME POPULATION.

059PROGRAM STEPS
HARM P. MILLAARD
NL-CAPELLE A/D IJSSEL

51172D 67-IRON DISJUNCTURE

PROGRAM SOLVE RESULTS OF LIST DATA DISJUNCTURE EACH DIAMETER IRON, USED USUAL TO MAKE REINFORCED CONCRETE.

221PROGRAM STEPS
LORENZO PORTILLO MORO
S-LAS VILLAS DE BENICASIM

51173D 67-TECHNICAL CHARACTERISTICS OF SYMETRICAL RECONST. WELDED STEEL-SECT

GIVEN THE DIMENSIONAL CHARACTERISTICS OF A SYMMETRICAL RECONSTITUTED STEEL SECTION, PROGRAM CALCULATES:
1: SECTION AREA
2: WEIGHT WITH REGARD OF THE LENGTH
3: PAINTING AREA WITH REGARD OF THE LENGTH OR OF THE WEIGHT
4: MAXIMUM AND MINIMUM MOMENTS OF INERTIA
5: MODULUS OF INERTIA
6: GYRATION RADIUS.

161PROGRAM STEPS
FRANCIS PARENT
F-STRASBOURG

51174D 67-TRIGONOMETRIC EXPANSIONS

UP TO N=51, THIS PROGRAM FINDS THE ELEMENTS OF THE EXPANSIONS OF COSX**N, SINX**N, CHX**N AND SHX**N IN TERMS OF COS PX OR SIN PX, CH PX OR SH PX. EVERY ELEMENT IS GIVEN BY A CODE WHICH CAN BE EASILY UNDERSTOOD. FOR N<34, ALL THE COEFFICIENTS HAVE LESS THAN 11 DIGITS, CONSEQUENTLY THE EXPANSIONS ARE GIVEN EXACTLY.

136PROGRAM STEPS
PIERRE MOLINARO
F-NANTES

51175D 67-SQUARE ROOT

THIS PROGRAM CALCULATES THE SQUARE ROOT OF A MAX. TEN DIGITS NUMBER INTO 30 CORRECT CIFRES. TIME ABOUT 30-50 SEC.

224PROGRAM STEPS
KENT A HIGSIROM
S-FLODA

51176D 97-DUNCAN'S TEST FOR MULTILATERAL TREATMENT COMPARISONS

DUNCAN HAS ADAPTED THE TEST OF STUDENT FOR STATISTICAL COMPARISONS (WITH EACH OTHER) OF SEVERAL GROUPS WITH EQUAL NUMBERS OF REPLICATIONS. THIS PROGRAM COMPARES UP TO 10 GROUPS. IT REQUIRES THE COMMON RESIDUAL ERROR TO THE VARIALBE (OBTAINED BY ANOVAR) AND THE TABLE OF SIGNIFICANT STUDENTIZED RANGES TABLED BY DUNCAN FOR 5% AND 1% PROBABILITY (PROVIDED).

164PROGRAM STEPS
JACQUES DECOMBAZ
CH-ORBE

51177D 67-CAROTID PULSE WAVE ANALYSIS

THE MAIN PARAMETERS OF THE CAROTID PULSE WAVE HAVE TO BE CORRECTED FOR THE HEART FREQUENCY AND SEX. FOLLOWING PARAMETERS ARE TO BE CALCULATED : UPSTROKE TIME, EJECTION TIME, ELEKTROMECHANICAL SYSTOLE, LEFT VENTRICULAR EJECTION TIME, PREEFECTION PERIOD, RATIO OF PEP/LVET. INPUT INTERVAL IN MM, OUTPUT INTERVAL IN SEC. ALSO LOWER AND UPPER LIMIT OF THE TIME INTERVALS CORRECTED FOR SEX AND HEART FREQUENCY ARE DISPLAYED.

217PROGRAM STEPS
LUDWIG STRAUSS
D-BUERSTADT

51178D 67-DATE-CONTROL OF GREGORIAN AND WEEKDAY OUTPUT

THIS PROGRAM IS CONTROLING WHETHER A DATE OF THE GREGORIAN CALENDAR BETWEEN THE 15TH OF OCTOBER 1582 AND THE 1ST OF JANUARY 4915 IS ALLOWED OR NOT. IF THE DATE IS ALLOWED THIS PROGRAM WILL ANSWER WITH THE WEEKDAY OF THIS DATE.

219PROGRAM STEPS
JUNGE RAINER
D-ROEDERMARK-URBERACH

51179D 67-PERSPECTIVE DRAWING

THE PROGRAM CALCULATES: THE DRAWING CO-ORDINATES OF THE FLIGHT LINES MEETING POINTS AND THAT OF WHATEVER OBJECT POINT. IT REQUIRES THE POINT CO-ORDINATES RELATED TO GROUND, SIGHT DIRECTION AND OBSERVER POINT. THIS CAN BE SHIFTED AND THE SIGHT DEVIATED HORIZONTALLY AND VERTICALLY WITHOUT ANY NEED OF OTHER CO-ORDINATES. TO OBTAIN THE WANTED SIZE OF THE DRAWING, IT IS ENOUGH TO FIX A CO-ORDINATE (WIDTH OR HEIGHT) OF A WHATEVER POINT OF THE OBJECTS.

162PROGRAM STEPS
PAOLO PELLICIARDI
I-BOLOGNA

51180D 97-STOCK PORTFOLIO RECORD

THIS PROGRAM KEEPS TRACK OF CAPITAL VALUE AND CAPITAL GAINS/LOSSES OF A STOCK PORTFOLIO. AVERAGE PURCHASE PRICE AND RESULT OF A SALE ARE CALCULATED AGAINST ORIGINAL PURCHASE PRICE. STOCK IS CHECKED AGAINST RECENT QUOTATION.
PORTFOLIO PERFORMANCE AND VALUE FROM/ON AN EVALUATION DATE ARE CALCULATED, I.E. ANNUAL OR QUARTERLY RESULT. DATA ARE RETAINED ON DATA CARD(S).

511800 (CONTD)

202PROGRAM STEPS
BART ONKENHOUT
NL-BLARICUM

511810 67-MAXIMUM POWER TRANSFER

PROGRAM WILL CALCULATE THE VALUES OF THE LOAD IMPEDANCES WHICH RESULT IN MAXIMUM POWER TRANSFER ACROSS THE TERMINALS OF AN ACTIVE NETWORK. THREE TYPES OF LOADDS ARE POSSIBLE:
1) VARIABLE RESISTANCE
2) VARIABLE RESISTANCE AND VARIABLE REACTANCE
3) VARIABLE RESISTANCE AND FIXED REACTANCE.

124PROGRAM STEPS
BRANKO SPOYARIC
YU-ZAGREB

511820 67-CAPACITOR CALCULATIONS

PROGRAM WILL CALCULATE INTERCHANGEABLE SOLUTION OF C,Q,U,EqL AND S.

218PROGRAM STEPS
BRANKO SPOYARIC
YU-ZAGREB

511830 67-PRICING CONTROL PROGRAM

IF PRICE AND QUANTITY OF EACH UNIT TO BE ORDERED AND DISCOUNT FACTOR ARE GIVEN, PROGRAM WILL CALCULATE TOTAL ORDER QUANTITY, TOTAL ORDER PRICE, DISCOUNTED ORDER PRICE (IF EXIST) AND AVERAGE UNIT PRICE (BASED ON AMOUNT TO BE INVOICED). PRINT CONTROL ROUTINE INCORPORATED.

071PROGRAM STEPS
BRANKO SPOYARIC
YU-ZAGREB

511840 67-UNBALANCED 3 PHASE LOADS

IF SOURCE VOLTAGES OF A 3 PHASE SYSTEM ARE GIVEN, PHASE AND LINE CURRENTS OF A 3 PHASE UNBALANCED LOAD WILL BE CALCULATED. PROGRAM WILL SOLVE FOR 3 WIRE DELTA AND 4 WIRE STAR CONNECTED LOAD.

157PROGRAM STEPS
BRANKO SPOYARIC
YU-ZAGREB

511850 67-97-LEAST SQUARES ADJUSTMENT OF POINTS-DISTANCE MEASURMENT.

THE PROGRAM CALCULATES POINTS, COORDINATED BY DISTANCE MEASUREMENT. IT IS POSSIBLE TO ADJUST THIS MEASUREMENT UP TO 5 DISTANCES FOR ONE NEWPOINT WITH THE LEAST SQUARES METHOD. CALCULATION OF THE ADJUSTED NEWPOINT, MY, MX, ALL PARAMETERS OF ERROR ELLIPSE AND THE ERRORS OF THE ADJUSTED DISTANCES.

655PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN

511860 67-97-HIGH PRECISION DIFFERENTIATION AND ZERO ITERATION NTH3

THE PROGRAM CALCULATES THE FIRST 4 DIFFERENTIAL FORMS OF F(X). EXACTNESS FOR F(X)=SINX:F',F'',F''' ERROR 10**-9, F'''' 10**-6. THE PROGRAM CALCULATES ALSO THE ZEROS OF F(X) AND ALL DIFFERENTIAL FORMS. THE PROGRAM CONTAINS 5 PARTS: THE BASEPROGRAM, USABLE ALONE, TO CALCULATE F(X) AND XO; YOU CAN ALSO LOAD ONE OF THE 4 DIFFERENTIAL PROGRAMS, WITHOUT A REENTER OF F(X). THE DIFFERENTIAL PROGRAM CALCULATES ALSO AN APPROXIMATED ERROR FOR F',F'',F''', F''''.

346PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN

511870 97-GAME OF LIFE (23X31)

IN THIS REALIZATION OF JOHN CONWAYS GAME THE POSITIONS OF COUNTERS ARE INTERPRETED AS BINARY NUMBERS. UNIQUE FEATURE: THE SIZE OF THE BOARD VARIES THROUGHOUT THE GAME. TO KEEP CALCULATION TIME SHORT IT HAS ALWAYS THE SMALLEST POSSIBLE VALUE. IF NECESSARY IT GROWS UP TO 25X33. FURTHER GROWTH LEADS TO ERROR DISPLAY. MOREOVER, AUTOMATIC SHIFTING OCCURS SO THAT MOVING ORGANISMS CAN NOT ESCAPE. ESPECIALLY SUITED FOR LONG UNCONTROLLED RUNS.

393PROGRAM STEPS
THOMAS BAUMANN
D-AUMUEHLE

511880 97-PARALLEL-TRACES TO AN AXE IN THE FORM OF A CLOTHOIDE

THE AXE OF A ROAD IS GIVEN BY STRAIGHT LINES, CIRCULAR ARCS AND CONNECTING LINES IN THE FORM OF CLOTHOIDS. WANTED ARE THE COORDINATES OF THE BOARDS OF THE ROAD, WITH A WIDTH OF 2X8/2, AS PARALLELS TO THE CLOTHOID-AXE.

172PROGRAM STEPS
HANSPETER BERNET
CH-BERNE

511890 97-BRAINSTORMING

THIS GAME ALLOWS TO GUESS A RANDOM NUMBER, SPECIFIED BY ITS NUMBER OF FIGURES AND THE ALLOWED VALUES OF THE FIGURES ITSELF. MOREOVER YOU MIGHT CHOOSE, WHETHER ALL FIGURES MUST BE DIFFERENT OR WHETHER SOME MIGHT BE EQUAL WITHIN THE RANDOM NUMBER. THE CALCULATOR, AS AN ANSWER, TELLS, HOW MANY RIGHT FIGURES ARE PLACED AT THE RIGHT LOCATION AND HOW MANY OF THE REMAINING FIGURES ARE GUESSED RIGHT BUT PLACED IN THE WRONG POSITION. THE IDEA IS TO FIND THE RIGHT NUMBER BY THESE INFORMATIONS.

224PROGRAM STEPS
WOLFGANG BOHN
D-DARMSTADT

511900 67-LOGISTIC CURVE FITTING WITH CHI SQUARE TEST OF GOODNESS

LOGISTIC CARDA COMPUTES A,B,C,D OF L(T)=A+B/1+CXEXP(-DT) EQUATION OF LOGISTIC CURVE THAT LIES BETWEEN LOWER AND UPPER LIMITS FIXED BY USER (LOWER LIMIT MUST BE DIFFERENT FROM ZERO). PRGM NEEDS A SET OF POINT (FROM 6 TO 10) REFERRING TO OBSERVATION TAKEN AT SPECIFIED TIMES AT EQUAL INTERVALS. FURTHER CARD A SUPPLIES : ESTIMATE, POINT OF INFLACTION, CHI SQUARE FOR GOODNESS OF FIT; CARD B MAKES CHI SQUARE TEST AT DIFFERENT LEVELS OF PROBABILITY AND DEGREES OF FREEDOM.

338PROGRAM STEPS
ILIO GALLETTA
I-GENOVA

511910 67-PRINTER DISPLAY FOR HP67

PRINTER DISPLAY PRESERVES USER FROM NERVOUS BREAKDOWN WHEN HE (OR SHE) IS IN A SERIOUS DOUBT TO HAVE LOAD CORRECT FILE UP TO 24 DATA FOR A SIMPLY SUM AND DESIRES AVOID THE NOISE OF RE-INPUT DATA JOINT TO ACHIVE NOT ERRONEUS RESULT. PRGM SUPPLIES QUICK (OR LESS) ROUTINES TO DO SO.

066PROGRAM STEPS
ILIO GALLETTA
I-GENOVA

511920 67-FREQUENCIES AND WEIGHTS OF SAMPLE UP TO 24 DIFFERENT ITEM

511920 (CONTD)

ASSIGNED UP TO 24 NUMBERS OF CODE TO DIFFERENT ITEMS OF A SAMPLE PROGR RUN QUICKLY FIRST OPERATION TO COLLECT FOR EACH ITEM THE NUMBER OF PIECES AND TOTAL WEIGHT OF THEM (G. T. IS SUPPLIED). ROUTINE GIVES A GREAT HELP WHEN DATA OF A SAMPLE ARE COMING FROM "BULK" TABLE.

041PROGRAM STEPS
ILIO GALLETTA
I-GENOVA

511930 67-5X7-MATRIX LETTER AND SYMBOL PRINTER

THE PROGRAM PRINTS ANY LETTER, FIGURE OR SIGN, USING THE 5X7 MATRIX SYSTEM. EACH 5X7 MATRIX CONSISTS OF 1'S AND 0'S, AND THEY ARE PRINTED AFTER EACH OTHER, ALONG THE PAPER. DATA CARDS ARE USED TO STORE THE CODE OF THE SYMBOLS. 24 SYMBOLS ON EACH CARD. PROGRAM CONTAINS AN ENCODER TO ENABLE THE USER, MAKING NEW DATACARDS. DATA FOR TWO CARDS ARE GIVEN. NOT USEFUL ON THE HP-67.

223PROGRAM STEPS
BJORN ENGSIG
DK-ALLEROD

511940 67-HEAT LOSS FROM WALLS AND PIPES

PROGRAM COMPUTES THE HEAT LOSS AND COOL SURFACE TEMPERATURE OF MULTICOMPONENT WALLS, PLATES OR PIPES AT NEAR AMBIENT CONDITIONS. BRITISH OR S.I. UNITS.

217PROGRAM STEPS
JOHN DUNDERDALE
GB- GRIMSBY, STH HUMBERSIDE

511950 67-INTEGRATION BY MONTE-CARLO METHODS

THE PROGRAM CALCULATES INTEGRALS WITHIN THE HIPERCUBE HAVING THREE SIDES OVER THE COORDINATED AXIS AND VOLUME UNITY BELONGING TO THE SPACE EN (N.LE.6) ACCORDING MONTE-CARLO METHODS. A RANDOM NUMBERS GENERATOR IS INCLUDED AS A SUBROUTINE. THE FUNCTION TO BE INTEGRATED MAY HAVE UP TO SIX VARIABLES AND MUST BE PROGRAMMABLE WITHIN 158 STEPS.

066PROGRAM STEPS
EDUARDO SALETE DIAZ
E-MADRID

511960 67-COBB-DOUGLAS FUNCTION

PROGRAM FITS A SET OF DATA POINTS TO A COBB-DOUGLAS FUNCTION, BY A LEAST-SQUARE METHOD. THE PROGRAM COMPUTES THE CONFIDENCE LIMITS FOR THE REGRESSORS. WITH GIVEN VALUES OF INPUTES WILL THE PROGRAM CALCULATE THE CONFIDENCE AND PREDICTION LIMITS OF OUPUT. THE OPTIMAL ALLOCATION BETWEEN INPUTS CAN BE COMPUTED FROM THE PRICES OF INPUTS AND SIZE OF OUPUT.

224PROGRAM STEPS
EVERT CARLSSON
S-GOTHENBURG

511970 67-SKAT SCORING

HELPS BOOK KEEPING FOR 4 (FOUR) SKAT-PLAYERS. LISTS DEALER (WHO WILL NOT PARTICIPATE). LISTS REMAINING "BOCK"-PLAYS (SCORING DOUBLE), IFANY.

128PROGRAM STEPS
SIEGFRIED MARUHN
D-HATTINGEN

511980 67-GAMMA AND BETA FUNCTIONS

COMPUTE GAMMA(X) AND BETA(X,Y) WITH AN APPROXIMATION FORMULA GIVING

51198D (CONTD)

L GAMMA(X) FOR ALL VALUES OF X>0. TWO DIFFERENT ALGORITHMS ARE USED ACCORDING AS 0<X<1 OR X>=1.

127PROGRAM STEPS
ALBERT L. BOISRAYON
F-LE BEAUSSET

51199D 67-AXONOMETRIC PERSPECTIVE DRAWING

THIS PROGRAM DRAWS ON YOUR DRAWING BOARD, POINT BY POINT, THE AXONOMETRIC PERSPECTIVE OF A SUBJECT OF YOUR CHOICE AND COMPUTE FUNDAMENTAL CHARACTERISTICS OF THIS AXONOMETRY WHEN POSITION OF AXONOMETRIC PLANE IS GIVEN.

223PROGRAM STEPS
ALBERT L. BOISRAYON
F-LE BEAUSSET

51200D 67-3PH MOTOR LOSS-SUMMATION SIMPLIFIED FORM

LOSS-SUMMATION OF THREE PHASE INDUCTION MOTORS IN SIMPLIFIED FORM FOR USE ON PLACES WITHOUT POSSIBILITY OF MEASUREMENTS WITH VARIABLE VOLTAGE. THE PROGRAM IS SUITABLE FOR COMPUTATION AT THE OPERATING PLACE OF MOTORS. IT COMPUTES THE CONSTANT AND THE LOAD DEPENDENT LOSSES, THE EFFICIENCY, THE POWER FACTOR AND THE OUPUT POWER OUT OF THE NO LOAD AND LOADING MEASUREMENT DATA. AN ADDITIONAL PROGAM COMPUTES THE EXCESS TEMPERATURE OF COIL OUT OF THE COLD AND WARM TERMINAL RESISTANCE.

222PROGRAM STEPS
ROLF CAUSIN
D-TRENDELBURG

51201D 67-3PH MOTOR, LOSS-SUMMATION 1 NO LOAD TEST

LOSS-SUMMATION OF THREE PHASE INDUCTION MOTORS ACCORDING TO DIN 57530, PART 2 (VDE 0530, PART 2/9.77). PROGRAM 1 : NO LOAD TEST. IT COMPUTES THE CONSTANT LOSSES OF THREE PHASE INDUCTION MOTORS, SEPARATES CORE AND FRICTIONAL LOSSES BY AID OF TWO TEST POINTS WITH REDUCED VOLTAGE, COMPUTES IDLE CURRENT DIFFERENCE FOR LOADING TEST WITH REDUCED VOLTAGE AND PREPARES AMOUNTS FOR DELIVERY TO PROGRAM 2 (LOADING TEST).

220PROGRAM STEPS
ROLF CAUSIN
D-TRENDELBURG

51202D 67-3PH MOTOR, LOSS-SUMMATION 2 LOAD TEST

LOSS-SUMMATION OF THREE PHASE INDUCTION MOTORS ACCORDING TO DIN 57530, PART 2(VDE 0530, PART 2/9.77). PROGRAM 2 : LOADING TEST (LINKED TO PROGRAM 1, NO LOAD TEST). IT COMPUTES THE LOAD DEPENDENT LOSSES OF THREE PHASE INDUCTION MOTORS OUT OF THE LOADING TEST DATA WITH RATED OR REDUCED VOLTAGE. IT ALSO COMPUTES THE DATA FOR RATED VOLTAGE WHEN TESTED WITH REDUCED VOLTAGE. AN ADDITIONAL PROGRAM COMPUTES THE EXCESS TEMPERATURE OF COIL.

223PROGRAM STEPS
ROLF CAUSIN
D-TRENDELBURG

51203D 67-CONSUMPTION:CARS, HEATINGS, ENGINES ETC.

PROGRAM NEEDS THE NOTICE OF KILOMETER -(OR MILEAGE)-RECORDER OF A CAR (OR OTHER ENGINE) AND THE QUANTITY OF FILLED UP PETROL (GAS). AT THE FILLING STATION YOU WILL KEY IN THE DATES AND LOAD THEM ON A MAGNETIC CARD. THEN YOU EVER CAN CONTROL THE ACTUAL AND OLD CONSUMPTIONS OF YOUR

51203D (CONTD)

CAR(OR OTHER ENGINES) AND THE AVERAGE OF CONSUMPTION SINCE DIFFERENT FREE MARKABLE POINTS. YOU ONLY NEED ONE CARD FOR PROGRAM AND DATES.

105PROGRAM STEPS
ARMIN WEIGT
D-SCHWERTE

51204D 97-GLOBAL PROFITABILITY RATIOS FINANCIAL PROFITABILITY RATIOS

THIS MANAGEMENT PROGRAM COMPUTES
1. CIRCULATING CAPITAL RATIO,
2. OWN CAPITAL RATIO,
3. ASSETS RATIO,
4. OWN CAPITAL PROFITABILITY RATIO,
5. ECONOMIC PROFITABILITY RATIO,
6. YEARLY CASH FLOW RATIO.

217PROGRAM STEPS
PIERRE MAIRE
F-FONTAINE

51205D 67-ANALYSIS OF 25 ARBITRARY CASH FLOWS.

THIS PROGRAM PROVIDES THREE IMPORTANT INFORMATIONS CONCERNING FINANCIAL INVESTMENTS. THEY ARE : IRR (INTERNAL RATE OF RETURN), NPV (NET TO PRESENT VALUE) AND FV (FUTURE VALUE). A NUMBER OF CASH FLOWS MUST BE GIVEN AND FOR NPV AND FOR FV ALSO AN ARBITRARY RATE OF INTEREST MUST BE GIVEN. THE NUMBER OF CASH FLOWS MAY BE FROM 2 THROUGH 25 AND EACH CASH FLOW MAY BE POSITIVE, ZERO OR NEGATIVE. THE CASH FLOWS MUST OCCUR AT EQUALLY SPACED TIME INTERVALS. EACH CASH FLOW IS STORED ALONE IN ITS OWN REGISTER.

073PROGRAM STEPS
NIELSEN SOREN VIDEBEK
DK-STRUER

51206D 97-DESIGN OF ACHROMATIC DOUBLET OBJECTIVES

GIVEN THE REFRACTIVE INDICES AND DISPERSIONS OF THE TWO GLASSES TO BE USED TOGETHER WITH THE OBJECT AND IMAGE DISTANCES THIN LENS SOLUTIONS ARE FOUND FOR A CEMENTED DOUBLET ACHROMAT OR AN APLANATIC DOUBLET ACHROMAT WITH SPLIT CONTACT IN EACH CASE THE TWO POSSIBLE SOLUTIONS ARE PRINTED OUT.

220PROGRAM STEPS
JAMES HOUGHTON
GB-TETBURY

51207D 67-LINEAR REGRESSION AND CURVE FIT WITH 2 VARIABLES OUT OF 5

PROGRAM STORES 5 VARIABLES (N TIMES AND GIVES CURVE FITTING WITH ALL 10 POSSIBLE PAIRS OF THESE. IT CALCULATES REGRESSION COEFFICIENT, LINEAR EQUATION FOR BEST CURVE FITTING AND BEST VALUES FOR GIVEN X OR Y. N CAN BE INCREASED OR DECREASED EVEN AT THE END OF ALL CALCULATIONS

348PROGRAM STEPS
HEINZ RECHMANN
D-LEVERKUSEN

51208D 67-CONCENTRIC MAGIC SQUARES OF ODD ORDER

GIVEN A MAGIC SQUARE OF ORDER N (N=2R+1,R=1,2,..) THE PROGRAM CONSTRUCTES MAGIC SQUARES OF ORDER (N+2M), R=1,2.. SO THAT THE SQUARES, WITHIN THE NEW SQUARES OF ORDER (N+2M) STILL ARE MAGIC ONES.

191PROGRAM STEPS
GUIDO PETZ
S-SOLNA

51209D 67-LIGHTNG COST PER LAMP AND INSTALATION

51209D (CONTD)

PROGRAM COMPUTES THE SPECIAL LIGHT COST FOR A LAMP IN FUNCTION OF POWER COST AND GIVEN LAMP LIFE; LAMP COST; AVERAGE LUMINOLS FLUX AND LAMP POWER.
PROGRAM COMPUTES ANNUAL COST FOR A LIGHTING INSTALLATION TAKING IN ACCOUNT THE INITIAL COST PER LUMINAIRE AND INSTALLATION; AMORTISATION OF INITIAL COST AND COST FOR MAINTENANCE AND POWER.

104PROGRAM STEPS
WERNER RIEMENSCHNEIDER
CH-WETTINGEN

51210D 97-RESECTION HYDROGRAPHIC STATION POINTER RESECTION 1

THE PROGRAM EXTRACTS THE CO-ORDINATES OF THE THREE SELECTED STATIONS FROM THE SEVEN CONTAINED IN THE STORES, PERFORMS THE RESECTION AND PRINTS EITHER THE CO-ORDINATES OF THE OBSERVING STATION AND THE OBJECT CODE OR THE MILLIMETRIC PLOTTING DISTANCES FROM A LOCAL ORIGIN. THE PROGRAM THEN RESETS FOR THE NEXT FIX.

219PROGRAM STEPS
MIKE STEPHENSON
GB-HULL.

51211D 97-EIGENVECTORS+EIGENVALUES (IF DISTINCT) OF 3X3 MATRICES

FOR A 3X3 SYSTEM MATRIX, WITH REAL EIGENVALUES OF DISTINCT MAGNITUDES, THE LARGEST EIGENVALUE AND ITS EIGENVECTOR ARE COMPUTED BY THE POWER METHOD, AND THE REMAINING ONES BY DEFLATION METHOD. UNLIKE THE ORIGINAL HEWLETT-PACKARD PROGRAM ON WHICH THIS IS BASED, THE ALGORITHM USED CONVERGES RELIABLY AND WITHOUT ERROR OR OVERFLOW, EVEN FOR SMALL OR LARGE EIGENVALUES. DESIGNED TO COPE WITH ILL-CONDITIONED MATRICES ALSO. EIGENVECTORS OUPUTTED WITH UNIT LENGTH. USER MAY PRE-SET CALCULATION ACCURACY.

223PROGRAM STEPS
MICHAEL A. GERZON
GB- OXFORD

51212D 67-SOUNDING TABLES FOR CYLIND. TANKS WITH SEMISPHERICAL ENDS

THIS PROGRAM ENABLES YOU TO CALCULATE SOUNDING TABLES FOR CYLINDRICAL TANKS WITH SEMISPHERICAL ENDS. FOLLOWING DATA OF TANK ARE NEEDED: INTERNAL DIAMETER AND LENGTH OF CYLINDRICAL PORTION.

206PROGRAM STEPS
WERNER HINTZE
D-HAMBURG

51213D 67-OUPUT OF TWO STROKE ENGINE

THIS PROGRAM CONTROLS THE PERFORMANCE OF 2-STROKE ENGINES VIA INDICATOR DIAGRAM.

137PROGRAM STEPS
WERNER HINTZE
D-HAMBURG

51214D 67-ORIENTATE DIRECTIONS

THIS PROGRAM DETERMINES THE ORIENTATE DIRECTIONS OF STATION ST AND GIVES ALSO THE CORRECTIONS AND THE CROSS DEFLEXION BY THE AIMING POINT

081PROGRAM STEPS
JOACHIN DOLIFF
D-HANNOVER

51215D 67-POKER-ROULETTE-REFLEXES TEST

THIS PROGRAM IS DIVIDED IN 3 PARTS:
1) THE GAME OF POKER WITH DICE
2) THE GAME OF ROULETTE

512150 (CONTD)

3) THE TEXT OF REFLEXES.

146PROGRAM STEPS
GIVLIO FANTI
I-PADOVA

512160 67-THREE VARIABLES LINEAR REGRESSION WITH USER DEFINED SCALES.

IN THIS PROGRAM THE USER MAY KEY IN ARBITRARY FUNCTIONS TO CHANGE SCALES ON X AND/OR Y AND/OR Z AXIS UP TO FORTY PROGRAM STEPS WITHOUT MERGING ANOTHER CARD.

184PROGRAM STEPS
PIERRE GRANIER
F-VANVES

512170 67-SUCCESSIVE SCUBA-DIVING TABLE

THIS PROGRAM CALCULATES THE MAJORATION OF DIVING DURATION TO INPUT IN 51159D "DIVING TABLE" PROGRAM WHEN THE DIVING TO COMPUTE FOLLOWS ANOTHER DIVING, AND THE TIME BETWEEN THE TWO DIVING IS BIGGER THAN 15 MINUTES.
WARNING: CHECK WITH OFFICIAL TABLE IN REAL DIVING. THE PROGRAM WORKS FOR EVERY TIME INTERVAL AND DEPTH.

088PROGRAM STEPS
MICHEL SIQUET
B-PLANCENOIT

512180 67-WATER DROPPING

YOU HAVE TO DROP 200 LITRES OF WATER FROM A SUPERIOR TANK INTO AN INFERIOR ONE CROSSING A LITTLE TANK AND THE WATER MUST NOT OVERFLOW. TO DO IT YOU CAN REGULATE THE WATERFLOW BY MEANS OF A VALVE. TRY TO DROP THE WATER AS FAST AS POSSIBLE. YOU CAN PLAY ALONE OR WITH ANOTHER PLAYER.

168PROGRAM STEPS
LUIGI PONINI
I-CASTELLANZA

512190 67-X RAY FLUORESCENSION LINEAR PARABOLIC & HYPERB CURVE FIT

GENER. THE SAME AS 51219C BUT OUTPUTS RV (REMAINDER VARIANCE) A BETTER BASE FOR COMPARISSION INSTEAD OF SNN**2. PROGRAM ALSO FITS FOR HYPERBOLIC CURVE. DATA PAIRS ARE TO BE PUT IN ONLY ONCE TO CALCULATE REGRESSIONCOEFF, VARIANCE ON THAT COEFF & RV(LIN) & RV(PAR). OPTION TO DELETE ERRON DATA PAIR(S)

281PROGRAM STEPS
JOHAN DECAT
B-GENT.

512200 67-TRI-CONE DRILLBIT NOZZLE SIZING

COMPUTES THE NUMBER (ONE TO THREE) AND SIZES OF AN ALTERNATE COMBINATION OF NOZZLES, GIVEN ORIGINAL SIZES OR TOTAL AREA OF A COMBINATION OF 1,2 OR 3 NOZZLES PREVIOUSLY SELECTED FOR USE IN A ROTARY TRICONE DRILLBIT. BLANK AND AVAILABLE SIZES MAY BE SPECIFIED. SIZES ARE INPUT AND DISPLAYED IN 32 NDS OF AN INCH.

101PROGRAM STEPS
JACK COURTNEY
U.A.E.-DUBAI

512210 97-21-STATISTIC(TESTING FOR INDEPENDENCE OR HOMOGENEITY)

1. THIS PROGRAM ANALYSES AN R*C CONTINGENCY TABLE TESTING THE NULL HYPOTHESIS THAT TWO VARIABLES ARE INDEPENDENT OR HOMOGENEOUS.
2. REDUCING THE TABLE TO THE TYPE OF R*2 ENABLES TO TEST THE NULL HYPOTHESIS THAT TWO INDEPENDENT SAMPLES ARE OF HOMOGENEOUS DISTRI-

512210 (CONTD)

BUTION.

110PROGRAM STEPS
WOLFGANG SCHOENRADE
D-HAMBURG

512220 67-SINGLE-DOUBLE ENDED LINEAMENTS ORIENTATION, NEW STATISTIC

LINEAMENT ORIENTATIONS BEING SORTED IN EQUAL WIDTH AZIMUTHAL CLASSES OF DO ARE SCANNED USING MOVING SECTOR OF DO=(N+1)X00(N+1,ODD INTEGER). BY RECTORIAL ANALOGY, STATISTICAL LOAD (SL) OF EACH CLASS (EFFECTIVE N) IS DEFINED ACCORDING BINOMIAL SYMETRIC DISTRIBUTION AS SL AND TOTAL STATISTICAL LOAD OF BISSECTRICE AS SUMMATION OF ALL SL COMPUTED FOR EACH INITIAL ANGULAR CLASS.

084PROGRAM STEPS
ANDRE RIVIERE
F-BOURG-LA-REINE

512230 97-POINT OF INTERSECTION BETWEEN STRAIGHT LINE AND CLOTHOIDE.

THE PROGRAM CALCULATES THE INTERSECTION POINT BETWEEN A STRAIGHT LINE AND A CLOTHOIDE, WICH IS GIVEN BY TWO POINTS (START-POINT OF CLOTHOIDE AND ANOTHER POINT ON THE TANGENT STRAIGHT LINE IS GIVEN BY TWO POINTS, FOR INSTANCE: ONE POINT ON THE AXE OF A ROAD. DISTANCE BETWEEN POINT AND CLOTHOIDE IS ALSO CALCULATED.

184PROGRAM STEPS
HANSPETER BERNET
CH-BERNE

512240 67-GLARE IN STREETLIGHTING

THE PROGRAM COMPUTES THE DISCOMFORT AND DISABILITY GLARE AS DESCRIBED BY INTERNATIONAL COMMISSION OF ILLUMINATION IN PUBLICATION CIE NO 31-76.

223PROGRAM STEPS
WERNER RIEMENSCHNEIDER
CH-WETTINGEN

512250 67-COMBINATIONS OF RESISTANCES

PROGRAM CONSISTS OF AN STAR-DELTA AND DELTA-STAR CONVERSION WITH AUTO DATA-ENTERING. MOREOVER PROGRAM GIVES TWO LABELS FOR PARALLEL-AND SERIESCONNECTION CONCERNING ONLY X AND Y REGISTERS, SO THAT YOU MAY USE THE WHOLE STACK.

084PROGRAM STEPS
JEAN SCHANNES
L-BETTEMBOURG

512260 97-POLYNOMIAL APPROXIMATION 8TH DEGREE INTERPOLATION

THIS PROGRAM ALLOWS 5 CARDS - BY MEANS OF THE LEAST SQUARES SUM METHOD ACCORDING TO CHEBYSHEV, IT REPLACES A CONTINUE FUNCTION F(X) OR THE DISCRET VALUES YI OF A CHARR BY A NTH DEGREE POLYNOMIAL P(X) WITH 2<=N<=8. THE VALUES XO,..XI...XN ENABLE TO DETERMINE THE CORRESPONDENT VALUES OF F(X) OR OF YI SHALL BE IN ARTHIMETICAL PROGRESSION. AT THE END OF COMPUTATIONS, THE COEFFICIENTS AO..AN..A8 OF POLYNOMIAL P(X) ARE STORED IN REGISTERS FROM R0 TO R8.

871PROGRAM STEPS
ROBERT PIERRE RAYMOND
F-MEUDON

512270 97-APPLIC. OF POLYNOM APPROXIM

THIS PROGRAM ALLOWS 7 CARDS AND FOLLOWS THE PROGRAM ENTITLED "POLYNOMIAL APPROXIMATION 8TH DEGREE". IT PERMITS TO COMPUTE DIRECTLY, FOR

512270 (CONTD)

X INCLUDED IN THE APPROXIMATION DOMAIN : -THE POLYNOMIAL ITSELF, -THE AREA S OF THE POLYNOMIAL INTEGRAL BETWEEN TWO LIMITS AND THE COORDINATES OF S GRAVITY CENTER, -THE SOLID VOLUME V OBTAINED BY ROTATION OF S AROUND X A X IS AND THE ABSCISSA OF V GRAVITY CENTER, -THE MOMENT OF INERTIA I OF THIS V VOLUME, -THE FIRST AND SECOND DERIVED FUNCTIONS, CURVATURE(RADIUS,CENTER)

323PROGRAM STEPS
ROBERT PIERRE RAYMOND
F-MEUDON

512280 97-SPACE ATTACK

AN ALIEN SPACE-VESSEL ATTACKS YOU WITH ITS PHASERS. IT IS YOUR TASK TO DESTROY THE ALIEN BEFORE IT BLOWS YOU APART.

195PROGRAM STEPS
KARL MOENS
B-MORTSEL

512290 97-DURBIN-WATSON TEST OF AUTOCORRELATION

DW-STATISTIC TESTS WHETHER RESIDUALS OF REGRESSION ARE AUTOCORRELATED. GIVEN EQUATION, R2 AND BASIC VALUES OF REGRESSION - UP TO THREE INDEPENDENT VARIABLES-, DW COEFFICIENT IS COMPUTED.

216PROGRAM STEPS
PETER PESCHEL
D-ESSEN

512300 97-33 ADDITIONAL FLAGS-OPERATIONS: SET, CLEAR, INVERT, TEST

PARAMETER: "FLAGNUMBER N" IN STACK-REGISTER X. "FLAG N" WILL BE SET BY GSBB, CLEARED BY GSBC, SET IF CLEARED/CLEARED IF SET BY GSBD, TESTED BY GSBA; TESTRESULT: X>Y IF TESTED FLAG IS CLEARED. STACK: 1=ORIGINAL Y;Z,Y=T,T IF FLAGVALUE CHANGED, 2** N,FRAC(RO/2) ELSE: X=.5 IF FLAG UNCHANGED, X=2**(N-1) IF SET, X=-2**(N-1) IF CLEARED BY GSBB, GSBC, GSBD.
LBL1, GSBA USED BY B,C,D; RO STORES FLAGS.

034PROGRAM STEPS
FRIEDRICH LAHER
D-MUENCHEN

512310 67-FLOW PARAMETERS FOR ISENTROPIC FLOW (INTERCHANGEABLE SOL)

THIS PROGRAM REPLACES ISENTROPIC FLOW TABLES (SUB-AND SUPERSONIC) FOR IDEAL GASES IN CONVERGING-DIVERGING PASSAGES. IT ALSO CALCULATES THE DEFLECTION ANGLE FOR SUPERSONIC DETENTE (PRANDTL-MEYER). ALL VALUES ARE INTERCHANGEABLE. WHEN ENTERING THE PROPORTION CRITICAL SECTION/REAL SECTION ONE HAS TO SPECIFY IF ONE WORKS IN A SUPERSONIC FLOW.

216PROGRAM STEPS
GUIDO DENDIEVEL
B-BRUSSELS

512320 97-PERSPECTIVE SKETCH

THE PROGRAM TRANSFORMS THE DATA U; V AND W FROM A BY THREE DIMENSIONS GIVEN OBJECT TO THE VALUES X AND Y TO PLOT A PERSPECTIVE SKETCH. THE WATCHERS POINT AND THE PROJECTION PLANE ARE ELIGIBLE.

132PROGRAM STEPS
HORST BEHLEN
D-PADERBORN-DAHL

512330 67-THOMSON BRIDGE

PROGRAM WILL CALCULATE UNKNOWN RE-

233D (CONTD)

SISTANCE (RX) AND RELATIVE MEASURE UNSAFENESS (DELTA) FOR THOMSON BRIDGE.

125PROGRAM STEPS
BRANKO SPOYARIC
YU-ZAGREB

512340 67-MUTUAL INDUCTANCE

PROGRAM WILL CALCULATE MUTUAL INDUCTANCE BETWEEN TWO COILS BY :
1) BALISTIC METHOD
2) CAREY-FOSTER'S BRIDGE METHOD

089PROGRAM STEPS
BRANKO SPOYARIC
YU-ZAGREB

512350 67-2X2 COMPLEX MATRIX MULTIPLICATION AND POWERS

THE PROGRAM MULTIPLIES TWO 2X2 MATRICES WITH COMPLEX ENTRIES. THE PRODUCT IS DISPLAYED WITHOUT DESTRAYING THE ORIGINAL MATRICES. THE PROGRAM ALSO RAISES A COMPLEX 2X2 MATRIX TO THE NTH POWER.

223PROGRAM STEPS
ALEXANDER GRUZA
GB-LONDON

512360 67-VOLTMETER & AMPERMETER MEASURE RANGE DESIGN

WITH MEASURE RANGES OF INSTRUMENTS GIVEN PROGRAM WILL CALCULATE THE VALUES OF RESISTORS THAT SHOULD BE ATTACHED TO THE INSTRUMENT TO OBTAIN THOSE RANGES.

170PROGRAM STEPS
BRANKO SPOYARIC
YU-ZAGREB

512370 67-UNBALANCED 3 PHASE LOADS-CONTINUED

PROGRAM CALCULATES LINE CURRENTS AND PHASE VOLTAGES OF UNBALANCED 3 WIRE STAR CONNECTED LOAD. SOURCE VOLTAGES AND LOAD IMPEDANCES ARE ONLY INPUT. IT IS MORE CONVENIENT TO USE THIS PROGRAM IN CONJUCTION WITH PROGRAM 51184D WHICH WILL OBTAIN AUTO DATA ENTRY AND CALCULATION OF 3 WIRE DELTA AND 4 WIRE STAR CONNECTED LOAD.

173PROGRAM STEPS
BRANKO SPOYARIC
YU-ZAGREB

512380 67-PARAMETRIC ITERATION

PROGRAM EVALUATES UP TO NINE QUANTITIES EXPRESSED IN TERMS OF A SINGLE PARAMETER. A REQUIRED VALUE CAN BE ASSIGNED TO ANY ONE QUANTITY AND THE SET CALCULATED USING ITERATION. DISPLAYED QUANTITIES CAN BE LIMITED TO A CHOSEN TRIO OR THE WHOLE SET CAN BE DISPLAYED. THE USERS SET OF PARAMETRIC EQUATIONS CAN BE KEYED IN OR MERGED. SIDE 2 CARRIES A SIMPLE EXAMPLE.

099PROGRAM STEPS
SIDNEY WALLACE ECKETT
GB-ESSEX

512390 67-SUPERHIRN

THIS PROGRAM REALISES THE GAME OF "SUPERHIRN". THE CALCULATOR CHOOSES A 4-DIGIT NUMBER AND YOU HAVE TO FIND OUT THE NUMBER.

202PROGRAM STEPS
RAINER WURZEL
D-VECHTA

400D 67-LOGARITHM OF GAMMA-FUNCTION EXTENDED RANGE OF GAMMA-FUNCTION

51240D (CONTD)

THE PROGRAM APPROXIMATES THE LOGARITHM (LN) OF THE GAMMA-FUNCTION VERY ACCURATELY FOR ANY REAL FROM -10**9 TO 10**97. IF THE LN OF GAMMA IS LESS 230, THE GAMMA-FUNCTION ITSELF CAN BE COMPUTED WITH CORRECT SIGN. RESULTS ARE OBTAINED WITHIN 10 SECONDS.

136PROGRAM STEPS
ULRICH HAHN
D-FLENSBURG

51241D 67-BI-LINEAR INTERPOLATION

ASSUME THAT AN ORIGINE IS LOCATED IN THE BOTTOM-LEFT CORNER OF A GRID SQUARE OR SOMEWHERE ELSE, AND THAT Z-VALUES ARE ASSIGNED TO THE GRID CORNERS, CLOCKWISE FROM THE BOTTOM-LEFT CORNER, THE PROGRAM CALCULATES A Z-VALUE FOR ANY X/Y COMBINATION AND USES A TECHNIQUE KNOWN AS BI-LINEAR INTERPOLATION.

100PROGRAM STEPS
R. HOOIJBERG
NL-DRUNEN

512420 67-EPHEMERIS OF THE SUN

IN ORDER TO INCREASE THE ACCURACY OF THE CO-ORDINATES OF THE SUN TO 1S OF ARC, MONTHLY SETS OF POLYNOMIAL CO-EFFICIENTS (TABULATED IN THE "STAR ALMANAC FOR LAND SURVEYORS FOR THE YEAR 19**") ARE ENTERED IN THE DATA REGISTERS 0-9 AND A-D AND STORED AT SIDE 2 OF THE PROGRAM CARD. R, DEC, E AND S.D. FOR THE SUN ARE CALCULATED AT ANY INSTANT OF TIME, WITHOUT INTERPOLATION. HOWEVER, ONE MUST USE THE STAR ALM. H.M.ST.OFFICE, LONDON.

088PROGRAM STEPS
R. HOOIJBERG
NL-DRUNEN

512430 67-EGG-SHAPED CURVE

GIVEN TWO NON-CONCENTRIC, NON-INTERSECTING CIRCLES WITH RADII R1 AND R2 IN A RECTANGULAR CO-ORDINATE SYSTEM, THIS PROGRAM MY BE USED TO CALCULATE THE X/Y VALUES OF A CURVE WITH ONLY ONE SYMMETRY-AXIS, WITH TWO TANGENT POINTS AT THE GREATER CIRCLE AND TWO TANGENT POINTS AT THE SMALLER CIRCLE.

072PROGRAM STEPS
R. HOOIJBERG
NL-DRUNEN

512440 67-THEORIE OF COSTS

THIS PROGRAM MAKES IT POSSIBLE TO SPECIFY DATA SOLUTIONS FOR EACH FUNCTION X = F(R) WITH THE VALUES OF R,X+,X*,X-. THE CALCULATION OF X* AND X- CAN SELECTIVELY BE CALCULATED. THIS PROGRAM IS SUITABLE FOR MATH-CALCULATION, BUT IT IS ESPECIALLY RELATED TO OPERATIONAL-ECONOMY CALCULATIONS OF THE THEORY OF PRODUCTION AND COSTS. INCLUDING SAMPLE SOLUTIONS AND DRAWINGS.

166PROGRAM STEPS
CLAF GOETTE
D-LILIENTHAL/SEEBERGEN

512450 97-T STATISTICS (EXPANDED)

THIS PROGRAM IS AN EXPANDED VERSION OF 00115D (PAIRED T STAT. + T STAT. FOR THE MEANS.) MAIN ADDITIONS ARE: DATA SET MAY ALSO BE ENTERED AS X-AVERAGE,S/N; WHEN DATA SET IS ENTERED AS INDIVIDUAL POINTS THESE 3 CHARACTERISTICS MAY ALSO BE CALCULATED; DIFFERENT SETS MAY BE COMPARED AGAINST ONE MASTER SET; MORE EFFICIENT.

214PROGRAM STEPS
PETER VAN DEN HAMER

512450 (CONTD)

NL-THE HAGUE

512460 67-PERMUTATIONS

INPUT : A SET OF ANY 2<=N<= 23 REAL NUMBERS (E.G.: 13,7,3,7,13).
-OUTPUT : EITHER ./ NEXT PERMUTATION (13,7,3,13,7), OR ./ BASIC NATURAL PERMUTATION (3,7,7,13,13), OR ./ LIST OF ALL PERMUTATIONS, OR ./ LIST OF ALL REMAINING PERMUTATIONS GIVEN THE INPUT. -2 INPUT & 2 DISPLAY/OUTPUT ROUTINES. -FAST REGISTER SORTING SBR INCLUDED.

140PROGRAM STEPS
JIM KLTSCHERA
D-MOERFELDEN/WALLDORF

512470 97-WAVEVECTOR DEPENDENT RAMANSCATTERING IN CUBIC CRYSTALS

WAVEVECTOR DEPENDENT FREQUENCIES AND SUSCEPTIBILITIES OF POLAR LATTICE VIBRATIONS OF CUBIC TWO-ATOMIC CRYSTALS ARE CALCULATED. THE SO FOUND DISPERSIONRELATIONS CAN BE EXPERIMENTALLY VERIFIED BY RAMANSCATTERING OF LIGHT BY POLARITONS. INPUT DATA ARE THE TO- AND LO-FREQUENCY, RELATIVE LO-SCATTERING-INTENSITY AT LARGE WAVEVECTOR AND THE DIELECTRIC CONSTANT IN THE BANDGAP.

112PROGRAM STEPS
MICHAEL NIPPUS
D-NEUFAHRN

512480 67-GONIOMETRIC MATRIX

PROGRAM COMPUTES THE DETERMINANT OF A 3X3 GONICMETRIC MATRIX WHEN IS GIVEN THE ELEMENTS OF THE MATRIX. YOU MUST INPUT THE ANGLES AND THE KIND OF THE FUNCTION (SIN, COS OR TAN) WITH A CODE.

105PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK

512490 67-BINOMIAL ESTIMATING

PROGRAM COMPUTES THE ESTIMATING OF THE DIFFERENCE BETWEEN TWO BINOMIAL PARAMETERS WITH THREE CONFIDENCE COEFFICIENTS.

075PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK

512500 97-2X2 MATRIX OPERATIONS

PROGRAM CALCULATES THE INVERSE OF A 2X2 MATRIX WITH NOT SYMMETRIC COEFFICIENTS AND SOLVES A SYSTEM OF 2 SIMULTANEOUS EQUATIONS IN 2 UNKNOWNS. THE SECOND SIDE OF THE PROGRAM CARD MAY BE USED AS DATA STORAGE FOR THE INVERSE MATRIX.

112PROGRAM STEPS
GEORG RAABE
D-BRAUNSCHWEIG

512510 67-CONVERSION OF UNITS USED IN SPECTROSCOPY

EVERY SPECTRAL-LINE IS COMPLETELY DETERMINED BY ITS WAVELENGTH (M OR ANGSTROEM), ITS FREQUENCY (HZ), ITS ENERGY (EV) OR ITS WAVE-NUMBER (1/CM). PROGRAM CONVERTS THESE UNITS AT THE PUSH OF ONE BUTTON ONLY.

106PROGRAM STEPS
BERND HOFFMANN
D-DUISBURG

512520 67-KINETIC TEMPERATURE/CALORIC CONVERSIONS

TO PREDICT EXPIRATION DATES FOR PRODUCTS AT ALTERING TEPPERATURES

512520 (CONTD)

THE DEGRADATION PRECESS SHOULD BE SIMULATED BY LABORATORY CONDITIONS. FOR PRODUCTS WHOSE LOSS RATE CONSTANT IS A FUNCTION OF TEMPERATURE ACCORDING TO THE ARRHENIUS RELATION SHIP, IT IS POSSIBLE, TO DETERMINE A SINGLE VIRTUAL TEMPERATURE FOR THE TESTING PROCEDURE. THE PROGRAM CALCULATES THIS AVERAGE OF THE KINETIC TEMPERATURE. ADDITIONAL IT SUPPLIES SEVERAL CALORIC CONVERSIONS.

106PROGRAM STEPS
MANFRED SOEFFTGE
D-WEINHEIM

512530 67-FIRST ORDER SMOOTHING OF UNEQUALLY SPACED DATA POINTS

DATA POINTS WHICH ARE SCATTERED DUE TO RANDOM ERRORS OF OBSERVATION OR OTHER RANDOM INFLUENCES SHOULD BE SMOOTHED, BEFORE POLYNOMIAL APPROXIMATION OR ANY OTHER CURVE FIT IS CARRIED OUT. THIS PROGRAM WAS SPECIALLY CONCEIVED FOR SCATTERED DATA POINTS WHICH ARE NOT EQUALLY SPACED AND PERFORMS SINGLE, DOUBLE OR TRIPLE SMOOTHING OF FIRST ORDER.

188PROGRAM STEPS
HENRIQUE E. ADLER
PORT.-OPORTO

512540 67-THIRD ORDER SMOOTHING OF EQUALLY SPACED DATA POINTS

DATA POINTS WHICH ARE SCATTERED DUE TO RANDOM ERRORS OF OBSERVATION OR OTHER RANDOM INFLUENCES SHOULD BE SMOOTHED, BEFORE POLYNOMIAL APPROXIMATION OR ANY OTHER CURVE FIT IS CARRIED OUT. THIS PROGRAM DOES SINGLE, DOUBLE OR TRIPLE SMOOTHING OF A SET OF EQUALLY SPACED DATA POINTS THE SMOOTHING IS OF THIRD ORDER.

180PROGRAM STEPS
HENRIQUE E. ADLER
PORT.-OPORTO

512550 67-LEGENDRE APPROXIMATION FOR UNEQUALLY SPACED DATA POINTS

THIS PROGRAM APPROXIMATES A FUNCTION, DEFINED BY A SET OF UNEQUALLY SPACED DATA POINTS, BY LEGENDRE POLYNOMIALS OF ANY DEGREE UP TO 7, USING THE LEAST SQUARES METHOD. SIMULTANEOUS COMPUTATION OF UP TO 8 COEFFICIENTS AND OF THE SUM OF SQUARED ERRORS FOR EACH DEGREE. A GENERALIZED SIMPSON FORMULA GIVING THIRD ORDER APPROXIMATION IS USED FOR THE INTEGRATIONS. PROJECTIONS OF Y VALUES CAN BE MADE. THE PROGRAM MAY BE USED FOR EQUALLY SPACED POINTS BUT NR 50520D WOULD BE BETTER FOR THAT.

212PROGRAM STEPS
HENRIQUE E. ADLER
PORT.-OPORTO

512560 97-HORROR IN THE CHEESE MAZE

YOUR OBJECT IS TO REACH THE CHEESE POT WITHOUT BEING EATEN BY SLIMEY PIG ON THE WAY. SLIMEY PIG MOVES AROUND THE MAZE GENERALLY TOWARDS YOU. EVERY MOVE YOU ARE TOLD THE DIRECTION TO SLIMEY PIG AND TO THE CHEESE POT. IN ABOUT HALF THE GAMES PLAYED, YOU GET EATEN.

364PROGRAM STEPS
DAVID PEDLAR
GB-WOKINGHAM

512570 97-RAYTRACE OF ONE RAY THROUGH SIX OR LESS SURFACES

USING STANDARD RAYTRACING EQUATIONS FOR MERIDIONAL RAYS A SINGLE RAY MAY BE TRACED THROUGH A MAXIMUM NUMBER OF SIX SURFACES. THE DATA FOR THE SURFACES ARE HELD UNCHANGED

512570 (CONTD)

IN THE STORAGE REGISTERS AND AFTER, DIFFERENT, RAY CAN BE TRACED THROUGH THE SAME SURFACES MERELY BY ENTERING THE OPENING DATA FOR THE RAY AND RE-RUNNING THE PROGRAM. CONRADY'S SYMBOLS AND SIGN CONVENTIONS ARE USED.

189PROGRAM STEPS
JAMES HOUGHTON
GB-TETBURY

512580 67-RADIO WAVE PROPAGATION : PLANE WAVE REFLECTION COEFFICIENT

PLANE WAVE REFLECTION COEFFICIENT COMPUTATION WITH VERTICAL OR HORIZONTAL POLARIZATION. PROVISION IS MADE FOR GRAPH PLOTTING VERSUS ANGLE OF INCIDENCE AND/OR WAVELENGTH OR FREQUENCY WITHIN ANY INTERVAL FOR EACH PARAMETER AT FIXED LINEAR INCREMENTS.

224PROGRAM STEPS
PIERRE GRANIER
F-VANVES

512590 97-3X3 MATRIX OPERATIONS WITH SYMMETRIC COEFFICIENTS

THIS PROGRAM CALCULATES THE INVERSE OF A 3X3 MATRIX AND SOLVES A SYSTEM OF 3 SIMULTANEOUS EQUATIONS IN 3 UNKNOWNS BY USING THE INVERSE MATRIX. THE COEFFICIENTS ARE SYMMETRIC : A(I,J) = A(J,I). DATA ENTRY: ONLY 6+3=9 DATAS; STORAGE USED : ONLY 13 REGISTERS.

171PROGRAM STEPS
GEORG RAABE
D-BRAUNSCHWEIG

512600 67-WALD'S SEQUENTIAL TEST

TAKING A RISK ALPHA OF TO REJECT A LOT OF PIECES CONTAINING LESS THAN PO DEFECTIVE ONES AND A RISK BETA TO ACCEPT A LOT CONTAINING MORE THAN P1 DEFECTS, THIS PROGRAM INDICATES, DURING A SEQUENTIAL TEST, IF WE MUST ACCEPT, REJECT OR CONTINUE THE TEST.

059PROGRAM STEPS
ANDRE LONGATTE
F-CHATENAY-MALABRY

512610 97-NUMERICL INTEGRATION WITH 3 DIFFERENT METHODS

THIS PROGRAM ESTIMATES THE VALUE OF AN INTEGRAL OVER A FINITE RANGE, USING 3 DIFFERENT METHODS :
1. RECTANGLES' RULE (2 DIFFERENT VALUES)
2. TRAPEZOIDAL RULE
3. SIMPSON'S RULE

089PROGRAM STEPS
PASCAL FAIVRE
CH-DELEMONT

512620 67-THESEUS AND MINOTAURUS

DO YOU KNOW THE OLD GREEK SAGA OF THESEUS AND MINOTAURUS? THESEUS HAD TO FIND THE TERRIBLE MONSTER MINOTAURUS IN A MAZE, TO KILL IT AND FIND THE WAY OUT, WHERE ARIADNE, THE KING'S DAUGHTER WAITED FOR HIM. IN THIS GAME, YOU ARE THESEUS AND HAVE TO DO HIS WORK. THE CALCULATOR MAKES UP A 10X10 MAZE AND LETS YOU FIND MINOTAURUS. UNFORTUNATELY, HE CANNOT SIMULATE ARIADNE...

223PROGRAM STEPS
DIRK ZABEL
D-BREMEN

512630 67-ODYSSEUS AT SKYLLA AND CHARYBDIS

DO YOU KNOW THE OLD GREEK SAGA OF ODYSSEUS? AFTER THE END OF THE WAR OF TROJA HE HAD TO GO THROUGH MANY

512630 (CONTD)

ADVENTURES BEFORE HE CAME HOME. AT THIS GAME, YOU ARE ODYSSEUS AND HAVE TO PASS WITH A SAILING-VESSEL BETWEEN TWO ROCKS. THE WIND IS NOT CONSTANT. YOU CAN CHOOSE AN ANGLE BETWEEN 70 AND -70 DEGREES FOR THE RUDDER AND YOU CAN STRIKE OR HOIST THE SAILS. GOOD LUCK !

324PROGRAM STEPS
DIRK ZABEL
D-BREMEN

512640 67-COMPUTATION OF CORRELATION COEFFICIENTS

GIVING A SET OF DATA PAIRS, THIS PROGRAM COMPUTES THE CORRELATION COEFFICIENTS WITH A LAG FROM ZERO TO EIGHT PERIODS AND THE REGRESSION COEFFICIENTS ON THE FORM : X(I) = A+B Y(I-K) FOR K=0 TO 8.

175PROGRAM STEPS
PHILIPPE BEAUGRAND
F-PARIS

512650 67-RESISTANCES-CAPACITANCES

THIS PROGRAM CALCULATES THE RESISTANCE BY GIVING THE COLOUR RINGS PRINTED ON THE RESISTANCE. ALSO THE STANDARD RESISTANCE IS CALCULATED BY A TOLERANCE FROM 5%, 10%, OR 20% THE PROGRAM CAN ALSO BE USED FOR CAPACITANCES.

224PROGRAM STEPS
JOCHEN WIECHERN
D-VISSELHOVEDE

512660 67-4X4 MATRIX MULTIPLICATION

PROGRAM CALULATES THE PRODUCT OF A 4X4 MATRIX WITH A 4XN MATRIX (N UNLIMITED).

097PROGRAM STEPS
JOHAN DECAT
B-GENT

512670 67-SCHWARZSCHILD CORRECTION

PROGRAM CALCULATES THE RIGHT EXPOSURE TIME WHEN CORRECTION IS NEEDED DUE TO THE SCHWARZSCHILD EFFECT (EXPOSURE TIMES LONGER THAN ONE SECOND) FOR EKTACHROME & KODACOLOR II.

066PROGRAM STEPS
JOHAN DECAT
B-GENT

512680 97-FUNCTIONS OF A SYMMETRIC 3X3 MATRIX

DESIGNED FOR USE WITH PROGRAM 51211D, (EIGENVECTORS+EIGENVALUES). THIS PROGRAM PERMITS THE COMPUTATION OF ANY NUMBER OF USER-DEFINED FUNCTIONS OF A SYMMETRIC 3X3 REAL MATRIX WITH DISTINCT EIGENVALUES. REPEATED COMPUTATIONS OF DIFFERENT FUNCTIONS F(X) OF MATRIX X POSSIBLE WITHOUT REENTERING DATA. YOU CAN SIMULTANEOUSLY INCLUDE UP TO 12 USER-DEFINED FUNCTIONS IN PROGRAM AT ONE TIME. PARTICULARLY SUITED FOR ILLUSTRATING FUNCTIONAL CALCULUS OF OBSERVABLES IN QUANTUM MECHANICS.

130PROGRAM STEPS
MICHAEL GERZON
GB-OXFORD

512690 97-96-POINT GAUSSIAN QUADRATURE

EVALUATES INTEGRAL OF FUNCTIONS ON FINITE OR INFINITE INTERVALS, USING 96-POINT GAUSSIAN QUADRATURE FOR HIGH ACCURACY IN DIFFICULT CASES. USES FIVE DATA CARDS. "INTELLIGENT" DATA-CARD LOADING FEATURE GUARDS AGAINST USER ERROR, AND PROMPTS DATA CARD NUMBER. DESPITE CARE RE-

2690 (CONTD)

QUIREMENTS, TWO MEMORIES AVAILABLE FOR USER FUNCTION ROUTINE.

135PROGRAM STEPS
MICHAEL GERZON
GB-OXFORD

2700 97-RIEMANN ZETA FUNCTION/GAMMA FUNCTION

COMPUTES VALUE OF RIEMANN ZETA FUNCTION FOR REAL X DOWN TO -117.6 TO ABOUT EIGHT SIGNIFICANT FIGURES (DEPENDING ON X).USES EULER-MACLAURIN EXPANSION FOR X >-0.2 AND GAMMA FUNCTION MULTIPLICATION FORMULA FOR X<-0.2. ALSO COMPUTES GAMMA FUNCTION FOR X BETWEEN -69.3 AND 70.9 USING LOGARITHMIC STIRLING FORMULA FOR X>3 AND RECURRENCE RELATION FOR X<3. QUITE FAST.

224PROGRAM STEPS
MICHAEL GERZON
GB-OXFORD

2710 67-DIVISION OF TWO NUMBERS

A. THE NUMBER OF DECIMALS OF P/Q CAN BE COMPUTED FOR Q<10**10 (AXEL STRUBE, WOLFHAGEN GERMANY)
B. WHEN Q<10**5 YOU AFTERWARDS CAN GET DECIMALS IN SEQUENCES OF 210 AT A TIME. B TAKES ABOUT A THIRD OF A TO EXECUTE (8-210 DEC=3MIN)
C. PRODUCT OF TWO TEN DIGITS NUMBER TO ALL CIFRES

224PROGRAM STEPS
KENT A WIGSTROEM
S-FLODA

2720 67-PERIODICITY OF DECIMAL FRAC

THE PERIOD(S) CAN BE COMPUTED EITHER FOR ONE SINGLE NUMBER OR IN SEQUENCE OF 20 ODD SUCCESSIONAL (NOT WITH 5 DIVIDABLE) NUMBERS. TO COMPUTE THE NUMBER 529 THAT HAS A PERIOD OF 464 FIGURES TAKES ABOUT 6,5 MIN. THE RESULTS OF THE SEQUENCE 301-349 ABOUT 35 MIN. AFTERWARDS THE RESULTS CAN BE DISPLAYED REPEATEDLY.

222PROGRAM STEPS
KENT A WIGSTROEM
S-FLODA

2730 67-MULTIPLY TWO TWENTYDIGITS NUMBERS

THIS PROGRAM CALCULATES THE PRODUCT OF MAX. TWO TWENTYDIGIT NUMBERS WITH ALL FIGURES. IT MEANS UP TO MAX 40 FIGURES IN 25 SEC.

223PROGRAM STEPS
KENT A WIGSTROEM
S-FLODA

2740 67-TAKE

YOU HAVE THREE HEAPS INHOULDING 3,4 AND 5 UNITIES. ALTERNATLY YOU AND YOUR CALCULATOR TAKE AWAY ANY NUMBER OF UNITIES OUT OF ANY HEAP. YOU ARE THE WINNER IF YOUR CALCULATOR MUST TAKE THE LAST UNITY. ALL POSSIBLE CHEATS ARE ANSWERED BY AN ERROR.

224PROGRAM STEPS
JEAN SCHANNES
LUX-BETTEMBOURG

2750 97-POINT OF INTERSECTION OF A CLOTHOIDE WITH A CIRCLE

PROGRAM CALCULATES THE POINT OF INTERSECTION BETWEEN A CLOTOIDE (GIVEN BY THE PARAMETER A, THE SENS OF CURVATURE TO LEFT OR RIGHT AND THE LENGTH L) AND A CIRCLE GIVEN BY THE COORDINATES OF THE CENTER AND THE RADIUS R.

512750 (CONTD)

222PROGRAM STEPS
HANSPETER BERNET
CH-BERNE

512760 97-POINT OF INTERSECTION OF TWO CLOTHOIDES

THE PROGRAM COMPUTES THE POINT OF INTERSECTION OF TWO CLOTHOIDES, GIVEN BY THEIR TANGENTS, THEIR PARAMETERS A1 AND A2 AND THE SENS OF CURVATURE TO LEFT OR RIGHT.

224PROGRAM STEPS
HANSPETER BERNET
CH-BERNE

512770 97-INFLUENCE-LINES OF BENDING-MOMENTS IN A 4-FIELD-BEAM

PROGRAM COMPUTES THE INFLUENCE-LINES OF BENDING-MOMENTS IN EVERY POINT OF THE 4-FIELD-BEAM WISHED BY THE USER. DISTANCES FROM POINT TO POINT CAN BE CHANGED. NORMALLY IT IS 1 METER BEGINNING AT EVERY SUPPORT. WITH THE SAME SYSTEM IT WILL BE POSSIBLE TO CALCULATE THE MAX. BENDING-MOMENTS FOR TRAINS OF LOAD.

349PROGRAM STEPS
HANSPETER BERNET
CH-BERNE

512780 67-TIMER

THIS PROGRAM CONTAINS FIVE DIFFERENT TIMERS: 5 SECOND INTERVAL VISIBLE TIMER; MINIMUM INTERVAL VISIBLE TIMER; COUNT-UP TIMER; COUNT-DOWN TIMER; SPLITS (UP TO 15). AUTOMATIC CALIBRATION ROUTINES ARE INCLUDED FOR FAST CORRECTION OF INTERNAL CONSTANTS TO SUIT THE CHARACTERISTICS OF THE CALCULATOR WHEN IN USE.

220PROGRAM STEPS
SIDNEY WALLACE
GB-BUCKHURST HILL

512790 67-2X2 COMPLEX MATRIX

GIVEN A 2X2 MATRIX WITH COMPLEX ENTRIES, THE PROGRAM WILL YIELD ITS DETERMINANT, ITS INVERSE, AND ITS TWO EIGENVALUES. INCORPORATED IN THE PROGRAM IS A ROUTINE FOR SOLVING QUADRATIC EQUATIONS WITH COMPLEX COEFFICIENTS. THE PROGRAM IS COMPATIBLE WITH PROGRAM NO 51235D FOR CHAIN OPERATIONS.

211PROGRAM STEPS
ALEXANDER GRUZA
GB-LONDON

512800 97-PHASE-SHIFT NETWORK POLE/ZERO FREQUENCIES.

CALCULATES THE POLE/ZERO FREQUENCIES OF A CONSTANT PHASE DIFFERENCE NETWORK FOR ANY USER CHOICE OF PHASE DIFFERENCE (NOT JUST 90 DEGREES) ANY EVEN NUMBER OF POLE/ZEROS FROM 4 TO 34 AND EITHER DESIRED FREQUENCY RANGE OR DESIRED MAXIMUM ERROR FROM NOMINAL PHASE DIFFERENCE. IN EITHER CASE, THE UNSPECIFIED PARAMETER IS CALCULATED AND PRINTED BEFORE THE POLE/ZERO CALCULATION, PERMITTING CHANGE OF UNSATISFACTORY DESIGN PARAMETERS WITHOUT WAITING. BASED ON NEW FAST ALGORITHM.

223PROGRAM STEPS
MICHAEL GERZON
GB-OXFORD

512810 97-ACCURATE INTEGRATION OF AWKWARD FUNCTIONS

DO YOU WANT TO INTEGRATE FUNCTIONS ON AN INTERVAL WITH SINGULAR OR OSCILLATORY BEHAVIOUR? THIS PROGRAM HAS A BETTER CHANCE OF GIVING GOOD ANSWER IN REASONABLE COMPUTATION

512810 (CONTD)

TIME THAN OTHER METHODS. NEW ALGORITHM COMBINES EULER-MACLAURIN WITH GAUSSIAN TECHNIQUE. ADDITIONAL CHANGE OF VARIABLE MODERATES SINGULARITIES. EASY TO USE WITH MANUAL OR SEMI-AUTOMATIC OPTIONS. BASIC RULE HAS FAST ELEVENTH ORDER SPEED OF CONVERGENCE. ONE CARD HOLDS DATA + PROGRAM.

112PROGRAM STEPS
MICHAEL GERZON
GB-OXFORD

512820 97-CONTINUOUS HIGHWAY ELEVATIONS AT GRADIENT AND SIDEPOINTS

AT A SPECIFIED INTERVAL ELEVATIONS OF A HIGHWAY SURFACE ARE COMPUTED. THE PROGRAM USES VARIABLE SUPERELEVATIONS FOR LEFT AND RIGHT AND COMPUTES ON VERTICAL CURVES IF SO REQUIRED. THE SPECIFIC INPUT DATA (VERTICAL INTERSECTION POINT,CHANGE OF SUPERELEVATION RHS AND LHS) ARE CALLED BY A CODED DISPLAY. TEST FOR VALIDITY OF DATA CALLS AUTOMATICALLY FOR NEW DATA IF FAILED.

219PROGRAM STEPS
KLAUS STALLMANN
SULTANATE OF OMAN-MUSCAT

512830 67-COMMITTEE-PROBLEMS

GIVEN THAT A COMMITTEE OF A IS TO BE SELECTED AT RANDOM FROM A GROUP OF B MEN AND C WOMEN, THIS PROGRAM COMPUTES THE PROBABILITY THAT THERE WILL BE EXACTLY D MEN ON THE COMMITTEE.

059PROGRAM STEPS
JOHN VAN THIELEN
8-STABROEK

512840 67-ACCEPTANCE SAMPLING PLAN

THIS PROGRAM COMPUTES THE SO CALLED OPERATING CHARACTERISTIC CURVE OF THE ACCEPTANCE SAMPLING PLAN, THAT IS THE FUNCTION WHISH VALUE IS THE PROBABILITY OF ACCEPTING A LOT OF A IF IN FACT IT CONTAINS THE FRACTION P DEFECTIVE AND IF R IS A SAMPLE-SIZE.

060PROGRAM STEPS
JOHN VAN THIELEN
8-STABROEK

512850 67-VOTE-PROBLEMS

GIVEN N INDIVIDUALS ALL OF WHOM VOTED DEMOCRATIC (D), REPUBLICAN (R) OR INDEPENDENT (I), AND ASSUME THAT A PERSON WHO VOTES D,R OR I IN ONE ELECTION WILL VOTE D IN THE NEXT ELECTION WITH A PROBABILITY OF PD, R WITH PR AND I WITH PI, THIS PROGRAM COMPUTES THE PROBABILITY P THAT OF THE N INDIVIDUALS N1 VOTE D, N2 VOTE R AND N3 VOTE I (N1+N2+N3=N)

048PROGRAM STEPS
JOHN VAN THIELEN
8-STABROEK

512860 67-POINT FUNCTION

GIVEN A POPULATION N AND A PART OF THIS POPULATION WITH A SPECIAL KIND IN PERCENT AND SAMPLES OF N SELECTED AT RANDOM, THIS PROGAM COMPUTES THE PROBABILITY POINT FUNCTION.

055PROGRAM STEPS
JOHN VAN THIELEN
8-STABROEK

512870 67-PARETO DISTRIBUTION

THIS PROGRAM COMPUTES THE MATHEMATICAL EXPECTATION E(X) OF F(C,K) IF C AND K ARE POSITIVE CONSTANTS AND F THE PROBABILITY DENSITY FUNCTION

512870 (CONTD)

FOR A RANDOM VARIABLE X. THIS PROBABILITY LAW IS KNOWN AS THE PARETO DISTRIBUTION.

047PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK

512880 67-STAR-AND MESH CONNECTIONS

GIVEN THE IMPEDANCES Z1, Z2 AND Z3 AND THE PHASE-E.M.F.'S E1,E2 AND E3 THIS PROGRAM COMPUTES THE CURRENTS I1, I2 AND I3 IF :
A) THE IMPEDANCES FORM A STAR-CONNECTION
B) THE IMPEDANCES FORM A MESH-CONNECTION.

123PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK

512890 67-DRYING CALCULATION

WITH THIS PROGAM YOU CAN CALCULATE THE AMOUNT OF WATER THAT MUST BE EVAPORATE TO DRY A WET PRODUCT. THE AMOUNT OF THE DRY AIR TO DO THIS AND THE HEAT REQUIREMENT. ALSO THE ABSOLUTE WATER CONTENT OF MOIST AIR AND THE ENTHALPIE OF AIR-WATER-MIXTURES.

159PROGRAM STEPS
FRED SCHEUER
A-WIEN

512900 67-FISCHERIAN DISCRIMINATION 4 VARIABLES

STARTING FROM THE OBSERVATIONS MADE THIS PROGRAM CALCULATES AND PUTS INTO MATRICIAL FORM THE NECESSARY INPUTS FOR ENTERING IN PROGRAM 4X4 MATRIX OPERATIONS (00069D; OR IN MATH PAC 1: MA1-07 WITH TWO CARDS). IT ALSO CALCULATES, AND SETS IN THE PROPER REGISTER, THE ELEMENTS OF COLUMN 8, IN SUCH A MANNER THAT, LOADING THE CORRESPONDING CARDS, THE USER OBTAINS, WITHOUT TRANSCRIPTION, THE COEFFICIENTS OF THE DISCRIMINATION FUNCTION.

202PROGRAM STEPS
GUY RABELLE
F-BAUVAIS

512910 67-POLYGONALE COURSE OVER TEN INTERMEDIATE POINTS

THIS PROGRAM COMPUTES THE COORDINATES OF MOST TEN INTERMEDATE POINTS IN A POLYGONALE COURSE. DISTANCE AND ANGLE ERRORS ARE LEVEL. LARGE ERRORS CAN BE FOUND OUT. DISTANCE-CORRECTIVES IN CONSEQUENCE OF ALTITUDE AND BULGE OF THE EARTH CAN BE TAKEN INTO CONSIDERATION.

221PROGRAM STEPS
HANSJUERG GYSIN
CH-STANS

512920 67-RESISTANT-INERTIA-AND PRODUCT OF INERTIA MOMENT

WITH THIS PROGRAM YOU CAN CALCULATE THE LEVEL, THE COORDINATES OF THE CENTROID, THE RESISTANT MOMENT THE INERTIA MOMENT, THE PRODUCT OF THE INERTIA MOMENT, THE BEST TWIST ANGLE AND THE MAXIMAL/MINIMAL INERTIA MOMENT OF A PLEASURE LEVEL,IF YOU KNOW THE COORDINATES OF THE CORNER.

222PROGRAM STEPS
HANSJUERG GYSIN
CH-STANS

512930 67-HESSESCHE NORMALE OF A LEVEL

THIS PROGRAM CALCULATES THE NORMAL OF A PLANE SURFACE (A*X+B*Y+L*Z+D =0) FROM THE VECTOR EQUATION OF A LEVEL.

222PROGRAM STEPS
HANSJUERG GYSIN
CH-STANS

512940 67-MILNE'S PREDICTOR-CORRECTOR METHOD

PROGRAM USES A 4-TH ORDER PREDICTOR CORRECTOR METHOD TO ADVANCE THE SOLUTION OF A LINEAR 1-ST ORDER ORDINARY DIFFERENTIAL EQUATION. IT REQUIRES 4 STARTING VALUES, OBTAINED BY USING A PROGRAM SUCH AS MA1-11A OF MATH PAC 1. THE USER HAS THE OPTION OF OUTPUT OF INTERMEDIARY PREDICTED AND CORRECTED VALUES. OUTPUT FORMAT IS DEPENDENT ON INPUT FORMAT OF H AND TOL.

176PROGRAM STEPS
MICHAEL MC.INERNEY
EIRE-DUBLIN.

512950 67-MULTIPLE-PRECISION POWERS OF TWO

PROGRAM CALCULATES THE EXACT VALUE OF TWO RAISED TO THE NTH POWER, WHERE N IS ANY WHOLE NUMBER FROM 1 TO 750. THESE ARE NUMBERS OF UP TO 226 DIGITS! PROGRAM GIVES 100 PERCENT ACCURACY DOWN TO THE VERY LAST DIGIT! MERSENNE AND FERMAT NUMBERS ARE EASILY OBTAINED BY SUBSTRACTING OR ADDING 1 TO THE RESULT.

223PROGRAM STEPS
ROLAND N. ANDERSON
S-STOCKHOLM.

512960 67-COMBINATIONS

THIS PROGRAM CALCULATES :
1) PERMUTATIONS OR COMBINATIONS OF M DIFFERENT THINGS TAKEN N AT TIME WITH OR WITHOUT REPETITIONS
2) THE NUMBER OF PERMUTATIONS EXIST OF M DIFFERENT ELEMENTS OF N GROUPS.
3) THE FACTORIAL FOR N>69 ; (N<69)

220PROGRAM STEPS
WERNER HANSEN
D-INGELHEIM

512970 67-HYPERBOLICS

THSI PROGRAM CALCULATES THE HYPERBOLIC FUNCTIONS AND THEIR INVERSES. WHEN COMPUTING THE FUNCTIONS, THE "STACK" IS NOT WORIED AND THE ARGUMENT IS STORE IN THE "LAST X" - REG.

134PROGRAM STEPS
WERNER HANSEN
D-INGELHEIM

512980 97-ERROR FUNCTION

PROGRAM CALCUALTES ERF(X) VERY EFFECTIVELY TO 9 DIGIT ACCURACY USING A NONALTERNATING POWER SERIES EXPANSION FOR X < 2 AND A CONTINUED FRACTION APPROXIMATION FOR X >= 2. THE MATHEMATICAL BACKGROUND OF THE ALGORITHM USED IS DESCRIBED BY P. HENRICI IN "COMPUTATIONAL ANALYSIS WITH THE HP-25 POCKET CALCULATOR".

060PROGRAM STEPS
GUENTER SCHNELL
D-LILIENTHAL

512990 97-RESECTION II ERRORS IN COORDINATED POSN OF RESECTION

THE PROGRAM RUNS ON FROM PROGRAM 51210D 97 BY TAKING THE COORDINATED POSITION COMPUTED FOR THE RESECTION AND EVALUATING THE RADIUS OF THE ERROR CIRCLE EITHER USING THE STANDARD ERROR VALUES BUILT INTO THE PROGRAM OR USER SPECIFIED VALUES FOR THE POSITION MARKS AND RESECTED ANGLES.

512990 (CONTD)

220PROGRAM STEPS-
MIKE STEPHENSON
GB-WILLERBY

513000 67-FINITE BEAM ON ELASTIC FOUNDATION

PROGRAM CALCULATES: DEFLECTION Y ; BENDING MOMENT M; FLEXURAL SHEAR Q, AT ANY GIVEN POINT X FROM LEFT END OF A BEAM (NOT CLAMPED ENDS) ON AN ELASTIC FOUNDATON, LEADED WITH ONE CONCENTRATED LOAD AT DISTANCE A AND B FROM LEFT AND RIGHT ENDS RESPECTIVELY. FOR BEAMS LOADED WITH SEVERAL LOADS METHOD OF SUPERPOSITION MAY BE APPLIED.

222PROGRAM STEPS
JAVID MESBAH
IRAN-TEHRAN.

513010 97-POWERFUL RANDOM NUMBER GENERATOR AND CHI SQUARE TEST

TWENTY PROGRAM STEPS AND FOUR REGISTERS ARE USED FOR A TEN DIGIT RNG SUPPLYING 500 MILLION NUMBERS. PROGRAM PROVIDES FOR HISTOGRAM OF THE OUTPUT IN TWENTY REGISTERS AND COMPUTES CHI SQUARE. THE DOCUMENT SHOWS EXPERIMENTAL RESULTS OF CHI SQUARE DISTRIBUTION.

126PROGRAM STEPS
JEAN-CLAUDE HENTSCH
CH-CORSIER

513020 97-LOTTERY 580 NUMBERS WITHOUT REPEATS

PROGRAM DRAWS RANDOMLY FROM UP TO 580 NUMBERS WITHOUT REPEATING. EACH REGISTER STORES 29 BITS.

155PROGRAM STEPS
JEAN-CLAUDE HENTSCH
CH-CORSIER

513030 67-POINTS ON A CLOTHOIDE

THIS PROGRAM COMPUTES THE COORDINATES, IN THREE SYSTEMS, OF ANY POINT BELONGING TO A GIVEN CLOTHOIDE: RECTANGULAR AND POLAR COORDINATES FROM THE ORIGIN OF THE CLOTHOIDE, RECTANGULAR COORDINATES IN MAIN SYSTEM. IF DESIRED, CURVILINEAR ABSCISSA INCREASE BETWEEN TWO POINTS MAY BE A GIVEN QUANTITY.

171PROGRAM STEPS
MICHEL VEYRIER
F-LIMOGES.

513040 67-CURVE FITTING BY A POLYNOMIAL OF DEGREE 2

PROGRAM FITS A SET OF DATAPOINTS TO A POLYNOMIAL OF DEGREE 2. THERE ARE OPTIONAL POSSIBILITIES TO SELECT PAUSE INPUT/OUTPUT MODE AND TO MAKE PROJECTIONS OF KNOWN X VALUES, BASED ON THE CURVE FIT.

215PROGRAM STEPS
LARS STENMARK
S-STOCKHOLM.

513050 97-EXPONENTIAL AND SQUARE OF 4X4 REAL OR 2X2 COMPLEX MATRIX

SINGLE CARD PROGRAM, REQUIRING NO DATA REENTRY, COMPUTES THE EXPONENTIAL EXP X OF 4X4 RAL OR 2X2 COMPLEX MATRIX X, AND ALSO COMPUTES THE SQUARE X**2, AND REAL SCALAR MULTIPLES AX AND SUMS AI+X. CAN ALSO BE USED TO COMPUTE QUADRATIC POLYNOMIAL MATRIX AI+BX+CX**2, A,B, C REAL SCALARS. EXPONENTIAL CALCULATION TAKES SEVEN MINUTES. OPTIONAL SECOND CARD SIMPLIFIES ENTRY AND PRINTING OF MATRIX. USEFUL FOR CONTROL THEORY, QUANTUM MECHANICS, GROUP REPRESENTATION THEORY, DIF-

305D (CONTD)

FERENTIAL EQUATIONS.

447PROGRAM STEPS
MICHAEL GERZON
GB-OXFORD.

513060 97-ONE CARD 16 POINT GAUSSIAN QUADRATURE

CALCULATES THE INTEGRAL OF A FUNCTION OVER A FINITE OR INFINITE USING 16 POINT GAUSSIAN QUADRATURE FOR GOOD ACCURACY. DATA PLUS PROGRAM ON ONE EASY-TO-LOAD CARD, ALLOWING PREVIOUS CONTENTS OF 6 REGISTERS TO BE PRESERVED DURING DATA LOADING AND PROGRAM OPERATION. TWO USER-DEFINED FUNCTIONS SIMULTANEOUSLY AVAILABLE.

110PROGRAM STEPS
MICHAEL GERZON
GB-OXFORD

513070 97-IMPROVED STACK OF FOUR RATIONAL NUMBERS

REVERSE POLISH STACK OF FOUR RATIONALS WITH *X-/, ROLL-UP, ROLL-DOWN X EXCHANGE Y, ENTER, PRINT, CLX OPERATES EXACTLY IN ALL RESPECTS LIKE HP-67/97 STACK. PROGRAM NEVER GIVES WRONG ANSWERS EVEN FOR LARGE NUMERATORS AND DENOMINATORS, BUT GIVES OVERFLOW, INFINITY AND ERROR INDICATIONS AS APPROPRIATE. RISK OF OVERFLOW MINIMISED BY ELIMINATING COMMON FACTORS AT EVERY STAGE OF CALCULATION, NOT JUST AT END, SO CAN HANDLE BIG NUMERATORS AND DENOMINATORS. ALSO SIMPLIFIES FRACTIONS.

223PROGRAM STEPS
MICHAEL GERZON
GB-OXFORD

513080 97-SOIL STRESS PART 1 AREA LOAD, POINT LOAD, LINEAR LOAD

PROGRAM CALCULATES FOR SHALLOW FOUNDATION THE SOIL STRESS FOR 1) AREA LOAD 2) POINT LOAD 3) LINEAR LOAD. (SEE DIN 4019 BLATT 1). FOR AREA LOAD THE FOUNDATION IS RECTANGULAR; THE SOIL STRESS MAY BE CALCULATED AT ANY POINT OF THE FOUNDATION. POINT LOAD AND LINEAR LOAD MAY ALSO BE USED FOR PILE FOUNDATION OR A PILE WALL.

186PROGRAM STEPS
GEOR RAABE
D-BRAUNSCHWEIG.

513090 97-SOIL STRESS PART 2 HORIZONTAL LOAD TRIANGLE LOAD

PROGRAM CALCULATES FOR SHALLOW RECTANGULAR FOUNDATION FOR 1) TRIANGULAR VERTICAL LOAD (AREA 1) 2) HORIZONTAL RECTANGULAR AREA LOAD 3) TRIANGULAR HORIZONTAL AREA LOAD, (SEE DIN 4019, BLATT 2) THE SOIL STRESS AT A GIVEN LEVEL Z.

195PROGRAM STEPS
GEORG RAABE
D-BRAUNSCHWEIG.

513100 97-KNAPSACK PROBLEM

THIS PROGRAM GIVES A SOLUTION TO THE "KNAPSACK PROBLEM" I.E. SELECT THE BEST PROJECTS, EACH WITH ITS OWN PAY-OFF, OUT OF A GROUP THAT IS COLLECTIVELY CONSTRAINED BY A SINGLE RESOURCE, AND WHERE THE DECISION PER PROJECT IS DONE OR NOT.

192PROGRAM STEPS
BART ONKENHOUT
NL-BLARICUM.

513110 97-EXPONENTIAL ENTEGRAL, INTEGER ORDER

513110 (CONTD)

PROGRAM CALCULATES FOR INTEGER ORDER OF N>=0 THE EXPONENTIAL INTEGRAL EN(X) VERY EFFICIENTLY TO 9 DIGIT ACCURACY USING A POWER SERIES EXPANSION FOR X<=1 AND A CONTINUED FRACTION APPROXIMATION FOR X>1. ALSO, THE EXPONENTIAL INTEGRAL EI (X) IS CALCULATED. IN ALL CASES, ACCURACY AND CALCULATING TIME ARE DEPENDANT ON THE NUMBER OF DECIMAL PLACES SELECTED BY THE USER.

159PROGRAM STEPS
GUENTER SCHNELL
D-LILIENTHAL.

513120 67-BRAKING-COMPUTATIONS

PROGRAM COMPUTES TWO OTHER OF THE FOUR VALUES:
1. SPACE, 2. TIME, 3. VELOCITY, 4. ACCELERATION. IF TWO OF THESE FOUR VALUES ARE GIVEN (I.E. GIVEN: 2. TIME 4. ACCELERATION PROGRAM COMPUTES 1. SPACE AND OR 3. VELOCITY)

213PROGRAM STEPS
FRANZ KERSCHE
A-VIENNA.

513130 67-TAPE COUNTER POSITION TO TIME CONVERSIONS

PROGRAM CONVERTS TAPE COUNTER POSITIONS TO TIME AND VICE VERSA

148PROGRAM STEPS
WALTER LUTZ
D-FRANKFURT.

513140 67-PI DETERMINATION

THE PROGRAMS OFFER TWO WAYS TO CALCULATE PI.

156PROGRAM STEPS
ATTILIO FARINA
I-TORINO.

513150 67-RELATIVISTIC KINEMATICS (1) BOOSTS-ROTATIONS-ARB.HOM. L.T

PROGRAM PROVIDES EULER ROTATIONS OF 3-VECTORS, PURE BOOSTS AND HOMOGENEOUS LORENTZ TRANSFORMATIONS OF 4-VECTORS.

148PROGRAM STEPS
NEIL CRAIGIE
GB-LONG DITTON.

513160 97-DRUSKAL COUNTING PARADOX & "THE PSYCHIC MACHINE".

KRUSKA COUNTS HAVE BEEN DESCRIBED BY MARTIN GARDNER IN "SCIENTIFIC AMERICAN" FEBRUARY 1978. INPUT IS THE VALUE OF EACH CARD DEALT FROM A SHUFFLED DECK; CARD VALUE & SERIAL NUMBER IS PRINTED IN CONDENSED FORMAT. MACHINE HAS APPARENT ABILITY TO DETECT THE DEALER'S COUNT. CAN ALSO BE USED TO SHOW HOW THIS HAPPENS, HANDLING UP TO 20 STARTING CARDS. PAUSE FOR DATA INPUT IS PROVIDED.

133PROGRAM STEPS
DAVID HATCHER
GB-LONDON.

513170 67-MULTIPLE REGRESSION 2 3 OR 4 EXOG. NORMAL OR AUTOREGR.

FITS AN EQUATION OF THE FORM X=A+BZ(1)+CZ(2)+DZ(3)+EZ(4) BY LEAST SQUARES METHOD. (Z(3) AND/OR ONLY Z (4) MAY BE OMITTED; IF THE EQUATION IS AUTOREGRESSIVE THE ONLY NON-LAGGED VARIABLE HAS TO BE INTRODUCED AT EACH STEP ; NON-LINEAR FORMS ARE POSSIBLE IF ONE MAY TRANSFORM THEM IN LINEAR FORMS). IT USES THE PROGRAM 5.5 MATRIX OP WITH SYMETRIC COEF (50234).

513170 (CONTD)

336PROGRAM STEPS
PHILIPPE BEAUGRAND
F-PARIS.

513180 67-SOLUTIONS FROM MOLECULAR WEIGHT

TO PREPARE SOLUTIONS OF CHEMICAL SUBSTANCES OF KNOWN MOLECULAR WEIGHT, THE FOLLOWING VALUES ARE NEEDED: A) THE VOLUME OF THE SOLUTION, B) THE AMOUNT OF SUBSTANCE AND C) THE CONCENTRATION. FROM THE MOLECULAR WEIGHT AND ANY TWO OF THE THREE OTHER VALUES THE PROGRAM WILL CALCULATE THE THIRD.

059PROGRAM STEPS
PAUL LINUS HERRLING
CH-BINNINGEN.

513190 67-FLANGE PROFILE-FACTORS TO ASME PRESSURE VESSEL CODE

GIVEN THE OUTSIDE AND INSIDE DIAMETERS OF THE FLANGE, THIS PROGRAM WILL CALCULATE SHAPE FACTORS K,T,Z, Y AND U, TO THE FORMULA AS GIVEN IN THE ASME PRESSURE VESSEL CODE.

104PROGRAM STEPS
LESLIE A. TEMPERLEY
GB-MANCHESTER.

513200 67-WYE-DELTA TRANSFORMATIONS FOR R,L,C

WITH THE PROGRAM YOU CAN CONVERT THREE RESISTANCES OF AN A.C. CIRCUIT IN WYE-CONNECTION INTO DELTA-CONNECTION AND REVERSE.

157PROGRAM STEPS
REINHARD KLEINHAENTZ
A-VIENNA.

513210 67-WYE-DELTA TRANSFORMATIONS

WITH THE PROGRAM YOU CAN CONVERT THREE OHM-RESISTANCES IN WYE-CONNECTION INTO DELTA-CONNECTION AND REVERSE. NOT FOR INDUCTIVE OR CAPACITIVE-RESISTANCES!

071PROGRAM STEPS
REINHARD KLEINHAENTZ
A-VIENNA.

513220 67-BINARY ARITHMETICS II

WITH THE PROGRAM YOU CAN ADD, SUBTRACT, MULTIPLY AND DIVIDE TWO BINARY NUMBERS WITHOUT CONVERTING INTO DECIMAL SYSTEM.

220PROGRAM STEPS
REINHARD KLEINHANTZ
A-VIENNA.

513230 67-SQUARE OF FORTY DIGIT NUMBER

THIS PROGRAM CALCULATES THE SQUARE OF A MAX. FORTYDIGIT NUMBER TO ALL FIGURES. SUCH A SQUARE WITH 80 FIGURES TAKES ABOUT 110 SEC. TO EXECUTE. WITH THE CORR. ROUTINE AND PROGRAM 511750 IT IS POSSIBLE TO COMPUTE THE SQUARE ROOT TO 40 FIG.

446PROGRAM STEPS
KENT A WIGSTROEM
S-FLODA.

513240 67-EQUIVALENT RESISTANCE OF A DOUBLE-MESH NETWORK

GIVEN A DOUBLE-MESH NETWORK, THIS PROGRAM COMPUTES THE EQUIVALENT RESISTANCE OF THIS NETWORK.

060PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

513250 67-AREA OF A QUADRANGLE

513250 (CONTD)

GIVEN FOUR POINTS A,B,C AND D IN A PLANE, THIS PROGRAM COMPUTES THE AREA OF THE QUADRANGLE ABCD.

110PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

513260 67-SCHOTTKY-EFFECT

PROGRAM COMPUTES THE SATURATE-CURRENT IS IF IS GIVEN THE CATHODE-TEMPERATURE,(T) THE DIELECTRIC-CONSTANT, THE PHASE EMT AND THE KIND OF THE MEDIUM. YOU CAN ALSO COMPUTE IS FOR GIVEN T'S TO MAKE A SKETCH. THIS SYSTEM IS CALLED "THE SCHOTTKY-EFFECT".

149PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

513270 67-WIEN-BRIDGE FILTER

PROGRAM COMPUTES THE TRANSFER FUNCTION H(S) OF A WIEN-BRIDGE NOTCH FILTER WHEN IS GIVEN THE RESISTANCES R, R1 AND R2, RF AND THE CAPACITOR C.

078PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

513280 67-PREDICT NOISE IN DIGITAL SYSTEMS

GIVEN THE CIRCUIT PARAMETERS ZO,ZS, ZR AND E, THIS PROGRAM COMPUTES THE REFLECTIVE VOLTAGES IN DIFFERENT T'S TO SKETCH A DIAGRAM.

077PROGRAM STEPS
RONNIE VAN THIELEN
B-STABROEK.

513290 97-FRIEDMAN TWO-WAY ANALYSIS OF VARIANCE BY RANKS

CALCULATES FRIEDMAN'S STATISTIC CHI-SQUARE R WHICH DETERMINES THE PROBABILITY OF NULL HYPOTHESIS : NO DIFFERENCE BETWEEN K MATCHED SAMPLES. DISTRIBUTION FREE TEST.

056PROGRAM STEPS
GORDON RAE
GB-ABERDEEN.

513300 67-DESIGN OF ANCHORED DIAPHRAM RETAINING WALLS

THE PROGRAM COMPUTES THE PENETRATIONS BELOW EXCAVATION LEVEL REQUIRED FOR STABILITY OF ANCHORED RETAINING OR DOCK WALLS. IT ALSO COMPUTES THE HORIZONTAL FORCE FOR UNIT LENGTH OF WALL IN TIE RODS AND WALLINGS. THERE ARE SEPARATE BRANCHES FOR THE "FREE EARTH SUPPORT" AND "FIXED EARTH SUPPORT" CONDITIONS. A SEPARATE LINKED PROGRAM USES AN ALTERNATIVE METHOD FOR THE "FIXED EARTH SUPPORT" CONDITION.

376PROGRAM STEPS
MICHAEL J. GERAGHTY
IRELAND/ DUBLIN.

513310 67-OPERATING CONTROL, STEAM BOILERS

PROGRAM COMPUTES LOWER HEAT VALUE OF FUEL OILS, AIR AND OXYGEN DEMAND EXHAUST GAS AMOUNT, AIR EXCESS, EXHAUST LOSS, BOILER EFFICIENCY, STEAM AMOUNT, BOILER OUTPUT, AND OTHER.

211PROGRAM STEPS
WERNER HINTZE
D-HAMBURG.

513320 67-EXPANDED OPERATIONAL STACK OF SEVEN RATIONAL NUMBERS

513320 (CONTD)

COMPLICATED EXPRESSIONS OF RATIONAL NUMBERS, INVOLVING THE FOUR ARITHMETIC OPERATIONS, POWER TO ANY INTEGER EXPONENT AND INVERSE, CAN BE COMPUTED BY R.N.P. (AS HP CALCULATORS), AND AN EXPANDED OPERATIONAL STACK ALLOWS YOU TO MEMORIZE UP TO SEVEN FRACTIONS. THE RESULT IS ALWAYS SIMPLIFIED. MOREOVER THE PROGRAM INCLUDES BOTH G.C.D. AND L.C.M. OF TWO OR MORE NUMBERS.

198PROGRAM STEPS
GIANCARLO CORDONI
I-MONTEBELLUNA.

513330 67-PARABOLA DETERMINED BY THREE POINTS

GIVEN THE COORDINATES OF THREE NOT ALLIGNED POINTS, THE PROGRAM COMPUTES : THE PARAMETERS A,B,C, OF THE PARABOLA Y=A*X**2+B*X+C, THE VERTEX V, THE FOCUS F, THE DIRECTRIX Y=D, AND THE ORDINATE YP OF ANY POINT P OF THE CURVE WHOSE ABSCISSA IS XP.

180PROGRAM STEPS
GIANCARLO CORDONI
I-MONTEBELLUNA.

513340 67-INTERSECTION POINTS OF TWO OR MORE STRAIGHT LINES (UP TO 5)

THE PROGRAM STORES THE PARAMETERS OF TWO OR MORE STRAIGHT LINES (UP TO 5) GIVEN AS A*X+B*Y+C=0, AND COMPUTES THE COORDINATES OF THEIR INTERSECTION POINTS ACCORDING TO USER'S DECISIONS. EACH LINE CAN BE DRAWN BY ITS POINTS OF INTERSECTION BETWEEN X AND Y AXES.

090PROGRAM STEPS
GIANCARLO CORDONI
I-MONTEBELLUNA.

513350 67-STRAIGHT LINE-PARABOLA

GIVEN THE PARABOLA Y=A*X**2+B*X+C AND THE STRAIGHT LINE Y=M*X+Q, COMPUTES THE COORDINATES OF THEIR POINTS OF INTERSECTION (IF REAL), THE EQUATION OF THE TANGENT(S) IN A POINT OF THE CURVE OR FROM A POINT OUTSIDE OF THE CURVE, THE COORDINATES OF THE TANGENTIAL POINTS. MOREOVER ALL THE CHARACTERISTICS OF THE PARABOLA (VERTEX, FOCUS, DIRECTRIX, DERIVATIVE, ETC.) CAN BE COMPUTED.

216PROGRAM STEPS
GIANCARLO CORDONI
I-MONTEBELLUNA.

513360 97-SOLUTION TO F(X)=X WEIGSTEIN ITERATION

THIS PROGRAM USES WEIGSTEIN'S ALGORITHM TO SOLVE THE EQUATION F(X)=X. GIVEN AN INITIAL GUESS. FAST CONVERGENCE TO THE ROOT.

104PROGRAM STEPS
BERNARD SIRET
F-SAINT-CLOUD.

513370 67-PHARMACOKINETIC PARANETER

STANDARD PHARMACOLOGIC PROBLEMS CAN BE SOLVED BY USING THIS PROGRAM. FOLLOWING PARAMETERS WERE ACCEPTED BY THE PROGRAM: HALF-LIFE-PERIOD, SUBSIDENCE QUOTE, DISTRIBUTION VOLUME, DOSAGE, WEIGHT, DOSAGE INTERVAL, PLASMA CONC., CUMULATION FACTOR, SATURATION FACTOR, SUBSIDENCE FACTOR, NUMBER OF DOSAGE INTERVALS FOR 90% MAX, PLASMA CONC. MEDIUM PLASMA CONC., COTT ("CONCENTRATION TIMES TIME")

315PROGRAM STEPS
LUDWIG STRAUSS
D-BUERSTADT.

513380 67-TRIANGLE ELEMENTS IN TERMS OF ITS SIDES

PROGRAM CALCULATES ANGLE BISECTORS, SIDE BISECTORS, HEIGHTS, THE RADIUS OF THE INCIRCLE AND CIRCUMCIRCLE OF ANY TRIANGLE; GIVEN THE LENGTHS OF ITS THREE SIDES. IF THE LENGTHS OF ALL THREE SIDES ARE NOT KNOWN BUT INSTEAD ANY COMBINATION OF VALUES (ANGLES AND SIDES) WICH WOULD ALLOW FOR THEIR CALCULATION THROUGH THE USE OF PROGRAM 500910 "TRIANGLE CALCULATIONS" (STANDARD PAC HP-67/97), THEN THIS PROGRAM SHOULD BE USED TO OBTAIN THE LENGTHS OF THE THREE SIDES.

185PROGRAM STEPS
CHRISTOS CORITIS
D-MUENICH.

513390 97-VISCOSITY OF LEAD-CRYSTAL GLASSES

CALCULATES THE VISCOSITY-TEMPERATURE RELATION FROM THE WEIGHT PERCENTAGE COMPOSITION FOR GLASSES IN THE SYSTEM SODA-POTASH-LEAD OXIDE-BORIC OXIDE-SILICA. THE METHOD DIFFERS SIGNIFICANTLY FROM THAT USED IN 5C628D AND 5071?D. A DATA CARD IS NEEDED AS WELL AS A PROGRAM CARD.

213PROGRAM STEPS
MICHAEL CABLE
GB-SHEFFIELD.

513400 67-MEASUREMENT OF BULK PETROLEUM PRODUCTS.

THIS PROGRAM REPLACES PARTS OF THE ASTM-IP PETROLEUM MEASUREMENT TABLES. CALCULATES THE WEIGHT IN METRIC OR LONG TONS OF ANY PETROLEUM PRODUCT FROM GIVEN VOLUME IN BARRELS, API-GRAVITY OR SPECIFIC GRAVITY AND TEMPERATURE IN DEGREES FAHRENHEIT OR CELSIUS. OR CALCULATE THE VOLUME IN BARRELS FROM GIVEN METRIC TONS, API-GRAVITY/SPECIFIC GRAVITY AND TEMPERATURE. DATA CARD NECESSARY.

157PROGRAM STEPS
JOACHIM BLECHNER
D-SALZHAUSEN.

513410 67-FORMULA FROM ANALYTICAL DATA

THIS PROGRAM CALCULATES THE FORMULA FROM ANALYTICAL DATA WITHOUT MOLECULAR WEIGHT FOR THE ELEMENTS CARBON, HYDROGEN, OXYGEN, CHLORINE, NITROGEN, SULFUR, PHOSPHORUS, BROMINE, FLUORINE.

163PROGRAM STEPS
GUIDO STREIFF
CH-KUESSNACHT.

513420 67-SCHWARZSCHILD-COORDINATE TIME VERSUS PROPER TIME.

THIS PROGRAM EVALUATES THE TIME OF FALL OF A TEST PARTICLE TOWARD THE SINGULARITY OF A BLACK HOLE.

124PROGRAM STEPS
GEORGES ARDICHVILI
B-BRUSSEL.

513430 67-97-LINEAR CONFORMAL HELMERT-TRANSFORMATION SU 21

USABLE FOR MAINPOINTS AS MANY AS YOU LIKE. USING OF DATA CARDS. THE PROGRAM PRINTS ALL ENTERED VALUES (97). IT CALCULATES THE COORDINATES OF THE ADJUSTED MAINPOINTS, THEIR DIFFERENCES, THE DISTANCE CORRECTION, THE ERROR OF THE OLD-SYSTEM-COORDINATES, THE ERROR OF THE BARYCENTRE COORDINATES IN THE NEW SYSTEM.

317PROGRAM STEPS
JOHANNES GRUSS

513430 (CONTD)

D-WIESBADEN.

513440 67-97-CALCUL. OF POINTS DETERM. IN A NET OF ALIGN. BASES SU 1-1

NESSLINIENBERECHNUNG VR 22.00 A. IMPROVED MORE COMFORTABLE VERSION OF 50197/SU1, BUT WITHOUT DISTANCE CALCULATION FOR GIVEN LATERAL POINT COORDINATES. IT CALCULATES THE DISTANCE ERROR BETWEEN STARTING/END POINT WITH MAX ERROR, THE BASEPOINT THE LATERAL POINT AND THE TRIG. FUNCTION. USING OF TWO DIFFERENT MAXIMAL ERROR CLASSES, WITH/WITHOUT ERROR DISTRIBUTION. FEHLERGRENZEN GEM. FA II (RD.ERL.D.HESS.MIN.F. WIRTSCHAFT UND TECHNIK V.31.3.1970 (-IVC2-K4300A-114-)).

215PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

513450 67-3X3 CHARACTERISTIC MATRIX

PROGRAM CALCULATES THE CHARACTERISTIC MATRIX OF A 3RD ORDER LINEAR SYSTEM, GIVEN THE COEFFICIENTS MATRIX A (3X3), USING THE SOURIAU-FRAME-FADDEER ALGORITHM.

201PROGRAM STEPS
TERESIO BUSI
N-HALDEN.

513460 67-CINEMATICS

PROGRAM CALCULATES DISTANCE S, VELOCITY V, TIME T AND ACCELERATION A, IF TWO OF THEM ARE KNOWN VO AND SO ARE ALSO CONSIDERED.

224PROGRAM STEPS
JEAN SCHANNES
L-BETTEMBOURG.

513470 97-AUTOMATIC OR SELECTED CURVE FITTING

PART ONE - PROGRAM COMPUTES AT ONCE ALL NECESSARY SIGMAS (ENTERS NEGATIVE DATA). LAST DATA PAIR STORED. PART TWO - COMPUTES, BY THE LEAST SQUARES METHOD, THE COEFFICIENT OF CORRELATION AND THE COEFFICIENTS A& B OF THE LINE OF REGRESSION - L.R., EXPONENTIAL, LOGARITHMIC AND POWER CURVES - SELECTED EITHER BY THE USER OR AUTOMATICALLY (IN LATTER CASE BEST CURVE FIT)-GIVES ESTIMATIONS Y(X) OR X(Y)-ALLOWS SOME PROGRAMMED TRANSFORMATIONS OF DATA.

207PROGRAM STEPS
JEAN THIBERGE
F-CHERBOURG.

513480 67-DESTROY THE HIDDEN TARGET

ONE OF THE 10000 LOCATIONS ON THE SHOOTING LINE IS YOUR TARGET, GIVES YOUR ROCKET SPEED AND ELEVATION AND FIRE IT UPON THE TARGET, TRY TO DESTROY THE TARGET AS SOON AS POSSIBLE BECAUSE EACH MISS GIVES YOU A LOT OF "BLACK" POINTS. COMPETE WITH YOUR FRIENDS. THE PLAYER WITH SMALLEST "ACCOUNT" IS THE WINNER. FULL PRINTOUT FOR HP-97 PROVIDED.

100PROGRAM STEPS
BRANKO SPOYARIC
YU-ZAGREB.

513490 67-COMBINATION HUNTING

NINE 3-DIGIT COMBINATIONS ARE RANDOMLY SELECTED AND STORED IN A FORM OF AN 3X9 ARRAY. AFTER THE CALCULATOR DISPLAYS THE ARRAY YOU HAVE TO FIND AS MUCH AS YOU CAN COMBINATIONS IN ABOUT 30 TRIES. EACH COMBINATION REPRESENTS ALSO THE NUMBER OF POINTS THAT YOU WILL RECEIVE AFTER EACH CORRECT GUESS. PLAYER WITH THE GREATEST NUMBER OF

513490 (CONTD)

POINTS IS THE WINNER.

166PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

513500 67-REGISTER CONTENTS SUBROUTINE

DISPLAYS THE CONTENTS ONLY OF REGISTERS THAT CONTAIN SOME DATA. BECAUSE THE LAST NUMBER IN X REGISTER IS SAVED PROGRAM IS VERY ACCEPTABLE. TO BE EXECUTED AS A SUBROUTINE OF THE PROGRAM THAT WILL NEED THAT NUMBER FOR LATER CALCULATIONS.

029PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

513510 97-BODE-PLOT FROM STEP RESPONSE OF LINEAR SYSTEMS

THE BODE-PLOT OF A LINEAR TIME-INVARIANT SYSTEM IS COMPUTED FROM ITS STEP RESPONSE, WHICH IS GIVEN BY ITS NUMERICAL VALUES. THE AMPLITUDE OF THE STEP FUNCTION, THE TIME INCREMENT, THE VALUES OF THE STEP RESPONSE SAMPLED AT EQUIDISTANT TIMES, AND THE ANGULAR FREQUENCY HAVE TO BE INPUT. THE OUTPUT CONSISTS OF THE BODE-PLOT IN RECTANGULAR, POLAR OR LOGARITHMIC POLAR FORM.

310PROGRAM STEPS
FRANK DOERRSCHEIDT
C-PADERBORN.

513520 67-CHEBYSHEV ECONOMISATION

GIVEN A POLYNOMIAL P(X) OF DEGREE N AND A NON-NEGATIVE NUMBER EPS THIS PROGAM COMPUTES ANOTHER POLYNOMIAL Q(X) WITH DEGREE LESS OR EQUAL THAN N. THE MAXIMUM ABSOLUTE ERROR OF P(X)-Q(X) IS LESS OR EQUAL THAN EPS.
WITH THIS PROGRAM YOU CAN, THEREFORE, FIND POLYNOMIAL APPROXIMATIONS OF COMPLICATED FUNCTIONS, WHOSE TAYLOR EXPANSIONS ARE GIVEN.

154PROGRAM STEPS
WOLFGANG EHRHARDT
D-GOETTINGEN.

513530 67-TRIANGULAR NUMBERS

PROGRAM COMPUTES AND DISPLAYS THE SERIES OF TRIANGULAR NUMBERS UNTIL CALCULATOR OVERFLOWS AND CAN ALSO COMPUTE SPECIFIC TERMS OF THE SERIES.

023PROGRAM STEPS
ANDREW HERRON
GB-LONDON.

513540 67-DENSITY OF A LIQUID

PROGRAM COMPUTES THE DENSITY OF A LIQUID P WHEN IS GIVEN THE WEIGHT OF THE VOLUME OF THE LIQUID AND THIS VOLUME-WEIGHT IN AIR AND WATER

051PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

513550 67-NATURE OF A CONIC

PROGRAM DETERMINES THE NATURE OF A CONIC F(X,Y)=0 AND AFTER THAT SEVERAL Y'S FOR GIVEN X'S TO MAKE A SKETCH OF IT.

075PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

513560 67-THE BEST CURVE FITTING

THIS PROGRAM COMPUTES THE CORRELA-

513560 (CONTD)

TIONCOEFFICIENTS OF THE FOUR BASIC-CURVES, THEN TAKES THE BEST OF THEM AND COMPUTES THE COEFFICIENTS A AND B OF THE BEST FITTING CURVE, THE ESTIMATED VALUE OF Y ON X OR X ON Y AND THE STANDARD ERROR OF ESTIMATE OF Y ON X OR X ON Y. AND THE T OF STUDENT WITH TWO DEGREES OF FREEDOM, ENTERING THE DATA-PAIRS ONLY ONCE. YOU CAN ALWAYS CHANGE ANY DATA-PAIR BY ANOTHER.

224PROGRAM STEPS
RAYMOND BROECKX-JOHN VAN THIELEN
B-STABROEK.

513570 67-SPECTRAL RESPONSE FUNCTIONS

PROGRAM EVALUATES SPECTRAL RESPONSE PARAMETERS OF SOURCE-FILTER/DETECTOR COMBINATIONS. SPECIFIED IN THE 0.3/1.2 MICRON RANGE. GIVEN ANY TWO RESPONSE FUNCTIONS A THIRD FUNCTION IS DETERMINED. RESPONSE DATA IS ENTERED MANUALLY OR MERGED FROM AUXILIARY DATA CARDS (TWO DATA SETS PER CARD. 20 DATA VALUES PER SET). RESULTS ARE OF MODERATE ACCURACY AND RUNNING TIME IS APPROXIMATELY 7 MINUTES. PARAMETERS EVALUATED ARE INTEGRAL INPUT FLUX, SENSITIVITY AND OUPUT FLUX AND NORMALISED RESPONSE FUNCTIONS.

223PROGRAM STEPS
D.T. RANSOM
GB-CHISLEHURST.

513580 97-INTEGRATION OVER A CIRCULAR REGION

INTEGRATES USER-DEFINED FUNCTION F(X,Y) OF TWO VARIABLES OVER A CIRCULAR REGION WITH ANY RADIUS AND CENTRE, USING A HIGH-ACCURACY 31-POINT PRECISION-ELEVEN QUADRATURE METHOD BASED ON LOBATTO QUADRATURE.

131PROGRAM STEPS
MICHAEL GERZON
GB-OXFORD.

513590 97-FRACTIONAL INTEGRATION (RIEMANN-LIOUVILLE AND WEYL)

COMPUTES FRACTIONAL INTEGRALS OF ANY ORDER V>0 OF USER DEFINED FUNCTIONS F(X) EITHER OVER FINITE INTERVAL (RIEMANN-LIOUVILLE FRACTIONAL INTEGRAL) OR INFINITE INTERVAL (WEYL FRACTIONAL INTEGRAL). INCLUDES N-FOLD ITERATED INTEGRATION OF F(X). USES GAMMA FUNCTION SUBROUTINE AND 16-POINT GAUSSIAN QUADRATURE WITH TRANSFORMATION OF VARIABLE.

194PROGRAM STEPS
MICHAEL GERZON
GB-OXFORD.

513600 97-STEREOPHONIC CONVERSIONS

PROGRAM CONVERTS BETWEEN FIVE DIFFERENT WAYS OF REPRESENTING STEREOPHONIC IMAGES WITH INTERSPEAKER AMPLITUDE AND PHASE DIFFERENCES. 1) IMAGE POSITION AND PHASINESS ACCORDING TO MAKITA'S THEORY. 2) RELATIVE COMPLEX GAIN OF LEFT CHANNEL 4) SCHEIBER SPHERE COORDINATES ALPHA BETA. 5) RELATIVE GAIN IN DB AND TIME ADVANCE IN MSEC OF LEFT CHANNEL AT A STATED FREQUENCY.

208PROGRAM STEPS
MICHEAL GERZON
GB-OXFORD.

513610 97-INTEGRATION OVER SPHERICAL REGION & 3-D HERMITE INTEGRATION

PROGRAM PERFORMS HIGH-ACCURACY PRECISION ELEVEN NUMERICAL INTEGRATION OF FUNCTIONS F(X,Y,Z) OF 3 VARIABLES EITHER 1) OVER A SPHERICAL REGION OR 2) FINDS THE 3-DIMENSIONAL HERMITE INTEGRAL. INTEGRATION

513610 (CONTD)

CAN BE WITH ANY CENTRE AND RADIUS. USES EFFICIENT 86 POINT QUADRATURE METHODS BASED ON FACES EDGES AND VERTICES OF DODECAHEDRON.

162PROGRAM STEPS
MICHAEL GERZON
GB-OXFORD.

513620 67-TURNING CLOTHOIDA

GIVEN THE COORDINATES FROM THE TWO CENTRES OF THE CIRCLES AND THE TWO RADIUS. COMPUTES ALL ELEMENTS OF THE TURNING CLOTHOIDA.

423PROGRAM STEPS
KURT HAGER
CH-UZNACH.

513630 97-CH=COMPLETE HOROSCOPE (EPHEMERIS HOUSES, ASPECTARIAN) CARD 1

CARD 1-OF A SERIES OUT OF 12 CARDS COMPUTES BASIC DATA NECESSARY FOR FURTHER COMPUTATIONS (EPHEMERIS DATA OF SUN, MOON AND PLANETS FOR A.D. AND B.C. DATES). THE WHOLE SERIES OF 12 CARDS COMPUTES A COMPLETE HOROSCOPE ENCLUDING DATA LIKE LONGITUDE, SIGN, DAILY MOTION, LATITUDE, DISTANCE (ASTRONOMICAL UNITS AND PERCENTS) OF SUN, MOON, NODE AND PLANETS, CUSPS OF HOUSES (GOH, DR. W. KOCH METHOD), INVERTING POINT, DEAD POINT AND ASPECTARIAN WITHIN ORB (ADDED PERCENT VALUES).

224PROGRAM STEPS
WERNER POPP
D-GETTORF.

513640 97-CH=COMPLETE HOROSCOPE (EPHEMERIS HOUSES, ASPECTARIAN) CARD 2

CARD 2-OF A SERIES OUT OF 12 CARDS CONTINUES COMPUTING BASIC DATA NECESSERY FOR FURTHER COMPUTATIONS (EPHEMERIS DATA OF SUN, MOON AND PLANETS FOR A.D. AND B.C. DATES). THE WHOLE SERIES COMPUTES A COMPLETE HOROSCOPE ENCLUDING DATA LIKE LONGITUDE, SIGN, DAILY MOTION, LATITUDE, DISTANCE (ASTRONOMICAL UNITS AND PERCENTS) OF SUN, MOON, NODE AND PLANETS, CUSPS OF HOUSES (GOH, DR. W. KOCH METHOD), INVERTING POINT, DEAD POINT AND ASPECTARIAN WITHIN ORB (ADDED PERCENT VALUES).

223PROGRAM STEPS
WERNER POPP
D-GETTORF.

513650 67-97-CH=COMPLETE HOROSCOPE (EPHEMERIS, HOUSES, ASPECTARIAN) CARD 3

CARD 3 OF A SERIES OUT OF 12 CARDS CONTINUES COMPUTING BASIC DATA NECESSARY FOR FURTHER COMPUTATIONS (EPHEMERIS DATA OF SUN, MOON AND PLANETS FOR A.D. AND B.C. DATES). THE WHOLE SERIES COMPUTES A COMPLETE HOROSCOPE ENCLUDING DATA LIKE LONGITUDE, SIGN, DAILY MOTION, LATITUDE, DISTANCE (ASTRONOMICAL UNITS AND PERCENTS) OF SUN, MOON, NODE AND PLANETS, CUSPS OF HOUSES (GOH, DR. W. KOCH METHOD), INVERTING POINT, DEAD POINT AND ASPECTARIAN WITHIN ORB (ADDED PERCENT VALUES).

177PROGRAM STEPS
WERNER POPP
D-GETTORF.

513660 97-CH=COMPLETE HOROSCOPE (EPHEMERIS HOUSES, ASPECTARIAN) CARD 4

CARD 4 (SUN) OF A SERIES OUT OF 12 CARDS, CONTAINING PROGRAM AND DATA STEPS FOR SUN EPHEMERIS, CONTINUES PRECEDING CARDS 1-...-3 FOR OUTPUT OF SUN DATA. THE WHOLE SERIES OF 12 CARDS COMPUTES A COMPLETE HOROSCOPE

513660 (CONTD)

ENCLUDING DATA LIKE LONGITUDE, SIGN DAILY MOTION, LATITUDE, DISTANCE (ASTRONOMICAL UNITS AND PERCENTS) OF SUN, MOON, NODE AND PLANETS, CUSPS OF HOUSES (GOH, DR. W. KOCH METHOD), INVERTING AND DEAD POINT AND ASPECTARIAN WITHIN ORB (ADDED PERCENT VALUES).

081PROGRAM STEPS
WERNER POPP
D-GETTORF.

513670 67-CH=COMPLETE HOROSCOPE (EPHEMERIS HOUSES, ASPECTARIAN) CARD 4

CARD 4 (SUN) OF A SERIES OUT OF 12 CARDS, CONTAINING PROGRAM AND DATA STEPS FOR SUN EPHEMERIS, CONTINUES PRECEDING CARDS 1-...-3 FOR OUTPUT OF SUN DATA. THE WHOLE SERIES OF 12 CARDS COMPUTES A COMPLETE HOROSCOPE ENCLUDING DATA LIKE LONGITUDE, SIGN DAILY MOTION, LATITUDE, DISTANCE (ASTRONOMICAL UNITS AND PERCENTS) OF SUN, MOON, NODE AND PLANETS, CUSPS OF HOUSES (GOH, DR. W. KOCH METHOD), INVERTING AND DEAD POINT AND ASPECTARIAN WITHIN ORB (ADDED PERCENT VALUES).

081PROGRAM STEPS
WERNER POPP
D-GETTORF.

513680 67-97-CH=COMPLETE HOROSCOPE (EPHEMERIS, HOUSES, ASPECTARIAN) CARD 5-8

CARD 5 THROUGH 8 OUT OF A SERIES OF 12 CARDS CONTAIN(S) DATA FOR PLANETS' EPHEMERIS CALCULATING BASED ON PRECEDING CARDS 1 THROUGH 4. THE WHOLE SERIES OF 12 CARDS COMPUTES A COMPLETE HOROSCOPE ENCLUDING DATA LIKE LONGITUDE, SIGN, DAILY MOTION, LATITUDE, DISTANCE (ASTRONOMICAL UNITS AND PERCENTS) OF SUN, MOON, NODE AND PLANETS, CUSPS OF HOUSES (GOH, DR. W. KOCH METHOD), INVERTING POINT, DEAD POINT AND ASPECTARIAN WITH ORB (ADDED PERCENT VALUES).

000PROGRAM STEPS
WERNER POPP
D-GETTORF.

513690 67-97-CH=COMPLETE HOROSCOPE (EPHEMERIS, HOUSES, ASPECTARIAN) CARD 9

CARD 9 OUT OF A SERIES OF 12 CARDS PREPARES COMPUTING PROGRAM AND DATA FOR COORDINATES OF MOON AND HIS ASCENDING NODE. THE WHOLE SERIES OF 12 CARDS COMPUTES A COMPLETE HOROSCOPE ENCLUDING DATA LIKE LONGITUDE, SIGN, DAILY MOTION, LATITUDE, DISTANCE (ASTRONOMICAL UNITS AND PERCENTS) OF SUN, MOON, NODE AND PLANETS, CUSPS OF HOUSES (GOH, DR. W. KOCH METHOD), INVERTING POINT, DEAD POINT AND ASPECTARIAN WITHIN ORB (ADDED PERCENT VALUES).

224PROGRAM STEPS
WERNER POPP
D-GETTORF.

513700 97-CH=COMPLETE HOROSCOPE (EPHEMERIS HOUSES, ASPECTARIAN) CARD 10

CARD 10 OUT OF A SERIES OF 12 CARDS CONTINUES PROGRAM AND DATA FROM PRECEDING CARD 9 FOR COORDINATES OF MOON AND HIS ASCENDING NODE. THE WHOLE SERIES OF 12 CARDS COMPUTES A COMPLETE HOROSCOPE ENCLUDING DATA LIKE LONGITUDE, SIGN, DAILY MOTION, LATITUDE, DISTANCE (ASTRONOMICAL UNITS AND PERCENTS) OF SUN, MOON, NODE AND PLANETS, CUSPS OF HOUSES (GOH, DR. W. KOCH METHOD), INVERTING POINT, DEAD POINT AND ASPECTARIAN WITHIN ORB (ADDED PERCENT VALUES).

224PROGRAM STEPS
WERNER POPP
D-GETTORF.

513710 67-CH=COMPLETE HOROSCOPE (EPHEMERIS HOUSES, ASPECTARIAN) CARD 10

CARD 10 OUT OF A SERIES OF 12 CARDS CONTINUES PROGRAM AND DATA FROM PRECEDING CARD 9 FOR COORDINATES OF MOON AND HIS ASCENDING NODE. THE WHOLE SERIES OF 12 CARDS COMPUTES A COMPLETE HOROSCOPE ENCLUDING DATA LIKE LONGITUDE, SIGN, DAILY MOTION, LATITUDE, DISTANCE (ASTRONOMICAL UNITS AND PERCENTS) OF SUN, MOON, NODE AND PLANETS, CUSPS OF HOUSES (GOH, DR. W. KOCH METHOD), INVERTING POINT, DEAD POINT AND ASPECTARIAN WITHIN ORB (ADDED PERCENT VALUES).

224PROGRAM STEPS
WERNER POPP
D-GETTORF.

513720 97-CH=COMPLETE HOROSCOPE (EPHEMERIS HOUSES, ASPECTARIAN) CARD 11

CARD 11 OUT OF A SERIES OF 12 CARDS AFTER PRECEDING CARDS COMPUTING DATA OF SUN, MOON, NODE AND PLANETS WITH DATA LIKE LONGITUDE, SIGN, DAILY MOTION, LATITUDE, DISTANCE (ASTRONOMICAL UNITS AND PERCENTS) THEN COMPUTES CUSPS OF HOUSES (REFERENCES API=ASTROLOGICAL & PSYCOLOGICAL INSTITUTE OF BRUNO & LOUISE HUBER/CH). NEXT (LAST) CARD WILL ADD ASPECTARIAN WITHIN ORB AND PERCENT VALUES.

224PROGRAM STEPS
WERNER POPP
D-GETTORF.

513730 67-CH=COMPLETE HOROSCOPE (EPHEMERIS HOUSES, ASPECTARIAN) CARD 11

CARD 11 OUT OF A SERIES OF 12 CARDS AFTER PRECEDING CARDS COMPUTING DATA OF SUN, MOON, NODE AND PLANETS WITH DATA LIKE LONGITUDE, SIGN, DAILY MOTION, LATITUDE, DISTANCE (ASTRONOMICAL UNITS AND PERCENTS) THEN COMPUTES CUSPS OF HOUSES (DR. W. KOCH GOH-METHOD) ENCLUDING INVERTING AND DEAD POINT OF EACH HOUSE (REFERENCES: API=ASTROLOGICAL & PSYCHOLOGICAL INSTITUTE OF BRUNO & LOUISE HUBER/CH). NEXT (LAST) CARD WILL ADD ASPECTARIAN WITHIN ORB AND PERCENT VALUES.

224PROGRAM STEPS
WERNER POPP
D-GETTORF.

513740 97-CH=COMPLETE HOROSCOPE (EPHEMERIS HOUSES, ASPECTARIAN) CARD 12

CARD 12, THE LAST OUT OF A SERIES OF 12 CARDS AFTER PRECEDING CARDS COMPUTING DATA OF SUN, MOON, NODE AND PLANETS WITH DATA LIKE LONGITUDE, SIGN, DAILY MOTION, LATITUDE, DISTANCE VALUES, CUSPS OF HOUSES (DR. W. KOCH METHOD) ENCLUDING INVERTING AND DEAD POINT OF EACH HOUSE, THE LAST CARD COMPARES THE LONGITUDES OF BODIES FOR ALL ANGLES OF 0,30,60,90,120,150 AND 180 DEGREES WITHIN SPECIAL ORB. IT SHOWS THE CODE NUMBERS OF BODIES, KIND OF ANGLE IN DEGREES AND PERCENT VALUE IN 3 CATEG. GRADUATED IN AGE OF ORB

220PROGRAM STEPS
WERNER POPP
D-GETTORF.

513750 67-CH=COMPLETE HOROSCOPE (EPHEMERIS HOUSES, ASPECTARIAN) CARD 12

CARD 12, THE LAST OUT OF A SERIES OF 12 CARDS AFTER PRECEDING CARDS COMPUTING DATA OF SUN, MOON, NODE AND PLANETS WITH DATA LIKE LONGITUDE, SIGN, DAILY MOTION, LATITUDE, DISTANCE VALUES, CUSPS OF HOUSES (DR. W. KOCH GOH-METHOD) ENCLUDING INVERTING AND DEAD POINT OF EACH HOUSE, THE LAST CARD COMPARES THE

13750 (CONTD)

LONGITUDES OF BODIES FOR ALL ANGLES OF 0,30,60,90,120,150 AND 180 DEGREES WITHIN SPECIAL ORB. IT SHOWS THE CODE NUMBER OF BODIES, KIND OF ANGLE IN DEGREES AND PERCENT VALUE IN 3 CATEG. GRADUATED IN RGD OF ORB

218PROGRAM STEPS
WERNER POPP
D-GETTORF.

13760 97-VARIABLE POINT. GAUSSIAN QUADRATURE

PROGRAM EVALUATES INTEGRAL OF A FUNCTION EXPLICITLY KNOWN, USING GAUSS-LEGENDRE QUADRATURE METHOD. COEFFICIENTS FOR N=4, 8 AND 16 POINTS, TO BE STORED ON TWO CARDS, ARE SUPPLIED WITH PROGRAM DOCUMENTATION. THE SAME FUNCTION CAN THUS BE EVALUATED WITH DIFFERENT A. THE USER MAY PREPARE ADDITIONAL COEFFICIENT CARDS FOR EVEN N UP TO N=20, COEFFICIENTS CAN BE FOUND IN THE LITERATURE.

059PROGRAM STEPS
GUENTER SCHNELL
D-LILIENTHAL.

13770 97-SINE AND COSINE INTEGRALS

PROGRAM CALCULATES SIMULTANEOUSLY SI(X) AND CI(X) FOR REAL X>0. FOR SMALL X, POWER SERIES EXPANSION IS USED. FOR LARGE X, THE COMPLEX EXPONENTIAL INTEGRAL E1 (IX) IS CALCULATED USING A CONTINUED FRACTION APPROXIMATION AND CONVERTED TO THE RELATED SINE AND COSINE INTEGRALS (COMPLEX COMPUTATION IS ONLY USED INTERNALLY). ACCURACY AND CALCULATING TIME ARE DEPENDANT ON NUMBER OF DECIMAL PLACES SELECTED BY USER.

128PROGRAM STEPS
GUENTER SCHNELL
D-LILIENTHAL.

13780 67-TANK HEATING COILS

THE PROGRAM DETERMINES THE GEOMETRIC PARAMETERS AND THE HEATING SURFACE AREA OF SPIRAL (PANCAKE) WITH ENCIRCLING RING, RING HEADER, OR HAIRPIN WITH ENCIRCLING RING TYPE HEATING COILS FOR STORAGE TANKS, IN ENGLISH OR METRIC/SI UNITS. ALTERNATIVELY, FOR A GIVEN HEATING SURFACE AREA, IT FINDS ALL DEFINING PARAMETERS FOR THE SELECTED TYPE OF COIL.

222PROGRAM STEPS
GIUSEPPE LEGATO
I-CUSANO MILANINO.

13790 97-VOTING MACHINE

RECORDS VOTES FOR AND AGAINST ANY NUMBER OF CANDIDATES (OR PROPOSITIONS) UP TO TEN THEN PRINTS THE VOTES IN FAVOUR OF EACH, TOTAL VOTES CAST, TOTAL VOTES AGAINST AND TOTAL VOTES IN FAVOUR. THE VOTES RECORDED ON EACH BALLOT PAPER MAY BE PRINTED OR NOT PRINTED AS DESIRED. ABSTENTIONS OR SPOILED PAPERS MAY BE RECORDED SEPARATELY IF DESIRED. AN ERRONEOUS ENTRY CAN BE CANCELLED.

149PROGRAM STEPS
MICHAEL CABLE
GB-SHEFFIELD.

13800 67-SQUARE ROOT WITH 25 FIGURES.

THIS PROGRAM CALCULATES THE SQUARE ROOT OF A NUMBER, AND THIS WITH A PRECISION OF 25 RIGHT FIGURES. FOR EXAMPLE, IF WE WANT THE SQUARE ROOT OF 10, THE PROGRAM GIVES : 3,1622776601683793319988853 INSTEAD OF : 3,162277660 GIVEN BY THE SQUARE ROOT FUNCTION KEY OF THE

51380D (CONTD)

CLACULATOR.

148PROGRAM STEPS
ETIENNE FAURE
F-GENEST-LERPT.

51381D 97-VAPOUR PRESSURE FUNCTIONS

FINDS SATURATED VAPOUR PRESSURE, MOLAR ENTHALPY OF VAPORISATION AND BOILING POINT BY USE OF KIRCHHOFF'S AND THE CLAPEYRON-CLAUSIUS EQUATIONS. FOR WATER, DATA IN THE PROGRAM ENABLE CALCULATION OF TWO OF THESE FROM THE THIRD. ACCURACY BETTER THAN 0.2 PERCENT. FOR OTHER LIQUIDS TWO OF THEM MUST BE INPUT TO COMPUTE THE THIRD. THE PROGRAM ALSO SOLVES THE "STEAM DISTILLATION PROBLEM". SUITS EITHER HP 97 OR HP 67.

224PROGRAM STEPS
ARTHUR MORTON
GB-KENDAL.

51382D 67-IMPULSE RESPONSE FROM CHARACTERISTIC POLYNOMIAL

FROM THE INPUT, TRANSFER OR RESPONSE FUNCTION, EXPRESSED AS A POLYNOMIAL RATIO OF THE COMPLEX FREQUENCY VARIABLE, PROGRAM CALCULATES IMPULSE RESPONSE FOR EQUAL INCREMENTS OF TIME.ALTHOUGH POLYNOMIALS OF ORDER 9 MAY BE PROCESSED. ACCURACY IS INVERSELY RELATED TO THIS PARAMETER, LONG COMPUTATION TIME.

221PROGRAM STEPS
D.T. RANSOM
GB-CHISLEHURST.

51383D 67-CALCULUS OF E

THIS PROGRAM COMPUTES THE 250 FIRST DIGITS OF E (2.71828...)

093PROGRAM STEPS
PIERRE MOLINARO
F-NANTES.

51384D 67-NON PARAMETRIC TOLERANCE-INTERVAL

THE PROGRAM CALCULATES SMALLE SIZE, PROBABILITY OR PROPORTION COVERED BY SAMPLE EXTREMS (2 SIDED TEST) OR BELOW (ABOVE) THE LARGEST (SMALLEST) SAMPLE VALUES (1 SIDED TEST) WITH SPECIFIED PROBABILITY. YOU HAVE TO KNOW TWO VARIABLES AND CAN CALCULATE THE THIRD.

218PROGRAM STEPS
STEN SUNDBERG
S-OREBRO.

51385D 67-UNSTABLE ITERATION GAME OR BLOWOUTS HAPPEN

GAME PROGRAM BUILT AROUND THE ITERATION A(N+1) := AB(N)A(N)A(N)+C, B(N) A FUNCTION OF A RANDOM SEQUENCE AND PLAYER'S SUCCESSIVE ENTRIES. PLAYER'S GOAL IS TO MAXIMIZE THE AVERAGE A(N) WITHOUT CAUSING OVERFLOW (WHICH LIKELY HAPPENS) OR EXCEEDING A GROWTH CONDITION ON THE LAST MOVE. THE PROGRAM PROVIDES VARIOUS DEGREES OF DIFFICULTY, AUTOMATIC RANDOM SEED REFRESHER, RECORDING OF MAXIMAL RESULTS, PENALTIES AND SCORING FOR TWO PLAYERS.

223PROGRAM STEPS
FRANZ KIRCHHEIMER
D-FREIBURG.

51386D 97-CALCULATION FOR THE ROOT OF A CHEMICAL REACTION FIRST ORDER

THIS PROGRAM IS BASING ON THE MASS ACTION LAW FOR A CHEMICAL REACTION FIRST ORDER. IT CALCULATES THE CONCENTRATIONS OF EQUILIBRIUM FOR THE COMPONENTS IN THIS FIRST ORDER

51386D (CONTD)

REACTION.

187PROGRAM STEPS
ANDREAS LANCHAEUSSER
D-MEPPEN CT HUENTEL.

51387D 67-ZEROS OF FUNCTIONS

THE PROGRAM SEARCHES A GIVEN INTERVAL WITH A STEPLENGTH, SPECIFIED BY THE USER, FOR A CHANGE OF SIGN. WHEN A SUCH IS FOUND THE ROUTINE DETERMINES THE ROOT TO AN ACCURACY WHICH IS CONTROLLED BY THE DISPLAY. WHEN THE CHANGE OF SIGN IS CAUSED BY AN INFINITE DISCONTINUITY, THE PROGRAM HOWEVER, SKIPS THE SUBINTERVAL IN QUESTION AND CONTINUES THE SEARCH.

121PROGRAM STEPS
GUIDO PETZ
S-SOLNA.

51388D 97-ULTIMATE AXIAL STRENGTH OF H-SHAPED STEEL COLUMNS.

IN ACCORDANCE WITH THE "EUROPEAN BUCKLING CURVES" THE PROGAM GENERATES A TABLE LISTING THE ULTIMATE AXIAL STRENGTH ALONG X-X AND Y-Y AXIS OF 20 OF THE MOST COMMONLY USED H-SHAPES. ITS USEFULNESS IS PARTICULARLY CONVENIENT WHEN DESIGNING A BUILDING WITH REPETITIVE STOREY HEIGHTS. THE "PROPERTIES CARD" CONTAINS 10 IPB1 AND 10 IPB, RANGING FROM 160 TO 340 MM. OTHER CARDS FULLFILLING DIFFERENT NEEDS ARE EASY TO PREPARE.

169PROGRAM STEPS
PHILIPPE HERTIG
CH-LAUSANNE.

51389D 67-INVERSE TCHEBYCHEFF LP-FILTERS. POLES AND ZEROS.

INVERSE TCHEBYCHEFF LP-FILTERS HAVE MAXIMALLY FLAT APPROXIMATION IN THE PASSBAND AND TCHEBYCHEFF APPROXIMATION IN THE STOPPBAND. THE EVEN ORDER FILTER FUNCTIONS CALCULATED BY THIS PROGRAM DOES NOT HAVE A ZERO OF TRANSMISSION AT INFINITY AND ARE NOT REALIZABLE AS LC-LADDER NETWORKS.

169PROGRAM STEPS
NILS HAAHEIM
N-TRONDHEIM.

51390D 67-INVERSE TCHEBYCHEFF LP-FILTER TYPE C.N=6. POLES AND ZEROS

INVERSE TCHEBYCHEFF LP-FILTER HAVE MAXIMALLY FLAT APPROXIMATION IN THE PASSBAND AND TCHEBYCHEFF APPROXIMATION IN THE STOPPBAND. EVEN ORDER FILTERS OF TYPE C HAVE A ZERO OF TRANSMISSION AT INFINITY. THE POLES ZEROS AND CONSTANT FACTOR OF A SIXTH ORDER NORMALIZED LP-FILTER ARE CALCULATED.

385PROGRAM STEPS
NILS HAAHEIM
N-TRONDHEIM.

51391D 67-HANGING CABLE

A HANGING CABLE HAS THREE PROPERTIES :
1) ITS LENGTH.
2) THE DISTANCE BETWEEN THE FASTENINGS.
3) THE DEFLECTION, RELATIVE TO THE LINE THAT JOINS THE FASTENINGS (HORIZONTAL LINE).
THIS PROGRAM CALCULATES, WITH TWO PROPERTIES KNOWN THE REMAINING ONE.

209PROGRAM STEPS
ROBERT E.V. KOENE
NL-DORDRECHT.

51392D 67-LEAST SQUARES REGRESSION OF Z=A0

513920 (CONTD)

000000 +A1X+A2Y OR Y=A0+A1X+A2X2

THIS PROGRAM PROVIDES THE LEAST SQUARES REGRESSION COEFFICIENTS OF A) A THREE VARIALBES CASE (LINEAR) AND B) A PARABOLA. IT IS ALSO POSSIBLE TO CALCULATE PRACTICALLY ALL PROJECTIONS.

221PROGRAM STEPS
ROBERT E.V. KOENE
NL-DORDRECHT.

513930 67-STRESSES IN A CHAIN LINK OF ROUND WIRE

PROGRAM COMPUTES BENDING STRESSES, SHEAR STRESSES ANC TOTAL STRESSES IN THE CURVED PARTS OF A CHAIN LINK OF ROUND WIRE WITHIN THE ELASTIC REGION OF CHAIN MATERIAL.

175PROGRAM STEPS
TORSTEN ERLANDSSON
S-VAESTERVIK.

513940 67-STRESSES IN A STIFF STAKE CHAIN LINK OF ROUND WIRE.

PROGRAM COMPUTES BENDING STRESSES, SHEAR STRESSES AND TOTAL STRESSES IN THE CURVED ARTS OF A STAKE CHAIN LINK OF ROUND WIRE WITHIN THE ELASTIC REGION OF THE CHAIN MATERIAL. THE STAKE IS CONSIDERED TOTALLY STIFF.

223PROGRAM STEPS
TORSTEN ERLANDSSON
S-VAESTERVIK.

513950 97-AUTOMATIC SLOPE-STAKES FOR EARTHWORKS SETTING-OUT

PROGRAM COMPUTES INTERSECTION BETWEEN SLOPE OF THE HIGHWAY PROFILE AND THE GROUND. DECISIONS DONE BY THE PROGRAM :
1) CUT OR FILL SECTION (SEPERATELY FOR EACH SIDE OF CENTERLINE)
2) SUFFICIENT GROUND DATA GIVEN.

184PROGRAM STEPS
KLAUS STALLMANN
SULTANATE OF OMAN-MUSCAT.

513960 67-COMPLEX MATRIX MULTIPLICATION OF 2 SECOND-ORDER MATRICES

PROGRAM CALCULATES PRODUCT OF TWO (2X2) COMPLEX MATRICES. INPUT/OUTPUT ROUTINES ARE VERY EASY TO HANDLE. ALL ELEMENTS ARE SEQUENTIALY SPECIFIED IN TERMS OF REAL AND IMAGINARY PARTS. CALCULATIONS TAKES ABOUT 15 SECONDS. APPLICATIONS : ELECTRONIC ENGINERING, CHAIN CONNECTING OF CIRCUITS.

138PROGRAM STEPS
IR. JAN N. LUTTJEHUIZEN
NL-ZEVENBERGEN.

513970 97-USA STOCKBROKERS COMMISSION SCALE AND DISCOUNT

CALCULATES MINIMUM STOCK EXCHANGE, (NYSE, ASE, ETC.) COMMISSION SCALES AS ABANDONED MAY 1975, AGAINST WHICH DISCOUNTS ARE CURRENTLY NEGOCIATED. OBTAIN THE NET COMMISSION CHARGEABLE OR ASCERTAIN THE DISCOUNT AFFORED YOU. COVERING STOCKS SELLING AT $1 OR MORE, FOR SINGLE TRANSACTIONS OF $100 TO $300.000.

223PROGRAM STEPS
R.C. HARMEL
GB-LONDON.

513980 96-NORMAL PROBABILITY FUNCTION

PROGRAM CALCULATES THE CULMINATIVE NORMAL DISTRIBUTION FUNCTION VERY EFFICIENTLY (TO 9 DECIMAL PLACES IN 15 SECONDS OR LESS) USING A NONALTERNATING POWER SERIES EXPANSION

513980 (CONTD)

FOR X<=2 AND A CONTINUED FRACTION APPROXIMATION FOR X>2. THE DENSITY FUNCTION CAN ALSO BE CALCULATED.

087PROGRAM STEPS
GUENTER SCHNELL
D-LILIENTHAL.

513990 67-AREA-NAVIGATION

HEADING AND DISTANCE TO A WAYPOINT ARE CALCULATED FROM :
A) POSITION OF WAYPOINT TO A VOR/DME-(VORTAC)-STATION
B) POSITION OF AIRCRAFT TO THAT STATION (AZIMUTH AND DISTANCE)
ONE-SPEED-CORRECTION IS APPLIED, TIME TO WAYPOINT CALCULATED.

155PROGRAM STEPS
HANS SPRINGER
D-ZIRNDORF.

514000 97-AIRCRAFT, WEIGHT AND BALANCE

THIS PROGRAM CALCULATES THE ACTUAL TAKE-OFF-WEIGHT FROM EMPTY WEIGHT, FUEL AND LOADING; IT TOO CALCULATES THE DIFFERENCE BETWEEN ACTUAL AND MAXIMUN TO WEIGHT AND THE ARM OF THE CENTER OF GRAVITY.

089PROGRAM STEPS
HANS SPRINGER
D-ZIRNDORF.

514010 97-PROPORTIONAL ELECTION FOR MAX. 4 PARTIES. D'HONDT METHOD.

THIS PROGAM CALCULATES THE SEAT DISTRIBUTION FOR MAXIMUM FOUR PARTIES IN AN ELECTION, WHERE THE METHOD OF VICTOR D'HONDT IS USED. THE TOTAL NUMBER OF SEATS AND THE VOYES FOR THE DIFERENT PARTIES ARE INPUT VALLES. THE PROPORTIONAL VOTE NUMBERS ARE AUTOMATICALLY PRINTED.

224PROGRAM STEPS
KAJ G BACKAS
FL-HELSINKI.

514020 97-ONE AND TWO SUIT RESIDUE AS INTEGERS AND PERCENT IN BRIDGE

THIS PROGRAM CALCULATES SUIT DISTRIBUTION PROBABILITES A PRIORI IN THE CARD GAME BRIDGE, THE NUMBER OF CARDS, IN A CERTAIN SUIT, THAT THE DEFENDERS HAVE TOGETHER IS CALLED THE RESIDUE. ONE OR TWO SUIT RESIDUES ARE INPUTTED AND THE PROGRAM CALCULATES A TABLE OF THE PROBABILITIES. TWO PRINT MODES ARE SELECTABLE. PROGRAM TAKES INTO ACCOUNT, THAT ONE HAND CAN NOT HAVE MORE THAN 13 CARDS. TO DECREASE MAGNITUDE OF NUMBERS GREATEST COMMON DIVISOR IS USED.

224PROGRAM STEPS
KAJ G BACKAS
FL-HELSINKI.

514030 97-DOUBLE PRECISION ARITHMETIC FOR POSITIVE INTEGERS

NORMAL STACK OPERATIONS FOR MAXIMUM 18 DIGIT INTEGERS ARE ESTABLISHED IN A STACK OCCUPYING PRIMARY AND SECONDARY REGISTERS 6,7,8 AND 9. ON CARD #1 IS STACK CPERATIONS : ENTER CLX, ROLL UP, ROLL DOWN, EXCHANGE X&Y, STO(I), RCL(I), PRINT STACK, ADDITION AND SUBTRACTION. ON CARD #2 IS ENTER, CLX, ROLL DOWN AND MULTIPLICATION. ON CARD #3 IS ENTER CLX, ROLL DOWN AND DIVISION. STACK LOGG AFTER CLX IS USED. DIVIDED, DIVISOR, ADDENDS AND SUBTRAHENDS CAN BE MAX 18 DIGITS WITH A COMPUTATION RESULT OF MAX 19 DIGITS.

655PROGRAM STEPS
KAJ G BACKAS
FL-HELSINKI.

514040 67-L N GAMMA FUNCTION

THIS PROGRAM EVALLATES FOR POSITIVE ARGUMENTS THE NATURAL LOGARITHM OF THE GAMMA FUNCTION. MINIMAL ACCURACY IS 7 DECIMAL PLACES.

062PROGRAM STEPS
MICHEL WALK
NL-LEIDEN.

514050 67-BASIC TRIGONOMETRY TEACHER

THIS PROGRAM TEACHES TO YOUNG PEOPLE THE BASIC RULES OF TRIGONOMETRY, AS WELL AS HOW TO USE A SCIENTIFIC COMPUTER. IT FURNISHES RANDOMLY THE DIMENSIONS OF A TRIANGLE. TWO DIFFICULTY LEVELS :A) IT ASKS YOU WHAT THE SINE, THE COSINE OR THE TANGENT OF THE ACUTE ANGLE IS. B) YOU MUST FIND THE ANGLE. AFTER TWENTY ANSWERS, GOOD OR BAD, IT GIVES YOU A MARK.

175PROGRAM STEPS
JEAN-JPIERRE FAISAN
F-PARIS.

514060 67-POLYNOM DIVISION

THIS PROGRAM PERFORMS THE DIVISION OF TWO POLYNOMS OF ARBITRARY DEGREES. THE SUM OF DEGREES MUST NOT EXCEED THE NUMBER 16. THE DEGREE OF DIVISOR MUST OF COURSE BE LESS THAN THE DEGREE OF DIVIDEND. THERE IS VERY COMFORTABLE INPUT AND OUPUT SERVICE. BOTH POLYNOMS ARE OF ARBITRARY DEGREE.

086PROGRAM STEPS
HENNING LEGELL
D-EUTIN.

514070 67-MEAN SOUND PRESSURE LEVEL (VDI 2058)

THE PROGRAM COMPUTES THE MEAN SOUND PRESSURE LEVEL WHEN ENTERING THE VALUES AND SEQUENCES (ACCORDING TO VDI STANDARD 2058)

077PROGRAM STEPS
HELMUT VOGEL
D-HEILIGENHAUS.

514080 67-HURKLE GAME

A HURKLE IS HIDING ON A 10 BY 10 GRID. HOMEBASE ON THE GRID IS POINT 0,0 AND ANY GRIDPOINT IS A PAIR OF WHOLE NUMBERS SEPARATED BY A COMMA. TRY TO GUESS THE HURKES'S GRIDPOINT YOU GET 5 CHANCES. AFTER EACH TRY, HP 67 WILL TELL YOU THE APPROXIMATE DIRECTION TO GO TO LOOK FOR THE HURKLE.

132PROGRAM STEPS
HELMUT VOGEL
D-HEILIGENHAUS.

514090 67-LIMIT STATE DESIGN OF STEEL PINNED BASE PORTAL FRAME

PROGRAM DETERMINES THE MINIMUM PLASTIC SECTION MODULUS FOR THE RAFTER OF A PITCHED ROOF PORTAL FRAME. WHEN A SUITABLE BEAM SECTION IS SELECTED ONE OF 9 INPUT VARIABLES CAN THEN BE MODIFIED TO LOAD THIS SECTION TO THE ULTIMATE LIMIT STATE. PROGRAM WILL CONTINUE GIVING THE CORRESPONDING STANCHION PLASTIC MODULUS, FACTORED HORIZONTAL AND VERTICAL REACTIONS, FACTORED APEX AND EAVE MOMENTS.

224PROGRAM STEPS
PETER READMAN
EIRE-BAGENALSTOWN.

514100 67-BLINDLY FIRING

YOU START AT A DISTANCE OF 10 FROM THE CENTER. YOUR TASK IS TO COME AS CLOSE AS POSSIBLE BEFORE YOU FIRE. THE MACHINE TELLS YOU TO GO UP,DOWN

10D (CONTD)

TO THE LEFT OR TO THE RIGHT. WHEN YOU USE THE LAST MOVE THE MACHINE AUTOMATIC FIRE.

112PROGRAM STEPS
JENSEN EGON
DK-SONDERBORG.

51411D 67-BINOMINAL COEFFICIENTS DEEP NUMBERS

THIS PROGRAM CALCULATES THE COEFFICIENTS : A1,A2,A3..... OF A BINOM : (A+B)**X, JFXJS A REEL NUMBER. THE PROGRAM ALSO COMPUTES DEEP NUMBERS DIRECT.

085PROGRAM STEPS
HANSJUERG GYSIN
CH-STANS.

51412D 67-NORMAL AND BOUNDARY DEPTH DAM UP CURVE IN A TRAPEZ.

GIVEN : TRAPEZOID CHANNEL (SOLE BREATH AND SLOPE ANGLE ARE VARIABLE), THE PARAMETER OF HYDRAULIC SURFACE ROUGHNESS, THE FLOW TROUGH QUANTITY.
COMPUTED : THE NORMAL DEPTH, THE BOUNDARY DEPTH AND THE DAM UP CURVE BY STRICKLER.

199PROGRAM STEPS
HANSJUERG GYSIN
CH-STANS.

51413D 67-SHOPPING PROGRAM

IN THE HECTIC STATE OF THE DAILY SHOPPING THIS PROGRAM HELPS YOU TO KEEP ORDER IN PURCHASING. IT IS FAST AND VERY SIMPLE IN USING. THE PRICE OF ALL BOUGHT PRODUCTS IS DISPLAYED TO ENABLE YOU TO CONTROL THE MAN AT THE CASH-REGISTER. BUT YOU CAN ALSO CONTROL THE CORRECTNESS OF THE ENTRIES. WRONG ENTRIES CAN BE CLEARED EASILY. THIS PROGRAM WILL ALSO BE HELPFUL WHEN TO DECIDE WHICH OF PRODUCTS OF THE SAME KIND IS TO BUY.

067PROGRAM STEPS
HERMANN STRIJEWSKI.
D-GIFHORN.

51414D 67-RACING CAR

DRIVE A RACING-CAR ?
DO NOT MISS THE "START"; CHANGE GEAR IN TIME OR YOU WILL DESTROY THE MOTOR; DO NOT DRIVE TOO FAST, BECAUSE YOU WILL "LEAVE" THE COURSE ETC... NEVERTHELESS TRY TO REACH A HIGH AVERAGE SPEED.

224PROGRAM STEPS
MARIJAN VESELJAK
D-MOERS.

51415D 67-POISSON AND BINOMIAL PRECESSES SIMULATOR

THE USER CHOOSES THE VALUES OF THE PARAMETERS OF THE DISTRIBUTION CORRESPONDING TO THE PROCESS HE WISHES TO SIMULATE AS WELL AS THE NUMBER OF TIMES HE WISHES TO PERFORM THE SIMULATION. THE CALCULATOR WILL PRINT AN ORDERED SEQUENCE WITH THE OUTCOME OF EACH SIMULATION. THIS PROGRAM CAN BE USED TO SIMULATE MANY REAL SITUATIONS LIKE RADIOACTIVE DECAY AND SAMPLING.

100PROGRAM STEPS
CLAUDIO BENSKI
F-CLAIX.

51416D 67-POWERS OF NUMBERS

THIS PROGRAM COMPUTES Y**X FOR A POSITIVE INTEGER Y LESS THAN 10**5 TO A RESULT UP TO 10**190. ALL FIGURES ARE CORRECTLY COMPUTED AND STORED FOR LATER DISPLAY. TIME TO

51416D (CONTD)

EXECUTE THE LARGEST NUMBER IS 14 MIN (2**631) TO 27 MIN (317**75).

222PROGRAM STEPS
KENT A WIGSTROEM
S-FLODA.

51417D 67-DISTANCE BETWEEN LINE AND POINT IN SPACE

GIVEN A STRAIGHT LINE IN SPACE DEFINED BY TWO POINTS P1=(X1/Y1/Z1); P2=(X2/Y2/Z2) AND A POINT P3=(X3/Y3 Z3). THIS PROGRAM COMPUTES THE POINT L=(X2/Y2/Z2) ON THE STRAIGHT LINE NEAREST TO P3, THE VECTOR P3L AND THE DISTANCE P3L

100PROGRAM STEPS
CHRITIAN LANDOLT
CH-BECKENRIED.

51418D 67-X-RAY FLUORESCENSION EXTENDED EQUATION

PROGRAM CALCULATES THE COEFF OF THE EXTENDED EQUATION (1) OR (2). THE EXT EQ SHOULD BE USED WHEN ELEMENT A IS IN THE PRESENCE OF THE INTERFERING ELEMENTS B&C. (FITTING FOR LIN PAR OR HYP CURVE ISN'T REPRESENTATIF)
1): CA*A*IA+B*IA**2+C*CB*IA+D*CC*IA
2): CA=A**IA+B**IA**2+C**IB*IA+D*
*IC*IA
INPUT: CA, CB, CC, IA IN CASE (1)
OUTPUT: A, B, C, D, RV (RV: REMAINDER VARIANCE)

345PROGRAM STEPS
JOHAN DECAT
B-GENT.

51419D 67-SOIXANTE-NEUF

SIMULATES THE GAME OF SOIXANTE-NEUF (69). PROGRAM ROLLS THREE DICE, DISPLAYS EACH OF THEM & THE TOTAL SCORE. IT WARNS IF A "ZANT" (I.E. 3 TIMES THE SAME) IS THROWN OR SOIXANTE-NEUF.

067PROGRAM STEPS
JOHAN DECAT
B-GENT.

51420D 67-POLYNOMIAL MULTIPLICATION AND REAL ROOTS

THE PROGRAM PERFORMS MULTIPLICATION BETWEEN A UP TO 9TH DEGREE POLYNOMIAL WITH A UP TO 3RD DEGREE POLYNOMIAL. ALL COEFFICIENTS ARE STORED IN MEMORIES. IT ALSO HELPS TO FIND REAL ROOTS AND EVALUATES THE POLYNOMIAL FOR GIVEN X-VALUES. COMBINES WITH PROGRAM 502390.

224PROGRAM STEPS
JENS SUCKSDORFF
S-STOCKHOLM.

51421D 67-MULTIPLE REGRESSION WITH AUTOCORRELATED RESIDUES.

THE PRGM "MULTIPLE REGRESSION 2 3 OR 4 EXOGENEOUS VARIABLES" PERFORMS REGRESSIONS ; IN THE CASE OF BAD RESULT WITH THE CASE OF BAD RESULT WITH THE DURBIN-WATSON STATISTICS, THE RESIDUES ARE CORRELATED. ASSUMING THIS AUTOCOR. IS OF THE FIRST ORDER, THIS SECOND PRGM (USING THE FIRST ONE TOO) IMPROVE THE ESTIMATIONS BY COMPUTING THE COEF WITH THE VARIABLE X(T) - R*X(T-1), WHERE R IS THE ESTIMATED COEF OF CORREL. OF THE RESIDUES (ESTIMATED WITH THE DURBIN-WATSON VALUE).

217PROGRAM STEPS
PHILIPPE BEAUGRAND
F-PARIS.

51422D 67-97-ACCELERATION OF CONVERGENCE OF ALTERNATE SERIES

51422D (CONTD)

THIS PROGRAM CALCULATES THE SUM OF ALTERNATE SERIES AND ITERATIVE PROCEN USING A MATHEMATICAL METHOD CALLED ACCELERATION OF CONVERGENCE. WE CAN EASILY FIND THE LIMIT OF AN ALTERNATE SERIE EVEN IF THE SERIE HAS A VERY LOW CONVERGENCE. THE ACCURACY IS 10 POWER -10. THE TIME OF RECKONING IS EXTREMELY FAST.

105PROGRAM STEPS
FRANCOIS BALSALOBRE
F-SAINT-ETIENNE.

51423D 67-APN A PROGRAMMING NOTATION FOR OPERATIONS ON DATA VECTORS.

THIS PROGRAM PERMITS IMMEDIATE APL-LIKE MANIPULATIONS OF DATA VECTORS IN A TWO LEVEL, TEN ELEMENT, RPN STACK. SIX GENERALISED FUNCTIONS (ADDITION, SUBTRACTION, MULTIPLICATION DIVISION, POWER, LOGARITHM) ARE IMPLEMENTED IN BOTH MONADIC AND DYADIC FORM AND TWO OPERATORS (REDUCTION, INNER PRODUCT) MAY BE DEMONSTRATED. PARTICULAR FEATURES ARE EASE OF DATA ENTRY. USE OF CORRECTLY PRE-ENGRAVED KEYS FOR FUNCTION SELECTION AND A DISPLAY FACILITY FOR THE CURRENT VECTOR.

224PROGRAM STEPS
D.T. RANSOM
GB-CHISLEHURST.

51424D 67-INSTRUMENTLANDING

YOU SHOULD TRY TO LAND A AIRPLANE ON A SPECIAL MARKET, YOU WILL FIND THE RUDDER, SIDE ERROR AND DISTANCE

069PROGRAM STEPS
STEFAN LIND
S-BALSTA.

51425D 67-NORMAL AND INVERSE NORMAL DISTRIBUTIONS

THIS PROGRAM IS A VERY SHORT ALTERNATIVE TO THE STATISTICS PAC PROGRAM STI-09A162. ONLY ONE CARD WITH 094 PROGRAM STEPS IS NEEDED.

094PROGRAM STEPS
ARNOUD TEN CATE
NL-AMSTERDAM.

51426D 67-WEAK SOLUTION CHARACTERISTICS

PROGRAM CALCULATES CHARACTERISTICS (PH, CA,KA,CS) OF ACID OR BASE WEAK SOLUTIONS.

221PROGRAM STEPS
JEAN-PIERRE JALLET
B-BRUXELLES.

51427D 67-GAUSSIAN QUADRATURE FORMULA FOR 14 POINTS

THIS PROGRAM USES THE 14-POINT GAUSS-LEGENDRE QUADRATURE FORMULA TO FIND FINITE OR INFINITE INTEGRALS (OR THEIR SUMS) OF A CONTINUOUS FUNCTION GIVEN IN EXPLICIT FORM. THE ACCURACY IS GOOD, AND CAN BE INCREASED AT WILL BY AUTOMATIC REPEATED HALVING OF THE STEP LENGTH IN THIS CASE, ONLY THE CORRECT DECIMALS ARE DISPLAYED.

111PROGRAM STEPS
HENRIQUE E. ADLER
P-OPORTO.

51428D 67-BETA, GAMMA AND PSI FUNCTIONS FOR REAL ARGUMENTS

THIS PROGRAM CALCULATES THE BETA AND GAMMA FUNCTIONS FOR REAL POSITIVE OR NEGATIVE ARGUMENTS (NEGATIVE INTEGERS EXCLUDED) TO 10 EXACT FIGURES AND THE PSI FUNCTION (THE LOGARITHMIC DERIVATIVE) TO 8 EXACT FIGURES.

51428D (CONTD)

222PROGRAM STEPS
HENRIQUE E. ADLER
P-OPORTO.

51429D 97-BEND MOMENT DIAGRAM OF A CONT. BEAM'S SPAN-FRAME'S MEMBER

PROGRAM COMPUTES THE BENDING MOMENT AT ANY POINT OR GENERATES THE BENDING MOMENT DIAGRAM OF A CONTINUOUS BEAM'S SPAN OR FRAME'S MEMBER HAVING ONE BENDING MOMENT AT EACH END AND/OR UP TO FOUR POINT LOADS AND/OR UNIFORMELY DISTRIBUTED LOAD AND/OR SYMMETRIC TRAPEZOIDAL LOAD.

224PROGRAM STEPS
ANASTASE ANTONOPOULOS
GR-ATHENS.

51430D 67-THE FIBONACCI-NUMBER-SYSTEM (AND OTHER)

EVERY POSITIVE INTEGER HAS A UNIQUE REPRESENTATION AS A SUM OF FIBONACCI NUMBERS. THE PROGRAM FINDS AND DISPLAYS THESE NUMBERS IN DECREASING ORDER. THIS PROGRAM COMPUTES ALSO, ALL FIBONACCI NUMBERS BETWEEN TWO NUMBERS. THE NUMBER OF THEM, FINDS IF A INTEGER IS A FIBONACCI.

101PROGRAM STEPS
ATTILIO LESILIO
I-MILANO.

51431D 67-BASIC ALPHAMETICS

EVER SINCE THE EVENT OF THE WORLD'S FIRST PPC (NAMELY THE HP-65) CRYPTARITHMS, LIKE "NICE+NICE=HIGH", HAVE BEEN DUBBED 'ALPHAMETICS' BY HP-MACHINES-OWNERS. PROGRAM WILL EVALUATE ALL KINDS OF ALPHAMETICS ; CONSTANTS, LOWER & UPPER LIMITS ARE COVERED. RUN TIME DEPENDS ON USER'S PROGRAMMING SKILLS.

134PROGRAM STEPS
JIM R. KUTSCHERA
D-WALLDORF.

51432D 67-PRESSURE VESSEL-EXTERNAL PRESSURE DESIGN TO ASME-SI UNITS

THIS PROGRAM WILL DESIGN OR RATE A PRESSURE VESSEL FOR EXTERNAL PRESSURE TO THE ASME VIII DIVISION 1 CODE. WITH PRESSURE IN BARS AND DIMENSIONS IN MILLIMETRES. THE PROGRAM WORKS FOR CYLINDRICAL VESSELS WITH DISHED HEADS WHERE CROWN RADIUS IS EIGHTY PERCENT OF VESSEL DIAMETER. THE PROGRAM WILL ALSO CALCULATE THE REQUIRED SIZE OF FLAT BAR STIFFENING RINGS SHOULD THEY BE REQUIRED.

224PROGRAM STEPS
LESLIE A. TIMPERLEY
GB-MANCHESTER.

51433D 97-OPTIMUM MULTI-STAGE. PRODUCTION SCHEDULE

PROGRAM FINDS THE SEQUENCE OF MAX 9 JOBS TO BE PROCESSED (ALWAYS IN THE SAME ORDER) ON MAX. 9 MACHINES, SUCH THAT THE TOTAL PROCESSING TIME IS MINIMIZED.

224PROGRAM STEPS
BARET ONKENHOUT
NL-BLARICUM.

51434D 67-FLOW PARAMETERS FOR SHOCK FLOW (INTERCHANGEABLE SOL.)

THIS PROGRAM REPLACES SHOCK FLOW TABLES FOR IDEAL GASES. ALL VALUES ARE INTERCHANGEABLE. IF NECESSARY, VALUES ARE CALCULATED BY AN ITERATIVE METHOD. PRECISION DEPENDS ON THE DISPLAY STATUS (THE SHOCKS SHOULD BE NORMAL)

224PROGRAM STEPS

51434D (CONTD)

GUIDO DENDIEVEL
B-BRUSSELS.

51435D 67-SHOCK TESTS BY PERCUSSION

SHOCK TESTS BY HIGH IMPACT MACHINE COMPUTATION. PROGRAM DISPLAYS PEAK ACCELERATION DURING SHOCK KNOWING MECHANICAL PARAMETERS. PROVISION IS MADE FOR GRAPH PLOTTING VERSUS MASS AND/OR HEIGHT OF DROP WITHIN ANY INTERVAL FOR EACH PARAMETER AT FIXED LINEAR INCREMENTS.

137PROGRAM STEPS
PIERRE GRANIER
F-VANVES.

51436D 97-COMBINING SEVERAL 2X2 TABLES WITH COCHRAN'S Y-STATISTIC

PROGRAM COMBINES THE RESULTS FROM SEVERAL 2X2 CONTINGENCY TABLE TO YIELD COCHRAN'S Y-STATISTIC. THIS STATISTIC CAN BE USED TO TEST THE NULL HYPOTHESIS OF INDEPENDENCE BETWEEN THE TWO VARIABLES.

073PROGRAM STEPS
GORDON RAE
GB-ABERDEEN.

51437D 67-AREA CENTRE OF GRAVITY AND AREA MOMENT OF A SECTOR OR ARC

PROGRAM COMPUTES THE CENTRE OF GRAVITY, THE AREA-MOMENT AND THE AREA OF A SECTOR OF A CIRCLE-RING, WHEN YOU ENTER THE GREAT RADIUS ; THE SMALL RADIUS AND THE ANGLE. PROGRAM COMPUTES ALSO THE CENTRE OF GRAVITY OF AN ARC. THE AREA MOMENT CAN BE CALCULATED AT THE NEUTRAL AXLE AND AT THE DIAMETER AXLE.

112PROGRAM STEPS
JEAN SCHANNES
L-BETTEMBOURG.

51438D 97-NORMAL DISTRIBUTION INTEGRALS

THIS PROGRAM COMPUTES ANY INTEGRAL OF THE STANDARD NORMAL DISTRIBUTION BETWEEN ANY LOWER AND UPPER LIMITS, FROM MINUS INFINITY TO PLUS INFINITY, WITH BETTER THAN SEVEN DIGIT ACCURACY USING VERY LITTE PROGRAM MEMORY AND ONLY FIVE REGISTERS. SINCE NO NUMERICAL COEFFICIENTS ARE NEEDED AND THERE ARE NO SUBROUTINES CALLED THIS PROGRAM IS PARTICULARLY USEFUL AS A SUBROUTINE TO BE CALLED FROM A MAIN PROGRAM. IT WILL NEVER RUN LONGER THAN TWO MINUTES.

058PROGRAM STEPS
CLAUDIC BENSKI
F-CLAIX.

51439D 67-ATMOSPHERIC PRESSURE. ALTITUDE CONVERSION

YOU CAN COMPUTE THE PRESSURE TO A GIVEN ALTITUDE OR COMPUTE THE ALTITUDE TO A GIVEN PRESSURE DEPENDING ON MOMENTARY SEA-LEVEL PRESSURE. FREE CHOICE OF UNITS.

079PROGRAM STEPS
ULRICH HAHN
D-FLENSBURG.

51440D 67-GREG./JULIAN DATE CONVERSION AND EASTER (UNLIMITED RANGE)

THIS PROGRAM CALCULATES FOR ANY VALID ENTRY OR INTERMEDIATE RESULT: 1. DATE OF GREGORIAN EASTER IN THE GREGORIAN CALENDAR. 2. DATE OF ORTHODOX EASTER IN THE JULIAN CALENDAR. 3. CONVERSION OF GREGORIAN DATE TO JULIAN RECKONING. 4. CONVERSION OF JULIAN DATE TO GREGORIAN RECKONING. ENTRIES AND RESULTS ARE LIMITED ONLY BY THE CAPACITY OF THE HP-67. HOWEVER, BY SIMPLE MANUAL CALCULATING BEFOREHAND, HIGH YEAR

51440D (CONTD)

NUMBERS CAN BE REDUCED TO VALUES THAT THE CALCULATOR CAN HANDLE.

220PROGRAM STEPS
DANIEL TREEP
NL-ABCCUDE.

51441D 97-SPHERICAL TRIANGULATION

GIVEN LATITUDE AND LONGITUDE OF TWO RADIOLOCATION STATIONS AND BEARINGS FROM THEM TO A THIRD, ITS LATITUDE AND LONGITUDE ARE FOUND. ALSO COMPUTES GREAT CIRCLE BEARINGS AND DISTANCE BETWEEN TWO POSITIONS. CONVENIENT ROUTINES ARE INCLUDED FOR STORAGE AND RECALL OF UP TO 4 COORDINATE PAIRS. A SPHERICAL EARTH IS ASSUMED.

224PROGRAM STEPS
ANDREW M. STEPHENSON
GB-HYCOMBE.

51442D 97-5X5 DETERMINANT AND 4X4 MATRIX OPERATIONS

THIS PROGRAM IS AN IMPROVED VERSION OF ATTILIO FARINA'S PROGRAM NO 500760, AND IT CAN EXACTLY DO THE SAME FUNCTIONS WITH THE FOLLOWED AMELIORATIONS : 1) YOU MUST NOT INITIALIZE BEFORE ENTERING MATRIX ELEMENTS. 2) THE ACCURACY IS BETTER 3) YOU CAN COMPUTE THE "ASSOCIATED MATRIX" : EACH TERM OF THE INVERSE MATRIX IS MULTIPLIED BY THE DETERMINANT 4) IT IS POSSIBLE TO CORRECT EASILY FALSE ENTERED VALUES 5) IN ADDITION, THIS PROGRAM WORKS A LITTLE FASTER THAN NO 500760, WHICH WAS A VERY GOOD PROGRAM.

214PROGRAM STEPS
PASCAL FAIVRE
CH-DELEMONT.

51443D 97-5X5 MATRIX INVERSE AND DETERMINANT

THIS ONE CARD PROGRAM CAN FIND THE DETERMINANT AND THE "ASSOCIATED" MATRIX OF ANY 5X5 MATRIX AND THE INVERSE MATRIX CAN EASILY BE FOUND BY DIVIDING EACH TERM OF THE "ASSOCIATED" MATRIX BY THE DETERMINANT. MATRIX ELEMENTS ARE ENTERED IN A VERY SIMPLE WAY, ONLY ONCE, AND ARE SAVED BY THE PROGRAM. IT IS ALSO POSSIBLE TO CORRECT EASILY FALSE ENTERED VALUES. TIME EXECUTION : 50 SECONDS (DETERMINANT) AND 5 MINUTES (ASSOCIATED MATRIX).

224PROGRAM STEPS
PASCAL FAIVRE
CH-DELEMONT.

51444D 97-INTEGRATION WITH NEWTON COTES, ORDER 4

THIS PROGRAM (ONE OF A SUITE) ESTIMATES THE VALUE OF AN INTEGRAL OVER A FINITE RANGE USING THE NEWTON-COTES (ORDER 4) FORMULA, WHICH IS MORE PRECISE THAN SIMPSON' METHOD. THE RESULTS ARE EXACT FOR POLYNOMIALS UP TO 5TH DEGREE. THIS PROGRAM IS RATHER FAST. 157 STEPS ARE AVAILABLE FOR THE F(X)'S SUBROUTINE.

067PROGRAM STEPS
PASCAL FAIVRE
CH-DELEMONT.

51445D 97-INTEGRATION WITH NEWTON-COTES, ORDER 6

THIS PROGRAM (ONE OF A SUITE) ESTIMATES THE VALUE OF AN INTEGRAL OVER A FINITE RANGE USING THE NEWTON-COTES (ORDER 6) FORMULA, WHICH IS A LOT MORE PRECISE THAN SIMPSON' METHOD. THE RESULTS ARE EXACT FOR POLYNOMIALS UP TO 7TH DEGREE. THIS PROGRAM IS RATHER FAST. 142 STEPS ARE AVAILABLE FOR THE F(X)'S SUBROUTINE.

450 (CONTD)

077PROGRAM STEPS
PASCAL FAIVRE
CH-DELEMONT.

14460 97-INTEGRATION WITH NEWTON COTES, ORDER 8

THIS PROGRAM (ONE OF A SUITE) ESTIMATES THE VALUE OF AN INTEGRAL OVER A FINITE RANGE USING THE NEWTON-COTES (ORDER 8) FORMULA, WHICH IS A LOT MORE PRECISE THAN SIMPSON' METHOD. THE RESULTS ARE EXACT FOR POLYNOMIALS UP TO 9TH DEGREE. THIS PROGRAM IS RATHER FAST. 125 STEPS ARE AVAILABLE FOR THE F(X)'S SUB-ROUTINE.

099PROGRAM STEPS
PASCAL FAIVRE
CH-DELEMONT.

14470 67-FORCES OF A COUPLE ROOF (SPARRENDACH)

GIVEN THE DIMENSIONS OF A COUPLE ROOF THE PROGRAM COMPUTES THE REACTION FORCES VA,VB,HA,HB,MMAXIMUM BENDING MOMENT) AND THE LONGITUDINAL FORCES NA,NB FOR THE LOAD CASES DEAD LOAD, SNOW LOAD (DATA ACCORDING TO GERMAN REG. DIN 1055 ARE OPTIONAL), AND WIND LOAD.

208PROGRAM STEPS
CLAUS MARTIN DACHSELT
D-WITTEN-ANNEN.

14480 67-PIPELINE INTERPHASE OF SERIALLY PUMPED LIQUIDS.

THE PROGRAM DETERMINES THE PIPELINE INTERPHASE CHARACTERISTICS OF SERIALLY PUMPED, MISCIBLE BUT DISSIMILAR LIQUIDS GIVING THE LENGTH AND VOLUME OF THE OCCURRING INTERPHASE. FOR ANY INTERPHASE CUT-OFF MADE AT SOME CHOSEN PER CENT OF CHANGE FROM BASE STOCK (PURE, FIRST PRODUCT), RATIOS OF THE TWO FLUIDS FOR THE TWO SEPARATE INTERPHASES, ARE ALSO COMPUTED.

224PROGRAM STEPS
GIUSEPPE LIGATO
I-CUSANO MILANINO.

14490 67-ABCD #I A BOOLEAN CONDITION DIRECTORY

ABC #I IS A MNEMONIC REPRESENTING A BOOLEAN CONDITION DIRECTORY, PART 1.THE DIRECTORY COMPRISES SIXTEEN INDIVIDUAL PROGRAM STEP SEQUENCES WHICH PERMIT SUBROUTINE CALLS BASED ON THE TRUTH VALUE OF A BOOLEAN FUNCTION OF TWO VARIABLES REPRESENTED BY THE COMMAND CLEARED FLAGS F0 AND F1. EACH SEQUENCE IS VERIFIED AND POINTED TO BY A SIMPLE ROUTINE.

190PROGRAM STEPS
D.T. RANSOM
GB-CHISLEHURST.

14500 67-CHANGE OF SCALES

THIS PROGRAM CONVERTS LINEAR QUANTITIES FROM ANYONE SCALE TO ANOTHER SCALES CAN BE LOADED NUMERICALLY OR BY TWO RELATED QUANTITIES. IF NO SCALE IS INPUT, IT IS AUTOMATICALLY ASSUMED AS 1/1 (NATURAL SIZE). PROGRAM WORKS IN ANY MEASURING SYSTEM.

108PROGRAM STEPS
JIMMY PLATONIS
G-ATHENS.

14510 67-BARTLETT TEST VARIANCE ANALYSIS LINEAR CONTRASTS (SCHEFFE)

THE PROGRAMS COMPUTE THE BARTLETT-TEST VALUE. IF ITS CONDITIONS ARE FULFILLED, THE VARIANCE ANALYSIS (ONE WAY) IS PERFORMED. IF THERE

14510 (CONTD)

IS A SIGNIFICANCE, THE LINEAR CONTRASTS OF SCHEFFE, CAN BE COMPUTED. THE PROGRAMS CAN USE 4 GROUPS MAXIMALLY. THE RELEVANT DATA OF THE SINGLE GROUPS ARE STORED IN THE REGISTERS AND CAN BE TRANSFERRED ON MAGNETIC CARDS.

162PROGRAM STEPS
ALEXANDER BRAWANSKI
D-WUERZBURG.

14520 67-VARIANCE ANALYSIS (ONE WAY) IN CONNECTION WITH BARTLETT TEST

THE PROGRAM REPRESENTS A "ONE WAY" VARIANCE ANALYSIS IN CONNECTION WITH THE FOREGOING BARTLETT-TEST. THE PROGRAM SHOULD BE USED ONLY IN CONNECTION WITH THE BARTLETT-TEST, THOUGH THE VARIANCE ANALYSIS PROGRAM CAN BE USED ALONE AFTER SOME CORRECTIONS.

053PROGRAM STEPS
ALEXANDER BRAWANSKI
D-WUERZBURG.

14530 67-LINEAR CONTRASTS OF SCHEFFE IN CONNECTION WITH VAR. ANAL.

THE LINEAR CONTRASTS OF SCHEFFE FIND OUT THE SIGNIFICANT DIFFERENCES AMONG THE GROUPS BEING SIGNIFICANT IN THE VARIANCE ANALYSIS. THE PROGRAM CAN BE USED ONLY WITH THE FOREGOING VARIANCE ANALYSIS.

212PROGRAM STEPS
ALEXANDER BRAWANSKI
D-WUERZBURG.

14540 67-AERIAL COMBAT IN THREE

TWO SUPERSONIC FIGHTER JETS ENGAGE A SINGLE COMBAT. THE WINNER IS HE WHO SUCCEDS IN HAVING ENEMY AHEAD, WITHIN THE RANGE OF HIS WEAPONS. CRASHING, STALLING OR FLYING BACK HOME WITHOUT MANOEUVRING GIVES ENEMY VICTORY. IF BOTH PLANES ARE IN GOOD SHOOTING POSITION, DRAWN GAME IS DISPLAYED. PLAYERS CONTROL : JET ENGINE, ROCKET-MOTOR, AIR BRAKES, TURN WAY, CLIMB OR DESCENT ANGLE. ALL HORIZONTAL AND VERTICAL EVOLUTIONS OF ACTUAL JET FIGHTERS MAY BE SIMULATED.

223PROGRAM STEPS
MICHEL DE VALS
F-AIX EN PROVENCE.

14550 67-BAD 15

HERE THE CALCULATOR PLAYS BAD 15 WITH YOU. STARTING WITH A CERTAIN NUMBER (10000), THE PLAYERS (2 TO 19) GET A NUMBER EACH. THE HP-67/97 SHOWS YOU WHICH PLAYER IS GOING TO CHECK AND GIVE THIS NUMBER TO THE CALCULATOR. USING RULES, YOUR HP-67 97 DECIDES WHICH PLAYER HAS LOST THE GAME.

114PROGRAM STEPS
MARTIN LANDVER
D-FRANKFURT.

14560 67-ANOVA (ONE WAY)/OUTLIER-TEST.

THE PROGRAM COMPARES THE MEANS OF ANY NUMBER OF GROUPS OF OBSERVATIONS BY THE F-TEST. FOR THE GROUPS IT DETERMINES MEAN, STANDARD DEVIATION, EXTREME VALUES AND RANGE. THE TEST ACCORDING TO NALIMOV ENABLES TO ELIMINATE OUTLIERS. THE PROGRAM INCLUDES A PRINTING ROUTINE FOR HP-97 TOO.

185PROGRAM STEPS
MANFRED SOEFFTGE
D-WEINHEIM.

14570 97-ECONOMIC ORDER QUANTITY. VARIABLE SALES

14570 (CONTD)

NORMAL EOQ FORMULA'S WILL NOT HANDLE SALES WHICH VARY PER PERIOD I.E. SEASONAL ETC. PROGRAM HANDLES THIS PROBLEM FOR UP TO 18 FORECAST SALES PERIODS. EOQ FOR CONSTANT DEMAND (NO SHORTAPES) IS HANDLED. A DECISION TO STOCK OR NOT TO STOCK IS ALSO HANDLED.

191PROGRAM STEPS
BART OKKENHOUT
NL-BLARICUM.

14580 67-ANNUAL COST AND NPV CAPITAL PROJECT APPRAISAL

ANNUAL COST IS A TECHNIQUE OF PROJECT APPRAISAL, WHEREBY THE COMPARISON BETWEEN AN INITIAL CASH OUTLAY AND THE SUBSEQUENTLY ARISING CASH FLOWS IS EXPRESSED IN TERMS OF AN ANNUAL UNIFORM AMMOUNT. THE THECHNIQUE CAN BE USED TO EXPRESS BENEFIT OF CASH INFLOWS AS WELL AS COSTS.

203PROGRAM STEPS
WILLIAM F. A. STEELE
GB-CRES.

14590 67-BINOMIAL COEFFICIENTS

THE PROGRAM COMPUTES THE BINOMIAL COEFFICIENTS OF THE DEVELOPMENT (A+B) TO THE POWER OF N, (N<=32).

030PROGRAM STEPS
GEORGE GRUJBER
S-GOETEBORG.

14600 97-CONSTANT CALCULATION

SUPPOSING THAT MANY CALCULATIONS ARE DONE WITH CONSTANTS, THIS PROGRAM IS USED TO CALCULATE WITH CONSTANTS FOR %,+,-,X, ! AND SIGMA. AFTERWARDS BASIC AND REVISED SUMS COULD BE RECALLS. POSSIBLE USE ON HP 67 AND HP 97.

154PROGRAM STEPS
FRED KNAEPPER
E-MADRID.

14610 67-THE WEIBULL-DISTRIBUTION

THIS PROGRAM COMPUTES THE PARAMETERS OF THE WEIBULL-DISTRIBUTION WHEN IS GIVEN N DATA IN INCREASING ORDER.

071PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

14620 67-SKEWNESS AND KURTOSIS MOMENT COEFFICIENT

THIS PROGRAM COMPUTES THE MOMENT COEFFICIENTS OF SKEWNESS AND KURTOSIS FOR A SET OF GIVEN DATA.

087PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

14630 67-MULTILAYER COIL DESIGN

WITH THIS PROGRAM YOU CAN COMPLTE THE INDUCTANCE OR/AND RESISTANCE OF A COIL WHEN IS GIVEN THE DIMENSIONS AND THE NUMBER OF TURNS.

196PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

14640 67-SHUNT-PEAKED AMPLIFIER

THIS PROGRAM COMPUTES THE RELATION BETWEEN THE PHASE-EMF'S AND THE INPUT TIME WHEN A OSCILLOSCOPE IS ANALYZING AS A SHUNT PEAKED AMPLIFIER.

51539D 67-BANK ACCOUNT MANAGEMENT

YOU JUST HAVE TO KEY IN MOVEMENTS (CREDITS OR DEBITS) WHEN THEY OCCUR AND AT ANY MOMENT YOU CAN OBTAIN THE BALANCE AND/OR THE AMOUNTS OF THE LAST N OPERATIONS MADE ON THE ACCOUNT (0<N<10). PROGRAM AND DATAS FOR ONE ACCOUNT IN A SINGLE MAGNETIC CARD.

105PROGRAM STEPS
FRANCOIS SAINT-BLANCAT
POLYNESIA-MOOREA.

51540D 97-RESISTOR COLOUR CODING

THIS PROGRAM ENCODES THE COLOUR CODING OF RESISTORS WITH 4 (SIDE 2) OR 5 (SIDE 1+2) BANDS. THE VALUES IN Y AND Z REGISTER ARE SAVED. AFTER ENTERING LAST COLOUR, PROGRAM DISPLAYS THE MINIMAL AND MAXIMAL RESISTOR VALUE.

129PROGRAM STEPS
CHRISTIAN FANKE
D-VOERDE.

51541D 67-CORRECTING LESSONS PROGRAM

PROGRAM TRANSFORMS A REACHED (NOT NEGATIVE) POINT NUMBER TO A VALUE N WITH 1.0<=N<=6.0. THE USER GIVES THE POINT NUMBERS FOR THE VALUES 1.0; 4.4 (THIS IS THE MINIMUM FOR SUFFICIENT) AND 6.0. NEWTON'S INTERPOLATION FORMULA FOR A QUADRATIC POLYNOMIAL IS USED.

110PROGRAM STEPS
BERND ROTHMAIER
D-DURMERSHEIM.

51542D 67-MAGNETISM-CURVES

THIS PROGRAM RECALLS FROM DATA-CARDS MAGNETIC-FIELD-INTENSITY H AND PERMEABILITY IF THE INDUCTION B IS GIVEN. IT ALSO RECALLS INDUCTION B IF THE MAGNETIC-FIELD-INTENSITY H IS GIVEN. IN ALL CASES A LINEAR INTERPOLATION IS DONE. DATAS FOR CAST-IRON, DYNAMO-TIN AND ALLOID-TIN ARE GIVEN.

086PROGRAM STEPS
JEAN SCHANNES
L-BETTEMBOURG.

51543D 67-ARITHMETIC-OPERATIONS-SYSTEM-(AOS)

THIS PROGRAM ADDS AT YOUR REVERSE POLISH NOTATION-LOGIC AN ARTHMETIC OPERATIONS SYSTEM. FURTHERMORE IT CONTAINS A FLOATING POINT SUBROU-TINE. IT IS VERY USEFULL IF YOU WANT TO LEND YOUR MACHINE AT SOME-ONE WHO IS NOT ACCUSTOMED AT THE RPN-LOGIC.

074PROGRAM STEPS
JEAN SCHANNES
L-BETTEMBOURG.

51544D 67-FREQUENCY DIFFERENCES OF A QUARTZ OSCILLATOR

THIS PROGRAM HELPS YOU TO FIND A GOOD USABLE FREQUENCY FOR THE QUARTZ OSCILLATOR OF A DIGITAL QUARTZ CLOCK. IF YOU KNOW THE TIME DIFFERENCE PER YEAR, WEEK, DAY, HOUR, MINUTE OR SECOND IT CALCU-LATES THE REAL FREQUENCY OF THE OSCILLATOR OF THE CLOCK. OR IF YOU KNOW THE REAL FREQUENCY IT CALCULA-TES THE TIME DIFFERENCES THAT YOUR CLOCK WILL HAVE.

161PROGRAM STEPS
MARTIN LANDUA
D-FRANKFURT.

51545D 67-MIXED TEMPERATURES

WHEN YOU MIX TWO QUANTITIES OF WATER WHICH HAVE DIFFERENT TEMPERA-

51545D (CONTD)

TURES YOU GET A NEW QUANTITY WHICH HAS A NEW TEMPERATURE THAT DEPENDS ON THE OTHERS. USING THE EQUATION : +M=(+1*M1 + 2*M2)/(M1+M2) THIS PROGRAM CALCULATES ONE VARIABLE IF THE OTHER FOUR VARIABLES ARE KNOWN. IT ALSO CALCULATES THE NEW TEMPERA-TURE AND THE OTHER VARIABLES WHEN DIFFERENT SUBSTANCES WERE MISED.

109PROGRAM STEPS
MARTIN LANDUA
D-FRANKFURT.

51546D 67-DIFFERENCE SCHEME

THE PROGRAM COMPUTES THE LEADING DIFFERENCES OF A SET OF UP TO 23 FUNCTION VALUES.

041PROGRAM STEPS
GUIDEO PETZ
S-SOLNA.

51547D 67-FACTORIAL AND POWER, EXACT 200 DIGITS

THE PROGRAM COMPUTES EXACT FACTO-RIAL FOR INTEGER N LESS THAN 121, AND EXACT POWER PROVIDED THAT BASE AND EXPONENT ARE INTEGER, LESS THAN 100000, AND THE RESULT HAS 200 DIGITS AT MOST. THE PROGRAM IS COMPARATIVELY FAST, E.G. FACTORIAL OF 100 TAKES 13 MINUTES.

214PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

51548D 67-CONIC CLASSIFICATION AND REDUCTION

GIVEN THE COEFFICIENTS OF A CONIC IN HIS GENERAL FORM : A1X**2+A2Y**2 +A3XY+A4X+A5Y+A6=0. THE PROGRAM CLASSIFIES IT IN ELLIPSE (REAL OR IMAGINARY), HYPERBOLA, PARABOLA, PARALLEL LINES (R. OR I.), SECANT LINES (R. OR I.), OR IDENTICAL LINES. IN ADDITION, THE COEFFICI-ENTS OF THE CONIC REDUCED EQUATION IS ALSO OBTAINED.

224PROGRAM STEPS
MARTIN PEREZ
E-MADRID.

51549D 67-ALL COMPLEX OPERATIONS

THE PROGRAM COMPUTES WITH ONE OR TWO COMPLEX NUMBERS : Z*W, Z/W, Z**W, LN (Z), Z**N, Z**I/N (N INTE-GER). CHANGE POLAR TO RECTANGULAR FORM AND VICE VERSA. THE HANDLING OF DATA IS GREATLY SIMPLE. IT IS A OPTION TO COMPLEX OPERATIONAL STACK PROGRAMS.

161PROGRAM STEPS
MARTIN PEREZ
E-MADRID.

51550D 67-METEOROGOGICAL VARIABLE 1

INPUT : DRY-BULB, WET-BULB TEMPERA-TURES AND PRESSURE OF MOIST AIR. OUTPUT : RELATIVE HUMIDITY, VAPOR PRESSURE, MIXING RATIO, ABSOLUTE HUMIDITY, VIRTUAL TEMPERATURE, DEW-POINT AND FROST-POINT TEMPERATURES, SATURATION MIXING RATIO AND SATURA-TION VAPOR PRESSURE (OVER WATER AND OVER ICE), FAHRENHEIT TO CELSIUS CONVERSION. IT IS COMPATIBLE WITH METEOROLOGICAL VARIABLES. PART 2

159PROGRAM STEPS
MARTIN PEREZ
E-MADRID.

51551D 67-METEOROLOGICAL VARIABLES 2

INPUT : DRY-BULB, WET-BULB TEMPERA-TURES AND PRESSURE OF MOIST AIR. OUTPUT : POTENTIAL TEMPERATURE, EQUIVALENT POTENTIAL TEMPERATURE,

51551D (CONTD)

EQUIVALENT TEMPERATURE, DEW-POINT AND FROST-POINT, VIRTUAL POTENTIAL TEMPERATURE, SPECIFIC HEAT AT CONS-TANT PRESSURE FOR THE MOIST AIR (CPM), RATIO GAS CONSTANT FOR MOIST AIR/CPM, FAHRENHEIT TO CELSIUS CONVERSION, MIXING RATIO AND VAPOR PRESSURE. IT IS THE COM-PLEMENT TO METEOROLOGICAL VARIABLES PART 1.

176PROGRAM STEPS
MARTIN PEREZ
E-MADRID.

51552D 67-TRAVERSE-ACCURACY CHECK AND ADJUSTMENT

STARTING FROM POLAR COORDINATES OF EACH STATION, THIS PROGRAM CONVERT FIRST IN RECTANGULAR FORM, THEN FIND CLOSURE ERROR - EVEN FOR CLOSE POLYGON AND TRAVERSE BETWEEN TWO KNOWN VERTEX-, VERIFY ALLOWED ACCU-RACY, ADJUST A RELATIVE COORDINATES AND FINALLY CALCULATES THE ABSOLUTE COORDINATES FOR EACH VERTEX.

172PROGRAM STEPS
BRUNO ROMANO
I-GENOVA.

51553D 67-CONSUMPTION CAR FUEL WITH ACCU-MULATE AVERAGE.

STARTING OF THREE DATES (KM, PTAS OR LITERS 96 N.O. FUEL, AND PTS OR LITERS 90 N.O. FUEL) COMPUTES : KM, TOTAL LITERS, PTS AND LITERS 96 N.O PTS AND LITERS 90 N.O., PERCENTAGE CONSUMPTION, OCTANE NUMBER MIXTURE, COST BY LITER AND COST BY KM. IN ADDITION, BY MEANS INSTRUCTION "GOTO 0" AND R/S, COMPUTES ACCUMU-LATIVE PERCENTAGE CONSUMPTION FUEL AND ACCUMULATED TURNS.

099PROGRAM STEPS
JOSE FONT
E-BARCELONA.

51554D 67-NATURAL TORSION FREQUENCY

THIS PROGRAM FINDS THE PROPER FRE-QUENCIES FOR AN UNDAMPED TORSION-NALLY VIBRATING SYSTEM CONSISTING OF 2 TO 8 MASSES AND 1 TO 7 CONNECTING SPRINGS. REQUIRED INPUTS ARE INERTIA MOMENTS O AND SPRING CONSTANTS K.

189PROGRAM STEPS
PETER MARTIN
D-NUERNBERG.

51555D 97-BINOMIALS-MULTINOMIALS

GIVEN A MULTINOMIAL (2 OR MORE ELE-MENTS) (A1+A2+...AK)N THIS PROGRAM COMPUTES : 1) THE NUMBER OF MEMBERS OF THE SOLUTION.
2) THE EXPONENTS OF THE ELEMENTS.
3) THE MULTINOMIAL (BINOMIAL) COEF-FICIENT
4) THE VALUE OF EACH MEMBER
5) THE SUM OF THE COMPUTED AND ALL PRECEDING MEMBERS.

202PROGRAM STEPS
JOACHIM GERLACH
D-MODAUTAL.

51556D 97-REPLACEMENT POLICY

PROGRAM CALCULATES OPTIMAL REPLACE-MENT POLICY FOR TWO CASES :
A) REPLACEMENT OF SINGLE OBJECTS DUE TO OBSOLESCENCE.
B) REPLACEMENT OF GROUPS OF ITEMS OF RELATIVELY SMALL VALUE AND KNOWN PROBABILITY OF FAILURE.

224PROGRAM STEPS
BART ONKENHOUT
NL-BLARICUM.

51557D 67-SURFACE TENSION AND LAPLACE

51557D (CONTD)

00000D CONSTANT FOR WATER

PROGRAM COMPUTES SURFACE TENSION AND LAPLACE CONSTANT FOR WATER UP TO THE CRITICAL POINT. VARIABLES ARE TEMPERATURE AND DENSITY OF WATER AND SATURATED STEAM.

171PROGRAM STEPS
WERNER HINTZE
D-HAMBURG.

51558D 67-DYNAMIC VISCOSITY OF WATER AND STEAM

THIS PROGRAM COMPUTES DYNAMIC VISCOSITY OF WATER AND STEAM USING 4 INTERNATIONAL AGREED NUMERICAL EQUATIONS.
INPUT VARIABLES ARE : ABSOLUTE TEMPERATURE, PRESSURE, CORRESPONDING SATURATION PRESSURE AND SPECIFIC VOLUME.

124PROGRAM STEPS
WERNER HINTZE
D-HAMBURG.

51559D 67-UNIVERSAL ACTIVE FILTERS

PROGRAM COMPUTES THE FOUR NECESSARY RESISTORS FOR ANY KIND OF ACTIVE FILTER AS THERE ARE : LOW PASS, HIGH PASS, BAND PASS, BAND REJECT, BUTTERWORTH, BESSEL AN CHEBYSHEV TYPE.

221PROGRAM STEPS
WALTER BIGAN
A-VIENNA.

51560D 67-CURVE FITTING FOR AN IMPORTANT CLASS OF FUNCTIONS.

A METHOD IS PRESENTED FOR THE LEAST SQUARES OPTIMATION FOR A CLASS OF FUNCTIONS Y=Y (X,C1,...CN) WHICH CAN BE WRITTEN IN FORM OF A LINEAR COMBINATION AS F(Y)=SIGMA (J=1,..., N) F(CJ)*FJ(X), WHERE GENERALLY F(Y) IS SOME CONTINUOUS MONOTONIC TRANSFORMATION OF THE ORIGINAL FUNCTION Y. NMAX=4 FOR IMPLEMENTATION WITH AN HP-67/97. PROGRAM ALSO COMPUTES R**2.

224PROGRAM STEPS
IR. J.N. LUTTJEHUIZEN
NL-ZEVENBERGEN.

51561D 67-THE SKIN FRICTION DRAG COEFFICIENT

AFTER THE INPUT OF THE KINEMATIC VISCOSITY, THE LENGTH OF THE VEHICLE, THE PRESSURE ALTITUDE (PALT) AND THE CALIBRATED AIRSPEED (CAS) THIS PROGRAM COMPUTES THE SKIN FRICTION DRAG COEFFICIENT.

102PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51562D 67-SHELL OF INDUSTRIAL CONE

PROGRAM CALCULATES THE COORDINATES XI,YI FOR INDUSTRIAL CONE SHELL OF WHICH THIS CONE WILL BE MADE. THE GROUND AND UPPER PLANE FIGURES OF CONE ARE POLYGONES (OR SEGMENTS OF POLYGONES) OF KIND "N" AND ARE IN DECLINATION OF ALPHA DEGREES. WHEN "N" IS ABOUT 60 OR MORE IT IS ENOUGH PRECISE, AS WELL AS "CIRCLE" AND THEN THIS CONE IS USEFUL FOR INTERMEDIATE REDUCING PIPE IN PIPELINE, FOR TURBINE SPIRAL CASING SEGMENTS, SPECIAL SHELLS FOR MODELING,...ETC.

218PROGRAM STEPS
FRANC TOMSIC
YU-LJUBLJANA.

51563D 67-HERTZ THEORY

51563D (CONTD)

THIS PROGRAM CALCULATES CONTACT PRESSURE AND APPROACHING OF TWO BODIES FOR A GIVEN FORCE.

312PROGRAM STEPS
EDUARD STOESSEL
CH-DUEBENDORF.

51564D 67-DIFFERENTIAL GEOMETRY TNB AXIS KAPPA & TAU VALUES

THIS PROGRAM GIVES T,N AND B VECTOR VALUES AND CURVATURE AND TORSION OF CURVES IN ONE PARAMETER FUNCTIONS. IT CAN BE USED WITH TWO OR THREE DIMENSIONAL MODES.

221PROGRAM STEPS
FELIPE LANCA
E-CORDOBA.

51565D 97-NEWSBOY PROBLEM

PROGRAM CALCULATES THE OPTIMUM ORDER OR PRODUCTION QUANTITY FOR PERISHABLE GOODS. IT ALSO CALCULATES THE OPTIMUM IN OWN VERSUS HIRE SITUATIONS. THE DEMAND CAN BE ACCORDING TO A NORMAL, POISSON OR NEGATIVE EXPONENTIAL DISTRIBUTION. SPARE PART PROBLEM, GIVEN PROBABILITY OF FAILURE, IS HANDLED.

217PROGRAM STEPS
BART ONKENHOUT
NL-BLARICUM.

51566D 67-BANK ACCOUNT COMPUTATION

THIS PROGRAM ADMITS : 360, 365, 366 DAYS/YEAR CALCULATION BASES; INCREMENT OR DECREMENT OF SOME DAYS ON OPERATION DATES. LEAPYEARS AUTOMATICALLY CONSIDERED. CHRONOLOGICAL INPUT ORDER NOT REQUIRED. ALL DATA RECORDED ON PROGRAM CARD SIDE 2. OTHER DATA CARDS USABLE FOR UNLIMITED NUMBER OF ACCOUNTS. NO NEED OF WRITING DOWN THE RESULTS. EASY CORRECTION OF WRONG OPERATIONS. AUTOMATICAL CARRING OF DATA TO NEXT YEAR. EASY RECALLING OF CAPITAL, INTEREST AND TOTAL AMOUNT AT WHATEVER DATE.

111PROGRAM STEPS
PAOLO PELLICIARDI
I-BOLOGNA.

51567D 67-WORKDAYS

THIS PROGRAM CALCULATES THE NUMBER OF WORKDAYS TO A GIVEN MONTH AND THE YEAR.

224PROGRAM STEPS
SOCHEN WIECHERN
D-VISSELHOREDE.

51568D 67-SOLITAIRE

SOLITAIRE IS PLAYED BY ONE PERSON ON A 7 BY 7 BOARD, WHEREFROM FOUR 2 BY 2 PARTS HAVE BEEN CUT AWAY AT THE CORNERS. EACH SQUARE, EXCEPT THE MIDDLE ONE, IS OCCUPIED BY A PAWN. A MOVE CONSISTS IN TAKING AWAY ONE PAWN AS IN THE GAME OF DRAUGHTS, EITHER VERTICALLY, OR HORIZONTALLY. THE OBJECT OF THE GAME IS TO LEAVE EXACTLY ONE PAWN ON THE CENTRAL SQUARE. THE GAME CAN BE PLAYED EITHER BY USER, OR BY YOUR HP.

224PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51569D 67-BUCCANEER GAME

TWO, THREE OR FOUR PLAYERS, USING YOUR HP-67 SUCCESSIVELY, CAN PLAY THE OLD BUCCANEER-GAME ON A 10 BY 10 BOARD, WHERE A RANDOM NUMBER GENERATOR HAS PLACED THEIR SHIPS AND HARBOURS AND A TREASURE-ISLAND

51569D (CONTD)

AND CREW-ISLAND. PURPOSE OF THE GAME IS TO GET A CERTAIN AMOUNT OF TREASURE IN ONE'S HARBOUR, AVOIDING PIRACY BY THE OTHER PLAYERS AS MUCH AS POSSIBLE.

222PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51570D 67-SEVEN SUBMARINES

GIVEN A SEED, THIS PROGRAM FIRST PLACES SEVEN 3 BY 1 SUBMARINES IN A 10 BY 10 GRID, AT DIFFERENT ALTITUDES (DEPTHS). YOU HAVE TO DESTROY THESE SUBS, BY FIRING SHOTS TO CHOSEN (XY)-POINTS. AFTER EACH SHOT YOUR HP FURNISHES INFORMATION AS TO WHETHER A SUBMARINE HAS BEEN HIT IN ITS CENTER, ELSEWHERE, OR NOT AT ALL. A SUBMARINE, FLOATING UNDER ANOTHER ONE CANNOT BE HIT, UNLESS THE HIGHER ONE HAS BEEN DESTROYED FIRST. YOUR HP KEEPS TRACK OF SHOTS AND HITS UNTIL THE END.

202PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51571D 67-CHESS-ENDGAME 4

THIS PROGRAM PERMITS YOU TO PLAY WITH KING, BISHOP AND KNIGHT AGAINST MAC'S KING. THE FOUR CHESS PIECES ARE PUT ON ARBITRARY PLACES AND MAC MOVES FIRST. GAME ENDS EITHER BY CHECK-MATE OR BY A DRAW, OWING TO EITHER THE 50-MOVES RULE, OR THE FACT THAT MAC HAS NO MORE MOVE (PAT).

213PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51572D 67-POLYNOMIAL APPROXIMATION OF DEGREE UP TO 19

GIVEN THE VALUES OF A FUNCTION IN K+1 EQUIDISTANT POINTS, THIS PROGRAM CALCULATES THE VALUE OF THE POLYNOMIAL OF DEGREE K, APPROXIMATING THIS FUNCTION IN A GIVEN POINT THE DEGREE K BELONGS TO THE INTERVAL (2,19).

092PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51573D 67-JEWISH CALENDAR EXTENDED

GIVEN ANY YEAR Y A.D. BETWEEN 0 AND 20000, THIS PROGRAM (AS PROGRAM 50654D) CALCULATES THE JEWISH YEAR J, BEGINNING IN Y, ITS PLACE BOTH IN THE SOLAR AND LUNAR CYCLES, THE NUMBER OF MONTHS OF BOTH J-1 AND J, THE SEPTEMBER-DATE OF ROSH HASHANAH (JEWISH NEW YEAR) OF J AND THE MARCH-DATE OF PESACH (EASTER) OF J-1. FURTHERMORE, IT GIVES THE DAY OF THE WEEK OF ROSH HASHANAH, THE THEORETICAL DATE OF ROSH HASHANAH BEFORE USING THE FOUR POSTPONEMENTS RULE, AND THE LENGTH OF J IN DAYS.

224PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51574D 67-JEWISH YEAR 1

GIVEN ANY YEAR Y A.D. BETWEEN 0 AND 20000, THE LENGTHS IN DAYS OF THE JEWISH YEARS WHICH END AND START IN Y, AND THE SEPTEMBER-DATE OF ROSH HASHANAH FOR Y, THIS PROGRAM FINDS THE JEWISH DATES, CORRESPONDING TO GIVEN DATES A.D.

217PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51575D 67-JEWISH YEAR 2

GIVEN ANY JEWISH YEAR J A.M. BETWEEN 3760 AND 23760, ITS LENGTH IN DAYS AND THE SEPTEMBER-DATE OF ITS ROSH HASHANAH, THIS PROGRAM FINDS THE CIVIL DATES, CORRESPONDING TO GIVEN JEWISH DATES.

219PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51576D 67-SQUARE ROOT AND REST WITH ONE HUNDRED DIGITS

FOR ANY GIVEN POSITIVE INTEGER WITH UP TO 8 DIGITS, THIS PROGRAM CALCULATES UP TO ONE HUNDRED ACCURATE DIGITS, BOTH OF ITS SQUARE ROOT AND OF THE REMAINING REST.

219PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51577D 67-TOWERS OF HANOI AUTOMATIC SOLUTION.

IN THIS GAME, INVENTED BY THE FRENCH MATHEMATICIAN F.E.A. LUCAS, A NUMBER OF DISKS WITH UNEQUAL DIAMETERS FORM A FIRST PILE OR TOWER, WHILE TWO OTHER TOWERS ARE SUPPOSED TO BE EMPTY. BY MOVING DISKS, ONE AT THE TIME, FROM ONE TOWER TO ANOTHER, AND OBEYING CERTAIN RULES, THE DISKS HAVE TO BE BROUGHT TO THE THIRD TOWER. THIS PROGRAM GIVES A COMPLETE SOLUTION FOR UP TO 33 DISKS (CFR. PROGRAM NO 50342D).

151PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51578D 97-RADIOACTIVE DECAY AND DISTANCE FOR REQUIRED DOSE-RATE.

GIVEN ORIGINAL ACTIVITY AT REFERENCE DATE AND HALF LIFE OF NUCLIDE, PROGRAM CALCULATES ACTIVITY OF RADIOACTIVE SOURCE AFTER ANY ELAPSED TIME.
GIVEN ACTIVITY OF RADIOACTIVE SOURCE AND K-FACTOR OF NUCLIDE, PROGRAM CALCULATES DISTANCE FROM SOURCE AT WHICH SPECIFIED GAMMA RAY DOSE RATE WILL OCCUR.

034PROGRAM STEPS
PETER GILLESPIE
GB-BELFAST.

51579D 97-ECCENTRIC RECTANGULAR FOOTING

PROGRAM COMPUTES MAXIMUM AN MINIMUM COMPRESSIVE STRESSES (S1,S2), ECCENTRICITY (E), BENDING MOMENTS AND SHEARING FORCES (MX, QX AND MY, QY) OF A RIGID RECTANGULAR FOOTING. EARTH'S COEFFICIENT C (KG/CM**3) (BETTUNGSZIFFER), MOMENTS OF INERTIA OF THE COLUMN AND OF THE FOOTING AND HEIGHT OF THE COLUMN ARE TAKEN INTO CONSIDERATION. PROGRAM WORKS IN COORDINATION WITH SD-10A.

197PROGRAM STEPS
ANASTASE ANTONOPOULOS
GR-ATHENS.

51580D 97-NIM

BEFORE PLAY BEGINS, YOU SPECIFY A NUMBER OF PILES AND A NUMBER OF OBJECTS IN EACH PILE (ALL NUMBERS BETWEEN 1 AND 9). THEN, YOU AND THE CALCULATOR TAKE TURNS REMOVING ANY NUMBER OF OBJECTS (AT LEAST 1) FROM ONE PILE. WINNER OR LOSER, ACCORDING TO THE MODE OF PLAY, IS THE PLAYER WHO REMOVES THE LAST OBJECT. AVERAGE EXECUTION TIME FOR CALCULATOR'S MOVE ABOUT 20 SEC. (MAX 32 SEC). BINARY CODE SUM DISPLAYED IMMEDIATELY.

220PROGRAM STEPS

51580D (CONTD)

WOLFRAM SCHWABHAEUSER
D-STUTTGART.

51581D 67-DIRECT AND INVERSE ERROR FUNCTION

THAT PROGRAM COMPUTES DIRECT ERROR FUNCTION OR INVERSE ERROR FUNCTION OF A GIVEN NUMBER.

098PROGRAM STEPS
ALI AMRAOUI
MOROCCO-CASABLANCA.

51582D 67-FROM CONVENTIONAL ARABIC TO JULIAN/GREGORIAN CALENDAR.

THIS PROGRAM COMPUTES THE CORRESPONDING DATE IN THE JULIAN/GREGORIAN DATE WITH A GIVEN DATE IN THE CONVENTIONAL ARABIC CALENDAR. THE JULIAN PERIOD AND THE DAY OF THE WEEK ARE ALSO CALCULATED.

218PROGRAM STEPS
ALI AMRAOUI
MOROCCO-CASABLANCA.

51583D 67-FROM JULIAN-GREGORIAN TO CONVENTIONAL ARABIC CALENDAR.

THIS PROGRAM COMPUTES : THE JULIAN PERIOD AND THE DAY OF THE WEEK FROM 1ST JANUARY 4712 BEFORE CHRIST TO 22TH JANUARY 3268 AFTER CHRIST. THE DAY OF MONTH, THE MONTH AND THE YEAR OF CONVENTIONAL ARABIC CALENDAR, AVAILABLE AFTER JULY, 22TH, 622. DAYS BETWEEN DATES COULD BE EARLY FOUND. JULIAN CALENDAR IS USED BEFORE OCTOBER, 5TH 1582 AND GREGORIAN CALENDAR AFTER THAT DATE.

211PROGRAM STEPS
ALI AMRAOUI
MOROCCO-CASABLANCA.

51584D 67-EUCLIDIAN MULTIPLICATION

THIS PROGRAM COMPUTES THE EXACT VALUE OF PRODUCT OF TWO INTEGER AND POSITIVE NUMBERS. EACH GIVEN NUMBER CAN HAVE BETWEEN 1 AND 20 FIGURES. ONE OF THEM CAN BE PUT AS A CONSTANT FACTOR.

223PROGRAM STEPS
ALI AMRAOUI
MOROCCO-CASABLANCA.

51585D 67-PARTIAL SUM OF HARMONIC SERIE

THAT PROGRAM CALCULATES THE SUM OF A GIVEN NUMBER OF TERM OF THE HARMONIC SERIE.

089PROGRAM STEPS
ALI AMRAOUI
MOROCCO-CASABLANCA.

51586D 67-EUCLIDIAN DIVISION.

THIS PROGRAM DIVIDES TWO GIVEN NUMBERS. THE DIVIDEND MAY BE INTEGER AND POSITIVE, WITHOUT LIMIT OF FIGURES NUMBER. THE DIVISOR MAY BE INTEGER AND LESS THAN 10**20.

167PROGRAM STEPS
ALI AMRAOUI
MOROCCO-CASABLANCA.

51587D 97-TRANSFORMING TIME SERIES 1

DATA SERIE OF E.G. MONTHLY VALUES IS TRANSFORMED TO DATA SERIE OF
A) E.G. 3-,6- OR 12- MONTH AVERAGES
B) INDICES OF FREE CHOSEN BASE PERIOD
C) PERCENTUAL CHANGE RATES E.G. WITHIN 12- MONTH PERIOD
D) BOTH A,B OR B,C

081PROGRAM STEPS
PETER PESCHEL
D-ESSEN.

51588D 97-TRANSFORMING TIME SERIES 2

DATA SERIE IS TRANSFORMED TO FILE OF STANDARDIZED VALUES. SERIE MAY CONTAIN 38 DATA AT LEAST.

224PROGRAM STEPS
PETER PESCHEL
D-ESSEN.

51589D 67-GAUSSIAN-BEAM OPERATIONS

THIS PROGRAM PERFORMES RAY-TRACING OF GAUSSIAN BEAMS BY THE ABCD-LAW. THE OPTICAL STRUCTURES (LENSES, OPTICAL WAYS, MIRRORS, ETC..) ARE DESCRIBED BY 2X2 RAY-TRANSFER MATRICES AND ARE CHAINED BY MATRIX-MULTIPLICATION. THE PROGRAM ALSO DETERMINES THE GAUSSIAN BEAM PROPERTIES OF A RESONATOR COMPOSED OF A SEQUENCE OF OPTICAL ELEMENTS.

219PROGRAM STEPS
PETER LAEDRACH
CH-WORB.

51590D 67-97-THREE TRACKS ORDER THREE ACTIVE FILTER

THIS PROGRAM COMPUTES THE VALUE OF THE COMPONENTS NECESSARY TO REALIZE A THREE TRACKS-ORDER THREE ACTIVE FILTER, VARIABLE ACCORDING TO THE LOW AND HIGH CUT FREQUENCY OF THE LOUD SPEAKERS IN OPERATION. POWER REDUCTION : LOW 12 DECIBELS FOR OCTAVE. HIGH 18 DECIBELS FOR OCTAVE. DIAGAM IS GIVEN.

116PROGRAM STEPS
PIERRE MAIRE
F-SAINT-MARCELLIN.

51591D 97-MOTION BY DIFFERENT CENTRIPETAL FORCES

YOU RECEIVE THE X-Y- COORDINATES FOR THE MOTION OF A PARTICLE (OR A SATELLITE) BY A CENTRIPETAL FORCE. ALSO THE VELOCITY AT THIS MOMENT IS PRINTED. EXAMPLES: HARMONIC OSCILLATION, RUTHERFORD-DISTRACTION, SATELLITE OR PLANET.

101PROGRAM STEPS
EKKEHARD FABEN
D-FRANKFURT.

51592D 67-BIN, OCT, DEC, HEX, AND ANY BASIS CONVERSIONS

THIS PROGRAM CONVERTS A POSITIVE NUMBER FROM BINARY, OCTAL, DECIMAL OR HEXADECIMAL BASIS TO ONE OF THOSE BASIS. TWO EXTRA BASIS B1 AND B2 CAN ALSO BE DEFINED FOR OTHER CONVERSIONS. (B1 AND B2 INTEGER >=2).

097PROGRAM STEPS
FRANCOIS SAINT-BLANCAT
POLYNESIA-MOOREA.

51593D 67-97- THREE TRACKS ORDER TWO ACTIVE FILTER

THIS PROGRAM COMPUTES THE VALUE OF THE COMPONENTS NECESSARY TO REALISE A THREE TRACKS ORDER TWO ACTIVE FILTER. VARIABLE ACCORDING TO THE LOW AND HIGH CUT FREQUENCY OF THE LOUD SPEAKERS IN OPERATION. POWER REDUCTION : LOW : 6 DECIBELS FOR OCTAVE. HIGH : 12 DECIBELS FOR OCTAVE. DIAGRAM IS GIVEN.

110PROGRAM STEPS
PIERRE MAIRE
F-SAINT-MARCELLIN.

51594D 67-BASE ARITHMETIC AND CONVERSION

PROGRAM PERFORMS ADDITION, SUBTRACTION, MULTIPLICATION AND DIVISION OF WHOLE NUMBERS, FRACTIONS OR A COMBINATION OF BOTH (MIXED NUMBERS)

51594D (CONTD)

IN ANY BASE (POSITIVE INTEGER VALUE FROM 2 TO 99 INCLUSIVE). IN ADDITION PROGRAM CONVERTS WHOLE NUMBERS, FRACTIONS, OR A COMBINATION OF BOTH FROM ANY BASE TO BASE 10 AND VICE-VERSA.

222PROGRAM STEPS
ERNST E. SIE
D-EMMENDINGEN.

51595D 67-PERPETUAL INVENTORY

THIS PROGRAM ALLOWS TO PUT, AND ADD OR SUBTRACT QUANTITIES OF AN ARTICLE WITH ITS PRICES. IT GIVES THE AMOUNT FOR EACH ONE AND THE GREAT TOTAL FOR ALL ENREGISTERED. IT IS ALSO POSSIBLE TO DELETE ALL THE QUANTITIES AND MAINTAIN THE PRICES.

105PROGRAM STEPS
PAUL BOURDONNEAU
F-COMBS LA VILLE.

51596D 97-THERMAL RESISTANCE OF RADIATORS

THIS PROGRAM COMPUTES THE THERMAL RESISTANCE OF THE RADIATOR NECESSARY TO REMOVE THE HEAT PRODUCED BY THE POWER DISSIPATED IN THE SEMICONDUCTORS.
1. IN CONTINUOUS OPERATION
2. IN SWITCH OPERATION
3. IN CYCLICAL SWITCH OPERATION.

131PROGRAM STEPS
PIERRE MAIRE
F-SAINT-MARCELLIN.

51597D 67-COUNT CONTEST WITH HP-67

HP-67 AND PLAYER TRY TO COUNT FIRST TO NN, WITH DIFFERENCE N BETWEEN HP-67 AND PLAYER. AUTOMATIC DISPLAY AND INPUT. SO PLAYER HAS TO BE QUICK WITH INPUTS AND COUNTS IN FLASHING TIME (PAUSE). IT IS POSSIBLE TO SEE NN OR N IN THE FLASHING TIME WHEN THE GAME IS RUNNING. THIS PROGRAM DOES NOT ACCEPT CHEATING AT ALL.

217PROGRAM STEPS
HELGE RINGAS
N-PORSGRUNN.

51598D 67-STATISTICAL ANALYSIS OF VALUES FOR A TWENTY-FOUR PERIOD.

THIS PROGRAM GIVES FIRST THE DIFFERENCE IN PERCENTAGE BETWEEN TWO SERIES OF TWELVE VALUES. THEN FOR EACH ONE, ONE MAY GET THE TOTAL, THE MEAN, AND THE STANDARD DEVIATION. LAST FOR EACH PERIOD, ONE OBTAINS THE PERIODIC NUMBER, THE PERIODIC VALUE, THE DIFFERENCE WITH THE MEAN, THAT DIFFERENCE IN %, THE PERIOD INDEX NUMBER, AND THE % OF THE TOTAL.

208PROGRAM STEPS
PAUL BOURDONNEAU
F-COMBS LA VILLE.

51599D 67-PRESENT AND FUTURE BANK SITUATION

THIS PROGRAM ENABLES YOU TO HAVE AT ANY TIME THE STATE OF YOUR BANK SITUATION AT PRESENT AND IN THE FUTURE ACCORDING TO THE EXPECTED OPERATION. YOU MAY ENTER, MODIFY, SUPPRESS, ADD, MOVE UNTIL 18 SUMS PLUS THE LAST CREDIT BALANCE, EXTRACT THE SET OF BALANCES FROM THE SET OF SUMS AND REVERSE, CALCULATE RECEIPTS AND PAYMENTS BETWEEN TWO PERIODS, FIND THE PERIOD FOR WHICH THE BALANCE IS UNDER A GIVEN SUM AND BRING UP TO DATE YOUR ACCOUNT.

224PROGRAM STEPS
FRANCOIS ROPARS
F-FRANCONVILLE.

51600D 67-FREQUENCY RESPONSE FROM IMPULSE RESPONSE

PROGRAM COMPUTES, POINT BY POINT, THE APPROXIMATE FREQUENCY RESPONSE OF A SYSTEM FROM A 20 SEGMENT DESCRIPTION OF ITS IMPULSE RESPONSE. AN IN-BUILT TEST ROUTINE CAN BE USED TO EVALUATE THE ERRORS DUE TO THE FINITE DESCRIPTION. PROGRAM TAKES 112 STEPS, TEST ROUTINE 19 STEPS. APPROXIMATELY 90 SECOND PER POINT.

131PROGRAM STEPS
E.T. RANSOM
GB-CHISLEHURST.

51601D 97-MARKET

YOU ARE THE MANAGER OF A CONCERN WHO HAS TO USE ALL HIS SALESMANSHIP TO MAKE A BIG PROFIT. BUT WATCH OUT. THE MARKET IS UNSTABLE, FLUCTUATING AND DIFFICULT TO PREDICT...

220PROGRAM STEPS
KARL MOENS
B-MORTSEL.

51602D 97-BINOMIAL MULTINOMIAL COEFFICIENTS I

GIVEN UP TO 9 INTEGERS THE PROGRAM COMPUTES THE EXPONENT OF ANY MULTINOMIAL AND THE COEFFICIENT OF ANY MEMBER OF IT WITH THE GIVEN INTEGERS AS EXPONENTS.
BINOMIALS ARE A SPECIAL CASE FOR TWO INTEGERS.

099PROGRAM STEPS
JOACHIM GERLACH
D-MODAUTAL.

51603D 97-BINOMIAL-MULTINOMIAL COEFFICIENTS II

GIVEN UP TO 20 INTEGERS THE PROGRAM COMPUTES THE EXPONENT OF ANY MULTINOMIAL AND THE COEFFICIENT OF ANY MEMBER OF IT WITH THE GIVEN INTERGERS AS EXPONENTS. N>69 BINOMIALS ARE A SPECIAL CASE FOR 2 INTEGERS.

082PROGRAM STEPS
JOACHIM GERLACH
D-MODAUTAL.

51604D 97-BILINEAR TRANSFORMATION OF TRANSFER FUNCTION F(Z)

THE TRANSFER FUNCTION F(Z) OF A LINEAR SAMPLED-DATA CONTROL SYSTEM IS TRANSFORMED BY THE BILINEAR TRANSFORMATION Z=(1+W)(1-W). THE TRANSFORMED TRANSFER FUNCTION CAN BE USED TO COMPUTE THE BODE-DIAGRAM OF THE SAMPLED-DATA SYSTEM. AFTER INPUT OF THE ORDER AND THE COEFFICIENTS OF THE DENOMINATOR AND THE NUMERATOR POLYNOMIALS OF F(Z) THE TRANSFORMATION IS EXECUTED FOR POLYNOMIALS OF UP TO 9TH ORDER.

198PROGRAM STEPS
FRANK OOERRSCHEIDT
D-PADERBORN.

51605D 97-BILINEAR TRANSFORMATION OF CHARACTERISTIC EQUATION N(Z)=0

THE CHARACTERISTIC EQUATION N(Z)=0 OF A LINEAR SAMPLED DATA CONTROL SYSTEM IS TANSFORMED BY THE BILINEAR TRANSFORMATION Z=(1+W)/(1=W).THE TRANSFORMED EQUATION N(W)=0 CAN BE USED TO TEST THE STABILITY OF THE SAMPLED DATA SYSTEM BY ROUTH-CRITERION (SEE PROGRAM NUMBER 50277D). POLYNOMIALS N(Z) UP TO 19TH ORDER ARE TRANSFORMED AFTER INPUT OF THE ORDER AND THE COEFFICIENTS OF N(Z).

154PROGRAM STEPS
FRANK OOERRSCHEIDT
D-PADERBORN.

51606D 97-INVERSE BILINEAR TRANSFORMATION TO TRANSFER FUNCTION F(Z)

THE TRANSFORMED TRANSFER FUNCTION F(W) OF A LINEAR SAMPLED-DATA CONTROL SYSTEM IS RETRANSFORMED BY THE INVERSE BILINEAR TRANSFORMATION W=(Z-1)/(Z+1). THE RETRANSFORMED TRANSFER FUNCTION F(Z) CAN BE USED FOR THE DESIGN OF A DIGITAL COMPENSATOR FOR THE SAMPLED-DATA CONTROL SYSTEM. AFTER INPUT OF THE ORDER AND THE COEFFICIENTS OF THE DENOMINATOR AND THE NUMERATOR POLYNOMIALS OF F(W) THE TRANSFORMATION IS EXECUTED FOR POLYNOMIALS OF UP TO 9TH ORDER.

210PROGRAM STEPS
F. OOERRSCHEIDT
D-PADERBORN.

51607D 97-VARIABLE POINT. GAUSS-LAGUERRE QUADRATURE

PROGRAM EVALUATES THE INTEGRAL F(X) EXP(-X) DX FROM ZERO TO INFINITY USING GAUSS-LAGUERRE QUADRATURE METHOD. COEFFICIENTS FOR N=4 AND N=12 POINTS, TO BE STORED ON DATA CARDS, ARE SUPPLIED WITH DOCUMENTATION. THE USER MAY PREPARE ADDITIONAL COEFFICIENT CARDS, COEFFICIENTS CAN BE FOUND IN THE LITERATURE. THE BASIC IDEA OF THIS PROGRAM IS SIMILAR TO 97-VARIABLE POINT GAUSSIAN QUADRATURE 51376D.

027PROGRAM STEPS
GUENTER SCHNELL
D-LILIENTHAL.

51608D 67-SWISS AND GERMAN LOTTERY

PROGRAM COMPUTES EITHER FOR SWISS OR GERMAN LOTTERY SIX RANDOM NUMBERS.

100PROGRAM STEPS
MARK MAURON
CH-FREIBURG.

51609D 97-BRITISH INCOME TAX WIFES EARNINGS ELECTION.

THIS ELECTION ALLOWS A DEPARTURE FROM THE NORMAL RULE THAT THE INCOME OF A MARRIED WOMAN IS TREATED AS HER HUSBAND'S FOR TAX PURPOSES. UNDER THE ELECTION, EACH SPOUSE IS REGARDED AS A SINGLE PERSON; THE WIFE IS ASSESSED TO TAX ON HER EARNED INCOME ONLY, THE HUSBAND ON THE BALANCE OF JOINT INCOME. THIS PROGRAM CALCULATES WHETHER SUCH ELECTION IS BENEFICIAL. FURTHERMORE TOTAL TAX PAYABLE CAN BE COMPUTED FOR ANY YEAR FROM 1973/1974.

221PROGRAM STEPS
JOHN S.G. DOE
GB-REDHILL.

51610D 67-APPROXIMATION BY A SUM OF 3 WHATEVER FUNCTIONS

THIS PROGRAM COMPUTES THE COEFFICIENTS A,B,C OF THE BEST CURVE:
Y=AF1(X)+BF2(X)+CF3(X)
WHERE F1(X), F2(X), F3(X) ARE WHATEVER FUNCTIONS OF X. YOU CAN ALSO FIND Y'S FOR GIVEN X'S TO MAKE A DRAWN OF THE FUNCTION

162PROGRAM STEPS
ALAIN CHAPPUIS
CH-LAUSANNE.

51611D 67-SOLUTION OF A 2ND DEGREE SYSTEM

THIS PROGRAM SOLVES THE PAIR OF EQUATIONS :
AY**2+BXY+CX**2+DY+EX+F=0
GY**2+HXY+IX**2+KY+LX+M=0
BY THE EXACT METHOD REAL AND COMPLEX SOLUTIONS ARE GIVEN. THE COEFFICIENTS A,B,C,...,M MAY BE REAL.

51611D (CONTD)

779PROGRAM STEPS
ALAIN CHAPPUIS
CH-LAUSANNE.

51612D 67-97L.S.ADJUSTM./GAUSSIAN TRANSFORMATION **SU23**

THE PROGRAM TRANSFORMS GIVEN CORRECTION-EQUATIONS TO NORMAL-EQUATIONS (A'PA). FOR EVERY CORRECTION EQUATION YOU HAVE TO USE 1 SIDE OF A DATA CARD, SO ONLY ONE TIME ENTERING OF ALL DATAS. USABLE TILL 8 UNKNOWNS + PI,-LI. L.S. ADJUSTMENT OF SINGLE POINTS OR NETS IN CONNECTION WITH PROGRAM SU 22 AND A PROGRAM TO SOLUTE THE NORMAL-EQUATION-SYSTEM, WITH MATRIX INVERSION.

156PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

51613D 67-COMMON ARITHMETIC MEAN

THE PROGRAM CALCULATES THE COMMON ARITHMETIC MEAN, THE MEAN SQUARE ERROR OF UNIT WEIGHT AND THE MEAN SQUARE ERROR OF TE ARITHMETIC MEAN. USABLE FOR 10 VALUES AND 10 WEIGHTS ONLY ONE TIME DATA INPUT.

077PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

51614D 67-97L.S. ADJUSTM. DISTANCE & DIRECTION COEFFICIENTS **SU22**

LINK PROGRAM FOR CALCULATION OF DIRECTION AND DISTANCE COEFFICIENTS FOR LEAST SQUARES ADJUSTMENT. WITH STAND/TARGETPOINT-COORDINATES AND THE MEASURED DIRECTIONS AND DISTANCES THE PROGRAM CALCULATES THE COEFFICIENTS FOR CORRECTION EQUATION. POINT COORDINATES ARE STORED AT DATA CARDS, SO YOU HAVE TO LOAD ONLY THE SPECIAL CARDS. L.S. ADJUST OF SINGLE POINTS OR NETS IN CONNECTION WITH PROGRAM SU 23 AND A PROGRAM TO SOLUTE THE NORMAL-EQUATION-SYSTEM, WITH MATRIX INVERSION.

198PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

51615D 67-EQUATION OF A SPHERE

GIVEN THE EQUATION OF A SPHERE, THIS PROGRAM COMPUTES THE RADIUS AND THE COORDINATES OF THE CENTER.

062PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51616D 67-DISTANCE IN AN EINSTEIN-SPACE

AFTER THE INPUT OF THE COORDINATES OF TWO POINTS IN THE FOUR-DIMENSIONAL EINSTEIN SPACE, THIS PROGRAM COMPUTES THE DISTANCE BETWEEN THESE POINTS, ALSO THE DISTANCE IN AN EUCLIDEAN-SPACE AND THE DIFFERENCE BETWEEN THESE TWO DISTANCES IN % CM.

083PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51617D 67-PERIOD OF A SIMPLE PENDULUM

PROGRAM FINDS THE PERIOD OF A SIMPLE PENDULUM OF LENGTH L THAT IS DISPLACED FROM EQUILIBRIUM TO AN ANGLE B AND RELEASED WITH ZERO INITIAL VELOCITY.

074PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51618D 67-A STUPID PROGRAM

51618D (CONTD)

THIS PROGRAM MIGHT BE STUPID, IT MIGHT BE INGENIOUS. IT DEPENDS ON YOU. NEVERTHELESS, IT IS AN EFFORT TO APPROXIMATE THE UNIVERSAL LAW OF NATURE, EVEN WITH CATASTROPHIC SITUATIONS.

180PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51619D 67-WATER PRESSURE ON A DAM

THIS PROGRAM FINDS THE TOTAL FORCE F, EXERTED BY WATER PRESSURE ON A TRIANGLE WITH SIDES A,B AND C(B=C) LOCATED IN A VERTICAL PLANE ON THE WET FACE OF A DAM WHEN THE TOP EDGE IS HORIZONTAL AND D BELOW THE SURFACE.

048PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51620D 67-POSITION VECTOR AS A LINEAR FUNCTION

LET P,Q AND R DENOTE POSITION VECTORS SUCH THAT P=(A,B,C),Q=(D,E,F) AND R(G,H,I). THIS PROGRAM EXPRESSES THE POSITION VECTOR OT, WHERE T(J,K,L) AS A LINEAR FUNCTION OF P,Q AND R.

161PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51621D 67-RATIO-POINT OF A LINE-SEGMENT

GIVEN THE POINTS M(A,B,C) AND N(D,E,F) AND THE RATIO P/Q OF THE LINE-SEGMENT MN, THIS PROGRAM COMPUTES THE COORDINATES OF THE RATIO-POINT.

056PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51622D 67-ANGLE BETWEEN TWO VECTORS

GIVEN TWO VECTORS BY THEIR COORDINATES P(A,B,C) AND Q(D,E,F), THIS PROGRAM DETERMINES THE ANGLE BETWEEN THOSE TWO VECTORS.

055PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51623D 67-ORTHOGONAL BASIS FOR SPACE

GIVEN THE POSITION VECTORS P(A,B,C) Q(D,E,F) AND R(G,H,I), THIS PROGRAM CAN VERIFY THAT A SET OF THIS VECTORS P,Q AND R CONSTITUTES AN ORTHOGONAL BASIS FOR THREE DIMENSIONAL SPACE.

071PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51624D 67-CARTESIAN IN POLAR

GIVEN THE GENERAL EQUATION OF A CIRCLE AX2+BX+AY2+CY+D=0, PROGRAM COMPUTES THE POLAR EQUATION OF THAT CIRCLE PR2-2R1R COS (THETA-PHI)=Q2-R2.

060PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51625D 67-FOUR DEGREE NEWTON-COTES NUMERICAL INTEGRATION

THIS PROGRAM WILL PERFORM NUMERICAL INTEGRATION FOR BOTH EXPLICIT FUNCTIONS AND FOR THE DISCRETE CARE. THE FUNCTION'S ERROR WITH THIS SYSTEM IS Y(6)*(8/945)*H**7 WHILE THAT IN THE SIMPSON'S RULE IS Y(4)*

51625D (CONTD)

(1/90)*H**5 WHERE Y(6) AND Y(4) ARE THE SIXTH AND FOURTH ORDER DIFFERENTIALS AND H THE SPACING BETWEEN X VALUES.

088PROGRAM STEPS
JOSE REYES ESTEBAN
E-AVILES.

51626D 97-RADIO-ASSAY OF CARBON 14 BY LIQUID SCINTILLATION COUNTING

THE COUNTS PER MINUTE AND EITHER SAMPLE CHANNELS RATIO OR EXTERNAL STANDARD CHANNELS RATIO, DATA NORMALLY AVAILABLE DIRECTLY FROM LIQUID SCINTILLATION COUNTERS, ARE ENTERED AND THE EFFICIENCIES OF COUNTING AND RATIOS ARE FITTED TO A QUADRATIC EQUATION. DISINTIGRATIONS PER MINUTE OF UNKNOWNS ARE CALCULATED AFTER ENTRY OF COUNTS PER MINUTE AND RATIO. BACKGROUND SUBTRACTION IS AVAILABLE.

154PROGRAM STEPS
JOHN MURRAY
GB-ABERDEEN.

51627D 97-DEAD RECKONING CALCULATOR

PROGRAM KEEPS AN UP-TO-DATE DEAD RECKONING LOG, CALCULATING THE SHIP'S POSITION AT ANY TIME WITH ALLOWANCE FOR SET AND DRIFT. IT WILL ALSO CALCULATE HEADING REQUIRED, DISTANCE REMAINING, E.T.A., POSITION PREDICTIONS. A POSITION FIX RESTARTS THE CALCULATION AND SHOWS ANY UNACCOUNTED SET AND DRIFT.

222PROGRAM STEPS
GERALD A. BAYNE
F-CANNES.

51628D 67-CONVERSION GEO/SPHEROID INTO GEO/SPHERE CO-ORDINATES.

THIS PROGRAM CONVERTS GEOGRAPHICAL CO-ORDINATES OF A SPHEROID INTO GEOGRAPHICAL CO-ORDINATES OF A SPHERE OR VICE VERSA. INPUT DATA OF THE SPHEROID ARE : MAJOR AXIS, MINOR AXIS AND LATITUDE.
THIS PROGRAM REQUIRES A SET OF DATA PROVIDED BY THE SPHEROID/SPHERE (S/S) CONSTANTS PROGRAM NO 51629D.

082PROGRAM STEPS
M. HOOIJBERG
NL-AB DRUNEN.

51629D 67-SPHEROID-SPHERE CONSTANTS CALCULATIONS

THE PROGRAM CALCULATES THE SPHEROID SPHERE CONVERSION CONSTANTS FOR CONVERSION OF GEOGRAPHICALS OF A SPHEROID INTO THOSE OF A SPHERE OR VICE VERSA. INPUT DATA OF THE SPHEROID ARE : MAJOR AXIS, MINOR AXIS AND LATITUDE.

156PROGRAM STEPS
M. HOOIJBERG
NL-AB DRUNEN.

51630D 67-CALCULATION OF A BOUNDARY IN GEOGRAPHICALS

A BOUNDARY OF A CONCESSION IS USUALLY DEFINED BY MEANS OF GEOGRAPHICAL CO-ORDINATES. THIS PROGRAM CALCULATES THE INTERMEDIATE POINTS AT SPECIFIED INTERVALS OR AT A SPECIFIED LONGITUDE AND IT REQUIRES A SET OF DATA PROVIDED BY THE S/S CONSTANTS PROGRAM NO 51629.

162PROGRAM STEPS
M. HOOIJBERG
NL-AB DRUNEN.

51631D 67-(IOR) CALCULATION INDEX OF REFRACTION/EDM-LIGHT.

51631D (CONTD)

THE PROGRAM CALCULATES THE IOR FOR EDM LIGHT WAVE INSTUMENTS. INPUT DATA ARE THE DRY AND WET BULB TEMPERATURE (FOR TROPICAL AREAS) OR DRY BULB TEMPERATURE ONLY, AND BAROMETRIC PRESSURE.

217PROGRAM STEPS
M. HOOIJBERG
NL-AB DRUNEN.

51632D 97-PARABOLIC REGRESSION WITH CONFIDENCELIMITS OF PREDICTION

THE PROGRAM FITS THE COEFFICIENTS OF THE MODEL Y=A(X-X0)**2 + B(X-X0) +C WITH RESPECT TO THE INPUT-POINTS IT ALSO GIVES THE STANDARD DEVIATIONS OF THE UNBIASED ESTIMATES OF COEFFICIENTS AND OF INPUT POINTS. YOU MAY CALCULATE Y TO GIVEN VALUES X TOGETHER WITH CONFIDENCE LIMITS OF THE PARABOLA OR OF ADDITIONAL POINTS.
EVEN AFTER CALCULATION OF COEFFICIENTS IT IS POSSIBLE TO ADD OR DELET POINTS TO THE INPUT SET AND CALCULATE AGAIN.

407PROGRAM STEPS
SIEGBERT FOERSTER
D-ROSSTAL.

51633D 67-ONLY WITH STACK AND LAST X

THANKS TO RPN LOGIC, YOU CAN DO INTRICATE COMPUTATIONS WITHOUT THE REGISTERS R0 UNTILL R25 : SOLUTION OF QUADRATIC EQUATION, ANGLE AND AREA OF TRIANGLE, GCD AND LCM AND PARTITION OF AN INTEGER IN POWERS ON BASE 3.

166PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51634D 67-MASTERMIND 45 FORMATS

CHOOSE YOUR OWN FORMAT : FROM A 1 DIGIT NUMBER COMPOSED OF THE DIGITS 1 OR 1 AND 2 OR ... 1 TILL 9, VIA A 2 DIGIT NUMBER COMPOSED WITH 1 AND 2 OF 1 AND 2 AND 3 OR ... 1 TILL 9 ENDING AT A 9 DIGIT NUMBER COMPOSED WITH THE NUMBERS 1 TILL 9.

129PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51635D 67-HOW TO PAY N CENTS

PROGRAM COUNTS IN HOW MANY WAYS YOU CAN PAY N CENTS AND IT SHOWS ALSO ALL THOSE DIFFERENT WAYS.

209PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51636D 67-CLOCKWORK MODEL

A SIMPLE CLOCKWORK MODEL WITH AND WITHOUT H<->H.MS. ONLY A MIDNIGHT CHANGE IS CONSTRUCTED. RUNS SLOW.

105PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51637D 67-ARRANGE AN ARRAY FROM SMALL TO LARGE

ARRANGE AN ARRAY OF 2(3,4,...16) NUMBERS BY CHANGING NEIGHBOURS OR ARRANGE M ARRAYS OF N NUMBERS SIMULTANEOUSLY OR ARRANGE M ARRAYS TILL ONE ARRAY.

212PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51638D 67-MAGIC SQUARE OF 16 FIELDS.

51638D (CONTD)

A SQUARE IS DIVIDED INTO 4X4 = 16 FIELDS. SIXTEEN, NONZERO, DIFFERENT INTEGERS ARE PLACED SO THAT IN HORIZONTAL, VERTICAL AND DIAGONAL DIRECTION THE SUM IS EQUAL.

195PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51639D 67-MAGIC SQUARE OF 9 FIELDS

A SQUARE IS DIVIDED INTO 3X3 = 9 FIELDS. NINE, NONZERO, DIFFERENT INTEGERS ARE PLACED SO THAT IN HORIZONTAL, VERTICAL AND DIAGONAL DIRECTION THE SUM IS EQUAL.

103PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51640D 67-PRIMEFACTORS AND PRIMENUMBERS

TO SEPERATE AND INTEGER INTO PRIME FACTORS; TO SEE IF AN INTEGER IS A PRIMENUMBER; ALL PRIMENUMBERS; ALL PRIMENUMBER >=N.

131PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51641D 67-COMBINATIONS AND PROBABILITY

TO OBTAIN THE NUMBER OF PERMUTATIONS OF M OBJECTS OUT OF N; THE BINOMIAL COEFFICIENTS; BINOMIAL PROBABILITY AND DITTO CUMULATIVE.

143PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51642D 67-THEOREM OF PYTHAGORAS

TO OBTAIN TRIPLETS AND QUARTETS OF NUMBERS WHO SATISFY THE TWO AND THREE DIMENSIONAL THEOREM OF PYTHAGORAS : A2+B2=C2
A2+B2+C2=D2

134PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51643D 67-TIC TAC TOE

IN THIS PROGRAM HP MAY BE THE BEGINNER OR USER MAY BE THE BEGINNER. HP PLAYS A STRATEGY THAT CAN NOT BE IMPROVED BY A HUMAN PLAYER.

224PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51644D 67-BASE TRANSFORMATION AND ARITHMETIC

TO TRANSFORM A NUMBER FROM ONE BASE A (2<=A<=100) TO A BASE B (2<=B<=100) AND TO DO ARITHMETIC +,-,X,DIV AND YX IN ANY BASE A (2<=A<=100) YOU CAN USE DECIMALS.
PROGRAM STOPS WHEN DISPLAY IS FILLED.

219PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51645D 67-BLINDMAN'S BUFF

A POINT WANDERS AT RANDOM ALONG THE COORDINATE AXES DIRECTIONS IN A CLOSED AREA AND STOPS AT (0,0). ALSO THREE DIMENSIONAL.

149PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51646D 67-THROWING N COINS TOGETHER

51646D (CONTD)

TOSS N COINS TOGETHER, 1<=N<=19. THE AMOUNT OF HEADS IS X, 0<=X<=N. REPEAT THIS M TIMES AND COUNT THE TOSSES WITH THE SAME X. THERE IS A RELATION WITH THE TRIANGLE OF PASCAL.

050PROGRAM STEPS
HANS AUSEMS
NL BREDA.

51647D 67-PERMUTATIONS-VARIATIONS-COMBINATIONS

SHOWS ALL THE PERMUTATIONS OF THE NUMBERS 1,2,...N (2<=N<=9)
SHOWS ALL THE VARIATIONS OF M NUMBERS OUT OF THE N (2<=M<=N<=9)
SHOWS ALL THE COMBINATIONS OF M OUT OF N. (1<=M<=N<=9).
DOES THIS PROGRAM RUN FASTER THAN ANYBODY ELSE?

188PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51648D 67-SOIL PRESSURE UNDER A FOUNDATION

PROGRAM DETERMINES THE MAXIMUM SOIL PRESSURE UNDER A FOUNDATION, GIVEN TWO MOMENTS, MX AND MY, AND A VERTICAL FORCE V. THE PROGRAM CHECKS THE LOCATION OF THE RESULTANT VERTICAL FORCE, VR, AND COMPUTES THE SOIL PRESSURE BY THE CORRESPONDING FORMULA. FURTHERMORE IT IS INDICATED IF THE COMPRESSIVE ZONE IS LESS THAN HALF OF THE FOUNDATION AREA (NOT ALLOWED TO GERMAN REG. DIN 1054)

223PROGRAM STEPS
CLAUS M. DACHSELT
D-WITTEN-ANNEN.

51649D 67-LENGTH AREA VOLUME

IN SCHOOLPRACTICE YOU OFTEN MEET THE TRIPLET : AREA BETWEEN THE GRAPHE OF A FUNCTION AND THE X-AXIS THE LENGTH OF THAT CURVE AND THE VOLUME WHEN YOU ROTATE THE GRAPHE AROUND THE X-AXIS. USED IS THE METHOD OF SIMPSON WITH AND WITHOUT THE RICHARDSON CORRECTION (R.C.). FAST CONVERGENCY

175PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51650D 67-THOMSON WEIR FLOW FORMULA

THOMSON WEIR FLOW FORMULA FOR FREE FLOW CONDITIONS. ANGLE A, HEIGHT H OR FLOW Q CAN BE OBTAINED IF TWO OF THEM ARE KNOWN. EITHER METRIC OR U.S. UNITS CAN BE USED I.E. METER OR FOOT (H) AND CUBICMETER/HOUR OR SECOND-FOOT (Q).

157PROGRAM STEPS
ROSEN BJOERN
S-BROMMA.

51651D 67-CIPOLETTI WEIR FLOW FORMULA

CIPOLETTI WEIR FLOW FORMULA FOR FREE FLOW CONDITIONS. WIDTH W, HEIGHT H OR FLOW Q CAN BE OBTAINED IF TWO OF THEM ARE KNOWN. EITHER METRIC OR U.S. UNITS CAN BE USED I.E. METER OR FOOT (W,H) AND CUBICMETER/HOUR OR SECOND-FOOT (Q).

137PROGRAM STEPS
ROSEN BJOERN
S-BROMMA.

51652D 67-RECTANGULAR WEIRS FLOW FORMULA

RECTANGULAR WEIRS, SUPPRESSED OR CONTRACTED, FLOW FORMULA FOR FREE FLOW CONDITIONS. WIDTH W, HEIGHT H OR FLOW Q CAN BE OBTAINED IF TWO OF

51652D (CONTD)

THEM ARE KNOWN. EITHER METRIC OR U.S. UNITS CAN BE USED I.E. METER OR FOOT (W,H) AND CUBICMETER/HOUR OR SECOND-FOOT (Q).

178PROGRAM STEPS
ROSEN BJOERN
S-BROMMA.

51653D 67-SOUTRO WEIR FLOW FORMULA

SOUTRO WEIR FLOW FORMULA FOR FREE FLOW CONDITIONS. RECT. SECT. HEIGHT A, WIDTH W, HEIGHT H OR FLOW Q CAN BE OBTAINED IF THREE OF THEM ARE KNOWN. ONLY METRIC UNITS CAN BE USED I.E. METER (A,W,H) AND CUBIC-METER/HOUR (Q)

134PROGRAM STEPS
ROSEN BJOERN
S-BROMMA.

51654D 67-SMALL PARSHALL FLUME FLOW FORMULA

SMALL PARSHALL FLUME FLOW FORMULA FOR FREE FLOW CONDITIONS. FORMULA IS VALID FOR WIDTH W = 1,2,3,6 OR 9 INCHES. HEIGHT H OR FLOW Q CAN BE OBTAINED. EITHER METRIC OR U.S. UNITS CAN BE USED I.E. METER OR FOOT (H) AND CUBICMETER/HOUR OR SECOND-FOOT (Q).

146PROGRAM STEPS
ROSEN BJOERN
S-BROMMA.

51655D 67-MEDIUM/LARGE PARSHALL FLUME FLOW FORMULA

MEDIUM OR LARGE PARSHALL FLOW FORMULA FOR FREE FLOW CONDITIONS. FORMULA VALID FOR WIDTH W (MEDIUM) 1-8' OR W (LARGE) 10-50'. HEIGHT H OR FLOW Q CAN BE OBTAINED. EITHER METRIC OR U.S. UNITS CAN BE USED I.E. METER OR FOOT (H) AND CUBIC-METER/HOUR OR SECOND-FOOT (Q).

198PROGRAM STEPS
ROSEN BJOERN
S-BROMMA.

51656D 67-GREAT NUMBERS DIVISION : DIVISOR UP TO 120 DIGITS

THIS PROGRAM DIVIDES 2 NUMBERS. THE QUOTIENT IS UNLIMITED. THE DIVISOR IS LIMITED TO 120 DIGITS. THE DIVI-DEND IS AS LONG AS YOU WANT. THE NUMBER OF WORKING MEMORIES IS PROGRAMMABLE. THE QUOTIENT IS NOT STORED BUT DISPLAYED BY NUMBERS OF 5 DIGITS.

161PROGRAM STEPS
PIERRE MOLINARO
F-NANTES.

51657D 67-50 STEPS PROGRAMMABLE HP MACHINE FOR COMPLEX CALCULUS

THE PROGRAM CREATES AN ADDRESSABLE OPERATIONAL STACK OF 5 COMPLEX NUMBERS INCLUDING LSTX. THERE ARE 65 FUNCTIONS, 4 MEMORIES AND 2 TESTS FOR PROGRAMMABLE LOOPS; ENTER ROLL UP, EXCHANGE, LSTX, +, X, CHS, 1/X, X TO THE POWER N OR 1/N, STO N, STO+N, STOXN, RCLN, WITH N UP TO 9. MANY PROGRAMS ASTUTENESSES ARE POSSIBLE. POWER LIMITED ONLY BY USER'S IMAGINATION.

221PROGRAM STEPS
PIERRE MOLINARO
F-NANTES.

51658D 67-APPROXIMATION BY A SUM OF 4 WHATEVER FUNCTIONS

PROGRAM COMPUTES THE COEFFICIENTS A,B,C,D OF THE BEST CURVE. Y=AF1(X)+BF2(X)+CF3(X)+DF4(X) WHERE F1(X)...F4(X) ARE WHATEVER FUNC-

51658D (CONTD)

TIONS OF X. YOU CAN ALSO FIND Y'S FOR GIVEN X'S TO MAKE A DRAWN OF THE FUNCTION.

225PROGRAM STEPS
ALAIN CHAPPUIS
CH-LAUSANNE.

51659D 67-APPROXIMATION BY A SUM OF 5 WHATEVER FUNCTIONS

PROGRAM COMPUTES THE COEFFICIENTS A,B,C,D AND E OF THE BEST CURVE. Y=AF1(X)+BF2(X)+CF3(X)+DF4(X)+EF5 (X) WHERE F1(X)... F5(X) ARE WHAT-EVER FUNCTIONS OF X. YOU CAN ALSO FIND Y'S FOR GIVEN X'S TO MAKE A DRAWN OF THE FUNCTION.

323PROGRAM STEPS
ALAIN CHAPPUIS
CH-LAUSANNE.

51660D 97-4 SIMULTANEOUS EQUATIONS IN 4 RATIONAL VARIABLES

SOLVES SYSTEM OF 4 LINEAR EQUATIONS IN 4 VARIABLES, WHERE BOTH COEFF. AND SOLUTIONS ARE RATIONAL NUMBERS. USES GAUSS-JORDAN REDUCTION FOR SOLUTION. EUCLIDEAN ALGORITHM IS USED TO SIMPLIFY RATIONALS AT ALL STAGES OF CALCULATION TO MINIMISE RISK OF OVERFLOW, SO CAN HANDLE QUITE LARGE NUMERATORS AND DENOMI-NATORS. CANNOT GIVE ERRONEOUS RESULTS, BUT GIVES OVERFLOW, ERROR OR INFINITY INDICATIONS WHEN APPRO-PRIATE.

414PROGRAM STEPS
MICHAEL GERZON
GB-OXFORD.

51661D 97-REVERSION OF SERIES WITH 8 TERMS

GIVEN FUNCTION Y=F(X) AS A POWER SERIES IN X, PROGRAM COMPUTES THE REVERSION X=G(Y) AS A POWER SERIES IN Y. UNLIKE PREVIOUS REVERSION PROGRAMS, THIS PROGAM COMPUTES FIRST EIGHT TERMS OF SERIES WITHOUT CONSTANT TERM, I.E. INCLUDING TERM IN X**8 AND Y**8. USES NEW ALGO-RITHM INVOLVING REPEATED SUBSTITU-TIONS, USING ONLY A MEMORY REGIS-TERS.

218PROGRAM STEPS
MICHAEL GERZON
GB-OXFORD.

51662D 97-REVERSION OF SERIES WITH 11 TERMS.

PROGRAM COMPUTES THE COEFFICIENTS OF THE REVERTED POWER SERIES X=G(Y) GIVEN THE FIRST ELEVEN COEFFICIENTS OF A POWER SERIES Y=F(X) WITHOUT CONSTANT TERM. HANDLES TERMS UP TO THOSE IN X**11 AND Y**11. USES A NEW REPEATED SUBSTITUTION ALGORITHM QUITE FAST AND USES ONLY 13 REGISTERS.

491PROGRAM STEPS
MICHAEL GERZON
GB-OXFORD.

51663D 67-TO SINK SHIPS

GAME FOR TWO PLAYERS. EVERY PLAYER HAS TO TRY TO DESTROY THE FIVE SHIPS OF THE OTHER. THE PLAYER, WHOSE SHIPS ARE FIRSTLY DESTROYED, IS THE LOSER.

222PROGRAM STEPS
JUERGEN GLOGER
D-NAGOLD.

51664D 67-REAL AND COMPLEX TRIGONOMETRICS AND HYPERBOLICS AND INVERSE

THE PROGRAM CALCULATES SIN, COS, TAN, SINH, COSH, TANH, AND THEIR INVERSE FUNCTIONS FOR COMPLEX OR

51664D (CONTD)

REAL ARGUMENTS. IF REAL STATUS IS CHOSEN, THE STACK BEHAVES LSLAL. LAST Z OR LAST X IS SAVED.

218PROGRAM STEPS
ULRICH HAHN
D-FLENSBURG.

51665D 67-ENERGY-RELATIONS

PROGRAM CALCULATES ENERGY IN JOULE; KELVIN; VOLTAGE; EQUIVALENT MASS; WAVELENGTH OR FREQUENCY OF A PHOTON TIME AND THE SIGNAL TO NOISE RATIO FOR INFORMATION THEORY. YOU PUT IN ONE VALUE AND GET ALL OTHERS.

192PROGRAM STEPS
HORST VOELZ
D-BERLIN.

51666D 67-TIMER AND CLOCK

PROGRAM ALLOWS TO USE THE CALCULA-TOR AS AN EXACT CLOCK WITH AN ERROR OF ONLY ABOUT 4 SECONDS IN 24 HOURS YOU MAY ALSO START AT TIME 0.0000, OR YOU LET COUNT UP THE TIME TO ABOUT 4.8 MILLIONS OF HOURS. YOU ALSO MAY COUNT THE TIME BACKWARD.

111PROGRAM STEPS
ARMIN WEIGT
D-SCHWERTE.

51667D 67-ACCELERATION, SPEED, TIME AND DISTANCE.

TWO OF FOUR DATES ARE GIVEN, PRO-GRAM CALCULATES THE OTHER ONES OF ACCELERATION, SPEED, DISTANCE AND TIME.

112PROGRAM STEPS
ARMIN WEIGT
D-SCHWERTE

51668D 67-FOOD COMPOSITION MAJOR AND MINOR COMPONENTS

COMPUTES THE PERCENTUAL COMPOSITION IN MAJOR COMPONENTS OF THE DRY SUBSTANCE OF A FOOD PRODUCT AND THE COMPOSITION IN MINOR COMPONENTS IN MG./100G. UP TO 22 COMPONENTS CAN BE LISTED.

076PROGRAM STEPS
ROBERT FREDERIC MENZI
CH-GENEVA.

51669D 67-FOOD COMPOSITION-MAJOR AND MINOR COMPONENTS (DATA CARDS)

COMPUTES THE PERCENTUAL COMPOSITION IN MAJOR COMPONENTS OF THE DRY SUBSTANCE OF A FOOD PRODUCT AND THE COMPOSITION IN MINOR COMPONENTS IN MG/100 G. THE COMPOSITION OF THE INGREDIENTS ARE RECORDED ON DATA CARDS AND MUST NOT BE ENTERED AT THE KEYBOARD.

105PROGRAM STEPS
ROBERT FREDERIC MENZI
CH-GENEVA.

51670D 67-FACTS OF NOISE

THIS PROGRAM COMPRISES ROUTINES WITH WHICH THE USER CAN ASSESS THE NOISE OF AN ELECTRONIC SYSTEM. THE FOUR PRINCIPAL DETERMINATIONS ARE (A) NOISE OF RESISTANCE, CURRENT AND OTHER DEVICES. THESE LATTER EXPRESSED IN TERMS OF THEIR NOISE FIGURES, (B) NOISE IN A FREQUENCY INTERVAL AS A FUNCTION OF THE SLOPE OF THE CHARACTERISTIC, (C) NOISE IN TERMS OF SPOT FREQUENCY AND GAIN FIGURES, AND (D) SUMMATIONS OF INDIVIDUAL COMPONENTS.

205PROGRAM STEPS
D.T. RANSOM
GB-CHISLEHURST.

51671D 67-STAGNANT RUNNING OR COUNTERFLOW RINSE TANK CONCENTRATIONS

PROGRAM CALCULATES THE FINAL CONCENTRATION AFTER T(HR.MIN.S) IN A STAGNANT OR A RUNNING OR A CASCADE RINSE STATION (WITH N COUNTERFLOW TANKS). ENTER VOLUME OF RINSE TANK, HOURLY CARRY-OVER OF PROCESS SOLUTION (V) WITH CONCENTRATION (CE), AND TIME (T). IF FINAL CONC. (CT) HAD BEEN ANALYZED, (V) OR (T) CAN BE CALCULATED FOR STAGNANT RINSE. CONCENTRATIONS OF RUNNING OR COUNTERFLOW RINSE TANKS CAN BE DETERMINED AFTER ENTERING WATERFLOW RATE AND NO. OF RINSE STATIONS (CASCADES) NC.

110PROGRAM STEPS
GUENTER FISCHER
D-KAARST.

51672D 67-S.O.R. ITERATION

SUCCESIVE OVER-RELAXATION-ITERATION SOLVES SYSTEMS OF UP TO 22 EQUATIONS OF 22 VARIABLES (LINEAR OR NON-LINEAR). IT GENERALIZES GAUSS-SEIDEL'S METHOD AND CAN SPEED UP CONVERGENCE OF ITERATIONS TO A SOLUTION VECTOR CONSIDERABLY.

055PROGRAM STEPS
GUIDO PETZ
S-SOLNA.

51673D 97-PREDICTION WITH CONFIDENCE INDICATION ON TWO IND. VAR.

AVAILABLE DATA IS USED AS IN PROGRAM 00139D. THIS PROGRAM ALSO PROVIDES STANDARD ERRORS AND GIVEN A 'T' PERCENTILE, CONFIDENCE INTERVALS FOR REGRESSION ESTIMATES AND FUTURE PREDICTIONS. FURTHER DATA CAN BE ADDED, OR OLD DATA REMOVED, SO THAT RESULTS CAN BE RECALCULATED ON A BASIS MODIFIED BY EXPERIENCE.

221PROGRAM STEPS
J. DAVID HILL
GB-ROTHERHAM.

51674D 67-DIE SET FOR WIRE DRAWING

THIS PROGRAM CALCULATES A DIE SET FOR WIRE DRAWING WITH REDUCTION IN AREA FOR EACH DIE UNCHANGED OR FALLING OR RISING. THE REDUCTION IN AREA CAN BE OUTPUT IN % OR AS LOGARTHMICAL CHANGE (TRUE STRAIN).

189PROGRAM STEPS
FRANZ SAGMUELLER
A-HEHENBER.

51675D 67-ELECTRONIC DESIGNERS VADE MECUM

ALTHOUGH FORMULATED FOR THE ELECTRONIC DESIGNER THIS PROGRAM WILL BE OF USE IN OTHER DISCIPLINES SINCE IT CONTAINS A USEFUL EXPANSION OF THE "INTERCHANGEABLE SOLUTIONS" CONCEPT. THE EQUATIONS GIVEN ARE A=B*C*D*E, A=(B**2+C**2)**1/2, A=11(1/B+1/C), A=(B*C*D/E)**1/2 WITH EXAMPLES OF THEIR USE. A DATA CARD IS REQUIRED.

211PROGRAM STEPS
D.T. RANSOM
GB-CHISLEHURST.

51676D 67-SORTING 48 DATA

UP TO 48 INTEGERS LESS THAN 10**5 WILL BE RANGED IN DECREASING ORDER. SORTED DATA ARE SAVED FOR LATER DISPLAY. IT IS POSSIBLE TO CORRECT DATA WHENEVER DURING THE INPUT OPERATION FOR 48 DATA PROGRAM TAKES ABOUT 12 MINUTES AND IS ENDED WITH THE SUM OF ALL.

224PROGRAM STEPS
KENT A WIGSTROM
S-FLODA.

51677D 67-CONT. FRAC. OF SQUARE ROOTS

PROGRAM COMPUTES THE SPECTRA (=PERIODICITY) OF CONT. FRACTIONS FOR SQUARE ROOTS OF INTEGER LESS THAN 10**5. IT ALSO COMPUTES CONT. FRAC FOR VULGAR AND DECIMAL FRACTION, GREATEST COMMON DIVISOR (GCD) FOR TWO NUMBERS.

218PROGRAM STEPS
KENT A WIGSTROEM
S-FLODA.

51678D 97-TWO-FIELD-BEAM EXTREMES UNDER DEAD LOAD/LIVE LOAD.

PROGRAM CALCULATES THE EXTREME BENDINGMOMENTS AND SUPPORT REACTIONS OF A TWO-FIELD-BEAM UNDER UNIFORMLY DISTRIBUTED DEAD LOAD/LIVE LOAD COMBINING THE DECISIVE LOADING CASES AUTOMATICALLY. LOADS MAY BE DIFFERENT IN EACH FIELD, A CANTILEVERARM-MOMENT AT THE FIRST SUPPORT CAN BE ALLOWED FOR. ONLY EXTREMES ARE PRINTED.

224PROGRAM STEPS
NICOLAI RIEPE
D-KOENIGSWINTER.

51679D 97-THREE-FIELD-BEAM EXTREMES UNDER DEAD LOAD/LIVE LOAD.

PROGRAM CALCULATES THE EXTREME BENDING MOMENTS AND SUPPORT REACTIONS OF A THREE-FIELD-BEAM UNDER UNIFORMLY DISTRIBUTED DEAD LOAD/LIVE LOAD COMBINING THE DECISIVE LOADING CASES AUTOMATICALLY. LOADS MAY BE DIFFERENT IN EACH FIELD. ONLY EXTREMES ARE PRINTED.

223PROGRAM STEPS
NICOLAI RIEPE
D-KOENIGSWINTER.

51680D 67-CIRCULAR PLATE EDGES SS. CENTRAL LOAD ON SMALL AREA

FOR A FLAT CIRCULAR PLATE OF CONSTANT THICKNESS WITH A UNIFORM LOAD OVER A VERY SMALL CENTRAL CIRCULAR AREA OF RADIUS RO AND WITH EDGES SIMPLY SUPPORTED. THIS PROGRAM WILL CALCULATES VALUES OF DEFLECTION, SLOPE, BENDING MOMENT AND BENDING STRESS.

222PROGRAM STEPS
LESLIE A. TIMPERLEY
GB-MANCHESTER.

51681D 67-TEACHER'S MARKSBOOK

THIS "TEACHER'S HELP" STORES YOUR TEST MARKS AND RECALLS AND ADDS THEM UP IN DIFFERENT WAYS : A) ONLY THE MARKS OF A CERTAIN TEST OR B) OF ALL TESTS OR C) OF A CERTAIN STUDENT. YOU CAN HANDLE ALSO WITH UP TO 120 ARBITRARY TWO DIGIT NUMBERS.

212PROGRAM STEPS
HANS C.M. AUSEMS
NL-BREDA.

51682D 97-COMPOSED LOG-NORMAL AND RAY LEIGH RADIO FADING PROBABILITY

FOR RADIO PROPAGATION WITH COMPOSED LOG-NORMAL AND RAY LEIGH FADING WITH SELECTION OR COMBINATION DIVERSITY RECEPTION THIS PROGRAM CALCULATES THE PROBABILITY THAT THE FADING DOES NOT EXCEED A GIVEN VALUE IN DECIBELS. INPUTS ARE DIVERSITY ORDER, STANDARD DEVIATION IN DB OF LOG-NORMAL COMPONENT, ACCURACY REQUIRED AND FADING IN DB REFERRED TO THE MEDIAN VALUE OF THE LOG-NORMAL DISTRIBUTION. RAY LEIGH FADING ALONE WITH DIVERSITY RECEPTION IS ALSO CONSIDERED.

203PROGRAM STEPS
GIOVANNI RODA

51682D (CONTD)

I-BUSTO ARSIZIO.

51683D 67-97L.S. ADJUSTMENT/CORRECTIONS AND ERRORS SU24

THE PROGRAM CALCULATES THE CORRECTION OF EVERY MEASURED VALLE, THE ERROR OF A MEASURED VALUE BEFORE ADJUSTMENT, THE ERROR OF THE ADJUSTED POINT COORDINATES, THE MEAN SQUARE ERROR OF UNIT WEIGHT AND SUM (VVP). IT IS POSSIBLE TO USE THE DATA CARDS FROM SU 23 FOR CORRECTION EQUATIONS, SO NO NEW DATA INPUT. IN CONNECTION WITH SU 22/23/25 26 IT IS POSSIBLE TO ADJUST SINGLE POINTS AND NETS. FOR SOLUTION OF NORMAL EQUATIONS USE A PROGRAM WITH MATRIX INVERSION.

154PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

51684D 67-97L.S. ADJUSTMENT DIRECTION CONDITION SU25

THE PROGRAM CALCULATES THE DIRECTION CONDITIONS FOR AN ADJUSTMENT OF OBSERVATION EQUATIONS WITH CONDITION EQUATION. YOU HAVE TO LEAD THE POINT COORDIATES ON DATA CARDS ONLY ONE TIME DATA INPUT. WITH THIS POINT AND THE GIVEN GRID BEARING CONDITIONS THE PROGRAM CALCULATES THE COEFFICIENTS. IN CONNECTION WITH SU 22/23/24/26 IT IS POSSIBLE TO ADJUST SINGLE POINTS AND NETS. FOR SOLUTION OF NORMAL EQUATIONS USE A PROGRAM WITH MATRIX INVERSION

136PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

51685D 67-97L.S. ADJUSTMENT/ERROR ELLIPSE & PEDAL CURVE SU26

THE PROGRAM CALCULATES ALL PARAMETERS OF ERROR ELLIPSE AND ELLIPSE PEDAL CURVE. YOU HAVE TO KNOW THE WEIGHT RECIPROCAL MATRIX OF ADJUSTMENT AND THE MEAN SQUARE ERROR OF UNIT WEIGHT. IT CALCULATES ALSO THE COORDINATES OF PEDAL CURVE IN ALL DIRECTIONS. IN CONECTION WITH SU 22/23/24/25 IT IS POSSIBLE TO ADJUST SINGLE POINTS AND NETS.

191PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

51686D 97-IMPLICIT CURVE TRACING

THIS PACKAGE CONTAINS TWO PROGRAMS WHICH ARE BOTH DESIGNED TO MAKE THE PLOTTING OF FUNCTIONS OF THE TYPE F(X,Y)=0 EASIER. A SUBROUTINE WHICH CALCULATES F(X,Y) AND ITS BOTH PARTIAL DERIVATIVES IS NEEDED. THE PROGRAMS CALCULATE APPROXIMATELY EQUALLY SPACED POINTS ON THE CURVE BY THE METHOD OF STEEPEST DESCENT. THE FIRST PROGRAM HAS 129 STEPS AND THE SIMPLIFIED SECOND PROGRAM 62 STEPS.

062PROGRAM STEPS
KIM KARLIN
FL-TURKU.

51687D 97-LIQUIDUS TEMPERATURES OF SODA LIME-ALUMINA-SILICA GLASSES

CALCULATES THE LIQUIDUS TEMPERATURE AND VISCOSITY AT THAT TEMPERATURE FROM THE COMPOSITION FOR GLASSES COMPRISING SODA, LIME, ALUMINA AND SILICA. COMPOSITIONS MUST BE EXPRESSED AS MOLAR PERCENTAGES (WT. PERCENT COMPOSITIONS MAY BE CONVERTED BY 50439D). IT IS ALSO NECESSARY TO DECIDE WHETHER THE GLASS LIES IN THE TRIDYMITE, DEVITRITE OR WOLLASTONITE PRIMARY PHASE FIELD : A DIAGRAM FOR DOING THIS IS SUPPLIED.

51687D (CONTD)

223PROGRAM STEPS
MICHAEL CABLE
GB-SHEFFIELD.

51688D 97-STANDARDIZATION OF GLASS-ELECTRODES

1. STANDARDIZATION OF COMBINED GLASS ELECTRODES WITH STANDARD BUFFER SOLUTIONS (NBS, IN GERMANY DIN 19266) BY THE LEAST SQUARES METHOD.
2. CALCULATION OF CORRECTED PH VALUES.

200PROGRAM STEPS
HERMANN A. CSUVALA
A-VIENNA.

51689D 97-MORTGAGE REPAYMENTS PLUS TAX RELIEF

THIS PROGRAM COMPUTES (1) THE YEARLY REPAYMENTS (2) THE INTEREST CHARGED ON THE MONEY BORROWED (3) THE CAPITAL REPAYMENT FOR THE YEAR (4) THE TAX RELIEF ALLOWED BY THE INLAND REVENUE. THIS PROGRAM IS SUITABLE FOR THE U.K. ONLY, BUT IT CAN BE MODIFIED FOR OTHER COUNTRIES WHERE MORTGAGES MAY BE OBTAINED FROM BUILDING SOCIETIES.

090PROGRAM STEPS
BRINLEY MORGAN
GB-FOLKESTONE.

51690D 67-INVERSE OF A 4X4 MATRIX

THIS PROGRAM CALCULATES THE INVERSE OF A 4X4 MATRIX. THE MATRIX SOLUTIONS ARE STORED IN THE REGISTERS R5 TO R20 AND CAN BE DIRECTLY USED IN THE PROGRAM 50963D

216PROGRAM STEPS
ALAIN CHAPPUIS
CH-LAUSANNE.

51691D 67-COLOURCODE FOR CARBON-DUST RESISTANCES

THIS PROGRAM CALCULATES THE VALUE IN OHMS OF A CARBON RESISTANCE, ACCORDING THE COLOUR CODE GIVEN IN DIN 41429

047PROGRAM STEPS
JAN VUERINCKX
B-AARSCHOT.

51692D 97-CALENDAR WITH TIMES OF SUNRISE, SUNSET AND TWILIGHT

THE PROGRAM CALCULATES AND PRINTS A CALENDAR WITH DAILY TIMES OF THE BEGIN OF TWILIGHT, SUNRISE, MERIDIAN TRAVERSAL, SUNSET AND THE END OF TWILIGHT. INPUT DATA ARE LATITUDE AND LONGITUDE OF OBSERVER, TIME ZONE, DATE OF FIRST AND OF LAST PRINTOUT. AN AUXILIARY PROGRAM AND COEFFICIENTS NEEDED FOR THE CALCULATION ARE ON SEPARATE MAGNETIC CARD. THIS PROGRAM IS USEFUL FOR PLANING OUTDOOR ACTIVITIES (E.G. AIRPORT).

296PROGRAM STEPS
GUENTER SCHNELL
D-LILIENTHAL.

51693D 97-ROOTS OF POLYNOMINAL DEGREE 3 TO 5 BY QD-ALG. AND NEWTON

THE PROGRAM FINDS ALL REAL ROOTS OF A POLYNOMINAL OF DEGREFE 3,4 OR 5, USING TWO METHODS. CRUDE APPROXIMATIONS ARE OBTAINED BY THE QD ALGORITHM (IF THE QD SCHEME EXISTS) AND THEN USED AS STARTING VALUES FOR NEWTON'S METHOD. IN AUTOMATIC MODE, BOTH METHODS ARE LINKED.

216PROGRAM STEPS
GUENTER SCHNELL

51693D (CONTD)

D-LILIENTHAL.

51694D 97-ANNUITIES AND COMPOUND AMOUNTS

NEW PROGRAM APPLIES RECENTLY PUBLISHED DISCOUNTED CASH FLOW CALCULATION TECHNIQUES TO IMPROVE SD-05A PROGRAM FOR INTEREST RATE CALCULATIONS. NEW PROGRAM IS SIGNIFICANTLY SHORTER - USES LESS STORAGE REGISTERS (TWO LESS) - CALCULATES INTEREST RATE IN 9 SECONDS VS. 19 SECS MIN. WITH EXISTING PROGRAM - CAN SOLVE PROBLEMS NOT SOLVABLE WITH EXISTING PROGRAM AND IS MORE CERTAIN TO CONVERGE.

196PROGRAM STEPS
NORMAN H. WILD
GB-LONDON..

51695D 97-DISPERSION OF MICROSTRIP EFFECTIVE DIELECTRIC CONSTANT

ON MICROSTRIP LINES NO TEM-WAVES ARE PROPAGATING. THEREFORE THE EFFECTIVE DIELECTRIC CONSTANT DEPENDS ON FREQUENCY. THE PROGRAM CALCULATES THIS DEPENDENCE AND THE RATIO MICROSTRIP WAVELENGTH/FREE SPACE WAVELENGTH AT A GIVEN FREQUENCY AND GIVEN GEOMETRY : STRIPWIDTH W, HEIGHT H OF SUBSTRATE AND RELATIVE DIELECTRIC CONSTANT. CONDUCTOR THICKNESS IS ASSUMED TO BE ZERO AND THE DISTANCE D OF UPPER SHIELDING GREATER THAN 8XH. ADDITIONAL THE PROGRAM CALCULATES THE CHARACTERISTIC IMPEDANCE Z PHI IN OHM.

167PROGRAM STEPS
WALTER SCHUMACHER
D-PFINZTAL.

51696D 67-DIVISION OF 80 FIG. NUMBERS

THIS PROGRAM IS DEDICATED TO R. BROECKX FOR HIS INGENIOUS METHODS TO HANDLE LARGE NUMBERS.
PROGRAM EXECUTES DIVISION BY TWO 80-FIG NUMBERS. THE QUOTIENT CAN BE COMPUTED UP TO 80 FIG AND THEN IT TAKES 9 MIN.

223PROGRAM STEPS
KENT A WIGSTROEM
S-FLODA.

51697D 97-COMBICARD

COMBICARD IS A PROGAM FOR COMBINING THE DATA IN THE PRIMARY REGISTERS OF TWO CARDS. THE CONTENTS OF EACH REGISTER IS ADDED TO, SUBTRACTED FROM, MULTIPLIED BY OR DIVIDED BY THE CONTENTS OF THE CORRESPONDING REGISTER OF THE OTHER CARD. (16 REGISTERS, INCLUSIVE OF I). A SPARE CARD IS NEEDED TO HOLD INTERMEDIATE DATA.

155PROGRAM STEPS
ARTHUR MORTON
GB-KENDAL.

51698D 67-GREATEST COMMON DIVISOR, LEAST COMMON MULTIPLE, PRIME

THIS PROGRAM COMPUTES THE GREATEST COMMON DIVISOR AND THE LEAST COMMON MULTIPLE OF MAXIMAL 22 INTEGERS. IT ALSO CAN EXAMINE WHETHER AN INTEGER IS A PRIME OR NOT.

134PROGRAM STEPS
JUERGEN GLOGER
D-NAGOLD.

51699D 67-DIRECTIONAL SURVEY CALCULATIONS AVERAGE ANGLE METHOD

PROGRAM COMPUTES DIRECTIONAL DRILLING SURVEYS USING THE AVERAGE ANGLE METHOD. SURVEY STATION DATA, INPUT AND COMPUTED, CAN BE SAVED ON A DATA CARD FOR USE IN THE NEXT SURVEY CALCULATION. COURSE LENGTH,

51699D (CONTD)

TVD, COORDINATES, SECTION AND DOGLEG ARE COMPUTED FOR EACH SURVEY
OPTIONS COMPUTE DISTANCE, DIRECTION AND ANGLE TO TARGET FROM SURVEY; COORDINATES OF A PROJECTION FROM SURVEY TO TARGET TVD AND ITS DISTANCE AND DIRECTION FROM TARGET; TVD, COORDINATES AND SECTION OF ANY MEASURED DEPTH.

220PROGRAM STEPS
JACK COURTNEY
U.A.E.-DUBAI.

51700D 67-BEAMS SINGLE SPAN, SHEARS AND MOMENTS

THIS PROGRAM CALCULATES SHEARS AND MOMENTS AND THE DISTANCE OF THE MAXIMUM SPAN MOMENT FROM THE LEFT SUPPORT FOR COMBINED LOADING OF POINT LOADS AND MULTIPLE TRAPEZOIDAL LOADS, WHICH MUST NOT EXCEED THREE FOR EACH TYPE OF LOADING. SUPPORT MOMENTS, IF ANY, MUST BE KNOWN BEFOREHAND.

712PROGRAM STEPS
AGHA MUNIR SHERWANI
U.A.E.-SHARJAH.

51701D 67-BASE TRANSFORMATION ALSO FOR FRACTIONAL NUMBERS

PROGRAM CONVERTS A NUMBER (ALSO FRACTIONAL) IN DECIMAL-SYSTEM TO A NUMBER WITH GIVEN BASE AND VICE-VERSA. BASE LESS THAN 100.

185PROGRAM STEPS
HEIKO BEHRENDS
D-BREMEN.

51702D 67-CYCLIC PATTERNS

WITH THIS PROGRAM AND A FEW SHEETS OF GRAPH PAPER MANY DESIGNS CAN BE PRODUCED WITH A MINIMUM OF EXPERIENCE. ELLIPSES, CYCLOIDS, SPIRALS AND LISSAJOUS' FIGURES ARE AVAILABLE; SINCE THE ANGULAR RESOLUTION IS SELECTABLE. STRAIGHT EDGED VARIANTS OF THE FIGURES MAY BE DRAWN. ALL FIGURES MAY BE ENLARGED, ROTATED AND OFFSET; RECTANGULAR/POLAR AND MANUAL/AUTO OPERATING MODES MAY BE SPECIFIED.

175PROGRAM STEPS
D.T. RANSOM
GB-CHISLEHURST.

51703D 67-FOOL-PROFF BASE CONVERSION

PROGRAM CONVERTS WHOLE NUMBERS, FRACTIONS OR A COMBINATION OF BOTH (MIXED NUMBERS) FROM ANY BASE (POSITIVE INTEGER VALUE FROM 2 TO 99 INCLUSIVE) TO BASE 10 AND VICE-VERSA. PROGRAM PROVIDES A CHECK ON THE VALIDITY OF THE ENTERED DATA (UNREALISTIC AND OUT OF RANGE DATA ARE REJECTED), BEFORE THE SELECTED CONVERSION IS EXECUTED.

210PROGRAM STEPS
ERNST E. SIE
D-EMMENDINGEN.

51704D 97-PERPENDICULAR FROM A POINT TO A CLOTHOIDE

THE PROGRAM ALLOWS TO DROP A PERPENDICULAR FROM A POINT TO A CLOTHOIDE IN EVERY SYSTEM OF COORDINATES.

166PROGRAM STEPS
HANSPETER BERNET
CH-BERNE.

51705D 67-DISPLACEMENT BY DRAFT SURVEY

THIS PROGRAM PERFORMS THE STANDARD DRAFT SURVEY REQUIRED TO ESTABLISH THE DISPLACEMENT OF ANY SHIP CALI-

51705D (CONTD)

BRATED IN IMPERIAL UNITS : VARIABLES BEING THE DRAFTS AND TRIM OF THE SHIP, WATER DENSITY AND THE APPROPRIATE HYDROSTATIC DATA AT THE CORRECTED MEAN DRAFT.

224PROGRAM STEPS
TONY TUCKER
GB-DARTMOUTH.

51706D 67-SIMULTANEOUS DIFF. EQUATIONS RUNGE-KUTTA FIFTH ORDER METHOD

THIS PROGRAM SOLVES A SYSTEM OF TWO SIMULTANEOUS FIRST ORDER DIFFERENTIAL EQUATIONS BY A FIFTH ORDER SIX STAGE RUNGE-KUTTA BUTCHER METHOD, PERMITTING GREATER STEPLENGTH AND/OR HIGHER ACCURACY THAN THE USUAL FOURTH ORDER METHOD. THE PROGRAM MAY ALSO BE USED FOR SOLVING SECOND ORDER DIFFERENTIAL EQUATIONS.

147PROGRAM STEPS
HENRIQUE ADLER
P-PORTO.

51707D 67-FIRST ORDER DIFF. EQUATIONS RUNGE-KUTTA FIFTH ORDER METHOD

THIS PROGRAM SOLVES FIRST ORDER DIFFERENTIAL EQUATIONS BY A FIFTH ORDER SIX-STAGE RUNGE-KUTTA-BUTCHER METHOD, PERMITTING GREATER STEP-LENGTH AND/OR HIGHER ACCURACY THAN THE USUAL FOURTH ORDER METHOD.

110PROGRAM STEPS
HENRIQUE ADLER
P-PORTO.

51708D 67-SECOND ORDER DIFF. EQUATIONS RUNGE-KUTTA FIFTH ORDER METHOD

THIS PROGRAM SOLVES SECOND ORDER DIFFERENTIAL EQUATIONS BY A FIFTH ORDER SIX-STAGE RUNGE-KUTTA-BUTCHER METHOD, PERMITTING GREATER STEP-LENGTH AND/OR HIGHER ACCURACY THAN THE USUAL FOURTH ORDER METHOD.

138PROGRAM STEPS
HENRIQUE ADLER
P-PORTO.

51709D 97-COLLAR BEAM ROOF PART 1 KEHLBALKENDACH

THIS PROGRAM CALCULATES BENDING MOMENTS BEARING FORCES AND NORMAL FORCES USING THREE LOAD CASES :
1) LINEAR LOAD AT THE WHOLE ROOF.
2) LINEAR LOAD AT THE LEFT SIDE.
3) LINEAR LOAD AT THE RIGHT SIDE OF THE ROOF.
THIS PROGRAM AND DATA ARE INTERCHANGEABLE WITH THE PROGRAMS COLLAR BEAM ROOF PART 2 AND 3.

224PROGRAM STEPS
GEORG RAABE
D-WOLFSBURG.

51710D 97-COLLAR BEAM ROOF PART 2 KEHLBALKENDACH

THIS PROGRAM CALCULATES BENDING MOMENTS BEARING FORCES AND NORMAL FORCES USING 4 LOAD CASES :
1) LINEAR LOAD AT THE LOWER PART OF THE ROOF.
2) LINEAR LOAD AT THE COLLAR BEAM.
3) POINT LOAD AT THE LEFT HANDSIDE.
4) POINT LOAD AT THE RIGHT HANDSIDE
THIS PROGRAM AND DATA ARE INTERCHANGEABLE WITH THE PROGRAMS COLLAR BEAM ROOF PART 1 AND 3.

217PROGRAM STEPS
GEORG RAABE
D-WOLFSBURG.

51711D 97-COLLAR BEAM ROOF PART 3 KEHLBALKENDACH

THIS PROGRAM CALCULATES BENDING MOMENTS BEARING FORCES AND NORMAL

51711D (CONTD)

FORCES USING TWO LOAD CASES :
1) WIND LOAD AT THE LEFT SIDE,
2) WIND LOAD AT THE RIGHT SIDE.
THIS PROGRAM AND THE DATA ARE INTERCHANGEABLE WITH THE PROGRAMS COLLAR BEAM ROOF PART 1 AND 2.

223PROGRAM STEPS
GEORG RAABE
D-WOLFSBURG.

51712D 67-ALPHA TO MORSE ENCODER

THIS PROGRAM ENCODES THE 26 LETTERS OF THE ALPHABET INTO THEIR EQUIVALENT IN MORSE CODE. PROGRAM IS EXPLICITLY TABI ,TAKING A MAXIMUM OF 8 SECONDS TO ENCODE A LETTER INTO MORSE CODE.

223PROGRAM STEPS
ANDREW HERRON
GB-LONDON.

51713D 67-BIORHYTHMS AND COINCIDENCES

CALCULATES THE THREE DATES OF THE PHYSICAL (23 DAYS), SENSITIVITY (28 DAYS), AND COGNITIVE (33 DAYS) CYCLES BETWEEN 1ST MARCH, 1900 AND FEBRUARY 28TH, 2100. THE COINCIDENCE OF ANY TWO OF THE THREE CYCLES AT ONE OF FOUR POINTS, E.G. MAXIMUM, MINIMUM, AND PASSING ZERO, MAY ALSO BE CALCULATED.

221PROGRAM STEPS
JOHN DUNDERDALE
GB-GRIMSBY.

51714D 67-HARMONIC ANALYSIS FOR PULSES

PROGRAM AUTOMATES THE FOURIER EQUATION, THAT MEANS IT COMPUTES THE AMPLITUDE OF ANY HARMONIC FROM THE SUM OF ALL SINE AND COSINE SUMS AS WELL AS THE PHASE ANGLE TOO.

088PROGRAM STEPS
WALTER BICAN
A-VIENNA.

51715D 97-ROMBERG INTEGRATION

THIS PROGRAM EVALUATES THE INTEGRAL OF A FUNCTION EXPLICITLY KNOWN USING THE TRAPEZOIDAL RULE AND THE ROMBERG ALGORITHM. THE PROGRAM STOPS AS SOON AS THE DESIRED ACCURACY HAS BEEN ACHIEVED (PROVIDED THE INTEGRAND HAS CONTINUOUS DERIVATIVES)

097PROGRAM STEPS
GUENTER SCHNELL
D-LILIENTHAL.

51716D 67-PHOTOMACROGRAPHY 35MM OR 6X6 CAMERA

THIS PROGRAM CALCULATES FRAME PHOTOMACROGRAPHY PROBLEM WITH YOUR 6X6 OR 24X36 CAMERA. YOUR HP67 CALCULATES ALL NECESSARY INFORMATIONS: SPEED AND APERTURE FOR DEPTH OF FIELD INPUT, PHOTOMACROGRAPHY WITH CLOSE UP LENS AND EXTENSION LENGTH, DISTANCE SUBJECT-OBJECTIF.

189PROGRAM STEPS
JEAN REIBEL
F-FONTENAY-AUX-ROSES.

51717D 67-ELLIPTIC LP-FILTERS, EVEN ORDER TYPE C. POLES AND ZEROS.

ELLIPTIC LP-FILTERS OF TYPE C HAVE A ZERO OF TRANSMISSION AT INFINITY. THE GAIN AT F=0 IS EQUAL TO ONE. PROGRAM 50476D ELLIPTIC LOW-PASS FILTERS. POLES AND ZEROS. PART 1 AND 51113D ELLIPTIC LP-FILTERS. N EVEN : POLES AND ZEROS PART 1 ARE USED. TO OBTAIN A SPECIFIED STEEPNESS, THE HYPOTHETICAL STEEPNESS, KC' MUST BE CALCULATED, PROGRAM

51717D (CONTD)

50961D. THE MAXIMUM ORDER IS 8.

119PROGRAM STEPS
NILS HAAHEIM
N-TRONDHEIM.

51718D 97-OVEN DRIED MOISTURE CONTENT

TO CALCULATE THE OVEN DRIED MOISTURE CONTENT (PERCENTAGE OF DRY WEIGHT) OF SOIL SAMPLES, ARITHMETIC MEAN AND RANGE OR STANDARD DEVIATION OF THE ACCUMULATED RESULTS.

076PROGRAM STEPS
ALLEN PARKER
GB-WINTNEY.

51719D 97-BATCH HEAT TRANSFER. MEDIA CHANGING PHASE.

FOR A BATCH OF LIQUID HEATED OR COOLED BY A TH-MEDIA CHANGING PHASE PROGRAM CALCULATES ANY OF THE FOLLOWING : HT-SURFACE, HT-COEFF., BATCH TEMP., OR TIME FOR PROCESS, GIVEN THE OTHERS. PROGRAM ALSO CALCULATES A SET OF DATA POINTS FOR PROCESS. OUPUTS ARE : TIME, BATCH TEMP., RATE OF HT, FLOW OF MEDIA. SPC. HEAT AND TH-COEFF. MAY BE CHANGED DURING CALCULATION.

177PROGRAM STEPS
OVE VILSTRUP
DK-SONDERBORG.

51720D 97-BATCH HEAT TRANSFER. MEDIA CONSTANT FLOW.

FOR A BATCH OF LIQUID HEATED OR COOLED BY A HT-MEDIA HAVING CONSTANT FLOW, PROGRAM CALCULATES ANY OF THE FOLLOWING : HT-SURFACE, HT-COEFF., BATCH TEMP., OR TIME FOR PROCESS, GIVEN THE OTHERS. PROGRAM ALSO CALCULATES A SET OF DATA POINTS FOR PROCESS. OUTPUTS ARE : TIME, BATCH TEMP., RATE OF HT, OUTLET TEMP. OF MEDIA. SPC. HEAT AND HT-COEFF. MAY BE CHANGED DURING CALCULATION.

207PROGRAM STEPS
OVE VILSTRUP
DK-SONDERBORG.

51721D 97-BATCH HEAT TRANSFER. DELTA T MEDIA CONSTANT.

FOR A BATCH OF LIQUID HEATED OR COOLED BY A HT-MEDIA HAVING CONSTANT INLET AND OUTLET TEMPERATURES, PROGRAM CALCULATES ANY OF THE FOLLOWING : HT-SURFACE, HT-COEFF., BATCH TEMP., OR TIME FOR PROCESS, GIVEN THE OTHERS. PROGRAM ALSO CALCULATES A SET OF DATA POINTS FOR MEDIA. SPC. HEAT AND HT-COEFF. MAY BE CHANGED DURING CALCULATION.

222PROGRAM STEPS
OVE VILSTRUP
DK-SONDERBORG.

51722D 67-WEIR HYDRAULIK COMPUTATIONS CASE : FREE OVERFALL

THE PROGRAM COMPUTES ALL MISSING PARAMETERS OF A FREE OVERFALL WEIR.

150PROGRAM STEPS
GABRIEL MONCAYO
D-FRANKFURT.

51723D 67-HYDRAULIK-PARAMETERS IN IRREGULAR RIVER CROSS SECTIONS

THE PROGRAM COMPUTES : AREA, WETED PERIMETER, HYDRAULIK RADIUS R; R**2/3; A.R**2/3 FOR SURVEYED CROSS SECTIONS IN NATURAL CHANNELS, FOR 9 ELEVATIONS IN ONE RUN! ALSO GOOD FOR VERY IRREGULAR RIVER CHANNEL.

224PROGRAM STEPS

51723D (CONTD)

GABRIEL MONCAYO
D-FRANKFURT.

51724D 67-ERRORS ON F'(A)

F'(A) IS APPROXIMATED WITH THE MID-POINT RULE, WITH AND WITHOUT THE RICHARDSON CONNECTION. PROGRAM ALSO SHOWS THE TRUNCATION AND ROUNDING OFF ERRORS AND THE BEST VALUE OF DELTA A. THE NEXT PROGRAM "THE FIRST 5 DIFF. QUOTIENTS" GIVES YOU THE VALUES OF THE THIRD AND FIFTH DIFF. QUOTIENT THAT YOU NEED AT THIS ERROR COMPUTATION.

198PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51725D 67-THE FIRST FIVE DIFFERENTIAL QUOTIENTS

THE VALUE OF F'(A) IS THE BEST AND THE VALUE OF THE FIFTH DIFFERENTIAL QUOTIENT IS GOOD ENOUGH TO SERVE THE FORMER PROGRAM : "ERRORS ON F'(A)".

210PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51726D 67-ERRORS ON INTEGRATION

THIS PROGRAM INTEGRATES WITH ONE OR MORE DOUBLE "SIMPSON STEPS". THERE ARE TWO POSSIBILITIES :
A) YOU WILL NOT KNOW THE ERROR YOU MADE UNTILL THE COMPUTATIONS ARE OVER
B) YOU KEY IN THE REQUIRED ACCURACY ON THE FOREHAND AND THE PROGRAM WILL CHOOSE THE NUMBER AND THE VARIABLE WIDTH OF THE INTEGRATION STEPS. ACCURACY CAN REACH 10 -8.

161PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51727D 67-PHOTO DARKROOM : SOLUTION CONCENTR. & WEIGHT CONVERSIONS 1

TWO PROGRAMS FOR DARKROOM HOBBYIST MIXING CHEMICALS :
1) CONVERTS ANY ONE OF PERCENT CONCENTRATION, GRAMS/LITER, GRAINS/FL. OUNCE, OUNCES/QUART OR GALLON INTO ANY OR ALL OF THE OTHERS;
2) INTERCONVERTS GRAMS, GRAINS, AVOIRD. OUNCES, MILLILITERS AND FLUID OUNCES. OPTION OF US AND IMPERIAL BRITISH LIQUID MEASURE WITH BOTH PROGRAMS. USES DATA CARD IN ADDITION TO PROGRAM CARD

210PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

51728D 67-PHOTO DARKROOM: SOLUTION CONCENTRATION & WEIGHT CONVERSIONS 2

TWO PROGRAMS FOR PHOTO DARKROOM WORKER MIXING CHEMICALS :
1) CONVERTS ANY ONE OF PERCENT CONCENTRATION, GRAMS/LITER, GRAINS/FL. OUNCE, OUNCES/QUART OR GALLON INTO ANY OR ALL OF THE OTHERS;
2) INTERCONVERTS GRAMS OR MILLILITERS, GRAINS, MINIMS, AVOIRD. AND FLUID OUNCES. SIMILAR TO SOLUTION CONCENTRATIONS AND WEIGHT CONVERSIONS PROGRAM 1, BUT FOR US LIQUID MEASURE ONLY (OR BRITISH IMPERIAL LIQUID MEASURE ONLY) AND WITHOUT SEPARATE DATA CARD.

221PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

51729D 67-PHOTO DARKROOM : SOLUTION CONCENTRATION CONVERSIONS 3

51729D (CONTD)

TWO PROGRAMS FOR DARKROOM HOBBYIST MIXING CHEMICALS: 1) INTERCONVERTS PERCENTAGE CONCENTRATION, GRAMS/LITER, GRAINS/FL. OUNCE AND OUNCES/QUART, WITH OPTION OF US OR BRITISH IMPERIAL LIQUID MEASURE EQUIVALENTS 2) CALCULATES PARAMETERS OF PERCENTAGE CONCENTRATION CHANGES (INITIAL AND FINAL CONCENTRATION, AMOUNT OF WATER NEEDED FOR DILUTION, ETC.). SIMILAR TO SOLUTION CONCENTRATION & WEIGHT CONVERSION PROGRAM 1, BUT WITH PERCENTAGE CHANGES IN PLACE OF WEIGHTS. NEEDS NO DATA CARD.

192PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

51730D 67-CAMERA LENS ANGLES OF VIEW & RELATED PARAMETERS

PROGRAM CALCULATES CAMERA ANGLES OF VIEW, FOCAL LENGTH OF LENS, IMAGE FORMATS, OBJECT FIELDS AND OBJECT DISTANCES FROM VARIOUS COMBINATIONS OF THESE PARAMETERS. WHERE TWO IMAGE FORMAT DIMENSIONS ARE INPUT (WIDTH AND HEIGHT), THREE ANGLE OF VIEW OUTPUTS (HORIZONTAL, VERTICAL, DIAGONAL) ARE OBTAINED, OR TWO OBJECT FIELD OUTPUTS, AND VICE-VERSA. FOCAL LENGTH AND IMAGE FORMAT MAY BE INPUT AND OUTPUT IN MM OR INCHES, OBJECT DISTANCE AND SIZE IN METRES.

222PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

51731D 67-FRACTION ARITHMETIC WITH 4 FUNCTIONS & STACK MANIPULATION

THIS MODIFIED VERSION OF PROGRAM 50006D PERMITS FOUR-FUNCTION ARITHMETIC (ADDITION, SUBTRACTION, MULTIPLICATION, DIVISION) WITH FRACTIONS AND IN ADDITION PROVIDES TWO POSSIBILITIES OF STACK MANIPULATION : A1/B1 INTERCHANGE AN/BN, AND 1/X (RECIPROCAL) OF A1/B1. ALSO PROVIDED IS A PRINT-OUT OPTION, AND A "LAST X" TYPE RECALL OF LAST FRACTION ENTERED.

162PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

51732D 67-DESTROY THE ENEMY-ROCKET

YOU ARE THE COMMANDER OF A BASE ON AN ISLAND. FROM A HOSTILE SUBMARINE WHICH IS SOMEWHERE ON THE SEA, A ROCKET WITH AN ATOMIC WAR-HEAD IS RELEASED AIMING TO THE BASE. THE COORDINATES X AND Y OF THE SUBMARINE ARE DETERMINATED BY A SEED AND A RANDOM-NUMBER-GENERATOR. THE HOSTILE ROCKET MUST BE DESTROYED WITH THE HELP OF DEFENCE-ROCKETS.

220PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51733D 67-BINOMIAL PROBABILITY DISTRIBUTION

GIVEN THE NUMBER OF SUCCESSES N, OBSERVED IN N TRIALS, AND THE PARAMETER OF THIS BINOMIAL POPULATION, THIS PROGRAM COMPUTES THE BINOMIAL PROBABILITY DISTRIBUTION.

057PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51734D 67-RADIATION FORMULA OF PLANCK

PROGRAM COMPUTES THE EMISSIVE POWER OF THE BLACK BODY WHEN IS GIVEN TAU AND LAMBDA, AND SUCCESSIVELY THIS POWER FOR DIFFERENT DELTA TAU TO MAKE A SKETCH.

51734D (CONTD)

104PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51735D 67-PROOF THE SPECIAL RELATIVITY

WITH THIS PROGRAM YOU CAN PROOF THE SPECIAL RELATIVITY. GIVEN TWO SYSTEMS CONCOIDE IN A RELATIVE MOTION ALONG THE COMMON X-AXIS, SUCH THAT AT T=0, THEIR ORIGINS FALL TOGETHER AND AN EVENT E IN BOTH SYSTEMS, YOU CAN COMPUTE A LENGTH FROM THE TWO SYSTEMS AND THEN COMPUTE THE % CHANGE OF THE REFRACTION.

096PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51736D 67-SPECIAL RELATIVITY I

GIVEN THE VELOCITY-VECTOR V AND THE ANGLES THETA AND PHI WITH THE Y AND Z AXIS IN A XYZ-SYSTEM, THIS PROGRAM COMPUTES THE VALUE OF V IN A SYSTEM S' THAT IS IN A RELATIVE MOTION ALONG THE COMMON X-AXIS, FROM SYSTEM S.

108PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51737D 67-DETERMINANT OF A "VIERSCHAAR"

PROGRAM COMPUTES THE DETERMINANT OF THE SO CALLED "VIERSCHAAR" IN THE PROBLEM OF THE GEODETIC PRECISION WHEN IS GIVEN THE DISTANCE R AND THE VALUE OF M.

106PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51738D 67-PRIME-NUMBER DISTRIBUTION

BECAUSE AN EXACT FORMULA TO COMPUTE THE NUMBER OF PRIMES BETWEEN 1 AND INFINITY DO NOT EXIST, THIS PROGRAM FINDS THIS NUMBER AND AFTER THAT THE PRIME-NUMBER DISTRIBUTION.

046PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51739D 67-FAST PRIME DISTRIBUTION

THERE IS NO FORMULA TO COMPUTE EXACTLY THE NUMBER OF PRIMES BETWEEN AN INTERVAL 1 AND INFINITY. THIS PROGRAM COMPUTES THIS NUMBER AND THE PRIME NUMBER DISTRIBUTION VERY FAST.

109PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51740D 67-DOUBLE E-DISTRIBUTION

PROGRAM COMPUTES THE SUM OF THE DIFFERENCES BETWEEN THE TWO BASIC LIMITS OF E IN THE INTERVAL 1 AND X TO INFINITY.
N! IS NOT LIMITED TO 69.

043PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51741D 67-EULERS'C-DISTRIBUTION

AFTER SOME MODIFICATIONS, THE C OF EULER CAN BE AN ELEMENT OF A DISTRIBUTION. THIS PROGRAM COMPUTES THIS DISTRIBUTION, OR POINT BY POINT, OR DIRECTLY FOR A X VALLE.

055PROGRAM STEPS
JOHN VAN THIELEN_
B-STABROEK.

51742D 67-KIND OF A CONIC

PROGRAM EXAMINES THE GENERAL EQUATION OF THE SECCND DEGREE. AX2+BXY+CY2+DX+EY+F=0, AND FINDS THE KIND OF THE CONIC (HYPERBOLEAN, PARABOLEAN, ELLIPTIC, CIRCLE OR LINES) WITH A CODE.
TO ELEMINATE THE EXPRESSION IN XY, THE CURVE MAKES A ROTATION PHI.

155PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51743D 67-GEOMETRIC DETERMINANT

PROGRAM COMPUTES A 3X3 DETERMINANT. AFTER THE INPUT OF THE NINE ELEMENTS YOU MUST SET IN A 5 DIGIT CODE TO COMPUTE SIN, COS OR TAN OF THE ELEMENTS AND THEN YOU CAN COMPUTE THE DETERMINANT.

102PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51744D 67-WIMBLEDON

HP PLAYS A TENNISGAME AND YOU CAN FOLLOW IT, SET BY SET, GAME BY GAME. SOMETIMES A REAL TENNISTRILLER

216PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51745D 67-FIBONACCI-DISTRIBUTION

PROGRAM COMPUTES A FIBONACCI-NUMBER DISTRIBUTION FOR A GIVEN X OR DIRECTLY, OR POINT BY POINT

053PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51746D 67-DIFFERENTIAL EQUATIONS-I

PROGRAM SOLVES A FIRST ORDER DIFFERENTIAL EQUATION WITH THE "THREE OVER EIGHT" RUNGE-KUTTA FORMULA

088PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51747D 67-DIFFERENTIAL EQUATION 2

PROGRAM SOLVES A DIFFERENTIAL EQUATION OF THE FIRST ORDER WITH THE FORMULA OF GILL.

110PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51748D 67-DIFFERENTIAL EQUATIONS 3

PROGRAM SOLVES A FIRST ORDER DIFFERENTIAL EQUATION WITH THE SIXTH-DEGREE FORMULA OF RUNGE-KUTTA SOME MODIFICATIONS ARE MADE TO RECEIVE A GREATER ACCURACY

252PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51749D 67-BASICALLY STEPPING

THIS PROGRAM COMPRISES SEVEN ARRANGEMENTS OF THE "BASIC" LANGUAGE VERSION OF THE REPEAT - UNTIL PROGRAMMING STRUCTURE. IN ITS MOST GENERAL FORM THE STATEMENT IS DESCRIBED BY "FOR I=A TO B STEP C, MODE D". THE ARRANGEMENTS VARY IN COMPLEXITY AND ARE INTENDED TO BE USED AS A LIBRARY SET FOR PROGRAM DEVELOPMENT.

139PROGRAM STEPS
D.T. RANSOM
GB-CHISLEHURST.

51750D 67-STACK EXPANSION

THIS PROGRAM EXPANDS THE STACK OF YOUR HP ON UP TO 22 LEVELS. FOUR ARITHMETICAL CALCULATIONS ARE POSSIBLE ("PLUS", "MINUS", "MULTIPLY", "DIVIDE"). THIS EXPANDED STACK WORKS LIKE THE USUAL STACK OF YOUR HP BUT HAS MORE LEVELS FOR MORE COMPLICATED CALCULATIONS. THE FUNCTIONS "PRINT STACK" AND "CLEAR STACK" ARE AVAILABLE. ALSO LAST X IS AVAILABLE IN REGISTER R0.

089PROGRAM STEPS
MARTIN LANDUA
D-FRANKFURT.

51751D 67-DISPLAY ROUNDING SUBROUTINE

THIS SUBROUTINE THAT HAS ONLY 12 STEPS MAY BE USED WITHIN LONGER PROGRAMS. IT ROUNDS THE DISPLAY BY USING DSP (I) TO DISPLAY THE EXACT NUMBER OF DECIMALS THAT ARE NECESSARY TO SHOW THE WHOLE NUMBER. THE DISPLAY DOES NOT HAVE ANY TRAILING ZEROS THEN. THE SUBROUTINE USES THE COMPLETE STACK AND THE REGISTER R1 AND ONE LABEL. IF THE NUMBER CONTAINS OF 9 DECIMALS THE PROGRAM RUNS 5 SEC.

012PROGRAM STEPS
MARTIN LANDUA
D-FRANKFURT.

51752D 97-REGRESSION LINE FOR GROUPED OR WEIGHTED DATA

THIS PROGRAM COMPUTES FOR 2 VARIABLES : THE MEANS, STANDARD DEVIATION, COVARIANCE, SLOPE OF THE REGRESSION LINE Y ON X, COEFFICIENT OF CORRELATION, RESIDUAL STANDARD DEVIATION OF THE ESTIMATE AND POINT ON THE REGRESSION LINE. INPUT ARE GROUPED DATA XI,YI,FK=FREQUENCY (INTEGER) AND/OR WEIGHTED, FI=WEIGHT (REAL). FOR GROUPED DATA OPERATION IS FASTER THAN FOR ST1-01 ESPECIALLY FOR GREATER FREQUENCIES. SOME FEATURES OF ST1-01 HAVE BEEN ABANDONED.

185PROGRAM STEPS
CHRISTIAN HOFFMANN
CH-8IRMENSDORF.

51753D 97-RESOURCE ALLOCATION

PROGRAM CALCULATES ALLOCATION, PROPORTIONAL AND AMOUNT, BETWEEN UP TO TEN PARTICIPANTS. NO LIMIT ON THE NUMBER OF PARAMETERS. USER CHOSEN POWER FUNCTIONS ARE APPLIED TO THE PARAMETERS AND USER CHOSEN RELATIVE WEIGHTS ASSIGNED TO THEM. PARTICIPANT WEIGHTS MAY ALSO BE USED.

221PROGRAM STEPS
FERNANDO SADEK
INDONESIA-JAKARTA.

51754D 67-PERMUTATIONS OF ARBITRARY NUMBERS

GIVEN N ARBITARY NUMBERS, 2<=N<=10, THIS PROGRAM DISPLAYS THE PERMUTATIONS.
SPEED : N=4 IN 4 MIN. 8 SEC.
N=5 IN 24 MIN. 56 SEC.

123PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51755D 67-"HORNER" SCHEME

PROGRAM IS BASED UPON HORNER SCHEMA YOU CAN SOLVE POLYNOMS AND TRANSFORM A NUMBER OF ANY SYSTEM (FOR EXAMPLE : DUAL-SYSTEM) IN EQUIVALENT NUMBER OF DECIMAL SYSTEM.

049PROGRAM STEPS

51755D (CONTD)

PETER SCHUTZ
D-KARLSRUHE.

51756D 67-HERITABILITY (GENETIC)

PROGRAM SHOWS PORTION OF GENETIC AND ENVIRONMENT IN MARKS LIKE INTELLIGENCE, TALLEST, WEIGH, SUCCESS IN SCHOOL.

142PROGRAM STEPS
PETER SCHUETZ
D-KARLSRUHE.

51757D 67-LENGTH CONVERSIONS AND SPEED TIME AND DISTANCE

THIS PROGRAM CONVERTS BETWEEN VARIOUS MEASURES OF LENGTH, METERS, FEET, FATHOMS, NAUTICAL MILES AND STATUTE MILES, IT ALSO FINDS A VALUE FOR SPEED, TIME OR DISTANCE WHEN THE OTHER TWO ARE SPECIFIED. THE VARIABLE TIME MAY BE EXPRESSED AS H.MS OR H.H.

097PROGRAM STEPS
GILLES SAUVAGNAT
F-BRON.

51758D 67-ACCELERATION DUE TO GRAVITY

GIVEN GEOGRAPHICAL LATITUDE AND HEIGHT ABOVE SEA LEVEL, THIS PROGRAM FIND ACCELERATION DUE TO GRAVITY, WITH AN ACCURACY OF AT LEAST 10**-3 METRES PER SQUARE SECOND. HEIGHT MAY BE GIVEN IN METRES OR FEET, AND GRAVITY IN METRES OF FEET PER SQUARE SECOND.

080PROGRAM STEPS
BJORN ENGSIG
DK-ALLEROD.

51759D 67-CURVE FITTING ANY CURVE

THIS PROGRAM FITS DATA POINTS (X,Y) TO A CURVE, THAT CAN BE DESCRIBED BY ONE OF THE FORMS : Y=A*X+B, Y=A*F(X)+B, G(Y)=A*X+B OR G(Y)=A*F(X)+B THE FUNCTIONS F AND G MUST BE KNOWN IF THEIR OPPOSITE ARE KNOWN TOO, IT IS POSSIBLE TO CALCULATE X FROM Y AND VICE VERSA.

124PROGRAM STEPS
ENGSIG BJORN
DK-ALLEROD.

51760D 67-CALCULATOR EXTENSION HYPERBOLICS ETC.

THIS PROGRAM REALLY EXTENDS CALCULATOR CAPABILITIES, WITHOUT LOOSING ANY COMFORT. EVERY FUNCTION INCORPORATED WORKS EXACTLY LIKE THE BUILD-IN FUNCTIONS; FOR STACK, LAST X AND ERROR-DISPLAY. (THE ERROR-DISPLAY IS CONTROLLED IE. IT DOES NOT OCCUR AS A RESULT OF A WRONG ARGUMENT FOR A BUILD-IN FUNCTION).

224PROGRAM STEPS
BJORN ENGSIG
DK-ALLEROD.

51761D 67-NMR-ABX-SPIN SYSTEM ANALYSIS

PROGRAM COMPUTES WITH THE THICE FOUR RESONANCE POSITIONS WHICH FORM THE AB-PART OF A ABX-NMR-SPIN SYSTEM CHEMICAL SHIFTS OF THE NUCLEUS A AND B, COUPLING CONSTANTS AMONG THEMSELVES AND WITH NUCLEUS X IN TWO SOLUTIONS.
IF THE WHOLE X-PART IN THE EXPERIMENTAL SPECTRUM IS VISIBLE, YOU CAN DIFFER BETWEEN SOLUTION 1 AND 2

146PROGRAM STEPS
WOLFGANG KRAPP
D-NEUSTADT.

51762D 67-NUMBER CONVERSION FROM ONE NUMBER SYSTEM INTO ANOTHER

51762D (CONTD)

THIS PROGRAM IS CHARACTERIZED BY ITS ABILITY TO CONVERT NUMBERS OF ANY SYSTEM (WITH BASE LIKE 10 OR BELOW) INTO ANY OTHER SYSTEM (SAME REQUIREMENTS) MERELY BY KEYING IN THE NUMBER AND THE BASES FOR INPUT SYSTEM AND OUTPUT SYSTEM.

112PROGRAM STEPS
LASSE KAISER
DK-NAERUM.

51763D 97-DESTROY THE SUBMARINES

THE CALCULATOR OR YOUR OPPONENT POSITIONS 9 SUBMARINES IN A 10X10X 10 GRID. YOUR TASK IS TO DESTROY THESE SUBMARINES WITH BOMBS, 9 TORPEDOES AND 1 AREA BOMB. THE CALCULATOR TELLS YOU THE QUALITY OF YOUR SHOOT (DIFFERENT POINTS FOR NEAR, VERY NEAR, NEARLY HIT, HIT FOR EACH SUBMARINE), MOVES THE MISSED SUBMARINES TO A NEW POSITION AND DESTROYS THE HIT SUBMARINES.

298PROGRAM STEPS
ROLAND SPEICHER
D-BECKINGEN.

51764D 67-MENSTRUATION FORECAST AND CONTRACEPTIVE

AFTER THE INPUT OF THE LAST TEN MENSTRUATION DATES VIA DATA CARD GIVES THE PROGRAM THE MOVING AVERAGE OF MONTH CYCLES AND A FORECAST TO THE NEXT EXPECTED DATES. WHEN A FUTURE DATE IS GIVEN IN, THE PROGRAM SHOWS SIGNALS MARKING THE CONCEPTION POSSIBILITY.

216PROGRAM STEPS
HEINZ DANZER
A-WIEN.

51765D 67-SPECIALLY DISTRIBUTED RANDOM NUMBERS

THE PROGRAM GIVES EQUAL-DISTRIBUTED RANDOM NUMBERS, OPTIONALLY TRANSFORMED IN ANY LIMITS, FURTHERMORE RANDOM NUMBERS IN BINOMIAL, POISSON WEIBULL AND NORMAL DISTRIBUTION, THE LAST NAMED OPTIONALLY DESTANDARDIZED. THE EQUAL DISTRIBUTED RANDOM NUMBERS CAN BE TESTED FOR RANDOMNESS.

217PROGRAM STEPS
HEINZ DANZER
A-WIEN.

51766D 67-SUPERSONIC FLIGHT SIMULATOR

THE PROGRAM PERMITS TO FLY A SUPERSONIC PLANE WITH A MAXIMUM SPEED OF MACH 5. THE MOST IMPORTANT PARAMETERS ARE INFLUENCING YOUR FLIGHT, AND YOUR REACTION ABILITY IN EVERY FLIGHT SITUATION IS DETERMINING A HAPPY LANDING.

170PROGRAM STEPS
HEINZ DANZER
A-WIEN.

51767D 67-CHUCK-A-LUCK

THIS PROGRAM SIMULATES A THROW OF THREE DICES. YOU MUST BET ON A NUMBER (1 TO 6). AT EACH TIME YOUR NUMBER APPEARS, YOU GET THE VALUE OF YOUR BET. IF IT DOESN'T APPEAR, YOUR MONEY IS LOST.

086PROGRAM STEPS
JEAN-PIERRE FAISAN
F-PARIS.

51768D 97-FINDING THE AMOUNT OF CIPHERS IN A GIVEN NUMBER

THE PROGRAM FINDS THE AMOUNT OF CIPHERS (FROM 0 TO 9) IN 4 GIVEN NUMBERS WITH UP TO 10 DIGITS EACH.

51768D (CONTD)

THE RESULTS OF THE PASSAGES CAN BE ADDED, SO A GREATER NUMBER OF CIPHERS CAN BE EXAMINED.

074PROGRAM STEPS
CHRISTIAN LINSMEIER
D-BALDHAM.

51769D 67-CUT AND FILL CONTINUOUSLY.

THIS PROGRAM IS TO CALCULATE VOLUME AND PRICE OF DOWNS OR DITCHES USING PROFILES AND DISTANCES.

150PROGRAM STEPS
FRITZ MAREK
A-WIEN.

51770D 67-NUMERICAL PRESTIDIGITATION AND OTHER TRICKS

THIS ROUTINE SOLVES 3 KINDS OF DIFFERENT PROBLEMS WHICH NEVER INTERFERE BETWEEN ONE ANOTHER: 1) VARIOUS MAGIC NUMERICAL TRICKS WHICH NEED, TO BE SUCCESSFUL, SOME RATHER LONG EXPLANATIONS (CHIEFLY PSYCHOLOGICAL), THAT YOU WILL HAVE TO FOLLOW SCRUPULOUSLY. 2) A SERIES OF PROBLEMS WHICH ARE EASILY SOLVED IN FUNCTION OF THE "TIME" ELAPSED, BUT WHICH THE CALCULATOR RESOLVES, WITH MUCH MORE DETAILS, ONLY IN FUNCTION OF "SPACE". 3) ANY DIVISION WHEN THE QUOTIENT CAN BE REQUIRED WITH ANY NUMBER OF DECIMALS.

224PROGRAM STEPS
DENYS WILQUIN
F-NICE.

51771D 67-EXPONENTIAL INTEGRAL & RELATED FUNCTIONS IN COMPLEX VAR.

THIS PROGRAM GIVES IN COMPLEX VARIABLE, THE FOLLOWING FUNCTIONS.
EI, E1, EM EXPONENTIAL INTEGRAL FUNCTIONS
LI LOGARITHM INTEGRAL
CI COSINUS INTEGRAL
SI SINUS INTEGRAL
CHI HYPERBOLIC COSINUS INTEGRAL
SHI HYPERBOLIC SINUS INTEGRAL.

221PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

51772D 67-TEXAS SIMULATOR

THIS PROGRAM SIMULATES A TEXAS CALCULATOR WITH OPERATIONS OF DIFFERENT PRIORITIES.I.E. 2+3*5 IS THE SAME AS 2+(3*5) BECAUSE MULTIPLICATION IS AN HIGHER PRIORITY OPERATION THAN ADDITION AND 10 REGISTERS SO YOU CAN LEND YOUR CALCULATOR TO SOME COLLEAGUE WHO HAS FORGOTTEN HIS CALCULATOR AND WHO DOES NOT ADMIT THAT POLNISH NOTATION IS THE BEST ONE.

190PROGRAM STEPS
PHILIPPE LEMAIRE
B-CHENEE.

51773D 67-DATAMATCH 200 A DATA IDENTIFICATION PROGRAM

THIS PROGRAM PERMITS THE STORAGE LOCATIONS OF A SPECIFIC POSITIVE INTEGER DATUM IN A DATAFLEX 210 ARRAY TO BE IDENTIFIED. A MAXIMUM OF 200 DATA CAN BE LOCATED ON ONE PASS. AFTER LOADING THE DATUM TO BE MATCHED, A SEARCH MAY PROCEED ON A DATUM ROW COLUMN OR ARRAY BASIS. DURING A SEARCH, VALID LOCATIONS ARE FLASHED USING A ROW COLUMN CODE DATAFLEX 210 (51511D) IS A COMPANION PROGRAM PROVIDING STORE AND RECALL FACILITIES.

161PROGRAM STEPS
D.T. RANSOM
GB-CHISLEHURST.

51774D 67-FIXED-ENDS BEAMS SUPPORT MOMENTS

THIS PROGRAM CALCULATES SUPPORT MOMENTS FOR POINT LOADS, UNIFORMLY DISTRIBUTED LOAD ON PART SPAN, AND FOR TRIANGULAR LOAD ON PART SPAN. BY USING THE PRINCIPLE OF SUPERPOSITION COMPLICATED BEAMS WITH MULTIPLE POINT LOADS AND COMBINED DISTRIBUTED LOADS OF UNIFORM OR VARYING INTENSITY MAY BE ANALYZED.

214PROGRAM STEPS
AGHA MUNIR SHERWANI
U.A.E.-SHARJAH.

51775D 67-SURVEILLANCE OF CAR OIL CONSUMPTION

WHEN YOU MAKE FUEL IN YOUR CAR, YOU ENTER NUMBER OF KM (OR MILES) OF YOUR CAR COUNTER, YOU ENTER THE VOLUME AND THE PRICE OF FUEL. THE PROGRAM GIVES YOU THE AVERAGE CONSUMPTION SINCE THE LAST TIME YOU HAVE SUPPLIED FUEL, THE AVERAGE CONSUMPTION OF THE FOUR LAST TIMES AND THE GENERAL AVERAGE. THEN THE AVERAGE COST OF KM (OR MILES) IS CALCULATED. THE 2ND SIDE OF CARD STORES THE NEW DATAS WHICH WILL BE USED THE TIME AFTER.

109PROGRAM STEPS
ALI AMRAOUI
MOROCCO-CASABLANCA.

51776D 67-PARABOLA TANGENT AT TWO GIVEN LINES IN TWO GIVEN POINTS

THIS PROGRAM DETERMINES THE COEFF. OF EQUATION OF PARABOLA TANGENT AT TWO LINES IN TWO GIVEN POINTS AND MAKES HP READY TO CONTINUE WITH PROGRAM NO 50680D. THE GIVEN POINT COULD BE ENTERED OPTIONALLY BY ITS PONCTUAL COORDINATES OR COEFFICIENT OF LINES.

183PROGRAM STEPS
ALI AMRAOUI
MOROCCO-CASABLANCA.

51777D 67-DIFFERENTIAL EQUATIONS III

THIS PROGRAM SOLVES A FIRST ORDER DIFFERENTIAL EQUATION WITH THE SIXTH-DEGREE FORMULA OF RUNGE-KUTTA SOME MODIFICATIONS ARE MADE TO RECEIVE A GREATER ACCURACY.

372PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51778D 67-DIFFERENTIAL EQUATIONS 4

IF YOU MIX THE SYSTEMS OF LAGRANGE, EULER AND RUNGE-KUTTA, YOU HAVE THE JOHNNY-SYSTEM.
THIS PROGRAM USES THE JOHNNY-SYSTEM TO SOLVE EVERY ORDINARY DIFFERENTIAL EQUATION OF THE FIRST DEGREE. THE JOHNNY-SYSTEM CAN BE OF THE N.TH ORDER AND N CAN BE EVERY POSITIVE INTEGER.
SO FAR AS I KNOW, SUCH SYSTEM IN NUMERICAL ANALYSIS DOES NOT EXIST.

057PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51779D 67-RELATIONSHIP BETWEEN TORQUE BHP AND BMEP

GIVEN R.P.M. AND DISPLACEMENT OF A 4 STROKE ENGINE AND ONE OF : TORQUE BHP AND BMEP. THE PROGRAM WILL SOLVE FOR THE REMAINDER. IF DISPLACEMENT ENTERED IN THE FORM OF BORE/STROKE/NO OF CYLINDERS, THE PROGRAM WILL IN ADDITION PROVIDE : PISTON AREA, BHP PER SQUARE INCH OF PISTON AREA AND PISTON SPEED.

183PROGRAM STEPS
WILLIAM STEELE
GB-FROME SOMERSET.

51780D 97-MONTH-CALENDAR-COMPUTATION

THIS PROGRAM GENERATES A CALENDAR FOR A MONTH, GIVEN THE MONTH AND THE YEAR IN THE FORM MM,YYYY.

206PROGRAM STEPS
ADALBERT LINDMEIER
D-STRAUBING.

51781D 67-SUM OF SERIES AND LIMIT OF RECURRENT SEQUENCES.

THIS PROGRAM COMPUTES THE LIMIT OF A CONVERGENT RECURRENT SEQUENCE DEFINED BY : U(N+1)=F(U(N)). IT ALSO COMPUTES THE SUM S=U(1)+...+U(N)+.. OF A SERIES WHERE U(N)=G(N). F AND G ARE TWO FUNCTIONS OF N PROGRAMMED BY THE USER. THE PRECISION OF THE RESULTS CAN BE SELECTED BY THE USER AT THE BEGINNING OF THE COMPUTATION FROM THE KEYBOARD.

040PROGRAM STEPS
GEORGES GALLE
F-CALUIRE.

51782D 67-TEMPERATURE VARIATIONS THROUGH A RADIATING SLAB

WE CONSIDER AN ISOTROPIC SOLID BOUNDED BY 2 PARALLEL PLANES WHICH EMIT BLACK BODY RADIATION. IF F(X) IS THE INITIAL TEMPERATURE, THE LINEAR DIFFERENTIAL EQUATION OF CONDUCTION OF HEAT CAN BE SOLVED BY THE FINITE - DIFFERENCE METHOD. THE SPATIAL AND TEMPORAL VALUES OF TEMPERATURE IN A SLAB OF THICKNESS L AND DIFFUSIVITY K CAN BE CALCULATED WITH GOOD APPROXIMATION BY USING A MESH SIZE DELTA X=L/N, DELTA T=L2/2N2K. N INTEGER <= 20.

085PROGRAM STEPS
RENE BAILLY-SALINS
F-IS-SUR-TILLE.

51783D 67-PEACH

PEACH IS A GAME OF 3 DIES. EACH PLAYER (UP TO 5) HAS THREE CHANCES. 4 MEANS A PEACH. YOU MAY KEEP THE PEACH AND PLAY WITH 2 DIES. STILL A 1 AND YOU HAVE ALREADY PEACH WITH 1,2,3,4,5 OR EVEN 6. YOU MAY KEEP THE 4 AND 1 AND TRY WITH ONE DIE. IF YOU REALISE 1,1,1, YOU ARE DIRECTLY THE WINNER OF THE GAME. NO CHEAT POSSIBLE.

222PROGRAM STEPS
JEAN SCHANNES
L-BETTEMBOURG.

51784D 67-4 COMPLEX NUMBER OP STACK 19 OPS INC SINH COSH TANH

PROGRAM ESTABLISHES 4 HIGH COMPLEX STACK FOR RPN CALCULATIONS WITH Z1 DISPLAYED. 20 LABELS AND R/S SELECT ENTER. MEMORY STO/RCL, EXCH., ROLL UP/DN,+,-,Z/Z,Z*Z,Z**Z,Z**1/N, N ROOTS, CHS, 1/Z, LN, EXP., SINH, COSH, TANH, REPEAT DISPLAY. FOR EASY RECOGNITION * SIX NUMERICAL LABELS HAVE FUNCTIONS ANALOGOUS TO THEIR KEYBOARD EQUIVALENTS. INTERNAL ROUTINES FOR AUTO STACK RISE AND FALL. (*HP-67 ONLY).

223PROGRAM STEPS
SIDNEY WALLACE ECKETT
GB-BUCKHURST HILL.

51785D 67-SOLUTION OF MATHIEU'S EQUATION PART 2 MATHIEU FUNCTIONS.

THIS PROGRAM, USED IN SEQUENCE WITH PROGRAM PART 1 OF MATHIEU'S EQUATION SOLUTION COMPUTES FOR THE SELECTED FUNCTION CE2N, CE2N+1, SE2N+1 SE2N+2 AND THE FIVE VALUES OF PARAMETER Q=0 THE CONSIDERED FUNCTION FOR ANY VALUE OF X. IT GIVES THE SUCCESSIVE FOURIER COEFFICIENTS OF ITS DEVELOPMENT AND THE NUMBER OF THEM USED IN COMPU-

51785D (CONTD)

TING.

139PROGRAM STEPS
ROPARS FRANCOIS
F-FRANCONVILLE.

51786D 67-SOLUTION OF MATHIEU'S EQUATION PART 1 EIGENVALUES OF C.E.

PROGRAM SOLVES THE CHARACTERISTIC EQUATION P=F(P,Q) OF MATHIEU'S EQUATION Y"+(P-2Q COS 2X)Y=0. IN THE FOUR CASES OF FUNCTIONS CE2N; CE2N+1;SE2N+1;SE2N+2. FOR A GIVEN FUNCTION, A GIVEN N>=0, YOU CAN SOLVES FIVE VALUES OF Q=0 AND FOR EACH OF THEM OBTAIN THE SOLUTION P, THE NORMALIZATION CONSTANT KO AND THE SET OF FOURIER'S COEFFICIENTS UNTIL THEY ARE VALID.

224PROGRAM STEPS
FRANCOIS ROPARS
F-FRANCONVILLE.

51787D 67-CALENDAR ETA

THE PROGRAM COMPUTES DAY, DATE, MONTH, YEAR AND TIME OF ARRIVAL IN A LIST. INPUT IS ZONE TIME DEPARTURE AND ARRIVAL, YEAR, MONTH AND DATE, DISTANCE SPEED, DEPARTURE TIME. IF DISTANCE IS IN REGISTER 4 FROM PREVIOUS PROGRAM IN FORM D/60 DISTANCE INPUT MAY BE OMITED.

170PROGRAM STEPS
KLAUS NYE-KNUDSEN
DK-KASTRUP.

51788D 67-ASTRO I MC ASC

INPUT LOCAL SIDERAL TIME, LATITUDE GEOGRAPHIQUE
A = YOU RECEIVE MC
RS = YOU RECEIVE ASC
THIS CARD SERVES AFTER WITHOUT OTHER INTRODUCTION FOR ASTRO II AND ASTRO III.
ASTRO II HOUSES CAMPANUS
ASTRO III HOUSES REGIOMONTANUS

146PROGRAM STEPS
JACQUES SUQUET
F-BANYULS/MER.

51789D 67-ASTRO 2 HOUSES REGIOMONTANUS

AFTER UTILISATION OF ASTRO I
ASTRO II GIVES WITHOUT INTRODUCTION OF DATA.
A = HOUSE XI REGIO
RS = HOUSE XII REGIO
RS = HOUSE II REGIO
RS = HOUSE III REGIO

147PROGRAM STEPS
JACQUES SUQUET
F-BANYULS/MER.

51790D 67-ASTRO 3 HOUSES CAMPANUS

AFTER UTILISATION OF ASTRO I OR ASTRO II
ASTRO 3 GIVE WITHOUT INTRODUCTION OF DATA.
A = HOUSE XI CAMPANUS
RS = HOUSE XII CAMPANUS
RS = HOUSE II CAMPANUS
RS = HOUSE III CAMPANUS

155PROGRAM STEPS
JACQUES SUQUET
F-BANYULS/MER.

51791D 67-ASTRO 4 TSL MC

INPUT ASCENDANT, LATITUDE GEOGRAPHIQUE
A YOU RECEIVE LOCAL SIDERAL TIME
RS YOU RECEIVE LOCAL MC TIME

097PROGRAM STEPS
JACQUES SUQUET
F-BANYULS/MER.

51792D 67-SINGLE UNDERTENSIONED BEAM

THIS PROGRAM COMPUTES THE JAMB FORCE, THE TENSILE FORCES IN BOTH TENSION CABLES AND THE SUPPORT MOMENT OVER THE JAMB.
GIVEN : DISTRIBUTED LOADS, TRIANGULAR LOADS, SINGLE LOADS, INERTIA MOMENT OF THE UPPER STRAB AND THE AREA OF THE TENSION CABLE.

223PROGRAM STEPS
HANSJUERG GYSIN
CH-STANS.

51793D 67-STUDY ON A FUNCTION

THE DUTCH ATHENEUM STUDENT IS SUPPOSED TO KNOW A) WHERE F(X) IS POSITIVE, NEGATIVE OR ZERO, B) WHERE F'(X) IS POSITIVE, NEGATIVE OR ZERO C) THE MAXIMUM AND MINIMUM OF F(X), D) THE LINEAR ASYMPTOTICS OF F(X) AND E) THE POINTS OF INFLECTION.
IF NOT : THIS PROGRAM CAN DO IT FOR HIM.

993PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

51794D 97-RENEWAL DYNAMICS OF A POPULATION

THE STATISTICAL EXPECTATION VALUE OF THE NUMBER OF OFFSPRING DEPENDS ON 1) THE NUMBER OF THE PRESENT LIVING GENERATION AND ITS DISTRIBUTION OVER AGE, 2) THE LEVEL AND DISTRIBUTION OVER AGE OF ITS STATISTICAL FERTILITY. (A POPULATION MAY ALSO BE E.G. AN ACCUMULATION OF CARS, MACHINES, TOOLS OR OTHER INSTRUMENTS THAT ARE TO BE REPLACED AFTER WORN OUT.) THE SUBMITTED PROGRAM DOES THE CALCULATION WORK ITERATIVELY

132PROGRAM STEPS
JOHANNES PETERS
D-DEISENHOFEN.

51795D 67-SPIRAL OF ARCHIMEDES

AFTER THE INPUT OF K AND PHI OF THE FUNCTION TAU=K PHI (THE SPIRAL OF ARCHIMEDES) THIS PROGRAM COMPUTES :
1) THE DERRIVATE IN THE POINT (PHI, TAU)
2) THE CURVATURE R IN THAT POINT
3) THE ARC LENGTH OF THE CURVE BETWEEN PHI 1 AND PHI 2

083PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51796D 67-TANGENT LINE AND RADIUS

GIVEN ANY FUNCTION Y=F(X), THIS PROGRAM COMPUTES :
A) THE LENGTH OF THE TANGENT LINE T IN A POINT X=A
B) THE RADIUS R IN THAT POINT WITH THE X-AXIS
YOU CAN ALSO COMPUTE Y'S FOR GIVEN X'S TO MAKE A SKETCH.

049PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51797D 67-AIR-PRESSURES AT VARIOUS ALTITUDES

GIVEN THE ALTITUDE IN METERS, THIS PROGRAM COMPUTES THE AIR-PRESSURE IN MM HG.

078PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51798D 67-JACOBI SYMBOL

THE JACOBI SYMBOL (A/B) IS COMPUTED FOR ANY POSITIVE INTEGER A AND ANY ODD POSITIVE INTEGER B BY MEANS OF A MODIFIED EISENSTEIN ALGORITHM.
REFERENCE : P. BACHMANN, DIE

51798D (CONTD)

ELEMENTE DER ZAHLENTHEORIE, TEUBNER VERLAG, LEIPZIG, 1892.

205PROGRAM STEPS
J.E. MEBIUS
NL-BERKEL RODENRYS.

51799D 67-GAUSSIAN QUADRATURE

PROGRAM COMPUTES FINITE OR INFINITE QUADRATURES BY GAUSS (GAUSS-LEGEND, GAUSS-LAGUERRE, GAUSS-HERMITE) METHOD. YOU CAN ELECT THE NUMBER OF USED FUNCTIONVALUES OF THE INTEGRAND BY READING IN DIFFERENT COEFFICIENT CARDS. AVAILABLE ARE : NUMBER K:=2 STEP 2 UNTIL 20 FOR GAUSS-LEGEND, K:=16 AND 20 FOR GAUSS-HERMITE AND K:=9 AND 10 FOR GAUSS-LAGUERRE.

100PROGRAM STEPS
BERND ROTHMAIER
D-DURMERSHEIM.

51800D 67-FOURIER COEFFICIENTS

USING A SPECIAL TRANSFORMATION OF THE INTEGRAND, IT IS POSSIBLE TO USE THE GAUSS-LEGEND INTEGRATION METHOD ALSO FOR HIGH FREQUENCES COEFFICIENTS. THE PROGRAM CAN USE ONE SYMMETRY OF THE PERIODIC FUNCTION F(X) WHICH IS DEFINED FOR (X) <= T/2 WITH THE PERIOD T. THIS METHOD RESULTS HIGH ACCURACY AND EASY CONTROL.

201PROGRAM STEPS
BERND ROTHMAIER
D-DURMERSHEIM.

51801D 67-DIGIT STORE

THIS PROGRAM ANALYSES, EACH LOADED INTEGER, TO DIGITS AND STORES THEIR NUMBER TO SERATE REGISTERS. ALSO KEEPS DOWN MULTITUDE OF LOADED NUMBERS, THE TOTAL OF THEM AND THE TOTAL OF STORED PIECES OF DIGITS. IT IS ALSO POSSIBLE TO POSE LIMITS, OUT OF WHICH, INSERTED NUMBERS ARE REJECTED.

112PROGRAM STEPS
JIMMY PLATONIS
GR-ATHENS.

51802D 67-CURVE FITTING BY A POLYNOMIAL OF DEGREE 3

FOR EITHER 67 OR 97 USE, THIS PROGRAM FITS A SET OF DATAPOINTS TO A POLYNOMIAL OF DEGREE 3, IN THE LEAST SQUARES SENSE. PROJECTIONS OF KNOWN X VALUES, BASED ON THE CURVE FIT, CAN BE MADE. PRINTOUT OF ALL INPUT AND COMPUTED VALUES CAN BE MADE (HP-97) BY USING THE OPTIONAL PRINT MODE. DATAPAIRS CAN BE ADDED OR/AND DELETED AT ANY TIME.

224PROGRAM STEPS
LARS STENMARK
S-STOCKHOLM.

51803D 67-CURVE FITTING BY A POLYNOMAL OF DEGREE 4

FOR EITHER 67 OR 97 USE THIS PROGRAM FITS A SET OF DATAPOINTS TO A POLYNOMIAL OF DEGREE 4 IN THE LEAST SQUARES SENSE. PROJECTION OF KNOWN X VALUES BASED ON THE CURVE FIT CAN BE MADE. PRINTOUT OF ALL INPUT AND COMPUTED VALUES CAN BE MADE (HP-97) BY USING THE OPTIONAL PRINT MODE. CARD # 2 IS AUTOMATICALLY LOADED AND EXECUTED.

331PROGRAM STEPS
LARS STENMARK
S-STOCKHOLM.

51804D 67-LINEAR TEMPERATURE-DEPENDENCE/THERMOMETER

TEMPERATURE DEPENDENCE OF VARIOUS PHYSICAL PARAMETERS MAY OFTEN BE DESCRIBED BY A LINEAR EXPRESSION OF THE FORM R2=R1*(1+TC*T2)/(1+TC*T1). THE PROGRAM SOLVES THIS EQUATION FOR EVERY OCCURING VARIABLE IF THE OTHER FOUR ARE ENTERED. FURTHER : TWO ROUTINES FOR FIXED TEMPERATURES OF 0 AND 20 DEGREES, AND TWO ROUTINES DEALING WITH TOLERANCES.

189PROGRAM STEPS
SCHWERI LEO
CH-SPREITENBACH.

51805D 67-ANOVA/BARTLETT-TEST/NALIMOV-TEST

THE PROGRAM COMBINES ONE-WAY ANALYSIS OF VARIANCE, OUTLIER-TEST ACCORDING TO NALIMOV AND BARTLETT-TEST. FOR THE GROUPS IS DETERMINES MEAN, STANDARD DEVIATION, EXTREME VALUES AND RANGE. THE PROGRAM INCLUDES A PRINTING ROUTINE FOR HP 97 TOO.

223PROGRAM STEPS
MANFRED SCHEFFGE
D-WEINHEIM.

51806D 67-TELEPHONE COST TIMER FOR ALL GERMAN GEBUEHRENEINHEITEN

THIS IS A SPECIAL TELEPHONE TIMER FOR GERMAN GEBUEHRENEINHEITEN. PROGRAM GIVES THE REST TIME YOU CAN SPEAK FOR THE SHOWN PRICE. AFTER STOP, YOU CAN GET ALSO THE TIME YOU HAVE SPOKEN AND THE NUMBER OF GEBUEHRENEINHEITEN.

165PROGRAM STEPS
ARMIN WEIGHT
D-SCHWERTE.

51807D 97-MONTHLY BUDGET CONTROL

MONTHLY EXPENDITURE AGAINST EACH OF A MAXIMUM OF 20 ACCOUNTS IS ACCUMULATED AND A YEAR END FORCAST (LINEAR EXTRAPOLATION) MADE AND COMPARED WITH BUDGET. THERE IS ALSO THE FACILITY TO SPREAD OVERHEAD EXPENDITURE ACROSS ALL ACCOUNTS IN PROPORTION TO THEIR SIZE.

220PROGRAM STEPS
DOUGLAS F RUSHMAN
GB-HULL.

51808D 67-EQUALLY-SPACED AND CHEBYSHEV INTERPOLATION

THE PROGRAM EVALUATES THE INTERPOLATING POLYNOMIAL OF DEGREE LESS THAN OR EQUAL TO N-1 THAT PASSES THROUGH N GIVEN POINTS (XK,YK), BY THE "BARYCENTRIC FORMULA" OF RUTISHAUSER. N MUST BE LESS THAN OR EQUAL TO 20. THE VALUES OF XK MUST BE EITHER EQUALLY-SPACED (XK=X0+K*H), OR CHEBYSHEV, I.E. XK=R+S*COS(PI*(K-0.5)/N).

149PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

51809D 67-COMPLEX 3X3 : SYSTEM SOLUTION DETERMINANT

SOLUTION OF A 3X3 COMPLEX SYSTEM BY CRAMER METHOD, 3X3 COMPLEX MATRIX DETERMINANT BY MINOR METHOD.

224PROGRAM STEPS
JEAN-PIERRE JALLET
B-BRUXELLES.

51810D 67-97-RESOLUTION OF ANY SYSTEM OF TWO EQUATIONS

THIS PROGRAM RESOLVES A SYSTEM OF TWO EQUATIONS; THESE EQUATIONS ARE NOT OBLIGATORY LINEAR. FOR INSTANCE WE CAN EASILY FIND WITH THIS PROGRAM THE INTERSECTION BETWEEN

51810D (CONTD)

TWO STRAIGHT, A STRAIGHT AND A CIRCLE, TWO CIRCLES, AN HYPERBOLA AND A CIRCLE ETC... THE ACCURACY IS GOOD IN A LOT OF CASES.

069PROGRAM STEPS
FRANCOIS BALSALOBRE
F-SAINT-ETIENNE.

51811D 67-FIELD MOMENTS AND SHEARFORCES IN A CONTINUOUS BEAM

THIS PROGRAM MAY BE REGARDED AS A SUPPLEMENT TO ANY CONTINUOUS-BEAM PROGRAM. GIVEN THE SUPPORT MOMENTS AND THE LOADING (DISTRIBUTED LOAD AND UP TO FIVE POINT LOADS FOR EACH SPAN), IT CALCULATES THE SHEAR FORCES, THE EXTREME FIELD MOMENT AND ITS LOCATION, THE MOMENTS AT ANY POINT OF INTEREST, AND THE LOCATIONS WHERE M=0

210PROGRAM STEPS
CLAUS M. LACHSELT
D-WITTEN-ANNEN.

51812D 67-ACCELERATION DUE TO EARTHS GRAVITY

PROGRAM COMPUTES THE ACCELERATION CAUSED BY THE EARTHS GRAVITY IN RELATION TO THE ALTITUDE ABOVE SURFACE.

057PROGRAM STEPS
DETLEF R. SCHMITT
D-OTTOBRUNN.

51813D 67-POLAR SOLUTIONS FOR 3 PHASE SYSTEMS

GIVEN LINE VOLTAGE AND LOADS IN RECTANGULAR FORM PROGRAM SOLVES FOR LINE/PHASE QUANTITIES OF VOLTAGE AND/OR CURRENT, PHASE POWERS AND TOTAL POWER IN ANY THREE PHASE SYSTEM, BALANCED OR UNBALANCED.

224PROGRAM STEPS
LAWRANCE B. HARTLEY
GB-BRIERFIELD.

51814D 67-SAG AND TENSION TABLE

THE PROGRAM COMPUTES THE "SAG AND TENSION TABLE" FOR WIRES OF OVERHEAD LINES. FROM A STATE OF WIRE DEFINED WITH HIS TEMPERATURE, HIS TENSION, AND HIS OVERLOADING COEFFICIENT, THE COMPUTER COMPUTES THE SAG AND THE TENSION FOR A SECOND STATE OF THE WIRE DEFINED WITH ANOTHER TEMPERATURE AND ANOTHER OVERLOADING COEFFICIENT.

220PROGRAM STEPS
JEAN-PIERRE ABRASSART
D-WALLDORF.

51815D 67-ALL ERROR FUNCTIONS IN COMPLEX VARIABLE

THIS PROGRAM GIVES, IN COMPLEX VARIABLE, THE FOLLOWING FUNCTIONS
ERF(Z)
ERFC(Z)
W(+-Z)
I**-1 ERFC(Z)
I**N ERFC(Z), N>=0.

224PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

51816D 67-FOURTH DEGREE POLYNOMIAL

PROGRAM CALCULATES THE REAL AND OR COMPLEX ROOTS OF 4TH DEGREE POLYNOMIAL WITHOUT ITERATION. PROGRAM CALCULATES ALSO REAL Y=F(X). POLYNOMIAL FORM: AX***4+BX**3+CX**2+DX+E=Y A=0. PROGRAM GIVES ALSO POSSIBILITY TO SOLVE 3RD DEGREE POLYNOMIAL IF E=0 AS X(AX**3+BX**2+CX+D)=Y. OR 2ND DEG. POLYNOMIAL IF E=D=0 AS X**2(AX**2+BX+C)=Y. OUT OF 4 ROOTS

51816D (CONTD)

ONE (OR TWO) IS ZERO. OTHERS ARE THE ROOTS OF EQUATION FROM THE BRACKETS. AUXILIARY Z-ROOT IS CALCULATED NORMALLY AND THEN ITERATED UP TO MAX. ACCURACY.

223PROGRAM STEPS
FRANC TOMSIC
YU-LJUBLJANA.

51817D 67-5X5 MATRIX INVERSION

THE PROGRAM USES GAUSS METHOD TO CONVERT ELEMENTS OF A 5X5 GENERAL MATRIX - STORED IN REG 00 TO 24 - INTO THOSE OF THE INVERSE MATRIX. IF MATRIX RANK IS NOT 5, A BLINKING SUBPROGRAM STOPS THE PROCESS.

224PROGRAM STEPS
GASTON MATTHYS
F-CHEVILLY-LARUE.

51818D 97-INFORMATION STORAGE AND RETRIEVAL SYSTEM

PERMITS THE STORING OF 1 TO 5 "CHARACTERISTICS" (CODED 01...99) FOR EACH OF UP TO 20 "ITEMS" (BOOKS, COLOR SLIDES, LETTER COPIES, ETC.) PER MAGNETIC CARD. SUBSEQUENT SEARCH, USING 1,2 OR 3 SPECIFIED CHARACTERISTICS, PRODUCES PRINT-OUT OF SEQUENTIAL NUMBERS OF "ITEMS" POSSESSING ANY OF THE SPECIFIED CHARACTERISTICS, TOGETHER WITH THE PERTINENT TWO-DIGIT CODE OF THE CHARACTERISTICS. AN UNLIMITED NUMBER OF CARDS MAY BE SEARCHED WITHOUT ANY ADDITIONAL INPUT.

179PROGRAM STEPS
WALTER OETTINGER
A-VIENNA.

51819D 67-IRISH INCOME TAX

PROGRAM CALCULATES PERSONAL INCOME TAX PAYABLE IN THE REPUBLIC OF IRELAND. USER INPUTS HIS INCOME; WIFE'S INCOME (IF ANY); MARITAL STATUS - SINGLE, MARRIED, WIDOWED; NUMBER OF CHILDREN; LIFE INSURANCE PREMIUMS; AGE; AND OTHER ALLOWANCES AS WRITTEN, IT IS BASED ON THE RATES AND ALLOWANCES FOR THE TAX YEAR 1978-'79, BUT IT CAN VERY EASILY BE MODIFIED.

220PROGRAM STEPS
RICHARD MC EVOY
IRELAND-DUBLIN.

51820D 67-METRIC THREAD ISO

THIS PROGRAM COMPUTES ALL STANDARDIZED DIMENSIONS OF A METRIC THREAD ISO.
YOU MAY INTRODUCE THE NOMINAL DIAMETER AND THE PITCH.

075PROGRAM STEPS
ALAIN CHAPPUIS
CH-LAUSANNE.

51821D 67-FOLLOW ME 2

THIS PROGRAM IS SIMILAR TO "FOLLOW ME SD-06A" IN THE STANDARD PAC, BUT YOU CAN INTRODUCE IN YOUR PROGRAM ANY HP 67 FUNCTION. THIS PROGRAM CAN NOT EASILY BE UTILIZED WITH HP-97.

421PROGRAM STEPS
ALAIN CHAPPUIS
CH-LAUSANNE.

51822D 67-SECOND-ORDER DIFF. EQUATIONS 5. ORDER WITH EMBEDDED 4. ORDER

THIS PROGRAM SOLVES SECOND-ORDER DIFFERENTIAL EQUATIONS BY A FIFTH-ORDER SIX-STAGE RUNGE-KUTTA-BUTCHER PROCESS FOR STEPLENGTH 2H AND EMBEDDED WITHIN THIS A FOURTH-ORDER FOUR-STAGE RUNGE-KUTTA FORMULA FOR

51822D (CONTD)

STEPLENGTH H. THUS, STARTING FROM XN, YN+1 IS CALCULATED VIA A FOURTH ORDER FORMULA AND YN+2 VIA A FIFTH-ORDER FORMULA WITH A TOTAL OF ONLY 6 STEPS. ON A PER-STEP BASIS ONLY THREE STAGES ARE REQUIRED AS COMPARED TO FOUR STAGE WITH ANY OTHER FOURTH-ORDER FORMULA.

165PROGRAM STEPS
HENRIQUE E. ADLER
P-PORTO.

51823D 67-SIMULTANEOUS DIFF. EQUATIONS 5. ORDER WITH EMBEDDED 4. ORDER

THIS PROGRAM SOLVES A SYSTEM OF TWO SIMULTANEOUS FIRST-ORDER DIFFERENTIAL EQUATIONS BY A FIFTH-ORDER SIX-STAGE RUNGE-KUTA-BUTCHER PROCESS FOR STEPLENGTH 2H AND EMBEDDED WITHIN THIS A FOURTH-ORDER FOUR-STAGE RUNGE-KUTTA FORMULA FOR STEPLENGTH H. THUS, STARTING FROM XN, YN+1 AND ZN+1 ARE CALCULATED VIA A FOURTH-ORDER FORMULA AND YN+2 AND ZN+2 VIA A FIFTH-ORDER FORMULA WITH A TOTAL OF ONLY 6 STEPS, AN ECONOMY OF ABOUT 25 PERCENT AS COMPARED TO ANY OTHER FOURTH-ORDER FORMULA.

173PROGRAM STEPS
HENRIQUE E. ADLER
P-PORTO.

51824D 67-FIRST-ORDER DIFF. EQUATIONS AUTO MATIC STEPLENGTH CONTROL

THIS PROGRAM SOLVES FIRST-ORDER DIFFERENTIAL EQUATIONS BY A FIFTH-ORDER SIX-STAGE SARAFYAN PROCESS AND EMBEDDED WITHIN THIS A FOURTH-ORDER FOUR-STAGE RUNGE-KUTTA FORMULA, BOTH FOR THE SAME STEPLENGTH. THUS, EVERY YN IS CALCULATED SIMULTANEOUSLY VIA A FOURTH-ORDER AND VIA A FIFTH-ORDER FORMULA. THE DIFFERENCE IS USED FOR AUTOMATIC VARIATION OF THE STEPLENGTH SO THAT ALL DISPLAYED FIGURES ARE EXACT. THE NUMBER OF DISPLAYED FIGURES CAN BE CHOSEN BY THE USER.

177PROGRAM STEPS
HENRIQUE E. ADLER
P-PORTO.

51825D 67-FIRST ORDER DIFF. EQUATIONS 5. ORDER WITH EMBEDDED 4. ORDER

THIS PROGRAM SOLVES FIRST-ORDER DIFFERENTIAL EQUATION BY A FIFTH ORDER SIX-STAGE RUNGE-KUTTA-BUTCHER PROCESS FOR 2H AND EMBEDDED WITHIN THIS A FOURTH-ORDER FOUR-STAGE RUNGE-KUTTA FORMULA FOR STEPLENGTH H. THUS STARTING FROM XN, YN+1 IS CALCULATED VIA A FOURTH-ORDER FORMULA AND YN+2 VIA A FIFTH-ORDER FORMULA WITH A TOTAL OF ONLY 6 STEPS. ON A PER-STEP BASIS ONLY THREE STAGES ARE REQUIRED AS COMPARED TO FOUR STAGES WITH ANY OTHER FOURTH-ORDER FORMULA.

129PROGRAM STEPS
HENRIQUE E. ADLER
P-PORTO.

51826D 67-RELATIVISTIC KINEMATICS II TWO PARTICLE SCATTERING

PROGRAM CONVERTS BEAM MOMENTUM IN THE LABORATORY FRAME TO THE CMS AND VICE VERSA, CALCULATES THE MANDELSTAM VARIABLE T AS A FUNCTION OF CMS ANGLE AND THE CMS ENERGY AND MOMENTUM GIVEN THE VALUE OF S AND THE PARTICLE MASSES SQUARED.

219PROGRAM STEPS
NEIL CRAIGIE
GB-LONG DITTON.

51827D 67-SKILL RACE

SKILL RACE IS A GAME TO TEST YOUR

51827D (CONTD)

FAST, RESISTING CAPACITY AND YOUR SKILL. YOU DRIVE A THREEGEARS CAR IN A TRACK WHERE 10 VEHICLES CAN DRIVE YOU GO UP, AND NINE VEHICLES GO DOWN. YOU MUST FIND THE PLACE WHERE YOU CAN PASS THROUGH AND SO YOU GET POINTS. TAKE CARE! COLLISIONS ARE FREQUENT! A TIMER AND A METER OF AMOUNT SPENT ARE ENCLUDED.

095PROGRAM STEPS
JEAN-PIERRE FAISAN
F-PARIS.

51828D 67-GENERAL RADAR EQUATION (FREE-SPACE)

GIVEN 10 OF 11 PARAMETERS VARIABLES THE PROGRAM WILL CALCULATE THE UNKNOWN VARIABLE USING AN INTERCHANGEABLE SOLUTION PROCEDURE WHICH TAKES ADVANTAGE OF THE KEYBOARD SENSING FLAG 3. THE RADAR EQUATION DOES NOT SPECIFY THE NATURE OF THE TRANSMITTED AND RECEIVED SIGNALS. SIGNALS MAY CONTINUE WAVE, AMPLITUDE, FREQUENCY MODULATED OR PULSED

161PROGRAM STEPS
UNE ENGELBRECHT
D-KOBLENZ.

51829D 67-COMPUTATION OF BANK ACCOUNTS WITH SECURITY

THIS PROGRAM HAS ALL THE CHARACTERISTIC OF PROGRAM 51566D BUT : THE AMOUNT CAN BE POSITIVE (CREDIT) OR NEGATIVE (DEBIT); INTEREST RATES AND DAYS/YEAR CALCULATION BASES CAN BE DIFFERENT FOR POSITIVE OR NEGATIVE AMOUNT; NOT CHRONOLOGICAL INPUT ADMITTED ONLY WHEN THIS DO NOT CAUSE A CHANGE OF THE AMOUNT SIGN. DATA ARE RECORDED ON A SIDE OF A SPECIAL CARD.

192PROGRAM STEPS
PAOLA PELLICIARDI
I-BOLOGNA.

51830D 67-SUN DIAL

THIS PROGRAM IS THE MATH SIMILE OF THE ANCIENT SUN DIAL. GIVEN THE HORIZONTAL SHADOW LENGTH OF A VERTICAL LINE IT CALCULATES LOCAL STANDARD TIME, CONSIDERING THE EQUATION OF TIME AND LOCAL TIME CORRECTIONS. NEEDED DATA AS : LONGITUDE-LATITUDE AND DATE OF OBSERVATION AND HEIGHT OF SHADOWING OBJECT CAN BE LOADED MANUALLY OR KEPT INTACT IN SPECIAL SUBROUTINES.

223PROGRAM STEPS
JIMMY PLATONIS
GR-ATHENS.

51831D 97-TESTING AND SORTING. PERMUTATIONS.

ANY GIVEN PERMUTATION OF UP TO 19 CONSECUTIVE OR NON CONSECUTIVE NATURAL NUMBERS AND ALL THE FOLLOWING PERMUTATIONS ENDING WITH THE REVERSE NATURAL ORDER MAY BE DISPLAYED AND TESTED IF EVEN OR ODD; THE TOTAL NUMBER OF COUPLES AND THE NUMBER OF COUPLES OF NATURAL AND OF REVERSE SEQUENCE ARE DISPLAYED.

224PROGRAM STEPS
JOACHIM GERLACH
D-MODAUTAL.

51832D 67-MAZES

BY ENTERING YOUR DESTINATION AND A SEED YOU GENERATE A UNIQUE MAZE. EACH TURN YOU CAN MOVE ONE OR MORE STEPS NORTH, EAST, SOUTH OR WEST. YOUR HP RESPONDS WITH A SINGLE NUMBER THAT TELLS YOU MAX. NUMBER OF STEPS IN ALL 4 DIRECTIONS. PLAYABLE BY ONE OR TWO. QUICK RETURN TO A MARKET POSITION. CONVENIENT USE.

51832D (CONTD)

224PROGRAM STEPS
PETER VAN DEN HAMER
NL-THE HAGUE.

51833D 67-OPTIMAL TWO-STAGE PRODUCTION SCHEDULES (JOHNSON'S RULE)

THIS PROGRAM USES JOHNSON'S OPTIMAL DECISION RULE FOR A NUMBER OF JOBS THAT HAVE TO GO ONTO TWO MACHINES IN THE SAME ORDER. OPTIMALITY IS DEFINED AS THE MINIMAL TOTAL ELAPSED TIME, WHERE THE ORDER OF COMPLETION OF THE JOBS HAS NO SIGNIFICANCE. THE MAXIMUM NUMBER OF JOBS FOR THIS PROGRAM IS TWENTY.

201PROGRAM STEPS
MARTIN HUMPHRIES
GB-BROMSGROVE.

51834D 67-REPLACEMENT IN ANTICIPATION OF FAILURE

THE FAILURE OF A COMPONENT ON A PIECE OF PLANT DURING PRODUCTION HOURS INCURS A "COST OF LOST PRODUCTION" WHILST IT IS BEING REPLACED. IT IS SOMETIMES ADVANTAGEOUS TO REPLACE SUCH COMPONENTS OUTSIDE PRODUCTION HOURS BEFORE THEY FAIL. THE PROBLEM IS TO DETERMINE AT WHAT AGE THEY SHOULD BE REPLACED SO AS TO MINIMISE COSTS. THIS PROGRAM HELPS SOLVE THAT PROBLEM.

068PROGRAM STEPS
MARTIN HUMPHRIES
GB-BROMSGROVE.

51835D 67-OUTDOOR BULK STORAGE BINS FOR HYDROPHILIC MATERIALS

THE PROGRAM DETERMINES THE CAPACITY OF OUTDOOR BULK STORAGE BINS WITH OCTAGONAL-SHAPED BASES FOR HYDROPHILIC MATERIALS OR, GIVEN THE CAPACITY, FINDS ALL GEOMETRIC FACTORS OF THE BIN. THE ENGINEER CAN ESTIMATE THE CONSTRUCTION PARAMETERS AND THE THEORETICAL QUANTITIES OF PLASTIC LAYERS NEEDED TO AVOID ATMOSPHERE EXPOSURE. PROGRAM IS VALID FOR ANY COHERENT UNIT SYSTEM.

204PROGRAM STEPS
GIUSEPPE LIGATO
I-CUSANO MILANINO.

51836D 67-TRANSFORM FOR ECLIPTIC LONGITUDE CLESTIAL INTO RIGHT ASCENTION

EACH POINT OF ECLIPTIC IS DETERMINATE BY CELESTIAL LONGITUDE, OR RIGHT ASCENSION OR DECLINATION. ONE DECLINATION HAVING TWO LONGITUDES AND TWO RIGHT ASCENSIONS. THIS PROGRAM TRANSFORMS LONGITUDE INTO RIGHT ASCENSION AND DECLINATION RIGHT ASCENSION INTO LONGITUDE AND DECLINATION, DECLINATION INTO TWO LONGITUDES AND TWO RIGHT ASCENSION.

106PROGRAM STEPS
JACQUES SUQUET
F-BANYULS/MER

51837D 67-TRANSFORM EQUATORIAL COORDINATES INTO CELESTIAL AND VICE VERSA.

THIS PROGRAM WITH 93 STEPS TRANSFORMS EQUATORIAL COORDINATES RIGHT ASCENSION, DECLINATION INTO CELESTIAL COORDINATES , CELESTIAL LONGITUDE, CELESTIAL LATITUDE AND VICE VERSA. DATA AND RESULTS ARE IN DEGREES, MINUTES, SECONDS IF FOR DATA ENTER IS 48 (83) 0806. DATA INDICATES 48 DEGREES 08'06", IF RESULT IS 48.0806, RESULT INDICATES 48 DEGREES 08'06".

093PROGRAM STEPS
JACQUES SUQUET
F-BANYULS/MER.

51838D 67-GAMMA AND POLYGAMMA FUNCTIONS

THE PROGRAM COMPUTES THE VALUES OF GAMMA, DIGAMMA AND ALL POLYGAMMA FUNCTIONS, WITH A VERY GOOD ACCURACY FOR REAL VALUES OF THE VARIABLE.

222PROGRAM STEPS
JEAN BARFETY
F-LE RAINCY.

51839D 67-CUSPIDS OF HOUSES CAMPANUS AND REGIONMONTANUS DIVISION

THIS PROGRAM CALCULATES LONGITUDE, RIGHT ASCENSION, DECLINATION AND POLE FOR PRIMARY DIRECTION OF CUSPIDS OF HOUSES CAMPANUS AND REGIO. THIS PROGRAM CALCULATES ALSO ALL DIVISIONS IN THESE HOUSES.

213PROGRAM STEPS
JACQUES SUQUET
F-BANYUS/MER.

51840D 67-HELICAL SPRING. ROUGH CALCULATION

THIS PROGRAM ALLOWS A CHECK COMPUTATION OR DESIGN FOR HELICAR SPRINGS OF ROUND WIRE WITH INTERCHANGEABLE IN AND OUTPUTS: FOUR OF THE SIX VARIABLES MUST BE KNOWN.

223PROGRAM STEPS
EDUARD STOESSEL
CH-DUEBENDORF.

51841D 67-CIRCLE-DIAGRAM

PROGRAM CALCULATES THE POINTS OF A CIRCLE-DIAGRAM UP TO 17 ELEMENTS OF R,C,L IN EACH CONNECTION. THE EQUATION FOR THE CIRCUIT OF THE ELEMENT IS NOT NECESSARY. YOU PUT IN THE VALUES OF THE ELEMENTS AND ITS CONNECTION ONLY ONCE. FOR EACH FREQUENCY YOU GOT THEN THE POINTS.

320PROGRAM STEPS
HORST VOELZ
D-BERLIN.

51842D 67-CASINO-BUSTER

KEEPING ACCOUNT OF 22 COMMONLY PLAYED CHANCES OF ROULETTE (SIMPLE CHANCES, THIRDS, COLUMNS, "TRANSVERSALES SIMPLES" AND 4 SPECIAL SERIES) THIS PROGRAM SHOWS YOU A) HOW OFTEN A SPECIFY CHANCE WAS HIT AND B) HOW LONG THIS PARTICULAR CHANCE IS MISSING. THE PROGRAM ALSO SEARCHES FOR NEGLECTED OR FAVORIZED CHANCES.

224PROGRAM STEPS
ROLAND KOESTRING
D-MUNICH.

51843D 67-CUSPIDS HOUSES PLACIDUS AND ALL DIVISIONS OF THESE HOUSES.

THIS PROGRAM CALCULATES LONGITUDE, RIGHT ASCENSION, DECLINATION AND POLE FOR PRIMARY DIRECTION OF CUSPS AND ALL DIVISIONS OF HOUSES PLACIDUS, TO SECOND DEGREE OR MORE IF PASS CENTESIMAL AFTER RESULT. DATA AND RESULTS ARE IN DEGREES, MINUTES AND SECONDS.
NOTA : IN EXCEPTION, ERROR ON P CAN EXCEED 1 SECOND BUT NOT EXCEED 2 SECONDS.

222PROGRAM STEPS
JACQUES SUQUET
F-BANYULS/MER.

51844D 67-EXTENDED PYTHAGOREANS

GIVEN AN INTEGER M, THIS PROGRAM GIVES YOU A LIST OF INTEGERS X,Y,Z, SATISFYING X**2+Y**2-Z**2=MXY, HCD(X,Y)=1, X>Y>0, Z>0. PUTTING M=0 GIVES PROPER PYTHAGOREAN NUMBERS.

110PROGRAM STEPS

51844D (CONTD)

RAYMOND BROECKX
B-WILRIJK.

51845D 67-QUATERNIONS

GIVEN TWO QUATERNIONS A AND B, THIS PROGRAM FINDS THEIR SUM A+B, THEIR DIFFERENCE A-B, THE PRODUCTS A.B AND B.A, AND THE QUOTIENTS Q AND Q DEFINED BY A=BQ AND A=QB.

216PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51846D 67-PRIMES WITH GIVEN LAST DIGITS

THIS PROGRAM FURNISHES A LIST OF PRIME NUMBERS WITH GIVEN LAST DIGITS, STARTING FROM A GIVEN LIMIT

097PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51847D 67-TWO DIOPHANTIC PROBLEMS

GIVEN THE INTEGER COEFFICIENTS, EITHER OF A LINEAR EQUATION WITH TWO UNKNOWNS, OR OF A SYSTEM OF TWO LINEAR EQUATIONS WITH THREE UNKNOWNS, THIS PROGRAM GIVES A LIST OF THE INTEGER SOLUTIONS.

140PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51848D 67-PLAYING WITH WARING'S CUBES

THIS PROGRAM ALLOWS YOU TO TEST WARING'S CONFECTURE (1770) THAT EVERY POSITIVE INTEGER IS THE SUM OF AT MOST 9 CUBES.

095PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51849D 67-LARGE FACTORIALS

FOR LARGE INTEGERS, THIS PROGRAM FINDS THE NUMBER OF DIGITS AND THE FIRST 8 DIGITS OF THEIR FACTORIALS.

064PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51850D 67-FACTORS BELONGING TO FIRST OR SECOND DEGREE SEQUENCES.

THIS PROGRAM FINDS ALL FACTORS OF A GIVEN INTEGER, BELONGING TO UP TO THREE GIVEN FIRST OR SECOND DEGREE SEQUENCES.

104PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51851D 67-PRIMES 4K+1

A PRIME 4K+1 IS THE SUM OF TWO SQUARES IN EXACTLY ONE WAY. IT ALSO IS A FACTOR OF AN INFINITY OF TERMS OF THE SEQUENCE 4NN+1. THIS PROGRAM GIVES A LIST OF PRIMES 4K+1, STARTING FROM A GIVEN LOWER LIMIT, AND FOR EACH PRIME FINDS THE TWO SQUARES MENTIONED, AND THE TWO LOWEST MULTIPLES IN THE SEQUENCE MENTIONED.

157PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51852D 67-LEGENDRE'S SYMBOL AND SOLVING XX=A MODULO P

GIVEN AN ODD PRIME P AND AN INTEGER A BETWEEN 0 AND P, THIS PROGRAM FINDS LEGENDRE'S SYMBOL (A/P) AND AFTERWARDS SOLVES XX=A MODULO P,

51852D (CONTD)

IFF (A/P)=1.

100PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51853D 67-DECIMAL EXPANSION OF A FRACTION

T AND N BEING POSITIVE INTEGERS, THIS PROGRAM FINDS THE COMPLETE DECIMAL EXPANSION OF T/N. IN PARTICULAR IT GIVES THE NUMBER, BOTH OF THE NON-PERIODIC AND OF THE PERIODIC DECIMALS, AND STOPS AUTOMATICALLY AFTER HAVING SHOWN EXACTLY ONE PERIOD OF PERIODIC DECIMALS.

084PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51854D 67-CYCLOIDS WITH ARBITRARY BASE

GIVEN F(X) AND ITS GRAPHICAL REPRESENTATION C, THIS PROGRAM PERMITS YOU TO DRAW CYCLOIDS, EPICYCLOIDS AND HYPOCYCLOIDS WITH BASE C.

071PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51855D 67-SPHERICAL TRIANGLES 1

THIS PROGRAM CALCULATES THE SIDES AA,BB,CC, AND THE ANGLES A,B,C OF A SPHERICAL TRIANGLE, GIVEN EITHER AA, BB, CC OR A,B,C, OR A,BB,CC, OR AA,B,C, OR A, AA, BB, OR AA, A,B OR A AND AA (WHEN AA=BB).

175PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51856D 67-SPHERICAL TRIANGLES 2

GIVEN THE SIDES OF A SPHERICAL TRIANGLE, THIS PROGRAM CALCULATES ITS HALF PERIMETER, THE RADIUS OF ITS INSCRIBED CIRCLE, ITS ANGLES, ITS HALF SPHERICAL EXCES, THE RADIUS OF ITS CIRCUMSCRIBED CIRCLE, THE RADII OF ITS EXTERIOR CIRCLES OF CONTACT, ITS ALTITUDES, ITS MEDIANS AND ITS INTERIOR BISECTORS.

169PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51857D 67-CIRLCES WITH GIVEN RADIUS TANGENT TO TWO GIVEN CIRCLES

GIVEN THE RADII AND THE COORDINATES OF THE CENTRA OF TWO CIRCLES, THIS PROGRAM CALCULATES THE COORDINATES OF THE CENTER OF EACH CIRCLE WITH GIVEN RADIUS, TANGENT TO THE TWO GIVEN CIRCLES.

112PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51858D 67-LEGENDRE-ERROR-LAGUERRE-HERMITE-AND HYPERGEOMETRIC FS

THIS PROGRAM CALCULATES VALUES OF LEGENDRE-FUNCTIONS PN(X), THE ERROR FUNCTION ERF(X), LAGUERRE FUNCTIONS LN(X), HERMITE FUNCTIONS HN(X) AND HYPERGEOMETRIC FUNCTIONS F(A,B,C,X)

165PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51859D 67-LAGUERRE'S EQUATION

GIVEN UP TO 23 CONSTANTS A,B,C... THIS PROGRAM SOLVES LAGUERRE'S EQUATION, ASKING FOR A NUMBER X, SO THAT THE SUM OF THE RECIPROCALS OF THE DIFFERENCES X-A, X-B, X-C,.....

51859D (CONTD)

EQUALS ZERO.

042PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51860D 67-SHARKS

YOU ARE IN THE MIDDLE OF A 100.100 BASIN, WHICH ALSO CONTAINS A NUMBER OF SHARKS, THAT WILL TRY TO CATCH YOU. YOU CAN ONLY ESCAPE BY REACHING AN EDGE OF THE BASIN. YOU CAN CHOOSE THE DIRECTION, BUT A RANDOM NUMBER GENERATOR DECIDES ON THE NUMBER OF SHARKS, THEIR VELOCITY AND YOURS. THE PROGRAM IS BASED ON FRIEDL MOESSLACHER'S SIMILAR HP 65-PROGRAM (50881)

120PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51861D 67-OMNIVOROUS SHARKS

AS IN SHARKS YOU ARE IN THE MIDDLE OF A 100.100 BASIN, WHICH ALSO CONTAINS A NUMBER OF SHARKS, THAT WILL DEVOUR YOU WHEN THEY CAN REACH YOU. THEIR NUMBER IS LARGER THAN BEFORE, BUT THEY'LL EAT EACH OTHER TOO, WHEN THEY CAN. YOU MUST TRY AND REACH AN EDGE OF THE BASIN TO BE SAFE.

166PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51862D 67-MAESTRO

STARTING WITH A SEED, MAC CHOOSES IN A CERTAIN ORDER 4 OBJECTS FROM A SET OF OBJECTS, HAVING 5 POSSIBLE COLOURS AND AT THE SAME TIME 5 POSSIBLE FORMS. YOU HAVE TO GUESS THE ORDER IN WHICH THE OBJECTS HAVE BEEN CHOSEN, AND THEIR COLOUR AND THEIR FORM. TO DO THIS, YOU PROPOSE SEVERAL POSSIBILITIES. AFTER EACH PROPOSAL, MAC GIVES YOU 3 KINDS OF INFORMATION.

151PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51863D 67-MISSING CARD

HAVING SHUFFLED A DECK OF TWELVE CARDS, MAC SHOWS ELEVEN OF THEM. YOU MUST GUESS THE MISSING CARD. EASY? TRY IT.

112PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51864D 67-CARDS IN PILES

A DECK OF K CARDS, NUMBERED FROM TOP TO BOTTOM AND KEPT FACE-DOWN, IS DEALT FACE-DOWN INTO M PILES FROM LEFT TO RIGHT. THE PILES ARE THEN ASSEMBLED FROM LEFT TO RIGHT, EACH PILE BEING DROPPED ON THE NEXT ONE. HAVING A COMPLETE DECK AGAIN, A CARD WILL NOW HAVE AN OLD AND A NEW SEQUENCE NUMBER. GIVEN ONE OF THEM, YOUR HP WILL FIND THE OTHER ONE.

080PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51865D 67-PROBLEM OF THE GOAT

A GOAT IS ATTACHED WITH A ROPE WITH LENGTH R TO A POLE ON THE BORDER OF A ROUND MEADOW WITH UNIT RADIUS, AND CAN GRAZE ON 1/K-TH PART OF THIS MEADOW. TO FIND R FROM K, AND K FROM R.

058PROGRAM STEPS

51865D (CONTD)

RAYMOND BROECKX
B-WILRIJK.

51866D 67-MORE THAN 100 FRENICLE MAGIC SQUARES OF ORDER 4.4

THIS PROGRAM GIVES 108 FRENICLE MAGIC SQUARES OF ORDER 4.4

150PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51867D 67-JEWISH CALENDAR EXTENDED

GIVEN ANY YEAR Y A.D. BETWEEN 0 AND 20000, THIS PROGRAM (AS PRGM 50694) CALCULATES THE JEWISH YEAR J, BEGINNING IN Y, ITS PLACE BOTH IN THE SOLAR AND LUNAR CYCLES, THE NUMBER OF MONTHS OF BOTH J-1 AND J, THE SEPTEMBER-DATE OF ROSH HASHANAH (JEWISH NEW YEAR) OF J AND THE MARCH-DATE OF PESACH (EASTER) OF J-1. FURTHERMORE, IT GIVES THE DAY OF THE WEEK OF ROSH HASHANAH, THE THEORETICAL DATE OF ROSH HASHANAH BEFORE USING THE FOUR-POSTPONEMENTS RULE, AND THE LENGTH OF J IN DAYS.

224PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

51868D 67-RUPTURE DISKS SELECTION

THE PROGRAM COMPUTES WITH ENGLISH, SI OR METRIC UNITS, THE EQUATIONS FOR THE SELECTION OF RUPTURE DISKS. GIVEN TWO OF THE THREE FOLLOWING VARIABLES, THE PROGRAM FINDS THE THIRD ONE : MASS FLOWRATE, GAGE (OR DIFFERENTIAL) BURSTING PRESSURE, DISK AREA (OR DIAMETER). THE PROGRAM IS APPLICABLE FOR LIQUID, GAS AND DRY, WET OR SUPERHEATED STEAM SERVICE AS PER ASME CODE AND API STANDARDS.

400PROGRAM STEPS
GIUSEPPE LIGATO
I-CUSANO MILANINO.

51869D 67-GRADUATE A ROD TO CALC. VOL. OF ELLIPT. SPHERICAL BOTTOM TANKS

THIS PROGRAM GIVES YOU THE POSSIBILITY TO MAKE GRADE MARKS ON A ROD TO SEE THE SUCCESSIVE VOLUMES WHICH CORRESPOND WITH THE GRADE MARKS ON THE ROD. YOU CAN USE THE PROGRAM FOR A SPHERICAL BOTTOM TANK (ELLIPTIC OR CYLINDRIC) WITH THE LENGTH PARALLEL TO THE EARTH.

092PROGRAM STEPS
IVO HUBENS
B-ANTWERP.

51870D 67-DATA SORTING

PROGRAM SORTS 25 NUMBERS (NO LIMITS) FROM THE LOWEST TO THE HIGHEST WITH POSSIBILITY OF DELETING AND REVIEWING NUMBERS.

166PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

51871D 67-CLEAR SUM

THIS ROUTINE MAY BE MERGED TO ANY PROGRAM FOR CLEARING JUST THE SIX STATISTIC-REGISTERS R14 TO R19. STACK AND LAST X REGISTER ARE NOT CHANGED.

014PROGRAM STEPS
ULRICH HAHN
D-FLENSBURG.

51872D 97-MUSICAL TEMPERAMENTS II TUNING

THIS PROGRAM CALCULATES THE FREQUENCY OF ANY NOTE ON A KEYBOARD

51872D (CONTD)

INSTRUMENT AS WELL AS THE BEAT RATE OF ANY INTERVAL TOGETHER WITH AN INDICATION OF WHETER TO WIDEN OR TO NARROW THE PERFECT INTERVAL. YOU CAN ALSO USE HISTORIC TEMPERAMENTS WHICH YOU MAY STORE ON DATA CARDS.

147PROGRAM STEPS
THOMAS BAUMANN
D-AUMUEHLE.

51873D 97-MUSICAL TEMPERAMENTS I CONVERSIONS

THIS PROGRAM IS DESIGNED TO DEAL WITH HISTORIC TEMPERAMENTS OF KEYBOARD INSTRUMENTS. IT CONVERTS A TEMPERAMENT EXPRESSED IN CENTS (EITHER ABSOLUTE OR RELATED TO EQUAL TEMPERAMENT) INTO FREQUENCIES AND VICE VERSA, USING AN ARBITRARY STANDARD PITCH. USE PROGRAM II TO ESTABLISH THE TEMPERAMENT ON AN INSTRUMENT.

175PROGRAM STEPS
THOMAS BAUMANN
D-AUMUEHLE.

51874D 67-THREE COUPLED 1ST ORDER FOUR VARIABLES DIFFERENTIAL EQUATION

THIS PROGRAM COMPUTES A THREE DIFFERENTIAL EQUATION SYSTEM OF FIRST ORDER WITH FOUR VARIABLES WHO'S GIVEN IN THE FORM :
X'=F(T,X,Y,Z)
Y'=G(T,X,Y,Z)
Z'=H(T,X,Y,Z)
THIS PROGRAM USES THE FOURTH ORDER RUNGE-KUTTA METHOD.

155PROGRAM STEPS
ALAIN CHAPPUIS
CH-LAUSANNE.

51875D 67-TWO COUPLED 1ST ORDER THREE VARIABLES DIFFERENTIAL EQUATION

THIS PROGRAM COMPUTES A TWO DIFFERENTIAL EQUATION SYSTEM OF FIRST ORDER WITH THREE VARIABLES WHICH IS GIVEN IN THE FORM :
X'=F(T,X,Y)
Y'=G(T,X,Y)
THIS PROGRAM USES THE FOURTH ORDER RUNGE-KUTTA METHOD.

112PROGRAM STEPS
ALAIN CHAPPUIS
CH-LAUSANNE.

51876D 67-SIMPLE AND DOUBLE INTEGRAL CURVE

THIS PROGRAM GIVES ALL POINTS OF THE SIMPLE OR DOUBLE INTEGRAL OF A FUNCTION. YOU INTRODUCE THE EQUATION Y=F(T) AND THE INITIAL VALUES. THIS PROGRAM CAN EASILY BE USED TO OBTAIN VELOCITY AND MOVEMENT CURVES ABOUT ACCELERATION EQUATION.

122PROGRAM STEPS
ALAIN CHAPPUIS
CH-LAUSANNE.

51877D 67-MIT-PUBLIC-KEY CRYPTOSYSTEM AND DIGITAL SIGNATURES

AUTHORS OF THE MIT/LCS/TM 82 PRESENTED AN ENCRYPTION METHOD WITH THE PROPERTY THAT WHILE PUBLICLY REVEALING AN ENCRYPTION KEY DOES NOT THEREBY REVEAL THE CORRESPONDING DECRYPTION KEY AND WHICH DUE TO THE DIFFICULTY OF FACTORING LARGE NUMBERS IS FOR ALL PRACTICAL PURPOSES UNBREABABLE. THIS PROGRAM IS A FIRST, SCALED-DOWN MODEL OF THE MIT METHOD AND INCLUDES ALL NECESSARY ALGORITHMS, HOWEVER, NO FAST-FACTOR-FINDER PROGRAM.

120PROGRAM STEPS
JIM R. KUTSCHERA
D-MOERFELDEN-WALLDORF.

51878D 67-THIN WALLED PRESSURE VESSELS (HOOP STRESS)

THIS PROGRAM PROVIDES AN INTERCHANGEABLE SOLUTION TO THE CYLINDER AND SPHERE HOOP STRESS FORMULAE. ANY THREE OF THE VARIABLE PRESSURE, DIAMETER, THICKNESS AND STRESS ARE INPUT TO OBTAIN A FOURTH. THE PROGRAM ALSO COMPUTES LONGITUDINAL STRESS IN A CYLINDER. IN ADDITION THE PROGRAM WILL ROUND THE THICKNESS TO SUIT PLATE SIZES AND DISPLAY THE NUMERATOR AND DENOMINATOR OF A FRACTION.

218PROGRAM STEPS
LESLIE A. TIMPERLEY
GB-MANCHESTER.

51879D 67-INTEGRAL TYPE FLANGE DESIGN TO BS 5500, ASME VIII, SNCT ET AL

THIS PROGRAM CALCULATES STRESSES AND ALLOWS THE USER TO DETERMINE A THICKNESS OF AN INTEGRAL-TYPE FLANGE IN ACCORDANCE WITH THE METHOD GIVEN IN BS 5500; 1976. PROGRAM ACCEPTS DIMENSIONS IN EITHER MM; CM OR INCHES AND PRESSURES AND STRESSES IN A CONSISTENT UNITS. PROGRAM WILL ALSO CALCULATE FOR PRESSURE IN BARS WITH STRESSES IN NEWTONS PER MM SQUARED.

637PROGRAM STEPS
LESLIE A. TEMPERLEY
GB-MANCHESTER.

51880D 67-PARTIAL OR TOTAL VOLUME OF A VESSEL OR TANK

THE PROGRAM WILL COMPUTE THE FULL OR PARTIAL VOLUME OF A VESSEL OR TANK FOR ANY COMBINATION OF THE FOLLOWING SECTIONS - CYLINDER, CONE FRUSTUM AND HEMI-ELLIPSOIDAL, HEMISPHERICAL, TORISPHERICAL AND BUMPED HEADS. TRAYS IN A VERTICAL VESSEL CAN ALSO BE ADDED. THE VESSEL MAY BE HORIZONTAL OR VERTICAL, BUT NOTE THAT A PARTIAL VOLUME OF A HORIZONTAL CONE CANNOT BE COMPUTED.

213PROGRAM STEPS
LESLIE A. TEMPERLEY
GB-MANCHESTER.

51881D 67-FOURIER COEFFICIENTS FOR LINEAR COMPOSED FUNCTIONS

ONE PERIOD OF A FUNCTION: F(X), INCLUDING DISCONTINUETIES WITHIN THE PERIOD, IS COMPOSED FROM MAX. 10 LINEAR PIECES. Y=F(X) IS ENTERED AS PAIRS OF COORDINATES: (X,Y), RATHER THAN PROGRAMMED. FOURIER COEFFICIENTS FOR F(X) ARE FOUND FROM EXACT MATHEMATICLY SOLUTIONS. AN "ABSENT USER ROUTINE" (AUR) MAKES IT POSSIBLE FOR THE USER TO BE BUSY ELSEWHERE WHILE THE CALCULATOR FINDS SEVERAL FOURIER COEFFICIENTS. X AND Y ARE REAL NUMBERS.

220PROGRAM STEPS
SOREN VIDEBAEK NIELSEN
DK-STRUER.

51882D 67-BEACON TO BEACON NAVITATION

THIS PROGRAM COMPUTES THE GREAT CIRCLE NAVIGATION. INPUT IS : INITIAL LATITUDE AND LONGITUDE AND LATITUDE AND LONGITUDE OF NEXT BEACONS. OUTPUT IS : INITIAL COURSE DISTANCE AND CUMULATED DISTANCE FROM FIRST POINT, LATITUDE OF THE VERTEX, LATITUDE CROSSING OF ANY LONGITUTE AND BOTH LONGITUDE CROSSING OF ANY LATITUDE. THE SAME FOR THE DIRECT TRACK FROM THE FIRST POINT TO ANY OF THE BEACONS.

224PROGRAM STEPS
PIERRE A. DELRUELLE
B-BRUSSELS.

51883D 67-LEVEL CONVERSION

51883D (CONTD)

PROGRAM CONVERTS ABSOLUTE AND RELATIVE LEVELS NP, DB, VOLTAGES, CURRENTS AND POWERS FOR INTERNATIONAL AND USA STANDARDS.

111PROGRAM STEPS
HORST VOELZ
D-BERLIN.

51884D 67-SORT ORDER AND STORE WITH A CODE

YOU PUT UP TO 24 VALUES. FOR EACH YOU CAN GIVE A CODE BETWEEN : -50 AND +50. PROGRAM SORTS THE VALUES IN THE REGISTER AND DISPLAYS THE CODES ONLY OR CODES AND VALUES.

112PROGRAM STEPS
HORST VOELZ
D-BERLIN.

51885D 97-MEMORY-GAME

THIS PROGRAM WILL TRAIN YOUR MEMORY BY GIVING YOU A SERIE OF THREE DIGIT-NUMBERS WITH A DEGREE OF DIFFICULTY UP TO 8 NUMBERS. THEN IT IS YOUR JOB TO KEY IN NUMBERS AGAIN. YOU WILL GET MARKS SHOWING YOU, HOW WELL YOU HAVE DONE.

224PROGRAM STEPS
MICHAEL TARNOWSKI
D-WIESBADEN.

51886D 97-BOWLING

PROGRAM SIMULATES A GAME OF "BOWLING". PLAYERS MAXIMUM : 9. EACH PLAYER HAS TWO THROWS. NUMBER OF PINS : 10.

163PROGRAM STEPS
MICHAEL TARNOWSKI
D-WIESBADEN.

51887D 97-EXPANDED OPERATIONAL STACK OF 6 COMPLEX NUMBERS

PROGRAM CREATES A 6 LEVEL STACK FOR EVALUATION OF LONG EXPRESSIONS WITH COMPLEX NUMBERS USING RPN. FUNCTIONS ARE : ENTER, +, -, X, /, EXCHANGE, LN, POWER, 1/Z, N-ROOTS. OPTIONAL SECOND CARD (MERGED IN) GIVES : EXP, SIN, COS, TAN AND THEIR HYPERBOLICS. SPECIAL ATTENTION HAS BEEN PAID TO EXECUTION SPEED : 5 BASIC FUNCTIONS IN 2 S.

311PROGRAM STEPS
GIANCARLO CORDONI
I-MONTEBELLUNA.

51888D 67-HARMONIC ANALYSIS AND SYNTHESIS

THIS PROGRAM APPROXIMATES AN EMPIRIC PERIODIC FUNCTION DEFINED BY AN EVEN NUMBER OF DATA POINTS UNIFORMLY DISTRIBUTED OVER 1 PERIOD BY A FOURIER SERIES OF UP TO 10 PAIRS OF COS- AND SIN-TERMS AND AN ABSOLUTE TERM (UP TO 10 HARMONICS). PRINT/PAUSE OUTPUT OF SUCCESSIVE COEFFICIENT PAIRS OR SEPARATE RECALL, BOTH IN RECTANGULAR OR POLAR FORM. AUTOMATIC PROJECTIONS OVER 1 PERIOD WITH ANY STEPSIZE (SYNTHESIS) OR SEPARATE PROJECTION FOR GIVEN ARGUMENTS, WITH UP TO 10 HARMONICS.

212PROGRAM STEPS
HENRIQUE E. ADLER
P-PORTO.

51889D 67-NUMBER-RACE

THIS PROGRAM PERMITS TO PLAY AGAINST HP BY ALTERNATING ADDITION OF INTEGERS BEGINNING AT ZERO. THE FIRST WHO REACHES THE AIM-NUMBER, WINS. THE HIGHEST ADDABLE NUMBER AND THE AIM-NUMBER ARE CHOOSEN BY THE PLAYER. ERROR IS DISPLAYED WHEN

51889D (CONTD)

PRESENTING NOT ALLOWED NUMBERS. GAMES WITHOUT CHANCE FOR THE PLAYER OR HP ARE NOT ACCEPTED (SHOWING BLINKING 0.0).

162PROGRAM STEPS
NORBERT BEUL
D-BERLIN.

51890D 67-TEMPERATURE VARIATIONS THROUGH A RADIATING DISK

WE CONSIDER AN ISOTROPIC THIN DISK WHICH EMITS BLACK BODY RADIATION.IF F(R) IS THE INITIAL TEMPERATURE, THE LINEAR DIFFERENTIAL EQUATION OF CONDUCTION OF HEAT CAN BE SOLVED BY THE FINITE-DIFFERENCE METHOD. THE SPATIAL AND TEMPORAL VALUES OF TEMPERATURE IN A DISK OF RADIUS R AND DIFFUSIVITY K CAN BE CALCULATED WITH GOOD APPROXIMATION BY USING A MESH SIZE DELTA R=R/N, DELTA T= R**2/2N**2K. N INTEGER <=20.

096PROGRAM STEPS
RENE BAILLY-SALINS
F-IS-SUR-TILLE.

51891D 97-DRAWING MASTER

GIVEN UP TO 17 POINTS, THIS PROGRAM GIVES YOU ALL THE OTHER POINTS NECESSARY TO MAKE A "COMPUTER-DRAWING" ON A 100 TIMES 100 GRID.

110PROGRAM STEPS
KARL MOENS
B-MORTSEL.

51892D 67-LITERAL DERIVATION. FUNCTION UP TO 100 STEPS

THIS PROGRAM CALCULATES THE DERIVATIVE OF A STORED FUNCTION. DERIVATIVE AND FUNCTION ARE CODED. FUNCTION CODE UP TO 100 DIGITS. 18 FUNCTIONS : X**N, N UP TO 9, INVERSE; SQUARE ROOT; EXP; LN; SIN; COS; CH; SH.
5 OPERATORS : +, -, X, (,). 10 EXTERNAL CONSTANTS. MULTIPLICATIONS UP TO 6 FACTORS. COMPOSING AS LONG AS YOU WANT.

224PROGRAM STEPS
PIERRE MOLINARO
F-NANTES.

51893D 67-47TH ORDER LITERAL CHEBYSHEV POLYNOMIALS AND TRIGO EXPANSIONS

THIS PROGRAM CALCULATES THE EXACT COEFFICIENTS OF CHEBYSHEV POLYNOMIALS UP TO 47TH ORDER AND ALSO GIVES THE EXPANSION OF COS NX, CH NX, SIN NX AND SH NX IN POWERS OF COSX, CHX, SINX OR SHX. UP TO 47TH ORDER.

150PROGRAM STEPS
PIERRE MOLINARO
F-NANTES.

51894D 67-COMPLEX POLYNOMIAL EVALUATION

THE PROGRAM EVALUATES A GIVEN POLYNOMIAL FOR ANY GIVEN COMPLEX NUMBER(S). IF THE COEFFICIENTS OF THE POLYNOMIAL ARE COMPLEX, THE DEGREE IS LIMITED TO 9; IF THEY ARE REAL, THE DEGREE MAY BE AS LARGE AS 19. THE COEFFICIENTS ARE ENTERED ONCE ONLY AND STORED. THE FIRST DERIVATIVE CAN ALSO BE COMPUTED.

153PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

51895D 67-TRIANGLE : CENTERS

THIS PROGRAM COMPUTES CENTER OF GRAVITY, ORTHOCENTER, CIRCUMCENTER, INCENTER, EXCENTERS AND GERGONNE'S POINTS OF ANY TRIANGLE IN THE PLANE BY A NUMERICALLY STABLE, EXPLICIT FORMULA. AREA, LENGTH OF SIDES,

51895D (CONTD)

ANGLES, CIRCUMRADIUS, INRADIUS, EXRADII ARE ALSO COMPUTED.

222PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

51896D 67-REGULAR POLYHEDRONS

GIVEN ONE OF THE FIVE QUANTITIES : LENGTH OF EDGE, CIRCUMRADIUS, INRADIUS, SURFACE AREA, VOLUME, OF ANY REGULAR POLYHEDRON (I.E. TETRAHEDRON, HEXAHEDRON, OCTAHEDRON, DODECAHEDRON, ICOSAHEDRON), THIS PROGRAM COMPUTES THE FOUR REMAINING QUANTITIES.

106PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

51897D 67-INTERSECTIONS OF STRAIGHT LINE AND CONIC

THE PROGRAM COMPUTES THE COORDINATES OF THE INTERSECTION POINTS OF A GIVEN STRAIGHT LINE AND A GIVEN CONIC.

222PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

51898D 67-OPERATIONAL STACK OF HAMILTONIAN QUATERNIONS

THE PROGRAM SIMULATES AN OPERATIONAL STACK OF FOUR HAMILTONIAN QUATERNIONS. OPERATIONS AVAILABLE ARE : ENTER, ROLL DOWN, EXCHANGE X AND Y, INPUT OF A QUATERNION (WITH AUTOMATIC STACK LIFT), DISPLAY OF THE Q. IN THE X REGISTER; ADD, MULTIPLY, MULITPLY BY A REAL NUMBER RECIPROCAL VALUE, CONJUGATE; ABSOLUTE VALUE; STORE, RECALL (ONE REGISTER).

220PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

51899D 67-ELLIPTIC INTEGRALS OF 1ST AND 2ND KIND, INCOMPLETE

THIS PROGRAM COMPUTES THE COMPLETE AND INCOMPLETE ELLIPTIC INTEGRALS OF 1ST AND 2ND KIND BY THE METHOD OF THE ARITHMETIC-GEOMETRIC MEAN (LANDEN'S TRANSFORMATION). THE PROGRAM IS VERY FAST. THE PERIPHERY OF AND ELLIPSE CAN ALSO BE COMPUTED

216PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

51900D 67-NORMAL AND CHI-SQUARE DISTRIBUTIONS

THE PROGRAM COMPUTES THE DENSITY FUNCTION AND THE CUMULATED DISTRIBUTION FUNCTION OF THE STANDARDIZED NORMAL DISTRIBUTION. FOR Z LESS THAN 3, A POWER SERIES REPRESENTATION IS USED; FOR Z GREATER THAN 3, A CONTINUED FRACTION IS USED. THE CUMULATIVE DISTRIBUTION FOR A CHI SQUARE DISTRIBUTED RANDOM VARIABLE IS COMPUTED, TOO.

197PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

51901D 67-R*S CONTINGENCY TABLE

THE PROGRAM COMPUTES THE CHI-SQUARE STATISTIC OF AN R TIMES S CONTINGENCY TABLE. R, S MUST BE GREATER THAN 1; S IS LIMITED TO BE LESS OR EQUAL TO 10, R IS UNLIMITED. THE ELEMENTS OF THE TABLE MUST BE LESS THAN 10000. ONLY THE ELEMENTS NIJ OF THE TABLE NEED BE ENTERED; THE SUMS OF ROWS AND COLUMNS ARE ALSO

51901D (CONTD)

COMPUTED.

141PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

51902D 67-T STATISTICS

THE PROGRAM COMPUTES T FOR PAIRED OBSERVATIONS, T FOR CORRELATION COEFFICIENT, T FOR ONE POPULATION MEAN AND T FOR TWO SAMPLE MEANS.

219PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

51903D 97-LISTAMARK

LISTACARDS PROCESS TEACHERS' MARK-LISTS LIKE A COMPUTER. LISTAMARK STORES THE SCORES OF UP TO 75 STUDENTS IN MEMORY AND ON ONE SIDE OF A DATA-CARD. MARKS MAY BE INCREMENTED, DECREMENTED AND INSPECTED BY RANDOM-ACCESS OR IN SEQUENCE. LISTS OF RAW TOTALS OR PERCENTAGES MAY BE PRINTED OUT. EACH MARK IS IDENTIFIED BY THE STUDENT'S BOOK-NUMBER PRINTED BESIDE THE MARK. ALL LISTS END WITH A MEAN.

224PROGRAM STEPS
E. ARTHUR MORTON
GB-KENDAL.

51904D 97-LISTASCALE

LISTACARDS PROCESS TEACHERS' MARK-LISTS LIKE A COMPUTER. LISTASCALE COMPUTES THE NUMBER, HIGHEST AND LOWEST SCORES, MEAN AND STANDARD DEVIATION OF AN ARRAY OF UP TO 75 SCORES STORED IN MEMORY OR ON ONE SIDE OF A DATA-CARD.
THE MARKS MAY THEN BE SCALED BETWEEN ANY REQUIRED LIMITS, LISTED AND RESTORED AS A PERCENTAGE OR OUT OF ANY REQUIRED MAXIMUM.

224PROGRAM STEPS
E. ARTHUR MORTON
GB-KENDAL.

51905D 97-LISTAGRADE

LISTACARDS PROCESS TEACHERS' MARK-LISTS LIKE A COMPUTER. LISTAGRADE PRINTS AN ANALYSIS OF PERFORMANCE OF EACH ONE OF AN ARRAY OF UP TO 75 STUDENTS STORED IN MEMORY OR ON ONE SIDE OF A DATA-CARD. OUPUT IS STUDENT'S BOOK-NUMBER, POSITION IN CLASS, PERCENT SCORE AND GRADE (1-5). THE PROGRAM WILL ALSO PRINT THE CLASS LIST IN ORDER OF MERIT.

200PROGRAM STEPS
E. ARTHUR MORTON
GB-KENDAL.

51906D 97-LISTAGRAM-ADCARD

LISTACARDS PROCESS TEACHERS' MARK-LISTS LIKE A COMPUTER. LISTAGRAM WILL DRAW A SIMPLE HISTOGRAM OF THE DISTRIBUTION IN 10 GROUPS OF THE SCORES OF UP TO 75 STUDENTS FROM AN ARRAY IN MEMORY OR ON ONE SIDE OF A DATA-CARD.
ADCARD WILL SUM EACH SCORE FROM ONE DATA-CARD WITH THE CORRESPONDING SCORE FROM ANOTHER. THE RESULTS ARE STORED IN MEMORY AND ON A CARD.

217PROGRAM STEPS
E. ARTHUR MORTON
GB-KENDAL.

51907D 97-LISTAGRAM 2

LISTACARDS PROCESS TEACHERS' MARK-LISTS LIKE A COMPUTER. LISTAGRAM, 2 DRAWS A HISTOGRAM WITH LABELLED AXES AND CUTTING-OUT GUIDES SHOWING THE DISTRIBUTION IN 10 GROUPS OF THE SCORES OF AN ARRAY OF UP TO 75

51907D (CONTD)

STUDENTS, FROM MEMORY OR ON A DATA-CARD. IT WILL PRINT OUT A LIST OF THE CONTENTS OF EACH GROUP. DATA REMAIN INTACT IN MEMORY.
ALL LISTACARDS ARE FULLY COMPATIBLE DATA IN MEMORY OR ON CARD TRANSFERABLE.

220PROGRAM STEPS
E. ARTHUR MORTON
GB-KENDAL.

51908D 67-HEXARITH: HEXADEC. ARITHMETIC AND CONVERSION

PROGRAM ADDS AND SUBTRACTS HEXADECIMAL NUMBERS OF INTEGER TYPE (UP TO FIVE DIGITS). COMPUTATION USES THE BUILT IN DECIMAL ARITHMETIC AND A CORRECTION PROCESS ON THE RESULT. THEREFOR ONLY 1 DIGIT SEPARATION PROCESS IS NECESSARY. PROGRAM CONVERTS HEXADECIMAL NUMBERS INTO THEIR DECIMAL REPRESENTATION AND VICE VERSA. STACK AND LAST X BEHAVE AS IN NORMAL 2 OPERAND / 1 OPERAND FUNCTIONS RESPECTIVELY.

174PROGRAM STEPS
HELGE LEHNHARDT
D-ALLENSBACH.

51909D 67-MAZE GAME

THE MACHINE FINDS THROUGH A MAZE. IT ASKS YOU IF IT CAN GO TO THE NORTH, THE EAST, THE WEST OR THE SOUTH.
YOU TELL THE MACHINE IF IT CAN OR NOT, AND THE MACHINE GIVES YOU A NEW QUESTION.

184PROGRAM STEPS
EGON JENSEN
DK-SONDERBORG.

51910D 67-STATICAL VALUES FOR CIRCLES AND ANNULI

THIS PROGRAM CALCULATES THE PROPERTIES OF CIRCULAR AND ANNULAR SECTIONS. ANY TWO VALUES OUT OF FIVE ARE ENTERED FOR CALCULATION OF THE REST. THESE FIVE VALUES ARE DIAMETER, WALL THICKNESS, SECTIONAL AREA, MOMENT OF RESISTANCE, AND MOMENT OF INERTIA. RADIUS OF INERTIA WILL ALSO BE CALCULATED.

223PROGRAM STEPS
DIETRICH ENSS
D-BARSBUETTEL.

51911D 67-SQUARE ROOT OUT OF A 72 DIGIT NUMBER

THIS PROGRAM COMPUTES SQUARE ROOTS OUT OF UP TO A 72 PLACE NUMBER EITHER WITH 34 FIG OR 70 FIG. THE EXECUTION TIME FOR 34 FIG IS 3 MINUTES AND FOR 70 FIG. 10 MINUTES.

652PROGRAM STEPS
KENT A WIGSTROM
S-FLODA.

51912D 67-FACTORIALS WITHOUT LIMITS FOR "N"

THIS SHORT PROGRAM MAKES POSSIBLE TO HP-67/97 COMPUTATION OF N! FOR NUMBERS "LARGE AT WILL", MORE SPEEDLY THAN OTHER PROGRAMS, AND GIVING THE OUTPUT (WHEN 10 EXPONENTS ARE THREE DIGITS LONG) IN THE FORM :"X MULT. 10**Y" (WHERE X IS CONTENT OF X REGISTER AND Y OF Y REGISTER). FOR N<=69, THE CALCULATOR USES N! OWN FUNCTION, WHILE FOR N>69 USES A COMBINATION OF N! FUNCTION AND USUAL FACTORIAL MULTIPLICATION.

062PROGRAM STEPS
CLAUDIO VIGHI
I-BOLOGNA.

51913D 67-97-UPDATED BASE CONVERSION

THIS PROGRAM CONVERTS WHOLE NUMBERS FROM BINARY OR OCTAL OR HEX. TO DECIMAL AND VICE-VERSA. ALSO CONVERTS BINARY STRAIGHT TO OCTAL. IN ADDITION AN AUTOMATIC TABULATOR IS PROVIDED, WHICH CONVERTS DECIMAL NUMBERS TO THE EQUIVALENT NUMBER IN THE SELECTED BASE. UNIQUE IS THE PROGRAMS ABILITY TO ACCEPT HEX. NUMBERS WITHOUT THE CONVENTIONAL ZEROS, AND TO DISPLAY/PRINT THE RESULT OF A DECIMAL TO HEX. CONVERSION IN THE SAME FORMAT. FLOW-CHARTED.

224PROGRAM STEPS
ERNST F. GIT
D-EMMENDINGEN.

51914D 67-TWO GAMES WITH NUMBERS

HP INVENTS A NUMBER OF FOUR DIGITS (0-9). THERE IS NOT TWO DIGITS EQUAL.
IN THE FIRST GAME, HP SPECIFIES THE DIGITS THAT YOU HAVE GUESSED AND IF THEY ARE IN THE RIGHT PLACE.
IN THE SECOND GAME, HP GIVES INDICATION +1, IF THE NUMBER IS GREATER THAN YOURS, AND -1, IF IT IS LOWER.

162PROGRAM STEPS
ENZO NOSEDA
I-COMO.

51915D 97-SPECIFIC GRAVITY OF FINE AND MEDIUM GRAINED SOILS

THIS PROGRAM CALCULATES THE SPECIFIC GRAVITY OF SOIL PARTICLES FROM LABORATORY RESULTS OBTAINED IN ACCORDANCE WITH BRITISH STANDARD PRACTICE (BS 1377:1975)

054PROGRAM STEPS
ALLEN J PARKER
GB-HARTLEY WINTNEY.

51916D 97-WEIGHT MOLAR CONVERSION OF COMPOSITION

CONVERTS WEIGHT PERCENT COMPOSITION TO MOLE PERCENT, OR VICE VERSA, FOR UP TO ELEVEN CONSTITUENTS. REQUIRED INPUTS ARE MOLECULAR WEIGHTS AND PERCENTAGE COMPOSITION. MOLECULAR WEIGHTS MAY BE CARRIED OVER FROM ONE CALCULATION TO THE NEXT WHICH MAKES THIS PROGRAM BETTER THAN 50439D WHEN A SERIES OF CALCULATIONS IS TO BE MADE FOR THE SAME SYSTEM.

175PROGRAM STEPS
MICHAEL CABLE
GB-SHEFFIELD.

51917D 67-EINZELSCHRITT-ALGORITHM (GAUSS-SEIDEL-METHOD)

ITERATIVE SOLUTION OF LINEAR EQUATIONS UP TO 4 UNKNOWNS. NECESSARY VARIABLES ARE GIVEN TO THE HP BY DIALOGUE AND THEN STORED. UP TO 3 AUTOMATIC TESTS FOR CONVERGENCE OF THE ITERATION SEQUENCE. IF NO CRITERION IS FULFILLED, THE HP STOPS AUTOMATICALLY AND DISPLAY "0"; OTHERWISE THE RESULTS OF THE N-TH STEP ARE DISPLAYED AND THE CALCULATOR CONTINUES WITH THE (N+1)-TH STEP. PROGRAM STOPS BY OPERATOR.

212PROGRAM STEPS
MICHAEL E. KLEWS
D-BERLIN.

51918D 97-ADJUSTMENT OF CHROMATIC ABERRATION OF A LENS SYSTEM

THE PROGRAM CALCULATES THE RADIUS OF CURVATURE OF THE LAST REFRACTIVE SURFACE OF AN OPTICAL SYSTEM SO THAT A PRESCRIBED VALUE OF THE LONGITUDINAL CHROMATIC ABERRATION IS OBTAINED. THE PROGRAM MAY ALSO BE USED TO FIND THE SPHERICAL ABERRA-

51918D (CONTD)

TION OF AN OPTICAL SYSTEM

135PROGRAM STEPS
JAMES HOUGHTON
GB-TETBURY.

51919D 67-LUNAR EPHEMERIS

GIVEN THE NUMBER OF DAYS SINCE THE REFERENCE DATE, JANUARY 0.0 1975, THE PROGRAM CALCULATES THE ECLIPTIC AND EQUATORIAL COORDINATES OF THE MOON, ITS PHASE, AND ITS HOURLY MOTIONS IN ECLIPTIC LATITUDE AND LONGITUDE.

223PROGRAM STEPS
PETER DUFFETT-SMITH
GB-CAMBRIDGE.

51920D 67-DIFFERENTIAL EQUATIONS NO 4

THIS PROGRAM SOLVES ORDINARY DIFFERENTIAL EQUATIONS WITH THE MODIFIED MILNE'S METHOD. THE FIRST THREE Y'S ARE COMPUTED WITH THE FOURTH ORDER RUNGE-KUTTA METHOD.

210PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51921D 67-D-DAY

ON THE 6TH JUNE 1944, YOU ARE THE COMMANDER-OFFICER OF A LITTLE LANDING-FLEET OF 10 LANDING SHIPS. THE CODE-NUMBER OF YOUR SHIP IS 3, THE NUMBER OF THE OTHERS; 1. YOU START IN THE LANDING-AREA AT 9 MILES FROM THE COAST OF NORMANDY (UTAH). YOU MUST TRY TO ARRIVE ON THE BEACH WITH A MAXIMUM NUMBER OF SHIPS, BUT THE CLOSER YOU COME TO THE BEACH, THE MORE THE ENEMY WILL SHOOT. AND IF THE ENEMY HITS ONE OF YOUR SHIPS OR YOURS, IT WILL SINK IMMEDIATELY AND IT IS LOST.

165PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51922D 67-LN-DISTRIBUTION

AFTER A MODIFICATION THE WELL-KNOWN EQUATION E**X=-2/PI SIGMA F(N); N=0 TO INF'Y CAN BEEN CHANGED INTO A LN-DISTRIBUTION : 1=LN -2/PI SIGMA F(N).
WITH THIS PROGRAM YOU CAN COMPUTE THIS DISTRIBUTION, POINT BY POINT OR DIRECTLY.

058PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51923D 67-THE HYPERGEOMETRIC EQUATION OR RIEMANN-P FUNCTION

GIVEN THE HYPERGEOMETRIC FUNCTION F(ALPHA, BETA, GAMMA, X**N) AS A DIFFERENTIAL EQUATION OF THE 2ND ORDER, THIS PROGRAM COMPUTES THE APROXIM. VALUES OF Y DEPENDING ON ALPHA, BATA, GAMMA AND X, POINT AFTER POINT. THEN YOU OBTAIN THE RIEMANN-P CURVE.

067PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51924D 67-THE HYPERGEOMETRIC DISTRUBUTION

AFTER THE INPUT OF M,N,K AND R, THIS PROGRAM COMPUTES THE HYPERGEOMETRIC DISTRIBUTION POINT AFTER POINT.

092PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51925D 67-ZETA FUNCTION OF RIEMANN

51925D (CONTD)

THIS YEAR, THE BELGIAN PIERRE DELIGNE HAS WON THE FIELDS-PRICE (SOMETIMES NAMED THE NOBEL-PRICE FOR MATHEMATICS) IN HELSINKI FOR HIS EXAMINATIONS CONCERNING THE ZETA-FUNCTION FOR THE RIEMANN-HYPOTHESIS.
THIS PROGRAM COMPUTES THIS FUNCTION FOR EVERY GIVEN COMPLEX NUMBER A+IB AND WITH N ELEMENTS.

050PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51926D 67-THEORY OF RELATIVITY

THE PROGRAM CALCULATES FROM ONE OF SEVEN VALUES THE OTHER SIX. FURTHER IT TRANSLATES THE FOUR-DIMENSIONAL COORDINATES X,Y,Z CT OF AN INITIAL SYSTEM IN A SYSTEM MOTIONED TO ITSELF (LORENTZ-TRANSFORMATION). FINALLY, IT CALCULATES THE LINE ELEMENT OF THE WORLD-WIDE.

171PROGRAM STEPS
HEINZ DANZER
A-VIENNA.

51927D 67-SUPERSONIC FLIGHT SIMULATOR WITH GEONAVIGATION

THIS PROGRAM ALLOWS THE SIMULATING FLIGHT OF A SUPERSONIC PLANE IN THE SAME KIND, LIKE PROGRAM 51766D BUT NOT OVER A RECTANGULAR SYSTEM. THE FLIGHT GOES OVER THE SPHERIC LATITUDE-LONGITUDE-GEONAVIGATIONAL SYSTEM.

215PROGRAM STEPS
HEINZ DANZER
A-WIEN.

51928D 67-HAMMURABI

YOU GOT A SMALL TERRITORY WITH 100000 NEGROID ABORIGINES AND A LOT OF WHEAT. YOU HAVE TO GOVERN THIS TERRITORY, FIGHTING, STARVATION, CHOLERA, RATS AND OVERPOPULATION. AFTER 15 YEARS' GOVERNMENT, YOU CAN READ YOUR ACHIEVEMENT ON THE FETCHED INFLATION FACTOR (IF YOU STILL HAVE PEOPLES AND LAND).

208PROGRAM STEPS
HEINZ DANZER
A-WIEN.

51929D 67-PERSPECTIVE AND SPHERE GRAPHIC

THE PROGRAM GIVES FOR ANY THREE-DIMENSIONAL POINT THE TWO-DIMENSIONAL POINT OF ITS PERSPECTIVE ON A PLANE OF PROJECTION. BEFORE BEING PICTURED A BODY CAN BE TRANSLATED OR ROTATED. THE PROGRAM ALSO ALLOWS A PLANE TEST TO BE PROJECTED -POINT BY POINT- ON A SPHERE AND THUS TO BE REGARDED IN PERSPECTIVE.

129PROGRAM STEPS
HEINZ DANZER
A-VIENNA.

51930D 67-SPHERIC NAVIGATION

THIS PROGRAM CALCULATES BETWEEN TWO GEOGRAPHIC POINTS ON THE EARTH THE DISTANCE AND THE INITIAL COURSE ANGLE, BOTH ORTHODROME (GREAT CIRCLE) AND LOXODROM (MERCATOR) VALUES. COURSE CONVERSION IS POSSIBLE, AND FOR EVERY LONGITUDE WILL THE LATITUDE BE CALCULATED. VALUES IN KM OR NAUTIC MILES.

205PROGRAM STEPS
HEINZ DANZER
A-WIEN.

51931D 67-GAS PIPELINE DESIGN RATIONAL FLOW FORMULA

51931D (CONTD)

MAJOR PARTS OF PROGRAM ARE 1) GAS PIPELINE FLOW (SOLVING FOR INLET PRESSURE, OUTLET PRESSURE, THROUGHPUT, STATION SPACING, AND APPROXIMATE DIAMETER). 2) COMPRESSOR STATION (SOLVING FOR STATION HORSEPOWER, AND FUEL CONSUMPTION). 3) PIPE DESIGN (SOLVING FOR ALLOWABLE PRESSURE, WALL THICKNESS AND INSIDE DIAMETER). 4) AVERAGE LINE PRESSURE (FOR DETERMINATION OF COMPRESSIBILITY,Z).

222PROGRAM STEPS
R. FRANKLIN PARKER
GB-LONDON.

51932D 67-GAMMA AND DIGAMMA FUNCTIONS AND DERIVATIVES

THE PROGRAM COMPUTES, WITH HIGH ACCURACY, FOR ANY REAL VALUE OF THE VARIABLE, THE VALUE OF THE GAMMA FUNCTION AND THAT OF ITS SUCCESSIVE DERIVATIVES (UP TO ELEVEN). IT COMPUTES AND USES THE VALUES OF THE DIGAMMA FUNCTION AND OF ITS DERIVATIVES. THE BASIC FORMULA IS AN ASYMPTOTIC EXPANSION WITH THE BERNOULLI'S NUMBERS

329PROGRAM STEPS
JEAN BARFETY
F-LE RAINCY.

51933D 97-SMOOTHING OF TIME SERIES

TIME SERIES ARE SMOOTHED ELIMINATING E.G. INFLUENCES OF SEASON OR BUSINESS CYCLES. PROGRAM USES MOVING AVG METHOD WITHIN A MULTIPLICATIVE MODEL. YOU CAN CHOOSE ANY EVEN NUMBER UP TO EIGHTEEN AS LENGTH OF SMOOTH PERIOD. OUTPUT OF SMOOTH COEFFICIENTS AND SMOOTHED DATA; WORKS WITH TWO PROGRAM AND DATA CARDS.

261PROGRAM STEPS
PETER PESCHEL
D-ESSEN.

51934D 67-CONTINUOUS BEAMS SUPPORT MOMENTS

THIS PROGRAM CALCULATES SUPPORT MOMENTS OF CONTINUOUS BEAMS OF UP TO 9 SPANS, FOR WHICH F.E. MOMENTS IN EACH SPAN ARE ALREADY KNOWN. THE BEAM MAYBE RESTING ON KNIFE-EDGE SUPPORTS OR MAY BE A FRAMED STRUCTURE, IN WHICH CASE ANY SIDESWAY EFFECT IS DISREGARDED. AS EACH SPAN IS DEALT SEPARATELY, IT IS POSSIBLE TO INTRODUCE EITHER LIVE OR DEAD LOADS AND OBTAIN ANY REQUIRED COMBINATION FOR THE CONSTRUCTION OF A MAXIMUM MOMENT ENVELOPE.

425PROGRAM STEPS
AGHA MUNIR SHERWANI
U.A.E. SHARJAH.

51935D 67-BS 5500 SPHERICAL SHELL DISIGN FOR INTERNAL PRESSURE

THE PROGRAM WILL CALCULATE TO BS 5500-1976 THE REQUIRED THICKNESS IN MM, OF A SPHERICAL SHELL OR A SPHERICAL CROWN PLATE OF A DISHED HEAD, WHEN SUBJECT TO INTERNAL PRESSURE. ALSO THE PROGRAM CALCULATES THE MAXIMUM WORKING PRESSURES, THE TEST PRESSURE AND THE STRESSES AT TEST WHICH IT WILL TEST AGAINST 90 PER CENT YIELD.

146PROGRAM STEPS
LESLIE A. TEMPERLEY
GB-MANCHESTER.

51936D 67-PRESSURE VESSEL-ERECTION WEIGHT OF A COLUMN

THIS PROGRAM COMPUTES AN ERECTION WEIGHT OF A STEEL VESSEL COLUMN FOR INPUTS OF LENGTH, DIAMETER, THICKNESS AND NUMBER OF TRAYS. THE PROGRAM WORKS IN METRIC UNITS

51936D (CONTD)

ONLY.

180PROGRAM STEPS
LESLIE A. TIMPERLEY
GB-MANCHESTER.

51937D 67-CIRCULAR PLATE EDGE FIXED & CENTRAL-LOAD ON SMALL AREA

FOR A FLAT CIRCULAR PLATE OF CONSTANT THICKNESS WITH A UNIFORM LOAD OVER A SMALL CENTRAL CIRCULAR AREA OF RADIUS RO AND WITH EDGES FIXED, THIS PROGRAM WILL CALCULATE VALUES OF DEFLECTION, SLOPE, BENDING MOMENT AND BENDING STRESS.

219PROGRAM STEPS
LESLIE A. TIMPERLEY
GB-MANCHESTER.

51938D 97-REINFORCING BAR SCHEDULE DIN 488

PROGRAM MAKES OUT REINFORCING BAR SCHEDULES FOR BUILDING PARTS OF REINFORCED CONCRETE ACCORDING TO DIN 488. LENGTHS AND WEIGHTS WILL BE SORTED AUTOMATICALLY BY DIAMETERS.

147PROGRAM STEPS
WOLFGANG STREUBER
D-KAISERSLAUTERN.

51939D 67-DIFFERENTIAL EQUATIONS 5

THIS PROGRAM CAN SOLVE ORDINARY DIFFERENTIAL EQUATIONS WITH THE SPECIAL METHOD OF PROGRAM NO 1778. BUT THE MEAN OF THE K'S IS COMPUTED WITH THE LINEAR REGRESSION METHOD.

091PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51940D 67-DIFFERENTIAL EQUATIONS 6

THIS PROGRAM CAN SOLVE ORDINARY DIFFERENTIAL EQUATIONS WITH THE SPECIAL METHOD OF PROGRAM NO 1778, BUT THE MEAN OF THE K'S IS COMPUTED WITH THE EXPONENTIAL CURVE FITTING.

095PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51941D 67-DIFFERENTIAL EQUATIONS 7

THIS PROGRAM CAN SOLVE ORDINARY DIFFERENTIAL EQUATIONS WITH THE SPECIAL METHOD OF PROGRAM NO 1778, BUT THE MEAN OF THE K'S IS COMPUTED WITH THE LOGARITHMIC CURVE FITTING.

093PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51942D 67-DIFFERENTIAL EQUATION 8

THIS PROGRAM CAN SOLVE ORDINARY DIFFERENTIAL EQUATIONS WITH THE SPECIAL METHOD OF PROGRAM NO 1778, BUT THE MEAN OF THE K'S IS COMPUTED WITH THE POWER CURVE FITTING.

094PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51943D 67-SIMPLE PENDULUM II

THIS PROGRAM COMPUTES, WITH A CLOSE APPROXIMATION, THE PERIODIC TIME T OF A SIMPLE PENDULUM IF IS GIVEN THE AMPLITUDE ALPHA.

058PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51944D 67-EULER'S FORMULA

51944D (CONTD)

THIS PROGRAM COMPUTES THE EULER'S FORMULA FOR ANY (Z) AND (N), POINT BY POINT OR DIRECTLY FOR N (N CAN BE MORE THAN 69).

044PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51945D 67-CONTINGENCY TABLES AND PRODUCT MATRICES

PROGRAM SYNTHETIZES ORIGINAL OBSERVATIONS INTO A STANDARDIZED "DATA BASE". OTHER PROGRAMS USE THIS DATA TO COMPUTE VARIOUS STATISTICS SO THAT NO FURTHER DATA IS TO BE INTRODUCED. TWO OPTIONS ARE AVAILABLE DEPENDING ON THE INTENDED KIND OF STATISTICS TO BE COMPUTED - CONSTRUCTION OF A CONTINGENCY TABLE CONTAINING UP TO 16 CELLS (TOTALS EXCLUDED, SUITABLE FOR NOMINAL TO RATIO LEVEL VARIABLES), OR A CROSS PRODUCT MATRICE CONTAINING 3 OR 4 INTERVAL OR RATIO LEVEL VARIABLES.

223PROGRAM STEPS
LUTTINGER AVIGDOR
F-FONTAINEBLEAU.

51946D 67-STATISTICS FOR CONTINGENCY TABLES-1

PROGRAM 1 COMPUTES THE CHI-SQUARE STATISTIC FROM A CONTINGENCY TABLE AS WELL AS THE CHI-SQUARE CUMULATIVE DISTRIBUTION. THE TABLE MAY CONTAIN UP TO 16 CELLS, AND MAY BE SAVED FOR FURTHER USE BY PROGRAMS 2 AND 3, WHICH COMPUTE OTHER STATISTICS. THE PROGRAM GUIDES THE USER AS TO WHICH VALUES TO ENTER. TABLES CONSTRUCTED BY PROGRAM "CONTINGENCY TABLES AND PRODUCT MATRICES" ARE ALSO ACCEPTED BY THIS PROGRAM.

224PROGRAM STEPS
AVIGDOR LUTTINGER
F-FONTAINEBLEAU.

51947D 67-STATISTICS FOR CONTINGENCY TABLES 2

PROGRAM 2 COMPUTES PHI, CRAMER'S V AND ASSYMETRIC LAMBDA FROM CONTINGENCY TABLES TREATED BY PROGRAM 1. TABLES CONSTRUCTED BY PROGRAM' CONTINGENCY TABLES AND PRODUCT MATRICES' AND NOT TREATED BY PROGRAM 1 MAY BE USED, BUT PHI AND CRAMER'S V MAY NOT BE COMPUTED. PROGRAM 2 ALSO PRINTS OUT THE TABLE (INCLUDING TOTALS) NO REINTRODUCTION OF DATA IS NEEDED.

224PROGRAM STEPS
LUTTINGER AVIGOR
F-FONTAINEBLEAU.

51948D 67-STATISTICS FOR CONTINGENCY TABLES 3

PROGRAM 3 COMPUTES ASSYMETRIC ETA FROM CONTINGENCY TABLES CONSTRUCTED BY PROGRAM 1 OR BY PROGRAM' CONTINGENCY TABLES AND PRODUCT MATRICES. IT ALSO PRINTS THE TABLE UNDER THE FORM OF COLUMN OR ROW PERCENTAGES. NO REINTRODUCTION OF DATA IS NEEDED

223PROGRAM STEPS
AVIGDOR LUTTINGER
F-FONTAINEBLEAU.

51949D 67-97-RASTER SCAN GRAPHICS

THE PROGRAM TRANSFORMS THREEDIMENSIONAL IN TWODIMENSIONAL COORDINATES, SO THAT IT IS POSSIBLE TO PLOT AN OBJECT IN A XZ-PLANE. IT IS POSSIBLE TO " GO AROUND THE OBJECT" THE FUNCTION HAS TO BE EXPLICIT OR IN PARAMETER REPRESENTATION.

160PROGRAM STEPS
JOHANNES GRUSS

51949D (CONTD)

D-WIESBADEN.

51950D 67-97-CUBIC SPLINE INTERPOLATION MTH6

THE PROGRAM INTERPOLATES WITH 5 GIVEN POINTS WITH CUBIC SPLINES. IT IS POSSIBLE TO USE UNEQUAL DISTANCES.

318PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

51951D 67-97-CUBIC SPLINE INTERPOLATION MTH5

THE PROGRAM INTERPOLATES WITH 3 GIVEN WITH CUBIC SPLINES. IT IS POSSIBLE TO USE UNEQUAL DISTANCES.

156PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

51952D 67-LONG DISTANCE REDUCTION

THE PROGRAM REDUCES DISTANCES, SPECIALLY EDM. THE FOLLOWING CORRECTIONS ARE USED: 1) CALCULATION OF ELLIPTIC RADIUS FOR SPHERICAL APPROXIMATION. 2) CALCULATION OF REFRACTION COEFFICIENT K. 3) REDUCTION OF REFRACTION OF ZENIT-ANGLE. 4) REDUCTION TO TANGENT PLANE OF STANDPOINT. 5) REDUCTION TO SPHERE OF STANDPOINT. 6) REDUCTION TO ZERO LEVEL. 7) GAUSS-KRUEGER-REDUCTION. FOR BOTH SIDE OBSERVATION OF ZENIT-ANGLE, IT IS POSSIBLE TO CALC. K. PROGRAM CALCULATES THE HEIGHT DIFFERENCE BETWEEN STAND/TARGETPOINT.

196PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

51953D 67-TEMPERATURE VARIATIONS ALONG A WIRE (ENDS AT CST. TEMP.)

THE LINEAR DIFFERENTIAL EQUATION OF CONDUCTION OF HEAT IN AN ISOTROPIC WIRE, WITH THE INITIAL TEMPERATURE F(X) AND THE ENDS KEPT AT CONSTANT TEMPERATURE, ADMITS A SOLUTION IN THE FORM OF INFINITE SERIE WITH INTEGRAL COEFFICIENTS. THE SPATIAL AND TEMPORAL VALUES OF TEMPERATURE ALONG THE WIRE ARE CALCULATED WITH GOOD APPROXIMATION BY SUMMING THE N<=19 FIRST TERMS OF THE SERIE.

110PROGRAM STEPS
RENE BAILLY-SALINS
F-IS-SUR-TILLE.

51954D 67-EVALUATION LOST HEAD FOR FLUID FLOW IN PIPES-COLEBROOK

THE DARCY-WEISBACH FORMULA IS THE BASIS FOR EVALUATION LOST HEAD. FRICTION FACTOR (F) IS OBTAINED FROM COLEBROOK EQUATION. THEREFORE IT IS NECESSARY FOR A DESIGNER TO KNOW REYNOLDS NUMBER AND THE SIZE OF THE SURFACE IMPERFECTIONS.

127PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

51955D 67-EVALUATION FLOW RATE FOR FLUID FLOW IN PIPES COLEBROOK

FOR A GIVEN LOST HEAD, LENGTH OF PIPE, INSIDE DIAMETER OF PIPE, KINEMATIC VISCOSITY AND THE SIZE OF THE SURFACE IMPERFECTIONS OF THE PIPE THIS PROGRAM WILL CALCULATE THE FLOW RATE OF THAT PIPE. THE BASIC EQUATIONS FOR SOLVING THE PROBLEM ARE DARCY-WEISBACH FORMULA AND COLEBROOK EQUATION.

149PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

51956D 67-EVALUATING DIAMETER OF THE PIPE COLEBROOK

FOR A GIVEN LOST HEAD, FLOW RATE, KINEMATIC VISCOSITY AND THE SIZE OF THE IMPERFECTIONS OF THE PIPE, DIAMETER IS OBTAINED.

175PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

51957D 67-EVALUATION LOST HEAD FOR FLUID FLOW IN PIPES-VON KARMAN

THE DARCY-WEISBACH FORMULA IS THE BASIS FOR EVALUATING LOST HEAD. FRICTION FACTOR () IS OBTAINED FROM VON KARMAN'S EQUATION (MODIFIED BY PRANDTL). THEREFORE IT IS NECESSARY FOR A DESIGNER TO KNOW REYNOLDS NUMBER AND THE SIZE OF THE SURFACE IMPERFECTIONS.

118PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

51958D 67-EVALUATING FLOW RATE FOR FLUID FLOW IN PIPES-VON KARMAN

FOR A GIVEN LOST HEAT, LENGTH OF PIPE, INSIDE DIAMETER OF THE PIPE, KINEMATIC VISCOSITY AND THE SIZE OF THE SURFACE IMPERFECTIONS OF THE PIPE, THIS PROGRAM CALCULATES THE FLOW RATE OF THAT PIPE. THE BASIC EQUATIONS FOR SOLVING THE PROBLEM ARE DARCY-WEISBACH FORMULA AND VON KARMAN'S EQUATION MODIFIED BY PRANDTL.

139PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

51959D 67-EVALUATING DIAMETER OF THE PIPE VON KARMAN

FOR A GIVEN LOST HEAD, FLOW RATE, KINEMATIC VISCOSITY AND THE SIZE OF THE IMPERFECTIONS OF THE PIPE, DIAMETER IS OBTAINED.

163PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

51960D 67-POLYGONAREA

THIS PROGRAM CALCULATES THE AREA AND THE GIRTH FROM A POLYGON WITH N-CORNERS.

081PROGRAM STEPS
SOCHEN WIECHERN
D-VISSELHOVEDE.

51961D 67-NUMBER OF SUBJECTS FOR CLINICAL TRIALS

THIS PROGRAM GIVES THE NECESSARY NUMBER OF SUBJECTS TO SEE A GIVEN DIFFERENCE BETWEEN TWO TREATMENTS. QUANTITATIVE (MEANS) OR QUALITATIVE (PERCENTAGES) DATA COULD BE ENTERED THE MOST OFTEN USED VALUES OF THE FIRST ORDER (ALPHA) AND SECOND ORDER (BETA) RISKS ARE INCLUDED IN THE PROGRAM. A SUB-ROUTINE CAN BE USED FOR OTHER VALUES ONLY IF YOU KNOW THE CORRESPONDING STANDARDISED DEVIATE.

202PROGRAM STEPS
ALAIN GUERIN
F-PARIS.

51962D 67-EQUILIBRATED RANDOMISATION BETWEEN 2 OR 3 TREATMENTS

WITH THIS PROGRAM YOU CAN GET LISTS OF EQUILIBRATED RANDOMISATIONS NECESSARY TO PLANE COMPARISON TRIALS (IN MEDICINE, AGRICULTURE, ETC.) A SUB-ROUTINE IS USED TO STORE THE LAST SEED TILL ANOTHER

51962D (CONTD)

UTILIZATION. LIKE IN RANDOM NUMBER GENERATOR STI-04A, YOU CAN CALCULATE THE MEAN AND THE STANDARD DEVIATION OF THE RANDOM GENERATOR TO BE SURE THERE WERE NO BIAS.

098PROGRAM STEPS
ALAIN GUERIN
F-PARIS.

51963D 97-COMPARISON OF LOTTONUMBERS

THIS PROGRAM IS FOR PEOPLE WHO PLAY LOTTO (6 AUS 49) AND USE THEIR NUMBERS FOR ONE MONTH. IT COMPARES THE WEEKLY NUMBERS AND MONTHLY NUMBERS AND PRINTS THE NUMBER OF THE FIELD AND THE HITS IN IT.

221PROGRAM STEPS
LUTZ KORFMACHER
D-KIRCHLENGERN.

51964D 67-TEMP. VARIATIONS ALONG A RADIATING WIRE (ENDS AT CST. TEMP.)

WE CONSIDER AN ISOTROPIC WIRE WHICH EMITS BLACK BODY RADIATION AND THE ENDS OF WHICH ARE KEPT AT CONSTANT TEMPERATURE. IF F(X) IS THE INITIAL TEMPERATURE, THE LINEAR DIFFERENTIAL EQUATION OF CONDUCTION OF HEAT CAN BE SOVED BY THE FINITE-DIFFERENCE METHOD. THE SPATIAL AND TEMPORAL VALUES OF TEMPERATURE IN A WIRE OF LENGTH L AND DIFFUSIVITY K CAN BE CALCULATED WITH GOOD APPROXIMATION BY USING A MESH SIZE DELTA X=L/N, DELTA T=L**2/2N**2K, N INTEGER <=20.

076PROGRAM STEPS
RENE BAILLY-SALINS
F-IS-SUR-TILLE.

51965D 67-ARCHIVE OF DATAS

THIS PROGRAM FILES ONE NUMBER OF DATAS, INDICATING WITH NUMBERS AFTER 1 TO 50.

223PROGRAM STEPS
LORENZO PORTILLO
E-VILLAS DE BENICASIM.

51966D 67-CARBONIC ACID EQUILIBRIA IN WATER CHEMISTRY

THIS PROGRAM WHICH USES THREE MAGNETIC CARDS GIVES AN INTERPRETATION OF A WATER ANALYSIS WHEN PH, ALKALINITY, CALCIUM HARDNESS AND IONIC STRENGTH ARE KNOWN.
THE FOLLOWING INFORMATIONS ARE OBTAINED : CHARACTER OF WATER (AGGRESSIVE OR SCALE FORMING), EQUILIBRIUM PH, CARBONIC ACID BALANCE AT EQUILIBRIUM, STABILIZATION PH, CARBONIC ACID BALANCE AFTER STABILIZATION.

538PROGRAM STEPS
J. HISSEL
B-LIEGE.

51967D 97-SELF CORRECTING ALARM CLOCK

DIGITAL ALARM CLOCK THAT IS EASY TO CALIBRATE FOR INDIVIDUAL HP 97S AND CAN BE ADJUSTED TO CHANGING ENVIRONMENTS WHILE IT RUNS. THE PAPER-ADVANCE MECHANISM SOUNDS AT THE CHOSEN TIME, AND THERE IS A TEN MINUTES DELAY ROUTINE FOR SLUGGARDS

111PROGRAM STEPS
PEDER VOETMANN
DK-BIRKEROD.

51968D 67-SHRINKAGE FIT

THE PROGRAM COMPUTES DIAMETRICAL GRIP, MAXIMUM TENSION IN THE TWO PARTS, TEMPERATURE DIFFERENCE SO THE TWO PARTS CAN BE PUT TOGETHER WITHOUT FORCE AND THE CRITICAL TEMPERATURE AT WHICH THE TWO PARTS

51968D (CONTD)

FALL APART IF THEY ARE MADE FROM DIFFERENT MATERIALS.

183PROGRAM STEPS
ERLING PEDERSEN
S-GOETEBORG.

51969D 67-PERFECT NUMBERS

A NUMBER IS SAID PERFECT WHEN THE SUM OF ITS DIVISORS (WITHOUT THE NUMBER HIMSELF) IS EQUAL TO THIS NUMBER. THIS PROGRAM CAN TEST A NUMBER IF IT IS PERFECT OR NOT AND CAN CALULATE THE PERFECT NUMBERS BETWEEN TWO INTEGERS GIVEN. MORLOVER, IT CAN GIVE YOU ALL THE DIVISORS OF AN INTEGER. SO, YOU CAN ALSO TEST IF A NUMBER IS A PRIME ONE OR NOT.

066PROGRAM STEPS
JEAN SCHANNES
L-BETTEMBOURG.

51970D 67-VARIABLE VARIANCE REGRESSION AND CONCENTRATION CURVES

CONCENTRATION Y COMPUTED AS LINEAR REGRESSION OF X, A PARTICULE OR PHOTON EMISSION USING FEW KNOWN STANDARDS-IMPLICITELY SUPPOSE CONSTANT X VARIANCE. AS IN CASE, VARIANCE IS EQUAL TO X- NOT CONSTANT RESULTS ARE SIGNIFICALLY BIASED FOR LOW CONCENTRATIONS. TAKING IN ACCOUNT THE TRUE STANDARD ERROR OF MEAN, PROGRAM COMPUTES IMPROVED REGRESSIONS COEFFICIENTS GIVING BETTER RESULTS FOR LOW CONCENTRATIONS, AVOIDING USE OF TWO SEPARATE REGRESSIONS FOR HIGH AND LOW CONCENTRATIONS.

070PROGRAM STEPS
ANDRE RIVIERE
F-BOURG-LA-REINE.

51971D 67-RADAR SIMULATOR

PROGRAM DETERMINES AN UFO (X,Y COORDINATES SOMEWHERE IN AN X-Y PLANE) AND THEN A RADAR SIMULATOR STARTS TO FIND THIS UFO.

106PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51972D 67-RADIATION-DENSITY

GIVEN A TEMPERATURE IN K AND A SPEEDINTERVAL DELTA V, THIS PROGRAM COMPUTES THE RADIATION DENSITY PHI FOR EVERY SPEED BETWEEN 0 AND C

088PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51973D 67-THE DISCHARGE CURRENT RESPONSE OF THE R-C-L-NETWORK.

PROGRAM COMPUTES THE DISCHARGE CURRENT RESPONSE OF A SERIES L-C-R-CIRCUIT AS A FUNCTION OF A TIME. THREE DIFFERENT CASES ARE POSSIBLE. A) A PERIODIC DISCHARGE. B) CRITICALLY DAMPED DISCHARGE. C) OSCILLATORY DISCHARGE.

133PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51974D 67-SPECIAL LOG-CURVE FITTING

GIVEN THE COORDINATES OF N DATA (X,Y), THE PROGRAM COMPUTES THE COEFFICIENTS A,B AND C OF THE BEST CURVE-FITTING Y=ALNX+BSCNX+CX YOU CAN ALSO COMPUTE EXPECTED Y'S FOR GIVEN X'S.

159PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51975D 67-US STANDARD ATMOSPHERE IN SI UNITS

PROGRAM COMPUTES PRESSURE, DENSITY TEMPERATURE AND VELOCITY OF SOUND FOR A GIVEN ALTITUDE H IN KM. THE PROGRAM WORKS FOR ALTITUDES SMALLER OR EQUAL TO 47KM. THE DATA ARE COMPUTED IN SI-UNITS.

205PROGRAM STEPS
R. DETLEF SCHMITT
D-OTTOBRUNN.

51976D 67-ROOTS OF A FUNCTION

PROGRAM SEARCHES FOR THE ROOTS OF A FUNCTION. USING A MODIFIED REGULA FALSI.

092PROGRAM STEPS
DETLEF R. SCHMITT
D-OTTOBRUNN.

51977D 67-VDI STEAMTABLE (PRESSURE TABLE)

PROGRAM COMPUTES THE SPECIFIC VOLUME OF STEAM FOR GIVEN PRESSURE AND TEMPERATURE USING SCHMIDT'S FORMULA.

084PROGRAM STEPS
DETLEF R. SCHMITT
D-OTTOBRUNN.

51978D 67-CURVE-FITTING OF PULMONARY PRESSURE-VOLUME CHARACTERISTICS

PROGRAM FITS FIVE DATA POINTS - TRANSPULMONARY PRESSURE FOR A GIVEN INFLATION VOLUME TO A THEORETICAL CURVE EXPRESSED BY LN(1-V/VO)=B-AP WHERE A AND B AND VO ARE PARAMETERS VO IS EMPIRICALY DETERMINED BY AN ITERATIVE ROUTINE.
THIS PROGRAM COMPUTES AND STORES ALL THE PARAMETERS NECESSARY FOR THE CALCULATION OF A AND B, AND CALCULATES VO AND THE REGRESSION COEFFICIENT.

216PROGRAM STEPS
MARIUS LAURENT
B-LA LOUVIERE.

51979D 67-CURVE-FITTING OF PULMONARY PRESSURE-VOLUME CHARACTERISTICS

FROM PARAMETERS COMPUTED AND STORED BY PART 1 OF THE PROGRAM, PART 2 COMPUTES AND DISPLAY VO, RELATED TO TOTAL LUNG CAPACITY, H, OR HALF INFLATION PRESSURE, AND PZ - THE PRESSURE WHEN V=0. 1/H IS ALSO DISPLAYED, AND IS WELL RELATED TO STATIC COMPLIANCE. A SIMULATION OF THE THEORETICAL PRESSURE VOLUME CURVE IS GENERATED WITH, FOR EACH POINT, THE PRESSURE, THE STATIC COMPLIANCE EXPRIMED BY V/P AND DV/DP.

115PROGRAM STEPS
MARIUS LAURENT
B-LA LOUVIERE.

51980D 67-CHEMICAL REACTION KINETICS

THE PROGRAM COMPUTES THE ACTIVATION PARAMETERS OF A CHEMICAL REACTION (FREQUENCY FACTOR, ACTIVATION-ENERGY, ENTROPY AND -ENTHALPY AS WELL AS FREE ENTHALPY OF ACTIVATION TOGETHER WITH THE STANDARD DEVIATIONS ON A GIVEN SIGNIFICANCE LEVEL FROM TEMPERATURE/RATE CONSTANT DATA PAIRS. ADDITIONAL YOU WILL GET DATA POINTS OF THE REGRESSION LINE FOR DRAWING AN ARRHENIUS OR AN EYRING PLOT AS WELL AS THE CORRELATION COEFFICIENT.

224PROGRAM STEPS
WOLFGANG W. KRAPP
D-NEUSTADT.

51981D 67-FOURIER COEFFICIENTS

51981D (CONTD)

THIS PROGRAM IS A SUPPLEMENT TO PROGRAM 51800D. IT ALLOWS FASTER COMPUTATION THAN PROGRAM 51800D, IF F(X) IS PERIDIC AND HAS TWO SYMNETRIES, WHICH ALLOWS TO REDUCE THE INTEGRATION INTERVAL TO THE FOURTH PART OF PERIOD. THE USED METHOD IS ANALOGOUS TO MY PROGRAM 51800D. AN APPENDIX COMPUTES THE OPTIMAL REPRESENTATION OF THE GAUSS-LEGEND COEFFICIENTS WITHIN TEN DIGITS FOR K=4.

197PROGRAM STEPS
BERND ROTHMAIER
D-DURMERSHEIM.

51982D 67-SIMPLE OPEN FRAMES

THIS PROGRAM CALCULATES VERTICAL AND HORIZONTAL REACTIONS AND SUPPORT MOMENTS OF SIMPLE OPEN RECTANGULAR FRAMES UNDER HORIZONTAL AND VERTICAL DISTRIBUTED AND POINT LOADS AND TEMPERATURE LOAD AND ANY COMBINATION OF THEM.

295PROGRAM STEPS
JIMMY PLATONIS
GR-ATHENS.

51983D 67-5 LINEAR EQUATIONS IN 5 UNKNOWN

THIS PROGRAM ALLOWS THE USER TO SOLVE A SYSTEM OF FIVE LINEAR EQUATIONS IN FIVE UNKNOWN BY THE METHOD OF TRIANGULATION, ALSO NAMED "CHOLESKY'S METHOD" AND OFTEN USED FOR GREATER SYSTEMS WITH THE HELP OF A COMPUTER.

324PROGRAM STEPS
DIDIER DE BRUYN
B-BRUXELLES.

51984D 97-EIGEN SYSTEM OF A 3X3 REAL MATRIX

THE PROGRAM COMPUTES ALL EIGENVALUES AND ALL ENGENVECTORS OF A 3X3 REAL MATRIX. FIRST DOMINANT EIGENVECTOR AND CORRESPONDING EIGEN VALUE ARE FOUND. THEN ZERO IS SUBSTITUTED TO THE EIGENVALUE AND PROCESS CONTINUES.

362PROGRAM STEPS
BERNARD SIRET
F-SAINT-CLOUD.

51985D 67-TEMPERATURE-PROBLEMS I

GIVEN A BODY AT A TEMPERATURE OF A DEGREE, PLACED OUTDOORS WHERE THE TEMPERATURE IS B DEGREE. IF AFTER T MINUTES THE TEMPERATURE OF THE BODY IS C DEGREE, THIS PROGRAM FINDS :
A) HOW LONG IT WILL TAKE THE BODY TO REACH A TEMPERATURE OF O DEGREE.
B) THE TEMPERATURE OF THE BODY AFTER T MINUTES.

055PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51986D 67-TEMPERATURE PROBLEMS II

GIVEN A BODY AT AN UNKNOWN TEMPERATURE, PLACED IN A ROOM WHICH IS HELD AT A CONSTANT TEMPERATURE OF A DEGREE. IF AFTER T1 MINUTES THE TEMPERATURE OF THE BODY IS T DEGREE 1 AND AFTER T DEGREE 2 MINUTES T DEGREE 2, THIS PROGRAM COMPUTES THE UNKNOWN INITIAL TEMPERATURE.

053PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51987D 67-A SPECIAL DISTRIBUTION

THIS PROGRAM COMPUTES THE NECESSARY M TO OBTAIN A ZERO-DIFFERENCE

51987D (CONTD)

BETWEEN SIN X AND DISTRIBUTION WITH A P ROUND-OFF.

060PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51988D 67-BACTERIA-CULTURE-MODEL

PROGRAM CREATES A MODEL OF BACTERIA CULTURE TO COMPUTE THE NUMBER OF STRANDS AT ANY TIME IF IS GIVEN THE NUMBER OF STANDS AFTER TWO TIME INTERVALS.

048PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51989D 67-THE HELLMANN POTENTIAL

THIS PROGRAM COMPUTES THE HELLMANN POTENTIAL FOR THE ISOLATED ALKALI ATOMS : NA, K, RB, CS.

095PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51990D 67-THE P-N JUNCTION DIODE

PROGRAM COMPUTES THE INSTANTANEOUS PLATE RESISTANCE TAU P AND THE DIFFERENTIAL PLATE RESISTANCE TAU P IF IS GIVEN : THE TEMPERATURE IN DEGREE CC, THE INVERSE SATURATION CURRENT ICO IN MU A AND THE DIODE VOLTAGE DROP UP.

068PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51991D 67-GEO-LOG CURVE FIT NO 3

PROGRAM COMPUTES THE COEFFICIENTS A,B,C AND D OF THE BEST FITTING CURVE Y=A+B COSX+CTGX+DLNX. AFTER THE INPUT OF N DATA PAIRS (X,Y) YOU CAN ALSO COMPUTE THE EXPECTED Y FOR GIVEN X'S.

216PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51992D 67-THE RESPONSE OF THE LCR NETWORK TO A RAMP VOLTAGE

THIS PROGRAM COMPUTES THE THREE POSSIBLE CASES (OVERDAMPED, CRITICALLY DAMPED OR DAMPED OSCILLATORY) OF A SERIE L-C-R CIRCUIT TO A RAMP VOLTAGE.

192PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51993D 67-CURRENT IN A R-L NETWORK

THIS PROGRAM DETERMINES THE RESULTING CURRENT IN A R-L CIRCUIT IF THE SUPPLY IS SWITCHED ON AT T=0 AT THE INSTANT WHEN THE SUPPLY VOLTAGE IS AT MAXIMUM.

066PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51994D 67-THE RESPONSE OF A RL OR A LC CIRCUIT TO A RAMP VOLTAGE

THIS PROGRAM COMPUTES THE CURRENT RESPONSE OF A RL OR A LC SERIES CIRCUIT TO A RAMP VOLTAGE.

067PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51995D 67-DIFFERENTIAL EQUATIONS 9

THIS PROGRAM SOLVES ORDINARY DIFFE-

51995D (CONTD)

RENTIAL EQUATIONS WITH THE MODIFIED SYSTEM OF PROGRAM NO 1777 BUT THE K'S ARE COMPUTED WITH A FORWARD - BACKWARD SYSTEM AND THE MEAN OF THE K'S BY THE METHODE OF A LINEAR REGRESSION.

116PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51996D 67-DIFFERENTIAL EQUATIONS 10

THIS PROGRAM SOLVES ORDINARY DIFFERENTIAL EQUATIONS WITH THE MODIFIED SYSTEM OF PROGRAM NO 1777 BUT THE K'S ARE COMPUTED WITH A FORWARD - BACKWARD SYSTEM AND THE MEAN OF THE K'S BY THE METHOD OF EXPONENTIAL CURVE FITTING.

119PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51997D 67-DIFFERENTIAL EQUATIONS 11

THIS PROGRAM SOLVES ORDINARY DIFFERENTIAL EQUATIONS WITH THE MODIFIED SYSTEM OF PROGRAM NO 1777 BUT THE K'S ARE COMPUTED WITH A FORWARD - BACKWARD SYSTEM AND THE MEAN OF THE K'S BY THE METHOD OF LOGARITHMIC CURVE FITTING.

118PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51998D 67-DIFFERENTIAL EQUATIONS 12

THIS PROGRAM SOLVES ORDINARY DIFFERENTIAL EQUATIONS WITH THE MODIFIED SYSTEM OF PROGRAM NO 1777 BUT THE K'S ARE COMPUTED WITH A FORWARD - BACKWAD SYSTEM AND THE MEAN OF THE K'S BY THE METHOD OF POWER CURVE FITTING.

120PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

51999D 67-DIFFERENTAL EQUATION 13

PROGRAM SOLVES ORDINARY DIFFERENTIAL EQUATIONS WITH THE ORIGINAL KUTTA METHOD.

066PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52000D 67-OPTIMAL ESTIMATION OF A MULTI FIX

THE PROGRAM COMPUTES A FIX FROM TWO OR MORE OBSERVATIONS. STANDARD DEVIATION MAY BE COMPUTED. DATA DISPLAID IN FORMAT DEGREES, MINUTES AND TENTHS OF MINUTES. (DD.MMM). FOR A RUNNING FIX THE ALTITUDES MUST BE CORRECTED FOR THE CHANGE IN POSITION BEFORE THEY ARE ENTERED. USE SIGHT REDUCTION 1,2 OR 3 WHICH HAVE AUTOMATIC SEILING CORRECTION.

140PROGRAM STEPS
JAN ANDERSEN
N-BERGEN.

52001D 67-FULLY ADJUSTABLE TIMER

A DATA PROGRAM CARD CREATES A 2 SECONDS STEP TIMER. THE ACCURACY IS CONTROLLED BY ONE REGISTER. AFTER 24 HOURS THE TIMER SKIPS TO ZERO AND STARTS AGAIN.

022PROGRAM STEPS
ULRICH HAHN
D-FLENSBURG.

52002D 67-SUMS OF THREE RECIPROCAL POWERS & BERNOULLI NUMBERS

52002D (CONTD)

IN ONLY A CARD, THIS PROGRAM GIVES THREE SUMS OF RECIPROCAL POWERS, VIZ RIEMANN ZETA, ETA AND LAMBDA. BESIDES THESE MATTERS, IT FURNISHES THE BERNOULLI NUMBERS. NEGATIVE ARGUMENTS FOR ZETA FUNCTION ARE PROVIDED.

218PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52003D 67-EULER NUMBERS AND STIRLING FACTORIAL

THIS PROGRAM GIVES EULER NUMBERS AND STIRLING FACTORIAL, BOTH FOR GREAT N. ACCURACY IS VERY GOOD. BESIDE THESE MATTERS, A SIGMA FUNCTION, BETA, IS PROVIDED.

224PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52004D 67-TETRAGAMMA FUNCTION IN COMPLEX VARIABLE

THIS PROGRAM GIVES, IN COMPLEX VARIABLE AND WITH A GREAT ACCURACY, THE TETRAGAMMA FUNCTION.

202PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52005D 67-PENTAGAMMA FUNCTION IN COMPLEX VARIABLE

THIS PROGRAM GIVES, IN COMPLEX VARIABLE AND WITH A GREAT ACCURACY THE PENTAGAMMA FUNCTION.

218PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52006D 67-STRUVE FUNCTIONS IN COMPLEX VARIABLE & ORDER ANY INTEGER

THIS PROGRAM GIVES, IN COMPLEX VARIABLE, THE H AND L STRUVE FUNCTIONS, ORDER ANY POSITIVE, ZERO OR NEGATIVE INTEGER.
ACCURACY IS VERY GOOD, BECAUSE TERMS OF EXPANSION SERIES REACH A LIMIT DOWN TO 10..-20

132PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52007D 67-BETA AND GAMMA FUNCTIONS IN COMPLEX VARIABLES IN ONE CARD

THIS PROGRAM OBTAINS, IN COMPLEX VARIABLE, THE BETA AND GAMMA FUNCTIONS WITH A GREAT ACCURACY. BESIDES THESE MATTERS, TWO AUXILIARY FUNCTIONS, AS LN R ARG AND EXPONENTIAL Z, ARE PROVIDED.

224PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52008D 67-PSI (DIGAMMA) FUNCTION IN COMPLEX VARIABLE

THIS PROGRAM FURNISHES IN COMPLEX VARIABLE AND A GREAT ACCURACY, THE PSI OR DIGAMMA FUNCTION.

200PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52009D 67-TRIGAMMA FUNCTION IN COMPLEX VARIABLE

THIS PROGRAM GIVES, IN COMPLEX VARIABLE AND WITH A GREAT ACCURACY, THE TRIGAMMA FUNCTION.

211PROGRAM STEPS
FELIPE LANDA

52009D (CONTD)

E-CORDOBA.

52010D 67-ROTARY MOTION SECOND ORDER DIFFERENTIAL EQUATION

THIS PROGRAM GIVES INTERCHANGEABLE SOLUTIONS OF SECOND ORDER DIFFERENTIAL EQUATION OF MOTION RELATING ANGULAR DISPLACEMENT, ELAPSED TIME MOMENT OF INERITA, DAMPING AND SPRING CONSTANTS USING ITERATION FOR QUANTITIES NOT EXPLICITLY DEFINED. NATURAL ANGULAR FREQUENCY, DAMPING RATIO, AND DAMPED ANGULAR FREQUENCY MAY HAVE ASSIGNED VALUES DURING CALCULATION OF OTHER QUANTITIES. INITIAL CONDITIONS ARE DISPLACEMENT AT TIME ZERO AND ZERO ANGULAR VELOCITY.

223PROGRAM STEPS
SIDNEY WALLACE ECKETT
GB-ESSEX.

52011D 97-THERMAL PROCESS EVALUATION FOR CANNED FOODS.

GIVEN THE PENETRATION DATA OF A PREPARED FOOD RELATED TO ITS CAN SIZE AND GIVEN THE PROCESSING PARAMETERS I.E. RETORT TEMPERATURE AND INITIAL TEMPERATURE, THE PROGRAM CALCULATES THE STERILIZING VALUES F. AND BB BASED ON BALL'S FORMULA, TO OBTAIN A COMMERCIAL STERILE FINISHED PRODUCT.

203PROGRAM STEPS
ERMINIO SANTI
I-SANGUINETTO.

52012D 67-DEFINITE INTEGRAL SIMPSON

INTEGRATES FUNCTION 'X' BETWEEN GIVEN LIMITS IN ONLY 50 STEPS.

050PROGRAM STEPS
LAWRENCE B. HARTLEY
GB-BRIERFIELD.

52013D 67-ECONOMETRICAL MODEL OF THE BELGIAN ECONOMY 2 (1969-1977)

WITH THIS PROGRAM YOU CAN COMPUTE THE GROSS INTERIOR PRODUCE ON REAL PRICES AFTER THE INPUT OF THE 9 SUB-ECONOMIES IN 10**6 BELGIAN FRANCS (BETWEEN 1969 AND 1977). YOU CAN ALSO COMPUTE THE EXPECTED G.I.P. FOR THE NEXT YEARS (E.G. 1978 ETC...).

148PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52014D 67-MONEY-MODEL FOR THE BELGIAN FRANC

THIS PROGRAM COMPUTES THE EXPECTED EVOLUTION OF THE BELGIAN FRANC IN THE RELATIONSHIP WITH THE TEN MOST IMPORTANT FOREIGN EXCHANGES RATES. THE BASIC MODEL IS CONSTRUCTED FOR THE RATES BETWEEN 1.12.77 AND 30.9.1978.

162PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52015D 67-SPECIAL LOGARITHMIC CURVE FITTING

PROGRAM COMPUTES THE COEFFICIENTS P,A,B AND C OF THE BEST CURVE FITTING Y=PL**AX+BX**2+CX**3 AFTER THE INPUT OF N DATA PAIRS (X,Y). YOU CAN ALSO COMPUTE EXPECTED Y'S FOR GIVEN X'S.

211PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52016D 67-DIFFERENTIAL EQUATIONS 14

52016D (CONTD)

PROGRAM SOLVES ORDINARY DIFFERENTIAL EQUATIONS WITH THE FOURTH ORDER RUNGE KUTTA WHICH ERROR IS MINIMIZED.

204PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52017D 67-SOARING

USE YOUR SKILL TO PILOT YOUR GLIDER CROSS-COUNTRY AROUND A TRIANGULAR COURSE. SELECT THE MOST SUITABLE TURNING POINTS WITH REGARD TO THE WEATHER CONDITIONS. IMPROVE YOUR CRUISING AND THERMAL CENTRING TECHNIQUES TO MAINTAIN A HIGH AVERAGE SPEED. GOOD JUDGEMENT IS NEEDED TO PHOTOGRAPH THE TURNING POINTS FROM THE CORRECT SECTOR. QUICK AND CORRECT DECISIONS ARE REQUIRED FOR A SUCCESSFUL FLIGHT.

392PROGRAM STEPS
TONY NORRIE
SEYCHELLES-VICTORIA.

52018D 67-REICHENBACH'S 3 VALUED LOGIC

ALL TEN OF REICHENBACH'S FUNCTIONS (INCLUDING LUKASIEWICZ'S THREE) FOR A THREE-VALUED LOGIC ARE AVAILABLE & WILL OPERATE ON THE CONTENTS OF STACK-REGISTERS Y AND X (OR X ONLY) -113 PROGRAM STEPS AVAILABLE FOR THE EVALUATION OF LENGTHY STATEMENTS.

111PROGRAM STEPS
JIM R. KUTSCHERA
D-MOERFELDEN-WALLDORF.

52019D 67-C(X),S(X), C1(X), S1(X) C2(X), S2(X), FRESNEL INTEGRALS & INDEFIN.

THIS PROGRAM GIVES SIMULTANEOUSLY, BY COUPLE, ALL FRESNEL INTEGRALS, C(X) AND S(X); C1(X) AND S1(X); C2(X) AND S2(X). BESIDES PROGRAM TO CALCULATE INDEFINITE INTEGRALS OF C(X) AND S(X) IS PROVIDED.

207PROGRAM STEPS
FELIPE LANDA
E-CORDOLA.

52020D 67-ELLIPTICAL TRAJECTORY OF A SATELLITE 2-DEMENSIONAL.

THIS PROGRAM CALCULATES ALL THE DATES OF AN ELLIPTICAL TRAJECTORY EXCEPT THE VELOCITY AND THE ANGEL. YOU NEED THE MINIMUM AND MAXIMUM ALTITUDES OF THE TRAJECTORY. IT IS A SUPPLYING TO PROGRAM "2-DIMENSIONAL TRAJECTORY OF A SATELLITE".

202PROGRAM STEPS
BERND STEINKUEHLER
D-HERFORD.

52021D 67-2-DIMENSIONAL TRAJECTORY OF A SATELLITE

THIS PROGRAM CALCULATES THE 2- DIMENSIONAL ELLIPTICAL TRAJECTORY OF A SATELLITE. YOU NEED THE MINIMUM AND MAXIMUM ALTITUDES OF THE TRAJECTORY. THEN YOU ARE ABLE TO CALCULATE THE DATES OF THE SATELLITE. V(R); R(V); T; X(R); R(X); B(R); R(B) .

212PROGRAM STEPS
BERND STEINKUEHLER
D-HERFORD.

52022D 67-ALPHA SHAPE FRAMES

THIS PROGRAM ON TWO CARDS, CALCULATES HORIZONTAL AND VERTICAL REACTION, TENSIONS AND MOMENTS OF SIMPLE FRAMES "ALPHA" SHAPE, UNDER DISTRIBUTED AND POINT LOADS.

52022D (CONTD)

448PROGRAM STEPS
JIMMY PLATONIS
GR-ATHENS.

52023D 97-67-SUN DECLINATION-EQUATION OF TIME DATA 1979 FOR PRGM 50856D

DATA, GIVEN ON THESE 2 CARDS ARE VALID FOR THE 1979 YEAR AND SHALL BE USED WITH PROGRAM 50856D- BY MEANS OF 2X2 POLYNOMIALS 8TH DEGREE IT PERMITS TO COMPUTE : 1ST SUN DECLINATION - 2ND EQUATION OF TIME, FOR A GIVEN DAY (MM.DD) AT A GIVEN HOUR EXPRESSED IN UNIVERSAL TIME (G.MT) IN SEXAGESIMAL MODE. THE COEFFICIENTS OF POLYNOMIALS HAVE BEEN OBTAINED BY MEANS OF PROGRAM 51226D FROM REAL VALUES OF SUN DECLINATION AND EQUATION OF TIME GIVEN BY SUN TABLES OF "CONNAISSANCE DES TEMPS"

000PROGRAM STEPS
PIERRE RAYMOND
F-MEUDON.

52024D 67-COMBINATORIAL ANALYSIS

THIS PROGRAM GIVES FOR ANY INTEGER FROM 0 TO INFINITE, FACTORIAL, BINOMIAL NUMBERS AND WITH OR WITHOUT REPETITION, COMBINATIONS AND VARIATIONS OF ANY KIND, AND TOTAL ACCURACY. YOU CAN CALCULATE IN A MOMENT FACTORIALS OF ORDER EVEN 10:80.

220PROGRAM STEPS
FELIPE LANDA
E-CORDOLA.

52025D 67-TRANSFORMATION FROM ROMAN NUMBERS INTO ARABIC NUMBERS

WITH THIS PROGRAM YOU CAN TRANSFORM A GIVEN ROMAN NUMBER INTO OUR USED SYSTEM OF ARABIC NUMBERS.

054PROGRAM STEPS
REINHARD KLEINHAENTZ
A-VIENNA.

52026D 67-TRANSFORMATION OF ARABIC NUMBERS INTO ROMAN NUMBERS

WITH THE PROGRAM YOU CAN TRANSFORM AN ARABIC NUMBER INTO A ROMAN NUMBER. FOR THE ROMAN NUMBERS A CODE USING ARABIC NUMBERS IS USED.

169PROGRAM STEPS
REINHARD KLEINHAENTZ
A-VIENNA.

52027D 97-67-GENERAL CIRCULAR DIAGRAM OF 3 PH ASYNCHRONOUS MOTOR

THIS PROGRAM ALLOWS 3 CARDS - BY MEANS OF THE GENERAL CIRCULAR DIAGRAM IT PERMITS TO DETERMINE THE ELECTRICAL AND MECHANICAL CHARACTERISTICS ACCORDING TO SPEED OF A 3 PHASE ASYNCHRONOUS MOTOR. THE USED METHOD WITH RESPECT OF THE STATOR WINDING RESISTANCE, IS DESCRIBED IN THE OLD FRENCH STANDARD NFC 51-100 (APRIL 1969) OF THE "UNION TECHNIQUE DE L'ELECTRICITE" IN PARIS, AND IS VALID FOR MOTORS OF RATED POWER UP TO 15KW.

565PROGRAM STEPS
PIERRE RAYMOND
F-MEUDON.

52028D 97-67-SIMPLIFIED CIRCULAR DIAGRAM OF 3 PH ASYNCHRONOUS MOTOR

THIS PROGRAM ALLOWS 3 CARDS - BY MEANS OF THE SIMPLIFIED CIRCULAR DIAGRAM IT PERMITS TO DETERMINE THE ELECTRICAL AND MECHANICAL CHARACTERISTICS ACCORDING TO SPEED OF A 3 PHASE ASYNCHRONOUS MOTOR. THE USED METHOD, WITHOUT RESPECT OF THE STATOR WINDING RESISTANCE, IS DESCRIBED IN THE OLD FRENCH STANDARD NFC 51-100 (APRIL 1969) OF THE "UNION TECHNIQUE DE L'ELECTRICITE" IN PARIS, AND IS VALID ONLY FOR MOTORS OF RATED POWER ABOVE 15KW.

512PROGRAM STEPS
PIERRE RAYMOND
F-MEUDON.

52029D 67-AMAZONSPLAY

THIS PLAY IS A TABLE GAME PLAYED ON A CHESS BOARD. YOU ARE PLAYING WITH A FIGURE CALLED "AMAZON". SHE CAN BEAT AS A QUEEN AND AS A KNIGHT. YOU PLAY WITH THE WHITE AMAZON AND THE CALCULATOR SETS THE BLACK AMAZON. WHITE BEGINS THIS PLAY. AT THE END OF THE PLAY THE CALCULATOR SHOWS THE WINNER IN THE DISPLAY.

186PROGRAM STEPS
JOCHEN WIECHERN
D-VISSELHOEVEDE.

52030D 97-XY-PLOTTER WITH 0.5% ACCURACY ALL Y-VALUES ARE PLOTTED XY-PLOTTER

THE Y-VALUE IS PLOTTED SIMILAR TO THE SCIENTIFIC NOTATION: THE LOCATION OF THE DECIMAL POINT IN A 11 FIGURES NUMBERS GIVES THE BASE NUMBER IN THE FIRST LINE. THE FRACTION PART OF THE BASE NUMBER IS ALSO PRINTED HERE FOR INCREASING TEN TIMES THE ACCURACY. THE FIRST LINE CONTAINS ALSO THE X-VALUE OR STEP NUMBER. THEN THE EXPONENT IS ADDED IN THE SECOND LINE, IF NECESSARY. AN Y-SCALE IS PRINTED TOO.

098PROGRAM STEPS
JUERGEN LEHMKUHL
D-MOESSINGEN.

52031D 97-4528 MONOSTABLE TIMING

THIS PROGRAM COMPUTES ONE OF THE THREE VARIABLES OF A MONOSTABLE TIMER CIRCUIT BUILD UP WITH A C-MOS INTEGRATED CIRCUIT 4528. THE THREE VARIABLES ARE : PULSE-TIME, C AND R OF THE CIRCUIT.

092PROGRAM STEPS
ADALBERT LINDMEIER
D-STEINACH.

52032D 67-FUNCTIONS OF THE MACHNUMBER

THE PROGRAM COMPUTES THE CRITICAL RELATIONS OF PRESSURE, TEMPERATURE AND DENSITY FOR GIVEN MACHNUMBER AND ISENTROPIC EXPONENT.

040PROGRAM STEPS
DETLEF R. SCHMITT
D-GTTGBRUNN.

52033D 67-OPTIMAL POLYGON FOR PARABOLA

FOR THE PARABOLA Y=X**2 AN OPTIMAL TCHEBYSHEF APPROXIMATION POLYGON IS COMPUTED IN THE INTERVAL 0<=A<=X<=B IF YOU GIVE THE NUMBER N OF POLYGON SEGMENTS, THE RESULTED POLYGON HAS THE SMALLEST POSSIBLE (RELATIVE) MAXIMUM ERROR. (A>0). IF YOU ENTER THE ALLOWED ERROR BOUND E, YOU GET THE SMALLEST POSSIBLE N. A SPECIAL CONSIDERATION EXPANDS THE CONCEPT, IF A=0.

221PROGRAM STEPS
BERND ROTHMAIER
D-GURMERSHEIM.

52034D 67-DIFFERENTIAL EQUATIONS 15

PROGRAM SOLVES ORDINARY DIFFERENTIAL EQUATIONS WITH THE SPECIAL METHOD OF PROGRAM NO 1777, BUT THE MEANS OF THE K'S ARE COMPUTED OR WITH THE LINEAR REGRESSION OR WITH THE LOGARITHMIC REGRESSION, DEPENDING THE CORRELATION COEFFICIENT.

52034D (CONTD)

173PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52035D 67-DIFFERENTIAL EQUATIONS 16

THIS PROGRAM SOLVES ORDINARY DIFFERENTIAL EQUATIONS WITH THE SPECIAL METHOD OF PROGRAM NO 1777, BUT THE MEAN OF THE K'S IS COMPUTED WITH THE MEAN-RESULT OF THE LINEAR AND LOGARITHMIC REGRESSION.

150PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52036D 67-BASIC ARITHMETIC WITH FRACTIONS

PROGRAM ENABLES USER TO PERFORM THE FOUR BASIC ARITH. OPERATIONS (+-*/) ON BOTH VULGAR AND PROPER FRACTIONS CHAIN OPERATION IS POSSIBLE. DIVISION BY GREATEST COMMON DIVISOR FOR RESULTING FRACTION IS AUTOMATIC. ONE RESULT MAY BE SAVED FOR LATER RE-USE.

156PROGRAM STEPS
HANS FLORIAN HOYER
D-STUTTGART.

52037D 67-GEOSTROPHIC WIDN AND GRADIENT WIND

THIS PROGRAM COMPUTES THE GEOSTROPHIC WIND FOR THE CONSTANT LEVEL SURFACES AND FOR CONSTANT PRESSURE SURFACES WITH INTERVENTION IN THE FIRST CASE, IF DESIRED, OF THE AIR DENSITY. IT AFTERWARDS COMPUTES THE GRADIENT WIND IN CYCLONIC OR ANTICYCLONIC CIRCULATION. FINALLY, IT COMPUTES, IN THE INERTIAL MOVEMENT, THE RADIUS OF CURVATURE AND THE PERIOD.

167PROGRAM STEPS
EUGENIO GLIVA
E-MADRID.

52038D 97-COMPLETE PARLOUR HORSE RACING

A HORSE RACE IS RUN COMPLETELY AS A PARLOUR GAME; NOTHING MORE THAN AN HP-97 IS NEEDED. THE MACHINE ISSUES THE BETTING TICKETS, CALCULATES THE ODDS AND RUNS THE RACE THROUGH A PSEUDO-RANDOM NUMBER GENERATOR. PROVISION IS MADE FOR SIMPLE AND HANDICAP RACES; FOR SECURITY NUMBERING OF TICKETS AND FOR KEEPING COMPLETE RECORDS OF EACH RACE; BONUSSES AS WELL AS FLAT OR FRACTIONAL TAKES ARE POSSIBLE.

222PROGRAM STEPS
FERNANDO SADEK
INDONESIA-JAKARTA.

52039D 67-HOUR ANGLE AND DECLINATION OF SUN

THE PROGRAM COMPUTES FOR GIVEN MEAN TIME THE HOUR ANGLE AND DECLINATION OF THE SUN. FURTHER IT COMPUTES THE SIDERAL TIME. THE NECESSARY DATA CARD DEPENDS ON LONGITUDE AND ZONE TIME OF THE CONSIDERED POINT OF EARTH. AS EXAMPLES WE WILL FOCUS OUR ATTENTION ON THE MERIDIANS OF GREENWICH AND BERLIN.

221PROGRAM STEPS
MICHAEL KLEWS
D-BERLIN.

52040D 67-THE TWO SPHERICAL FUNCTIONS OF LEGENDRE AND ASSOCIATED

THIS PROGRAM GIVES FIRST AND SECOND SPHERICAL LEGENDRE FUNCTIONS AND ASSOCIATED, PM/N AND QM/N FOR ANY ARGUMENT BEING REAL AND ANY INTEGER AS PER ORDER OR DEGREE.

52040D (CONTD)

224PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52041D 67-STANDARD ATMOSPHERE (SI)

THIS PROGRAM IS AN IMPROVED CONVERSION OF THE HP/65 AV1-11A TO THE SI (INTERNATIONAL SYSTEM OF UNITS) THAT HAS INPUTS, ALTITUDE OR PRESSURE. THE PROGRAM IS ADAPTED FOR USE WITH HP-97

210PROGRAM STEPS
JOSE REYES ESTEBAN
L-AVILES.

52042D 67-TAPERED COUPLING

THE PROGRAM COMPUTES VARIOUS DATAS FOR A TAPERED COUPLING. IF THE TORSIONAL MOMENT THAT IS NEEDED FOR THE CONSTRUCTION IS GIVEN, THE PROGRAM COMPUTES THE AXIAL FORCE NEEDED TO KEEP THE TWO PARTS TOGETHER, AND IF THE AXIAL FORCE IS GIVEN, THE PROGRAM COMPUTES THE MAXIMUM TORSIONAL MOMENT WITHOUT ANY RELATIVE MOVEMENT. THEN PROGRAM ALSO COMPUTES MAXIMUM TENSIONS IN THE TWO PARTS AND THE FORCE NEEDED TO SEPARATE THE TWO PARTS IF THE COUPLING IS SELF LOOKING.

220PROGRAM STEPS
ERLING PEDERSEN
S-GOETEBORG.

52043D 97-PASCAL'S TRIANGLE

THE PROGRAM COMPUTES THE FACTORS OF A BINOM WITH AN EXPONENT UP TO 69.

029PROGRAM STEPS
CHRITIAN LINSMEIER
D-BALDHAM.

52044D 67-AUXILIARY REGISTER OPERATIONS

THIS PROGRAM REPLICATES THE NORMAL REGISTER OPERATIONS OF THE CALCULATOR FOR SEGMENTED REGISTERS. THE USER DEFINED-KEYS PROVIDE TEN INDIVIDUAL OPERATIONS ON FIVE DIGIT POSITIVE INTEGERS STORED IN THE UPPER AND LOWER HALVES OF THE PRIMARY AND SECONDARY REGISTERS. STORE RECALL, INTERCHANGE AND ARITHMETIC OPERATIONS ARE REPRESENTED. PERMITS REGISTER EXPANSION FOR LIMITED RANGE DATA.

112PROGRAM STEPS
D.T. RANSOM
GB-CHISLEHURST.

52045D 97-REGRESSION OF THREE INDEPENDANT VARIABLES

FOR N SETS OF DATA, THE PROGRAM FITS A MULTIPLE REGRESSION OF THE FORM T=AX+BY+CZ+D AND CALCULATES FISHER Z TO TEST THE SIGNIFICANCE OF THE MULTIPLE REGRESSION; THE NUMBER OF DEGREES OF FREEDOM IS GIVEN TO FACILITATE THE USE OF Z TABLES. PROGRAM WILL ALSO ESTIMATE T; GIVEN X,Y AND Z.

441PROGRAM STEPS
FERNANDO SADEK
INDONESIA-JAKARTA.

52046D 67-SQUARE ROOT TO 182 FIGURES.

THIS TWO CARDS PROGRAM IS DEVELOPED IN CO-OPERATION WITH R. BROECKX BELGIUM. INPUT CAN BE EVER 8-DIGIT NUMBER >1. THE NUMBER OF FIG. OF THE ROOT CAN BE CHOOSEN AS 8K. K BELONGS TO 3<=K<=23. FROM THE FIRST CARD DESIGNED BY RB ARE UP TO 92 FIG. WITH REST ACQUIRED. THE OTHER CARD ALTERS THE REST TO MORE FIG. TYPICAL EXECUTION TIME 104 FIG.- 10 MIN AND 184 - 30 MIN.

52046D (CONTD)

446PROGRAM STEPS
KENT A WIGSTROM
S-FLODA.

52047D 67-SQUARE ROOT OUT OF A 76-DIGIT NUMBER

PROGRAM COMPUTES SQUARE ROOT OUT OF A NUMBER >1 WITH UP TO 76 FIGURES TO 19, 38 OR 76 FIGURES. EXECUTION TIMES ARE 40 SEC., 3 MIN., RESPECTIVELY 10 MIN.

367PROGRAM STEPS
KENT A WIGSTROM
S-FLODA.

52048D 67-CUBIC ROOT OUT OF A 38 DIGIT NUMBER

PROGRAM COMPUTES THE CUBIC ROOT OUT OF A NUMBER >1 WITH UP TO 40 FIGURES TO 36 OR 72 FIGURES. EXECUTION TIMES ARE 5 MIN. RESP. 20 MIN.

378PROGRAM STEPS
KENT A WIGSTROM
S-FLODA.

52049D 67-LONG PRODUCTS AND SQUARES

A) PRODUCTS OF TWO POS INTEGERS, EACH HAVING UP TO 56 DIGITS OR THE SQUARE OF SUCH ONE. TIME <7 MIN.
B) BY CHANGING A FEW STEPS IT IS POSSIBLE TO MULTIPLY TWO 80 FIG. INTEGERS WITH THE SAME ACCURACY AS THE LONGEST ONE < 8 MIN.
C) IT IS ALSO POSSIBLE TO COMPUTE TWO 80 FIG. NUMBERS TO ALL FIGURES. TIME < 14 MIN. THIS METHOD IS SIMILAR TO PROGRAM 50675.

223PROGRAM STEPS
KENT A WIGSTROM
S-FLODA.

52050D 67-LEAST DIVISOR OF AN INTEGER PRIMES

THIS PROGRAM FINDS THE LEAST DIVISOR OF ANY INTEGER. IF THE LEAST DIVISOR IS THE NUMBER ITSELF, THE NUMBER IS OF COURSE A PRIME. THE PROGRAM IS VERY FAST; IT TAKES ABOUT 2 MINUTES TO FIND OUT THAT 200003 IS A PRIME. THE PROGRAM USES A TABLE OF PRIMES, WHICH IS STORED ON DATACARDS WITH 30 PRIMES ON EACH CARD. A TABLE OF PRIMES UP TO 10000 IS GIVEN. WITH THREE DATACARDS, YOU CAN CHECK NUMBERS UP TO 210000.

099PROGRAM STEPS
BJORN ENGSIG
DK-ALLERUD.

52051D 67-CALCULATOR EXTENSION STATISTICS

THIS PROGRAM WORKS LIKE PROGRAM NO 51760D, BUT IT HAS OTHER FUNCTIONS ON IT. THESE ARE ALMOST THE SAME AS THE STATISTIC FUNCTIONS ON THE HP-92 INVESTOR : LINEAR REGRESSION, COEFFICIENT OF DETERMINATION, LINEAR ESTIMATE, PERCENT OF THE SUMMATIONS, PRINT/PAUSE SUMMATION REGISTERS, CLEAR SUMMATION REGISTERS, AND VARIANCE OF X- AND Y-DATA KEYED IN WITH THE SUMMATION KEYS. THE ERROR-DISPLAY OCCURS AND STACK AND LAST X CHANGES EXACTLY LIKE THEY DO FOR BUILD-IN FUNCTIONS.

224PROGRAM STEPS
BJORN ENGSIG
DK-ALLERUD.

52052D 67-DEFINITE INTEGRAL 2 SIMPSON

INTEGRATES FUNCTION "X", BETWEEN GIVEN LIMITS, TO OBTAIN NET AREA UNDER CURVE AND VOLUME TRACED OUT BY THE WHOLE OF THE AREA UNDER THE

52052D (CONTD)

CURVE, BETWEEN THE GIVEN LIMITS, IN ONLY 57 STEPS.

057PROGRAM STEPS
LAWRENCE B. HARTLEY
GB-BRIERFIELD.

52053D 67-STRESS DISTRIBUTION IN CYLINDRICAL TANKS

THIS PROGRAM CALCULATES STRESS DISTRIBUTION IN A CYLINDRICAL TANK, WITH UNIFORM WALL THICKNESS AND BUILT-IN LOWER EDGE, SUBMITTED TO THE ACTION OF A LIQUID PRESSURE.

210PROGRAM STEPS
JOSE AFONSO
P-LISBOA.

52054D 67-EXTENDED FACTORIALS

THIS PROGRAM CALCULATES THE FACTORIAL OF N (1<=N<=100) WITH ALL THE SIGNIFICANT DIGITS.

178PROGRAM STEPS
FERNANDO DEL REY
E-MADRID.

52055D 67-SOLUTION TO A SYSTEM OF LINEAR EQUATIONS

THIS PROGRAM CAN SOLVE ANY SYSTEM OF UP TO 7 LINEAR EQUATIONS, IF IT HAS A SINGLE SOLUTION, BY GAUSSIAN ELIMINATION. THIS IS A ONE CARD PROGRAM, COEFFICIENTS NEED TO BE ENTERED ONLY ONCE, AND NO EXTA DATA CARD IS NEEDED.

224PROGRAM STEPS
FERNANDO DEL REY
E-MADRID.

52056D 67-INCOMPLETE ELLIPTIC INTEGRAL OF THE 1ST KIND & FUNCTIONS

IT COMPUTES ANY ELLIP. FUNCTION RELATED TO THE INCOMPLETE ELLIP. INTEGRAL OF THE 1ST KIND U=F(K,PHI) I.E, FOR A GIVEN K,-1<=K<=1, IT WILL CALCULATE SN(U), CN(U), DN(U) & INVERSES, GIVEN U, CALCULATE PHI OR VICE VERSA. ACCURACY IS 8 DECIMALS OR BETTER. RUNNING TIME DOES NOT EXCEED 25 SEC. TIPICALLY 18. FURTHERMORE EVERY FUNCTION BEHAVES LIKE A BUILT-IN ONE (X IN LAST X, F(X) OVERWRITES X;Y,Z,T UNCHANGED), ALLOWING YOU TO USE RPN IN CALCULATIONS.

207PROGRAM STEPS
VALENTIN ALBILLO
E-MADRID.

52057D 67-MICROSTRIP AND STRIP-LINE CALCULATIONS.

THIS PROGRAM WILL SPEED THE DESIGN OF MICROSTRIP AND STRIP-LINE ELEMENTS, TWO TYPES OF LOW-LOSS TRANSMISSION LINES THAT ARE OFTEN USED AT MICROWAVE FREQUENCIES. WHEN GIVEN THE CHARACTERISTIC IMPEDANCE OF THE LINE, THE SUBSTRATE THICKNESS, THE CONDUCTOR THICKNESS AND THE DIELECTRIC CONSTANT OF THE MATERIAL SEPARATING THE CONDUCTORS THE PROGRAM DETERMINES THE WIDTH OF THE MICROSTRIP AND STRIP-LINE TRACE REQUIRED AND THE LINE'S VELOCITY FACTOR.

111PROGRAM STEPS
KONSTANTY BOUFAL
PL-WARSAW.

52058D 67-SEA BATTLE PERFECT

THIS GAME, YOU CAN PLAY AGAINST YOUR HP. THE HP AND YOU, SET 6 "SHIPS" ON A RECTANGULAR WITH 42 FIELDS. BY ASKING CODE-NUMBERS OF THE FIELDS IN PING-PONG SYSTEM YOU AND THE HP TRY TO GUESS THE POSI-

52058D (CONTD)

TIONS OF THE SHIPS THAT WERE SET BY THE ENEMY-PLAYER.
ATTENTION! THIS PROGRAM IS VERY TRICKY AND YOU HAVE TC BE A VERY GOOD PLAYER IF YOU WANT TC DEFEAT YOUR HP.

214PROGRAM STEPS
MARTIN LANDUA
D-FRANKFURT.

52059D 67-THREE-FOUR SQUARES THEOREM

THIS PROGRAM GIVES US AN EXAMPLE OF FOUR INTEGERS WHICH THE SUM OF THE SQUARES IS A GIVEN INTEGER. (I.E.: A SOLUTION OF THE EQUATION N=A**2+B**2+C**2+D**2 IN N)

223PROGRAM STEPS
RAYMOND GIRAUD
F-LEAS ANGLES.

52060D 97-COST OF TELEPHONE CALL (UK)

PROGRAM CONTINUALY UPDATES DISPLAY TO SHOW CURRENT COST OF TELEPHONE CALL. WORKS FOR ALL SELF-DIALLED CALLS AND OPERATOR CONNECTED INTERNATIONAL CALLS.
PROGRAM USES A LOOP WITH PAUSE AND COUNTER AS A CLOCK, AND CAN EASILY BE MODIFIED FOR MOST COUNTRIES.

083PROGRAM STEPS
ROD HARRIS
GB-FARNHAM.

52061D 67-POINT OF NO-RETURN

THE POINT OF NO-RETURN IS THE POINT ALONG THE TRACK FCRM WHICH AN AIRCRAFT WILL JUST RETURN TO DEPARTURE OR TO ALTERNATE WITH EMPTY TANKS, WITH ALL ENGINES RUNNING OR IN CASE OF ENGINE FAILURE OCCURING AT ANY TIME ALONG THE TRACK.

216PROGRAM STEPS
PIERRE TALMANT
F-PARIS.

52062D 67-ILS APPROACH

DURING ILS APPROACH, PILOTS, WHILE MAINTAINING HEADING, SPEED AND A CERTAIN RATE OF DESCENT, MUST CHECK ELAPSED TIME BETWEEN BEACONS AND MARKERS AND HEIGHT OF PASSAGE OVER THESE POINTS, EVEN IF GLIDE SLOPE TRANSMITTER OR RECEIVER IS UNSERVICEABLE.

098PROGRAM STEPS
PIERRE TALMANT
F-PARIS.

52063D 67-QUARTZ RESONATOR DEFLECTION

PROGRAM COMPUTES DATAS ABOUT QUARTZ RESONATOR IN SHOCK CONDITIONS.

221PROGRAM STEPS
ALAIN BERGER
CH-BOUDRY.

52064D 67-MID-POINTS

MID-POINT BETWEEN TWO SPECIFIED LANDMARKS IS THE POINT OF THE TRACK FROM WHICH AN AIRCRAFT WILL FLY THE SAME TIME TO ONE OF THEM OR THE OTHER. PROGRAM COMPUTES TIME AND DISTANCE FLOWN FRCM DEPARTURE TC MID-POINT BETWEEN DEPARTURE AND ARRIVAL, DEPARTURE AND ALTERNATE OR ARRIVAL AND ALTERNATE, WITH ALL ENGINES RUNNING AND IN CASE OF ENGINE FAILURE.

187PROGRAM STEPS
PIERRE TALMANT
F-PARIS.

52065D 67-DISTANCES AND HEADINGS ON EARTH BETWEEN TWO POINTS

52065D (CONTD)

KNOWING TWC POINTS CN EARTH BY THEIR LONGITUDE ANC LATITUDE, THIS PROGRAM GIVES THE DISTANCE, THE HEADING FROM EITHER TO THE OTHER, IN NAUTICAL MILES, STATUTE MILES OR KILOMETERS WITH AN OPTION FOR STRAIGHT LINE DISTANCE IN KILOMETERS.

224PROGRAM STEPS
JOHN P. LEEURTON
B-LONCIN.

52066D 67-EVALUATING LOST HEAD FOR FLUID FLOW IN PIPES-SMOOTH PIPES

THE DARCY-WEISBACH FORMULA IS THE BASIS FOR EVALUATING LCST HEAD. FRICTION FACTCR IS OBTAINED FROM BLASIUS EQUATION. THEREFORE IT IS NECESSARY FOR A DESIGNER TC KNCW REYNOLDS NUMBER AND THE SIZE OF A SURFACE IMPERFECTIONS.

076PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

52067D 67-EVALUATING FLOW RATE FOR FLUID FLOW IN PIPES-SMOOTH PIPES

FOR A GIVEN LOST HEAD, LENGTH, DIAMETER, KINEMATIC VISCOSITY AND THE SIZE OF THE SURFACE IMPERFECTICNS OF THE PIPE THIS PROGRAM WILL CALCULATE FLOW RATE. THE BASIC EQUATIONS FOR SOLVING THE PROBLEM ARE DARCY-WEISBACH FORMULA AND BLASIUS EQUATION.

123PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

52068D 67-EVALUATING DIAMETER OF THE PIPE-SMOOTH PIPES

FOR A GIVEN LOST HEAD, FLOW RATE, KINEMATIC VISCOSITY AND THE SIZE OF THE IMPERFECTIONS CF THE PIPE, DIAMETER IS OBTAINED. THE BASIC EQUATIONS ARE DARCY-WEISBACH FORMULA ANC BLASIUS EQUATION.

149PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

52069D 67-EVALUATING LOST HEAD FOR FLUID FLOW IN PIPES-ROUGH PIPES

THE DARCY-WEISBACH FORMULA IS THE BASIS FOR EVALUATING LOST HEAD. FRICTION FACTOR IS OBTAINED FRCM MODIFIED NIKURADSE EQUATION. THEREFORE IT IS NECESSARY FOR A DESIGNER TO KNOW REYNOLDS NUMBER THE SIZE OF THE SURFACE IMPERFECTIONS.

082PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

52070D 67-EVALUATING FLOW RATE FOR FLUID FLOW IN PIPES-ROUGH PIPES

FOR A GIVEN LOST HEAD, LENGTH, DIAMETER, KINEMATIC VISCOSITY AND THE SIZE OF THE SURFACE IMPERFECTIONS OF THE PIPE THIS PROGRAM CALCULATES FLOW RATE. THE BASIC EQUATIONS ARE DARCY-WEISBACH FORMULA AND MODIFIED NIKURADSE EQUATION.

082PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

52071D 67-EVALUATING DIAMETER OF THE PIPE-ROUGH PIPES

FOR A GIVEN LOST HEAD, FLOW RATE, KINEMATIC VISCOSITY AND THE SIZE OF THE IMPERFECTIONS OF THE PIPE, DIAMETER IS OBTAINED.

52071D (CONTD)

155PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

52072D 67-EVALUATING LOST HEAD FOR FLUID FLOW IN PIPES-RN<=32.4E+05

THE DARCY-WEISBACH FORMULA IS THE BASIS FOR EVALUATING LOST HEAD. FRICTION FACTOR IS CALCULATED BY USING OF FOLLOWING EQUATION : F=.0032+(.221/RN**.237). THE SIZE OF THE SURFACE ANC FLOW RATE ARE ONLY INPUTS.

084PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

52073D 67-EVALUATIING FLOW RATE FOR FLUID FLOW IN PIPES-RN<=32.4E+05

IF A LOST HEAD, DIAMETER, LENGTH, KINEMATIC VISCOSITY AND THE SIZE OF SURFACE IMPERFECTIONS OF THE PIPE ARE GIVEN, PROGRAM WILL CALCULATE FLOW RATE. THE BASIC EQLATIONS ARE DARCY-WEISBACH FORMULA AND FOLLOWING EQUATION (FOR FRICTICN FACTOR) : F=.0032+(.221/RN**.237).

131PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

52074D 67-EVALUATING DIAMETER OF THE PIPE-RN<=32.4E+05.

FOR A GIVEN LOST HEAD, FLOW RATE, KINEMATIC VISCOSITY AND THE SIZE OF THE IMPERFECTIONS OF THE PIPE, DIAMETER IS OBTAINED.

157PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

52075D 67-EVALUATING LOST HEAD FOR FLUID FLOW IN PIPES-NIKURADSE

THE DARCY-WEISBACH FORMULA IS THE BASIS FOR EVALUATING LOST HEAD. FRICTION FACTOR IS OBTAINED FROM NIKRADSE EQUATION. THEREFORE IT IS NECESSARY FOR A DESIGNER TC KNCW REYNOLDS NUMBER AND THE SIZE OF THE SURFACE IMPERFECTIONS.

082PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

52076D 67-EVALUATING FLOW RATE FOR FLUID FLOW IN PIPES-NIKURADSE

FOR A GIVEN LOST HEAD, LENGTH, DIAMETER, KINEMATIC VISCOSITY AND THE SIZE OF THE SURFACE IMPERFECTIONS PROGRAM CALCULATES FLOW RATE. THE BASIC EQUATIONS ARE DARCY-WEISBACH FORMULA AND NIKURADSE EQLATION.

082PROGRAM STEPS
BRANKC SPOLJARIC
YU-ZAGREB.

52077D 67-EVALUATING DIAMETER OF THE PIPE-NIKURADSE

IF LOST HEAD, FLOW RATE, KINEMATIC VISCOSITY AND THE SIZE OF THE IMPERFECTIONS OF THE PIPE ARE GIVEN, PROGRAM WILL CALCULATE DIAMETER OF THE PIPE. THE BASIC EQUATICNS ARE DARCY-WEISBACH FORMULA AND NIKURADSE EQUATION.

155PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

52078D 67-COMPLEX OPERATIONAL STACK

THE COMPLEX STACK WORKS LIKE THE NORMAL STACK WITH THE FCLLCWING FUNCTICNS : ENTER, ADD, SUBTRACT,

52078D (CONTD)

MULTIPLY, DIVIDE, E POWER Z1, LN (Z1), EXCHANGE Z1 AND Z2, Z2 POWER Z1, RECIPROCAL OF Z1, LAST Z, ABS(Z1), ROLL DOWN STACK, SQUARE ROOT OF Z1. STACKLIFT IS CONTROLLED BY FLAG 3.

203PROGRAM STEPS
ULRICH HAHN
D-KIEL.

52079D 67-PHOTOMACROGRAPHY WITH CLOSE UP LENS

THIS PROGRAM IS AUTOMATIC FOR 24X36 WITH 50 MM (OR DIFFERENT) AND FOR 6X6 WITH 80 MM (OR DIFFERENT). INPUT LENGTH OF SUBJECT (OR MAGNIFICATION), YOUR HP-67 CALCULATES THE POWER OF CLOSE UP LENS AND THE DISTANCE CLOSE UP LENS/ SUBJECT. INPUT THE NECESSARY DEPTH OF FIELD (OR APERTURE), HP-67 CALCULATES THE DEPTH OF FIELD (TOTAL, FORWARD THE SUBJECT, BACK THE SUBJECT) AND THE NECESSARY APERTURE.

222PROGRAM STEPS
JEAN REIBEL
F-FONTENAY AUX ROSES.

52080D 67-PROPAGATION IN THE SOLID

THIS PROGRAM CACLULATES THE SPEED OF THE SOUND OR THE MODULE OF YOUNG OR THE MASS BY VOLUME UNITY OF THE SOLID X, FOR TWO VALUES INPUT.

060PROGRAM STEPS
CHRISTIAN ROBERT COURNUT
F-BX-CAUDERAN.

52081D 67-BRINELL-VICKERS

THIS PROGRAM CALCULATES HARDNESS BRINELL AND VICKERS.

048PROGRAM STEPS
CHRISTIAN ROBERT COURNUT
F-BX-CAUDERAN.

52082D 67-MUTUAL CAPACITANCE OF SCREENED PAIRS OR QUADS

KNOWING FOUR OF THESE PARAMETERS : 1) CONDUCTOR DIAMETER, 2) INSULATED DIAMETER, 3) PERMITTIVITY RELATIVE, OF INSULATION MATERIAL, 4) MUTUAL CAPACITANCE, 5) RATIO BETWEEN DIAMETER UNDER SCREEN AND INSULATED DIAMETER, YOU CAN CALCULATE THE FIFTH VARIABLE YOU DO NOT KNOW. IF YOU CALCULATE THE INSULATE DIAMETER HP GIVES ALSO THE THICKNESS OF INSULATION.

124PROGRAM STEPS
ENZO NOSEDA
I-COMO.

52083D 67-PARABOLAS THROUGH FOUR GIVEN POINTS

GIVEN THE COORDINATES OF FOUR POINTS IN AN ORTHONORMAL BASE, THIS PROGRAM COMPUTES THE COEFFICIENTS OF PARABOLA'S EQUATION CONTAINING THESE POINTS, EVEN IF ONE OF THE PARABOLAS IS DECOMPOSED INTO TWO PARALLEL LINES.

224PROGRAM STEPS
ALI AMRAOUI
MOROCCO-CASABLANCA.

52084D 67-EXACT SOLUTION OF RATIONAL LINEAR SYSTEM IN 3 UNKNOWN.

GIVING A LINEAR SYSTEM IN THREE UNKNOWN IN WHICH ALL COEFFICIENTS ARE ENTEGERS, THIS PROGRAM GIVES THE EXACT SOLUTION. THE THREE UNKNOWN ARE GIVEN IN THREE RATIONAL FRACTIONS WHICH HAVE A SAME ENTEGER DENOMINATIOR AND ENTEGER NUMBERATOR

111PROGRAM STEPS

52084D (CONTD)

ALI AMRAOUI
MOROCCO-CASABLANCA.

52085D 67-CONIC'S CLASSIFICATION

THIS PROGRAM GIVES THE KIND OF A CONIC GIVEN BY ITS PONCTUAL EQUATION.

110PROGRAM STEPS
ALI AMRAOUI
MOROCCO-CASABLANCA.

52086D 67-CONIC THROUGH FIVE LINES/PARABOLA THROUGH FOUR LINES

THIS PROGRAM GIVES THE COEFFICIENTS OF PONCTUAL EQUATION OF CONIC TANGENT AT FIVE GIVEN LINES OR EQUATION OF PARABOLA TANGENT AT FOUR GIVEN LINES.

223PROGRAM STEPS
ALI AMRAOUI
MOROCCO-CASABLANCA.

52087D 97-DOUBLE MATCH

A GAME FOR ONE OR TWO PLAYERS. HIDDEN ON A MATRIX OF 36 SQUARES ARE EIGHTEEN PAIRS OF NUMBERS. EACH PLAYER REVEALS TWO SQUARES IN TURN ENDEAVOURING TO SELECT A MATCHED PAIR. ADVANTAGE IS GAINED BY REMEMBERING THE LOCATIONS OF UNMATCHED PAIR. POINT SCORING IS AUTOMATIC. THIS IS A TWO CARD PROGRAM. THE FIRST SETS UP THE PLAYING BOARD IN ONE OF 862 POSSIBLE WAYS. THE SECOND IS USED FOR PLAYING THE GAME.

407PROGRAM STEPS
PETER F. CRAWLEY
GB-PORTSMOUTH.

52088D 67-BS 5500 DESIGN OF SPHERE OR DISHED HEAD-EXTERNAL PRESSURE

THE PROGRAM WILL DESIGN A SPHERE OR A HEMISPHERICAL, TORISPHERICAL OR SEMI-ELLIPSOIDAL DISHED HEAD FOR A PRESSURE VESSEL SUBJECT TO EXTERNAL PRESSURE. IN ACCORDANCE WITH THE METHOD GIVEN IN BS 5500:1976 WITH REVISIONS TO APRIL 1978.

224PROGRAM STEPS
LESLIE A. TIMPERLEY
GB-MANCHESTER.

52089D 67-BS 5500 CYLINDRICAL VESSEL INTERNAL PRESSURE DESIGN

THIS PROGRAM WILL COMPUTE THE REQUIRED THICKNESS OF CYLINDRICAL SHELL WITH DOMED ENDS, FOR INTERNAL PRESSURE, IN ACCORDANCE WITH THE FOMULAE GIVEN IN BS 5500:1976. THE PROGRAM OUTPUTS VALUES FOR A SAMPLE WORKING FORM INCLUDED. THE TEST PRESSURE IS ALSO COMPUTED AND THE STRESSES AT TEST CHECKED AGAINST NINETY PERCENT YIELD STRESS.

206PROGRAM STEPS
LESLIE A. TIMPERLEY
GB-MANCHESTER.

52090D 67-PRESS VESSEL BS 5500 CYLINDER EXTERNAL PRESSURE DESIGN

THIS PROGRAM WILL DESIGN A CYLINDRICAL PRESSURE VESSEL FOR EXTERNAL PRESSURE TO THE BRITISH STANDARD BS 5500:1976 PRESSURE VESSEL CODE. THE PROGRAM WILL ALSO SIZE FLAT BAR STIFFENING RINGS TO THE METHOD "A" GIVEN IN THE CODE.

434PROGRAM STEPS
LESLIE A. TIMPERLEY
GB-MANCHESTER.

52091D 67-AIR POLLUTION

52091D (CONTD)

THE PROGRAM DETERMINES THE MAXIMUM GROUND LEVEL CONCENTRATION (OR ANY OTHER RELATED PARAMETER) OF A POLLUTANT PREDICTABLY EMITTED FROM A GIVEN CHIMNEY, IN METRIC UNITS, UNDER AVERAGE CONDITIONS. EMPIRICAL MODIFICATIONS ADDED TO THE ASME (AMERICAN SOCIETY OF MECHANICAL ENGINEERS) DIFFUSION MODEL AND TO HOLLAND'S EQUATION, PROVIDE THE SIMPLIFIED EQUATIONS OF PROGRAM. RESULTS ARE IN FAIR AGREEMENT WITH EXPERIENCE.

186PROGRAM STEPS
GIUSEPPE LIGATO
I-CUSANO MILANINO.

52092D 67-FRACTION OPERATIONS

PROGRAM CAN ADD, SUBSTRACT, MULTIPLY AND DIVIDE TWO FRACTIONS ; TAKE THE INVERSE OF A FRACTION AND RAISE A FRACTION INTO AN INTEGER POWER. RESULT IS ALWAYS A FRACTION. OPERATIONS CAN ALSO BE PERFORMED WITH NEGATIVE FRACTIONS. THE RESULT IS ALWAYS REDUCTED.

135PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52093D 67-FACTORIALS PERMUTATIONS AND COMBINATIONS EXTENDED RANGE

THIS PROGRAM CALCULATES FACTORIALS, PERMUTATIONS AND COMBINATIONS OF WHICH THE RESULTS COULD NORMALLY NOT BE DISPLAYED BY THE CALCULATOR.

111PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52094D 67-10-LEVEL STACK

THIS PROGRAM GIVES YOU THE POWER OF A STACK WITH TEN REGISTERS. WITH THE STACK YOU CAN PERFORM EVERY OPERATION OF YOUR HP-67/97 IF YOU SIMPLY PUSH A SUFFIX KEY AFTER EVERY OPERATION.

090PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52095D 67-STATICS OF SINGLE FIELD BEAM, ANY END CONDITIONS, ANY LOAD.

GIVEN A STRAIGHT UNIFORM BAR WITH ANY COMBINATION OF FIXED, SIMPLE SUPPORTED OR FREE ENDS AND ANY LOADING, THIS PROGRAM WILL CALCULATE THE TWO UNKNOWN PARAMETERS AT THE LEFT END, AND AFTER THAT CALCULATE MOMENT AND DEFLECTION IN 5 POINTS SPECIFIED BY THE USER.

221PROGRAM STEPS
HANS FLORIAN HOYER
D-STUTTGART.

52096D 67-REINFORCED RECTANGULAR SECTION COMPR. AND BENDING DIN 1045

GIVEN A RECTANGULAR CONCRETE SECTION WITH COMPRESSION AND BENDING LOADING, THE PROGRAM CALCULATES KH-VALUE ACCORDING TO DIN 1045 AND FINDS AREA OF NECESSARY REINFORCEMENT.

223PROGRAM STEPS
HANS FLORIAN HOYER
D-STUTTGART.

52097D 67-INFLUENCE LINE OF MOMENTS IN A CROSS BEAMS SET

SIMPLY SUPPORTED ON ITS CONTOUR AND MOMENTS IN AN UNIFORMED LOADED CROSS-BEAMS SET (BEAMS DON'T TAKE TORSION). ENTERS: SPANS LX-LY NUMBERS OF BEAMS NX-NY RIGIDITIES EXIX-EYIY. PROGRAM 2 GIVES MOMENTS

52097D (CONTD)

IN EACH CROSSING ENTERS POSITION OF UNIT LOAD X-Y. PROGRAM GIVES MOMENT IN EACH CROSSING.

224PROGRAM STEPS
PIERRE SILVAN
F-CHAMBERY.

52098D 67-RANDOM PERMUTATIONS

THIS PROGRAM PICKS OUT M RANDOM PERMUTATIONS OF THE NUMBERS 1 TO N FOR N<=21 AND DISPLAYS (HP-67: PRINTS) THEM.

080PROGRAM STEPS
SILVAN TROLK
D-KELTERN.

52099D 67-SUBMARINE DESTROYER WAR

THE PLAYER USES A DESTROYER AND TRIES TO DESTROY AN ENEMY SUBMARINE WHICH CAN SEND THE DESTROYER TO THE BOTTOM WITH TORPEDOS. TO LOCATE AND TO DESTROY THE SUBMARINE, THE DESTROYER IS EQUIPED WITH A SONAR AND DEPTH CHARGES. WHEN THE SUBMARINE SHOOTS A TORPEDO, THE PLAYER IS ABLE TO MOVE THE DESTROYER TO TRY TO ESCAPE. BE SURE THAT IF THE DESTROYER DOES NOT MOVE, THE TORPEDO WILL ALWAYS HIT ITS TARGET.

323PROGRAM STEPS
JEAN-PIERRE ABRASSART
D-WALLDORF.

52100D 67-GOMPERTZ CURVE FIT

THE GOMPERTZ CURVE FITS A SET OF DATA POINTS (I,Y(I),I=1,2,3,...N,..2N,...,3N . THE DATA POINTS MUST BE DIVIDED INTO 3 GROUPS, EACH HAVING N OBSERVATIONS. THE X'S SHOULD BE EQUALLY SPACED AND YI SHOULD BE GREATER THAN ZERO. THE GOMPERTZ CURVE OFTEN APPLIES WHERE EXPONENTIAL OR POWER CURVES FAIL TO CORRELATE.

179PROGRAM STEPS
ROBERT E.V. KOENE
NL-LISSE.

52101D 67-VALVE FLOWCOEFFICIENT FOR MASONEILAN CONTROL VALVES

THIS PROGRAM CALCULATES THE VALVE FLOWCOEFFICIENT -CV- FOR MASONEILAN CONTROLVALVES (LIQUID, GAS AND STEAM SERVICE).
THE USED FORMULAS ALSO APPLY TO OTHER TYPES, AS LONG AS THE CRITICAL FLOW FACTOR CF (PRESSURE RECOVERY RATIO) CAN BE DETERMINED.

559PROGRAM STEPS
ROBERT E.V. KOENE
NL-LISSE.

52102D 67-MEMORY GAME

YOU HAVE 12 PAIRS OF NUMBERS HIDDEN IN THE 24 REGISTERS OF YOUR CALCULATOR - YOU MUST DISCOVER THEM - THE 12 PAIRS MAY BE CHANGED AT ANY TIME. YOU CAN PLAY ALSO WITH ANOTHER PLAYER.

223PROGRAM STEPS
LUIGI POMINI
I-CASTELLANZA.

52103D 67-FIRE RESISTANCE OF TIMBER BEAMS

FOR A SIMPLE SUPPORTED RECTANGULAR TIMBER BEAM (NADELHOLZ, BR, SCH.H. GKL I,II) WITH GIVEN LOAD, A TIME IS CALCULATED, WHEN THE BURNING SECTION WILL FAIL BECAUSE OF SHEAR, BENDING OR LATERAL BUCKLING. (DIN 4102).

159PROGRAM STEPS
HANS FLORIAN HOYER
D-STUTTGART.

52104D 67-OPTIMAL RECTANGULAR LAMINATED TIMBER SECTION

FOR GIVEN DISTRIBUTED LOAD, SPAN AND MATERIAL CONSTANTS OF A SIMPLE SUPPORTED TIMBER BEAM THE SECTION WITH MINIMAL AREA IS FOUND, SO THAT BENDING STRESS, DEFLECTION AND SAFETY AGAINST LATERAL BUCKLING ARE EQUAL OR BETTER THAN ALLOWABLE. (DIN)

221PROGRAM STEPS
HANS FLORIAN HOYER
D-STUTTGART.

52105D 67-QUICK STORING, ORDERING AND RECALLING

WITH ONE KEY YOU STORE N NUMBERS, N<=24. THEN THEY WILL BE ORDERED IN A SHORT TIME (5 MIN. 10 SEC. IF 14 NUMBERS ARE ALL IN FALSE ORDER). AT LAST THE NUMBER AND CONTENTS OF R, TILL RN ARE SHOWN IN MAX. 75 SEC. (IF N=24).

058PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52106D 67-BANK ACCOUNTS (OR STOCKS) DAILY BALANCE COMPUTATION

ENTERING EVERY CREDIT OR DEBIT OPERATION AND ITS DATE, PROGRAM COMPUTES BALANCES OF UP TO 10 BANKS ACCOUNTS CODED 0 TO 9 (UP TO 20 IF DATES NOT REQUIRED) AND TOTAL BALANCE. RESULTS ARE STORED IN PRIMARY AND SECONDARY REGISTERS AND REGISTERED ON A DATA MAGNETIC CARD. PROGRAM CAN BE USED FOR ANY NUMBER OF GROUPS OF 10 (OR 20) ACCOUNTS. SUFFICIENT PROGRAM STEPS ARE AVAILABLE FOR (USER) COMPLEMENTARY ACTUALISING PROGRAM.

038PROGRAM STEPS
ANDRE RIVIERE
F-BOURG-LA-REINE.

52107D 67-DERIVATION OF DEGREE N

THIS PROGRAM COMPUTES ANY DERIVATION OF A CONTINUOUS FUNCTION.

073PROGRAM STEPS
HENNING LEGELL
D-EUTIN.

52108D 67-INTEGRALS OVER A TRIANGLE

GIVEN THE COORDINATES OF THE VERTICES OF A TRIANGLE IN THE PLANE, THE PROGRAM COMPUTES A FIRST VALUE OF THE INTEGRAL OF A FUNCTION OF 2 VARIABLES OVER THE TRIANGLE. ANOTHER ROUTINE THEN PARTITIONES THE TRIANGLE INTO 4 SUBTRIANGLES AND A SECOND VALUE IS OBTAINED. FINALLY RICHARDSON EXTRAPOLATION GIVES A STILL MORE ACCURATE VALUE OF THE INTEGRAL.

165PROGRAM STEPS
GUIDO PETZ
S-SOLNA.

52109D 67-POLYNOMIAL EVALUATION

THE PROGRAM EVALUATES AUTOMATICALLY POLYNOMIALS WITH REAL COEFFICIENTS AND REAL ARGUMENTS UP TO DEGREE 23, WITH REAL COEFF. AND COMPLEX ARGUMENTS UP TO DEGREE 19, WITH COMPLEX COEFFICIENTS AND COMPLEX ARGUMENTS UP TO DEGREE 9. MANUALLY ONE CAN EVALUATE POLYNOMIALS OF ANY DEGREE (COMPLEX ARGUMENTS AND COEFF.)

183PROGRAM STEPS
GUIDO PETZ
S-SOLNA.

52110D 67-2 SIMULTANEOUS NONLINEAR EQUATIONS

52110D (CONTD)

THE PROGRAM SOLVES 2 SIMULTANEOUS NONLINEAR EQUATIONS BY STEFFENSEN'S METHOD. WHEN NO INITIAL GUESS, SUFFICIENTLY NEAR THE SOLUTIONS, IS KNOWN, AN EMBEDDINGTECHNIC CAN BE EMPLOYED FOR SOLVING THE EQUATIONS.

137PROGRAM STEPS
GUIDO PETZ
S-SOLNA.

52111D 67-RANDOMWALK ON THE N-CUBE

THE PROGRAM SIMULATES THE RANDOMWALK OF A PARTICLE ON A N-DIMENSIONAL CUBE, STARTING ON THE VERTEX WITH COORDINATES (-1,-1....-1) AND STOPPING WHEN THE PARTICLE REACHES (1,1...1). EVEN A GIVEN NUMBER OF SIMULATIONS CAN BE PERFORMED AUTOMATICALLY 2<=N<=21. FOR SEVERAL SIMULATIONS : 2<=N<=18.

100PROGRAM STEPS
GUIDO PETZ
S-SOLNA.

52112D 67-PALINDROMIC NUMBERS

THE PROGRAM REVERSES THE ORDER OF THE DIGITS OF AN INTEGER AND TESTS WETHER THE OLD NUMBER EQUALS THE NEW ONE. IF NOT, THE SUM OF THE INTEGERS IS COMPUTED AND REVERSED AGAIN AND SO ON UNTIL THE NUMBER BECOMES A PALINDROMIC ONE. THE NUMBER OF ADDITIONS IS COUNTED.

117PROGRAM STEPS
GUIDO PETZ
S-SOLNA.

52113D 67-PRIMES

PROGRAM CAN FIND ALL PRIMES STARTING FROM ZERO, STARTING FROM A GIVEN NUMBER AND IN AN INTERVAL. IT ALSO DETERMINES WHETHER A GIVEN NUMBER IS A PRIME OR NOT. THE EXECUTION IS MUCH FASTER THAN WITH NORMAL PROGRAMS.

114PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52114D 97-BINOMIAL FORMULAE (A+B)**N OR (A-B)**N

THIS PROGRAM COMPUTES THE VALUE OF THE TERMS (BINOMIAL COEFFICIENTS AND EXPONENTS FOR "A" AND "B", IF "N" IS KNOWN), THE NUMERICAL VALUE OF THE TERMS, IF VALUES OF "A", "B" AND "N" ARE KNOWN, AND THE SUM OF ALL TERMS FOR N <=69.
IT IS ALSO POSSIBLE TO COMPUTE THE VALUE OF AN INDIVIDUAL TERM M MAX =(N+1).

175PROGRAM STEPS
ALEXANDER NIESSEN
D-EITORF.

52115D 67-ONEWAY ANAVAR AND T-TEST BETWEEN MEANS FOR PRODUCT MATRICE

BASED ON DATA ENTERED USING PROGRAM 51945D, THIS PROGRAM TESTS THE HYPOTHESIS THAT VARIABLES ARE ISSUED FROM THE SAME POPULATION. USER SPECIFIES THE NUMBERS OF THE VARIABLES TO BE TESTED; IF THERE ARE ONLY TWO, A T TEST FOR DIFFERENCE BETWEEN MEANS IS PERFORMED; IF 3 OR 4 VARIABLES ARE SPECIFIED, THE PROGRAM SWITCHES AUTOMATICALLY TO A ONE WAY ANALYSIS OF VARIANCE. ANY SUBJECT OF THE ORIGINAL DATA MAY BE SPECIFIED.

217PROGRAM STEPS
AVIGDOR LUTTINGER
F-FONTAINEBLEAU.

52116D 67-DESCRIPTIVE STATISTICS FOR PRO-

52116D (CONTD)

00000D DUCT MATRICE

BASED ON DATA ENTERED USING PROGRAM 51945D, THIS PROGRAM COMPUTES THE MEAN, STD DEVIATION, STD ERROR OF THE MEAN AND CONFIDENCE INTERVAL AT THE 95% LEVEL FOR EACH VARIABLE IN THE MATRICE. IT ALSO COMPUTES THE CORRELATION COEFFICIENTS AND THEIR CORRESPONDING T VALUES BETWEEN THE VARIABLES PRINTING THE UPPER TRIANGLE OF THE CORRELATION MATRIX. THE SAME STATISTICS MAY BE COMPUTED FOR VALUES ENTERED VIA THE "SIGMA PLUS" KEY.

211PROGRAM STEPS
AVIGDOR LUTTINGER
F-FONTAINEBLEAU.

52117D 67-TWO LINEAR EQUATIONS (CRAMER)

SPECIFICATIONS :
FIRST STORE 6 NUMBERS INTO 6 REGISTERS. THEN START AND WITHOUT FURTHER INTERFERENCE X,Y AND THE DETERMINANT WILL APPEAR WITHIN 10 SECONDS.

073PROGRAM STEPS
AUSEMS HANS
NL-BREDA.

52118D 67-TWO LINEAR EQUATIONS (INVERSE MATRIX)

SPECIFICATIONS :
FIRST STORE 6 NUMBERS INTO 6 REGISTERS THEN START AND WITHOUT FURTHER INTERFERENCE X,Y AND THE DETERMINANT WILL APPEAR WITHIN 6 SECONDS.

074PROGRAM STEPS
AUSEMS HANS
NL-BREDA.

52119D 67-TWO LINEAR EQUATIONS (GAUSS)

SPECIFICATIONS:
FIRST STORE 6 NUMBERS INTO 6 REGISTERS THEN START AND WITHOUT FURTHER INTERFERENCE X,Y AND THE DETERMINANT WILL APPEAR WITHIN 4 SECONDS.

084PROGRAM STEPS
AUSEMS HANS
NL-BREDA.

52120D 67-TWO LINEAR EQUATIONS (GAUSS-JORDAN)

SPECIFICATIONS :
FIRST STORE 6 NUMBERS INTO 6 REGISTERS THEN START AND WITHOUT FURTHER INTERFERENCE X,Y AND THE DETERMINANT WILL APPEAR WITHIN 5 SECONDS. IF NO SINGLE SOLUTION, RECALL THE ALTERED INPUT FOR COMPLETING INFORMATION.

109PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52121D 67-THREE LINEAR EQUATIONS (CRAMER)

SPECIFICATIONS :
FIRST STORE 12 NUMBERS INTO 12 REGISTERS THEN START AND WITHOUT FURTHER INTERFERENCE X,Y,Z AND THE DETERMINANT WILL APPEAR WITHIN 27 SECONDS.

134PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52122D 67-THREE LINEAR EQUATIONS (INVERSE MATRIX)

SPECIFICATIONS :
FIRST STORE 12 NUMBERS INTO 12 REGISTERS THEN START AND WITHOUT FURTHER INTERFERENCE X,Y,Z AND THE DETERMINANT WILL APPEAR WITHIN 15 SECONDS.

52122D (CONTD)

150PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52123D 67-THREE LINEAR EQUATIONS (GAUSS)

SPECIFICATIONS :
FIRST STORE 12 NUMBERS INTO 12 REGISTERS THEN START AND WITHOUT FURTHER INTERFERENCE X,Y,Z AND THE DETERMINANT WILL APPEAR WITHIN 13 SECONDS.

176PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52124D 67-THREE LINEAR EQUATIONS (GAUSS-JORDAN)

SPECIFICATIONS :
FIRST STORE 12 NUMBERS INTO 12 REGISTERS THEN START AND WITHOUT FURTHER INTERFERENCE X,Y,Z AND THE DETERMINANT WILL APPEAR WITHIN 31 SECONDS. IF NO SINGLE SOLUTION, RECALL THE ALTERED INPUT FOR COMPLETING INFORMATION.

222PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52125D 67-FOUR LINEAR EQUATIONS (CRAMER)

SPECIFICATIONS :
FIRST STORE 20 NUMBERS INTO 20 REGISTERS THEN START AND WITHOUT FURTHER INTERFERENCE. BUT TO LENGTHEN THE PROGRAM, X,Y,Z,T AND THE DETERMINANT WILL APPEAR WITHIN 100 SECONDS.

312PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52126D 67-FOUR LINEAR EQUATIONS (GAUSS)

SPECIFICATIONS :
FIRST STORE 20 NUMBERS INTO 20 REGISTERS THEN START AND WITHOUT FURTHER INTERFERENCE BUT TO LENGTHEN THE PROGRAM, X,Y,Z,T AND THE DETERMINANT WILL APPEAR WITHIN 31 SECONDS.

300PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52127D 67-FOUR LINEAR EQUATIONS (GAUSS-JORDAN)

SPECIFICATIONS :
FIRST STORE 20 NUMBERS INTO 20 REGISTERS THEN START AND WITHOUT FURTHER INTERFERENCE BUT TO LENGTHEN THE PROGRAM, X,Y,Z,T AND THE DETERMINANT WILL APPEAR WITHIN 83 SECONDS IF NO SINGLE SOLUTION RECALLS THE ALTERED INPUT FOR COMPLLETING INFORMATION.

422PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52128D 67-FIVE HOMOGENEOUS LINEAR EQUATIONS (GAUSS-JORDAN)

SPECIFICATIONS :
FIRST STORE 25 NUMBERS INTO 25 REGISTERS THEN START AND WITHOUT FURTHER INTERFERENCE BUT TO LENGTHEN THE PROGRAM, THE DETERMINANT APPEARS WITHIN 145 SECONDS. (IF ZERO RECALLS THE ALTERED INPUT FOR COMPLETING INFORMATION).

715PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52129D 67-MINIMUM QUARTZ RESISTANCE DETECTION

52129D (CONTD)

PROGRAM GIVES MINIMUM RESISTANCE AND CORRESPONDING FREQUENCY (FS) OF A QUARTZ CRISTAL WITH 10**-3 HZ ACCURACY.

146PROGRAM STEPS
ALAIN BERGER
CH-BOUDRY.

52130D 67-MINIMUM QUARTZ PHASE DETECTION

THIS PROGRAM GIVES MINIMUM PHASES AND CORRESPONDING FREQUENCY (FR) OF A QUARTZ CRISTAL WITH 10**-3 HZ ACCURACY.

174PROGRAM STEPS
ALAIN BERGER
CH-BOUDRY.

52131D 97-CONVERSION OF LATITUDE & LONGITUDE TO NATIONAL GRID NG 1

THIS PROGRAM COMPUTES NATURAL GRID REFERENCES FROM LATITUDE & LONGITUDE INPUT EITHER IN DECIMAL DEGREES OR D.MS, ALSO THE MERIDIONAL ARE BETWEEN 2 LATITUDES, USING THE PUBLISHED EQUATIONS & CONSTANTS FOR THE BRITISH GRID. IT REPLACES (WITH PROGRAMS NG2, NG3) THE PUBLISHED PROJECTION TABLES AND IS ACCURATE TO 1MM.

222PROGRAM STEPS
DAVID ARTHUR HATCHER
GB-LONDON.

52132D 97-NATIONAL GRID CONVERGENCE SCALE FACTOR & (T-T) NG3

FOLLOWING PROGRAM NG2 (OR WITH GRID REFERENCES AS INPUT, PROGRAM COMPUTES THE CONVERGENCE (C) & LOCAL SCALE FACTOR (F) OF A POINT. EQUATIONS ARE DERIVED FROM THE PUBLISHED EQUATIONS AND ARE AS ACCURATE AS THE PROJECTION TABLES. TRUE BEARING CORRECTION FACTOR IS COMPUTED FOR MANUAL USE. THE DATA REQUIRED IS THE SAME AS FOR NG1 AND NG2. A TABLE OF GRID LETTERS AND NUMBERS IS PROVIDED.

224PROGRAM STEPS
DAVID ARTHUR HATCHER
GB-LONDON.

52133D 97-CONVERSION OF NATIONAL GRID CO-ORDINATES TO LAT & LONG NG2

THIS PROGRAM COMPUTES LATITUDE AND LONGITUDE (FROM GREENWICH) IN D.MS AND D.DD GIVEN THE FULL GRID REFERENCE. ACCURACY IS TO 1MM EQUIV. IF REQUIRED. ALL EQUATIONS DERIVED FROM THE PUBLISED HANDBOOK, SO THIS PROGRAM (WITH PROGRAMS NG1 AND NG3) REPLACES THE PROJECTION TABLES. A TABLE OF GRID LETTERS AND EQUIVALENT NUMBERS IS INCLUDED. A PAUSE ROUTINE CALLS THE SECOND CARD AND TRANSFERS FLAG STATUS.

336PROGRAM STEPS
DAVID ARTHUR HATCHER
GB-LONDON.

52134D 97-GRAPHICAL OUTPUT OF DATA SERIES

THIS PROGRAM FINDS A GRAPHICAL OUTPUT FOR ALL NON-FUNCTION DATA SERIES, FOR TWO CASES :
1) DATA SERIES IS LIMITED UP TO 23 DATA.
2) UNLIMITED DATA SEQUENCE (MORE THAN 23 DATA).
GRAPHICAL OUTPUT CONSISTS IN 10 PRINT POSITIONS. THE PRINTED VALUES OF THE DATA INPUT ARE REPRESENTED BY (8) ON TOP OF A COLUMN OF 1'S.

135PROGRAM STEPS
MICHAEL TARNOWSKI
D-WIESBADEN.

52135D 67-LIFTING CONDENSATION LEVEL

THIS PROGRAM COMPUTES THE PRESSURE AND THE TEMPERATURE OF THE LIFTING CONDENSATION LEVEL WHEN A PARCEL OF AIR IS LIFTED ADIABATICALLY TO ITS SATURATION WITH THE POTENTIAL TEMPERATURE AND THE MIXING-RATIO REMAINING CONSTANT.

213PROGRAM STEPS
EUGENIO OLIVA
E-MADRID.

52136D 67-REAL LIFE GOLF

YOU PLAY A GAME OF GOLF ON MAPS DRAWN ON GRAPHIC PAPER TAKEN EITHER FROM REAL LIFE OR INVENTED. AS IN REALITY YOU CANNOT PREDICT EXACTLY WHERE THE BALL WILL GO, EXCEPT WHEN USING THE PUTTER ON GREEN. OPTIONALLY WIND MAKES IT EVEN HARDER FOR YOU. SELECT ONE OF 8 CLUBS, TAKE WIND DIRECTION AND STRENGTH INTO CONCIDERATION AND ENTER A COURSE, HOPING THAT THE BALL WILL AVOID ALL OBSTACLES. BALL IN HOLE AND SCORE IS SHOWN. THIS GAME IS COMPLETELY DIFFERENT FROM EARLIER GOLFGAME.

224PROGRAM STEPS
GOERAN THOERNBLAD
S-BROMMA.

52137D 67-FIRE RESISTANCE OF TIMBER COLUMNS

FOR GIVEN MATERIAL QUALITY, BUCKLING LENGTH AND COMPRESSIONAL FORCE, THE FAILURE TIME OF THE BURNING SECTION IS CALCULATED.

115PROGRAM STEPS
HANS FLORIAN HOYER
D-STUTTGART.

52138D 67-DEFINITE INTEGRAL 3 SIMPSON

WITH A CONTINUOUS AREA BETWEEN THE GIVEN LIMITS THE PROGRAM APPROXIMATES :
1) THE AREA UNDER THE CURVE.
2) THE VOLUME TRACED OUT BY THAT AREA, REVOLVED.
3) THE CENTROIDS OF THAT AREA... USING "SIMPSONS RULE".

071PROGRAM STEPS
LAWRENCE B. HARTLEY
GB-BRIERFIELD.

52139D 67-MARINE NAVIGATION WITH TERRESTRIAL ORIENTATION

ASSUMING FLAT EARTH GEOMETRY, THE PROGRAM SOLVES FIVE FUNDAMENTAL PROBLEMS IN SHORE NAVIGATION USING TERRESTRIAL ORIENTATION. DETERMINATION OF : 1) DISTANCE FROM HORIZON ANGLE AND HEIGHT, 2) POSITION FROM DISTANCE, AZIMUTH AND CO-ORDINATES OF MARK, 3) POSITION AND DISTANCE FROM CO-ORDINATES OF MARK, COURSE AND TWO SUCCESSIVE AZIMUTHS 4) POSITION AND DISTANCE FROM CO-ORDINATES OF TWO AND 5) OF THREE MARKS AND THE CORRESPONDING ANGLES.

223PROGRAM STEPS
KLAUS WILHELM
D-NORTHEIM.

52140D 97-APPLIC OF POLYNOM APPROXIM. COMPLETE PRGM 51227D

THIS PROGRAM ALLOWS 2 CARDS NUMBERED 8 AND 9 AND FOLLOWS THE 7 CARDS NUMBERED FROM 1 TO 7 PROGRAM 51227D. FOR DISCRETE VALUES Y OF A TABLE CORRESPONDING TO VALUES OF A VARIABLE X IN ARITHMETICAL PROGRESSION THE PROGRAM 51226 HAS PERMITTED TO REPLACE THE Y VALUES BY A POLYNOMIAL P(X) AND TO WRITE A DATA CARD FOR STORAGE IN PRIMARY REGISTERS OF THE POLYNOMIAL COEFFICIENTS. THESE CARDS NO 8 AND 9 PERMIT TO SOLVE DIFFERENTIAL EQUATIONS (1ST AND 2ND ORDER) WHERE

52140D (CONTD)

P(X) IS INCLUDED.

251PROGRAM STEPS
PIERRE RAYMOND
F-MEUDON.

52141D 97-SPECIFIC GRAVITY FOR AIR

THIS PROGRAM COMPUTES IN RELATION WITH ATMOSPHERIC HUMIDITY THE SPECIFIC GRAVITY.

194PROGRAM STEPS
KURT MANTAU
D-BERGISCH GLADBACH.

52142D 67-EQUATIONS OF MOTION

FROM THE 5 VALUES LENGTH S; TIME T; VELOCITY V; ACCELERATION B AND STARTING VELOCITY VO, YOU NEED 3 TO CALCULATE THE TWO OTHER. THE STARTING VELOCITY OR THE ACCELERATION MAY BE ALSO NULL. IF TWO RESULTS EXIST, YOU GOT THEM.

224PROGRAM STEPS
HORST VOELZ
D-BERLIN.

52143D 67-WHEATESTONE BRIDGE WITH LOAD

THIS PROGRAM CALCULATES FROM THE 5 RESISTORS OF THE WHEATE STONE BRIDGE FOLLOWING PARAMETERS : INPUT OUPUT-RESISTOR, TRANSMISSION RESISTOR; INPUT-,OUTPUT-CURRENT, OUTPUT VOLTAGE AND TRANSMISSION FACTOR

100PROGRAM STEPS
HORST VOELZ
D-BERLIN.

52144D 67-RIPPLE VOLTAGE

THIS PROGRAM CALCULATES RIPPLE VOLTAGE AT 50 C/S FOR RECTIFYING CIRCUITS AND ALSO FOR FILTERING CIRCUITS.

060PROGRAM STEPS
HORST VOELZ
D-BERLIN.

52145D 67-INFORMATION ENTROPY

THIS PROGRAM CALCULATES SHANNON-ALPHA AND BONGARD-ENTROPY FOR INFORMATION THEORY

112PROGRAM STEPS
HORST VOELZ
D-BERLIN.

52146D 67-HISTOGRAM

YOU CAN BUILD UP TO 20 CLASSES WITH INTEGER, EQUAL OR LOGARITHMIC DISTANCE. THE NUMBERS OF THE INPUT VALUES IN EACH CLASS ARE COUNTED.

111PROGRAM STEPS
HORST VOELZ
D-BERLIN.

52147D 67-MASTERMIND 136

WITH THIS PROGRAM YOU CAN PLAY 136 DIFFERENT KINDS OF MASTERMIND BECAUSE :
1) YOU CHOOSE THE NUMBER OF "ROWS" (NUMBER OF DIGITS) 1-9
2) YOU CHOOSE THE NUMBER OF "COLORS" (MAXIMUM OF DIGITS 1-9
3) YOU DECIDE WHETHER ALL THE "COLORS" (DIGITS) IN THE HIDDEN CODE (NUMBER) MUST BE DIFFERENT OR NOT.

224PROGRAM STEPS
FLEMING SONNERUP
DK-HELLERUP.

52148D 67-DISTRIBUTION OF MANDATES BY D'HONDT'S METHOD.

52148D (CONTD)

THIS PROGRAM DETERMINES THE DISTRIBUTION OF MANDATES IN A PARLIAMENT BY D'HONDT'S METHOD. IT CONSIDERS UP TO 9 PARTIES. THE PROGRAM CAN BE USED IN EACH PROPERTIONAL ELECTION SYSTEM. ON SIDE 2 OF THE CARD THE VALUES CAN BE STORED.

106PROGRAM STEPS
RALPH DIETER
D-WEINSTADT.

52149D 67-FOLLOWING LEGS OF GREAT CIRCLE NAVIGATION.

KNOWING THE POINTS, GIVES : DISTANCE, TRUE TRACK AT DEPARTURE AND ARRIVAL, VERTEX COORDINATES. GIVING THEN LONGITUDE OR DISTANCE OF ANY POINT OF THIS GREAT CIRCLE, COMPUTES ITS LATITUDE, ALL CORRECTIONS APPLIED BY THE PROGRAM. PREPARES THE CALCULATOR FOR NEXT LEG. MAKES INERTIAL NAVIGATION MONITORING EASY.

224PROGRAM STEPS
ANDRE FOURNERAT
F-YERRES.

52150D 67-BINARY ARTITHMETIC

PROGRAM PACKAGE TO PERFORM BINARY ARITHMETIC ON THE HP67 CALCULATOR. THE PACKAGE INCLUDES THE FOLLOWING FUNCTIONS :
ADD, SUBTRACT, 2-COMPLEMENT, 1-COMPLEMENT, AND, OR ENCODE, DECODE. FUNCTIONS WORK ON EITHER 8-BIT OR Y-BIT QUANTITIES.

222PROGRAM STEPS
AUGUST-WILHELM JAGAN
D-BUCHH./NORDHEIDE.

52151D 67-STATE OF DEAL GAS

GIVEN TWO STATES OF A GAS, PROGRAM CALCULATES PRESSURE, VOLUME, OR, TEMPERATURE IN ONE OF THESE STATES. SINCE ABSOLUTE TEMPERATURE IS REQUIRED DEGREE C TO K IS PROVIDED.

097PROGRAM STEPS
ALEX SLAETS
B-MECHELEN.

52152D 67-SIMPLE JACOBIAN AND NEVILLE'S THETA FUNCTIONS

ONLY A PROGRAM FOR SIMPLE JACOBIAN AND NEVILLE'S THETA FUNCTIONS. ITS EMPLOYMENT, AMONG OTHERS, ALLOWS TO OBTAIN JACOBIAN ELLIPTIC FUNCTIONS WITH VERY GOOD ACCURACY.

220PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52153D 67-NEVILLE'S THETA FUNCTIONS INFINITE PRODUCT METHOD

WITH 4 NEVILL'S THETA FUNCTIONS, WE CAN RAPIDLY OBTAIN EVERY JACOBIAN ELLIPTIC FUNCTIONS AND OTHER EMPLOYMENT. ACCURACY IS VERY GOOD AND PROGRAM IS SWIFT. EVERY ARGUMENTS, MODULUS AND PERIODS ARE STORED FOR FURTHER CALCULUS.

221PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52154D 97-SAFETY PIPES FOR HEAT GENERATORS

THIS PROGRAM, IN ACCORDANCE WITH THE ITALIAN MINISTERIAL DEGREE FIRST DECEMBER 1975, CALCULATES THE VIRTUAL LENGTH AND THE MAXIMUM ACCEPTABLE TERMIC POTENTIAL OF A SAFETY PIPE GIVEN THE ACTUAL LENGTH AND THE NUMBER OF BENDS FOR THE FOLLOWING INTERNAL DIAMETERS : MILLIMETERS 22.2, 27.9, 36.6, 42.5,

52154D (CONTD)

53.8, 69.6, 81.6.

222PROGRAM STEPS
MARIO RIPESI
I-SALERNO.

52155D 67-SOLUTION TO F(X)=0 BY REGULA FALSI

THIS PROGRAM GIVES YOU THE ROOT OF A FUNCTION BY A COMBINAISON OF THE BISSECTION METHOD WHICH CONVERGE SLOWLY BUT SURELY AND THE NEWTON-RAPHSON'S METHOD WHICH CONVERGE QUICKLY BUT WHEN YOU ARE NEAR THE SOLUTION. THIS PROGRAM RUNS EVEN QUICKER THAN "CALCULUS AND ROOTS OF F(X)" GIVEN IN THE STANDARD PAC.

055PROGRAM STEPS
DIDIER DE BRUYN
B-BRUSSELS.

52156D 67-SECTOR

THIS PROGRAM PERMITS ONE TO EIGHT PLAYERS TO PLAY SECTOR, THE OBJECT OF WHICH IS FOR EACH PLAYER TO MOVE A SHIP ON A PLAYING BOARD, LOCATE AN ENEMY SUBMARINE AND DESTROY IT. SECTOR EXISTS AS AN ELECTRONIC GAME, DISTRIBUTED BY PARKER BROTHERS.

223PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52157D 67-CLOCK PROBLEM

THIS PROGRAM CALCULATES THE TIMES BETWEEN 0 AND 12 HOURS, WHEN THE TWO HANDS OF A CLOCK MAKE A GIVEN ANGLE. IT ALSO FINDS THAT ANGLE, THE TIME BEING GIVEN.

076PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52158D 67-CUBIC SPLINE CURVE FITTING

THIS PROGRAM CALCULATES A CUBIC SPLINE CURVE THROUGH N GIVEN EQUIDISTANT POINTS (N=4,5,...9). ONCE FOUND, YOU CAN EITHER FIND INDIVIDUAL POINTS OF THE CURVE, OR HAVE A LIST OF COURDINATES OF SUCH POINTS WITH GIVEN GROWING OF X-VALUES BEING DISPLAYED (OR PRINTED). THE PROGRAM IS BOTH SHORTER AND FASTER THAN BRUCE MURDOCK'S SIMILAR PROGRAM 00315D, THOUGH THE METHOD RESTS THE SAME.

183PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52159D 67-DOG'S CURVE

GIVEN THE VELOCITIES OF A HARE AND OF A PURSUING DOG AND THE DISTANCE OF THE DOG TO THE RECTILINEAR PATH OF THE HARE, THIS PROGRAM CALCULATES THE DISTANCE, WHICH THE HARE CAN RUN BEFORE IT IS CAUGHT. MOREOVER, THE DOG'S CURVE CAN BE PLOTTED POINT BY POINT, TOGETHER WITH THE POSITION OF THE HARE AND THE TIME WHICH HAS ELAPSED.

112PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52160D 67-POKER PROBABILITES

THIS PROGRAM GIVES THE PROBABILITIES AND FREQUENCES FOR DIFFERENT POKER HANDS FROM A 4N-CARD-DECK (N=5,6,..13).

112PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52161D 67-PROBABILITIES OF CARD DISTRIBUTIONS

A SET OF 13 CARDS FROM A DECK OF 52 CARDS BEING COMPOSED OF A,B,C AND D CARDS OF DIFFERENT SUITS, THIS PROGRAM CALCULATES THE PROBABILITY FOR THE DISTRIBUTION (A,B,C,D). IT CAN ALSO GIVE YOU A COMPLETE LIST OF DISTRIBUTIONS AND CORRESPONDING PROBABILITIES.

152PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52162D 67-MONTE CARLO EXTENDED

AS IN GORAN THORNBLAD'S EXCELLENT PROGRAM 50542 ON THE SAME SUBJECT, TWO PLAYERS CAN PLAY ROULETTE AGAINST HP, ACTING AS BANK AND CROUPIER. SIMPLIFICATIONS ALLOW BOTH PLAYERS TO PLAY ON PAIRS OF NUMBERS TOO, EITHER VERTICAL OR HORIZONTAL. THIS POSSIBILITY WAS ABSENT IN THE PREVIOUS PROGRAM.

219PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52163D 67-EQUATIONS OF DEGREE 5 AND 10 HAVING ROOTS XI AND XIXJ RESP.

GIVEN A POLYNOMIAL EQUATION OF DEGREE 5 WITH ROOTS XI, THIS PROGRAM FINDS THE CORRESPONDING EQUATION OF DEGREE 10 WITH ROOTS XIXJ. SUBROUTINES PROVIDE IN FINDING THE (REAL) ROOTS OF THE FIRST EQUATION AND TESTING THEIR PRODUCTS AS ROOTS OF THE SECOND ONE.

224PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52164D 67-EQUATIONS OF DEGRRE 4 AND 6 HAVING ROOTS XI AND XIXJ RESP.

GIVEN A POLYNOMIAL EQUATION OF DEGREE 4 WITH ROOTS XI, THIS PROGRAM FINDS THE CORRESPONDING EQUATION OF DEGREE 6 WITH ROOTS XIXJ. SUBROUTINES PROVIDE IN FINDING THE (REAL) ROOTS OF THE FIRST EQUATION AND TESTING THEIR PRODUCTS AS ROOTS OF THE SECOND ONE.

120PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52165D 67-LINEAR SYSTEMS

THIS ONE-CARD PROGRAM SOLVES LINEAR SYSTEMS N.N WITH REAL COEFFICIENTS FOR N=2,3,..10, USING N DATA-CARDS. COEFFICIENTS HAVE TO BE KEYED IN ONLY ONCE.

219PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52166D 67-DETERMINANTS

THIS ONE CARD PROGRAM CALCULATES ANY DETERMINANT N.N (N=2,3,..11), USING N DATA-CARDS. ELEMENTS HAVE TO BE KEYED IN ONLY ONCE.

152PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52167D 97-67 6 OFF 49 GENERATION OF 8X6 LOTTERY NUMBERS

THIS PROGRAM GENERATES FOR 8 LOTTERY GAMES 6 RANDOM LOTTERY NUMBERS FOR EACH WITHOUT REPETITION FOR YOUR LOTTO FORM. THE PROGRAM NEEDS APPROXIMATLY 8 MINUTES CALCULATION TIME. THE PROGRAM PRINTS ALL DATA IN GAME SEQUENCE.

52167D (CONTD)

187PROGRAM STEPS
ALEXANDER NIESSEN
D-EITORF.

52168D 97-67 6 OFF 49 STORING OF DRAWED LOTTERY NUMBERS.

THIS PROGRAM STORES THE WEEKLY DRAWN RANDOM LOTTERY NUMBERS FROM THE GERMAN LOTTERY 6 OF 49 ON DATA CARDS.
THE PROGRAM CAN BE USED AS A MEMORY BUT IT IS ABSOLUTLY NECESSARY TO HAVE IT, IF YOU WANT TO USE THE PROGRAM "6 OF 49 EVALUATION OF DRAWED LOTTERY NUMBERS".

134PROGRAM STEPS
ALEXANDER NIESSEN
D-EITORF.

52169D 97-67- 6 OFF 49 EVALUATION OF DRAWED LOTTERY NUMBERS

THIS PROGRAM EVALUATE WHETHER THE SEED LOTTERY NUMBERS ARE EQUAL WITH THE WEEKLY DRAWN NUMBERS. WORKING WITH THIS PROGRAM IT IS NECESSARY TO HAVE PROGRAMS "6 OFF 49 STORING OF DRAWED LOTTERY NUMBERS" AND " 6 OFF 49 GENERATION OF 8X6 LOTTERY NUMBERS" AVAILABLE.

207PROGRAM STEPS
ALEXANDER NIESSEN
D-ETTORF.

52170D 67-MASTER-MIND WITH DOUBLE CODE

THIS PROGRAM PLAY WITH YOU A MASTER MIND GAME WHERE YOU HAVE TO FOUND A CODE OF 2 PARTS, EACH WITH 4 NUMBERS. IN EACH PART THE NUMBERS ARE ONLY IN A SINGLE TIME, BUT IN THE OTHER PART THE NUMBERS COULD BE THERE ALSO.

208PROGRAM STEPS
JUNGE RAINER
D-URBERACH-ROEDERMARK.

52171D 67-SYMMETRIC COMPONENTS OF AN UNSYMMETRIC SHORT CIRCUIT

THIS PROGRAM COMPUTES THE SYMMETRIC COMPONENTS OF AN UNSYMMETRIC SHORT CIRCUIT IN A 3-PHASES-SYSTEM. BY KNOWING THE SHORT CURRENT IN THE 3 PHASES THE PROGRAM FOUND THE COMPONENTS OF THE 1-2-0-SYSTEM IN POLAR OR RECTANGULAR FORM.

135PROGRAM STEPS
JUNGE RAINER
D-URBERACH-ROEDERMARK.

52172D 67-FACTORIALS INDICATION

N1!/N2! IS COMPUTED FOR EVER POSITIVE INTEGER LESS THAN 10**10 AND N1,N2 ARE NOT ZERO AND N1 IS NOT 1. PROGRAM IS VALID FOR N2>N1. THE RESULT IS GIVEN IN ABOUT 15 SEC AND TO TOTAL OF TEN FIGURES.
I.E. 10**6!/10**3!=2.05X10**5563141

110PROGRAM STEPS
KENT A WIGSTROM
S-FLODA.

52173D 67-FACTORIALS TO 140 FIG.

FACTORIALS N1!/N2! THERE N1>N2 AND N1<(10**10-10**5) WILL BE COMPUTED TO 10K FIG THERE K BELONGS TO 2, 14 TYPICAL EXECUTION TIMES 200!/100! WITH 100 FIG. TAKES 19 MIN. AND 1000! WITH 140 FIG ABOUT 6.5 HOURS.

222PROGRAM STEPS
KENT A WIGSTROM
S-FLODA.

52174D 67-POWERS OF NUMBER TO 215 FIG.

Y**X < 10**214 FOR 10**5 <Y < (10**10-10**5) CAN BE COMPUTED. FOR Y < 10**5 IS # 51416D APPLICABLE. COMPUTATION TO THE FULL RANGE TAKES ABOUT 22 MIN AND TO 100 FIG ABOUT 4 MIN.

217PROGRAM STEPS
KENT A WIGSTROM
S-FLODA.

52175D 67-LOGIC FUNCTIONS

PROGRAM PERFORMS THE LOGIC FUNCTIONS : AND, OR, NOT, EXOR FOR BINARY WORDS WITH VARIABLE LENGTH. THE STACK IS SAVED DURING OPERATIONS, SO YOU CAN WORK WITH BRACKETS AND CHAINED OPERATIONS.

112PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52176D 67-MULTIPLICATION OF NXN MATRIX WITH NX1 MATRIX (N=<12)

THIS PROGRAM CAN MULTIPLY AN NXN MATRIX (1=<N=<12) WITH A NX1 MATRIX THE ONLY SPECIAL THING IS THAT YOU MUST ENTER THE NX1 MATRIX FIRST.

096PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52177D 67-POWER SERIES OPERATIONS

GIVEN A FORMAL POWER SERIES P(X)= 1+A1*X+A2*X**2+..., THIS PROGRAM COMPUTES THE COEFFICIENTS BK, K=1..N, OF Q(X)=1+B1*X+... FOR Q= P**ALPHA, Q=EXP(P-1), Q=1+LOG(P). IF THE AK ARE GIVEN BY A FORMULA (LBL A, MAX. 94 STEPS), NMAX=19; IF THE AK ARE GIVEN BY VALUES, NMAX=9. METHOD: RECURRENCE RELATIONS. SPEED N=9: 2 MIN, N=19: 8 MIN, IF LBL A IS FAST. THE REVERSION Y*Q(Y) OF X*P(X) CAN ALSO BE COMPUTED; SPEED: N=9: 7 MIN,N=19: 50 MIN.

130PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

52178D 67-SYMMETRICAL LINEAR REGRESSION

THIS PROGRAM FITS A STRAIGHT LINE TO A GIVEN SET OF DATA POINTS, SO THAT: CASE I. THE SUM OF THE SQUARED VERTICAL DISTANCES OF THE POINTS TO THE LINE IS A MINIMUM (THE WELL-KNOWN "LINEAR REGRESSION"). CASE II. THE SUM OF THE SQUARED HORIZONTAL DISTANCES IS A MINIMUM (L.R. WITH X AND Y INTERCHANGED). CASE III. THE SUM OF THE SQUARED EUCLIDEAN DISTANCES IS A MINIMUM ("SYMMETRICAL" L.R.).

218PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

52179D 67-PRODUCT OF TWO SUMS OF FOUR SQUARES

THE PRODUCT OF TWO SUMS OF FOUR SQUARES CAN ITSELF BE REPRESENTED AS A SUM OF FOUR SQUARES. THIS PROGRAM IS SIMILAR TO 51013D, BUT GIVES ALL 96 SOLUTIONS INSTEAD OF 24 ONLY.

179PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

52180D 67-MULTIPLICATION OF LARGE NUMBERS

THIS PROGRAM MULTIPLIES TWO INTEGERS X AND Y. IF X HAS 10M DIGITS, Y MAY HAVE UP TO 100-10 DIGITS (M=1,2,3,4 OR 5). IT IS COMPARATIVELY FAST: THE MULTIPLICATION OF A 30-DIGIT NUMBER AND A 70-DIGIT NUMBER TAKES 95 SECONDS.

224PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

52181D 67-TWO-POINT TAYLOR SERIES

GIVEN THE FIRST N COEFFICIENTS OF THE TWO TAYLOR EXPANSIONS AT THE POINTS 0 AND 1 OF AN ANALYTIC FUNCTION, THIS PROGRAM COMPUTES THE FIRST 2N COEFFICIENTS OF THE "TWO-POINT TAYLOR SERIES" F(Z)=(C0+C1*Z)+(C2+C3*Z)*(Z-1)*Z+(C4+C5*Z)*((Z-1)*Z)**2+... BY A RECURRENCE FORMULA FROM RUTISHAUSER.

156PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

52182D 67-COMPUTATION OF LINEAR MULTI-STEP METHODS

52182D (CONTD)

GIVEN A POLYNOMIAL ALPHA (Z) OF DEGREE K<=19 THAT SATISFIES A STABILITY CONDITION, THIS PROGRAM COMPUTES A POLYNOMIAL BETA (Z) OF DEGREE M<=K SO THAT THE MULTI-STEP METHOD FOR SOLVING DIFFERENTIAL EQUATIONS, BASED ON THE COEFFICIENTS OF ALPHA (Z) AND BETA (Z), HAS ORDER P>=M+1.

180PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

52183D 67-ADAMS-BASHFORTH AND ADAMS-MOULTON METHODS

THIS PROGRAM IMPLEMENTS THE ADAMS-BASHFORTH AND ADAMS-MOULTON METHODS FOR K=1,2,3,4,5 (I.E., ORDER 1..5 FOR A-BASHFORTH, 2..6 FOR A-MOULTON) TO SOLVE A SINGLE FIRST-ORDER ORDINARY DIFFERENTIAL EQUATION. THE COEFFICIENTS OF THE METHODS ARE STORED ON DATA CARDS. AS A PREDICTOR FOR THE ADAMS-MOULTON METHOD, THE ADAMS-BASHFORTH METHOD IS USED. 79 PROGRAM STEPS ARE AVAILABLE FOR THE FUNCTION F.

145PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

52184D 67-MOEBIUS TRANSFORMATIONS

THIS PROGRAM HANDLES WITH MOEBIUS TRANSFORMATIONS W=F(Z)=(AZ+B)/(CZ+D), GIVEN BY FOUR COMPLEX NUMBERS A,B,C,D. THE FOLLOWING OPERATIONS ARE AVAILABLE, BASED ON TWO MOEBIUS TRANSFORMATIONS F,G: INPUT F, INPUT G, OUTPUT F, EXCHANGE F AND G; F:=F G, F:=GF; F:=INVERSE OF F; COMPUTE W=F(Z) FOR ARBITRARY COMPLEX Z; COMPUTE Z FROM W=F(Z) FOR COMPLEX W

216PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

52185D 67-MOEBIUS TRANSFORMATION FROM THREE GIVEN FUNCTION VALUES

GIVEN TWO TRIPLES OF DISTINCT NUMBERS (Z1,Z2,Z3), (W1,W2,W3) IN THE COMPACTIFIED COMPLEX PLANE (I.E. COMPLEX OR INFINITY), THIS PROGRAM COMPUTES A MOEBIUS TRANSFORMATION W=F(Z)=(AZ+B)/(CZ+D) THAT SATISFIES F(Z1)=W1 (I=1,2,3). PROGRAM 52184D CAN BE USED TO EVALUATE THE FOUND MOEBIUS TRANSFORMATION FOR ARBITRARY COMPLEX Z.

213PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

52186D 67-FOUR SIDE OPEN FRAMES.

THIS PROGRAM COMPUTES, ON TWO CARDS THE HORIZONTAL AND VERTICAL REACTIONS AND ELBOW MOMENTS OF FOUR-SIDED SIMPLE OPEN FRAMES UNDER ALL POSSIBLE LOADING CONDITIONS. ALSO, WITH A THIRD CARD, SOLVES FOR SPECIAL CASES OF THE SAME FRAMES.

642PROGRAM STEPS
JIMMY PLATONIS
GR-ATHENS.

52187D 67-TILE AREA ESTIMATION

GIVEN A TILE BY ITS DIMENSIONS WE CALCULATE BY THIS PROGRAM THE NECESSARY NUMBER AND AREA OF TILES TO COVER A GIVEN SURFACE. WE CAN ALSO OBTAIN THE TOTALLY REQUIRED TILES TO COVER A NUMBER OF GIVEN SURFACES BY A SPECIAL SUBROUTINE, WE CAN ESTIMATE THE AREA DIMENSIONS FOR AN INTEGRAL NUMBER OF TILES (NO WASTE).

109PROGRAM STEPS
JIMMY PLATONIS

52187D (CONTD)

GR-ATHENS.

52188D 67-WYE-DELTA TRANSFORMATION

GIVEN THREE OHM-RESISTANCES IN WYE-CONNECTION, THE PROGRAM COMPUTES THE APPROPRIATE RESISTANCE IN DELTA CONNECTION AND REVERSE.

057PROGRAM STEPS
ROBERT EMBRECHTS
B-RIJKEVORSEL.

52189D 97-CONTINUED FRACTION EXPANSION OF TRANSFER FUNCTION F(S)

THE CONTINUED FRACTION OF A N-TH ORDER (N<=9) LINEAR RATIONAL TRANSFER FUNCTION F(S) AT S= 0 IS COMPUTED. THE ORDER AND THE COEFFICIENTS OF THE NUMERATOR AND DENOMINATOR POLYNOMIALS OF F(S) HAVE TO BE INPUT. THE OUTPUT CONSISTS OF THE COEFFICCIENTS OF THE CONTINUED FRACTION OF F(S), WHICH CAN BE USED FOR THE DESIGN OF A LINEAR NETWORK REPRESENTING THE TRANSFER FUNCTION OR FOR APPROXIMATION OF F(S) BY A MODEL OF LOWER ORDER.

186PROGRAM STEPS
FRANK DOERRSCHEIDT
D-PADERBORN.

52190D 97-LANDSCAPE PERSPECTIVES FROM MAPS WITH GRID & CONTOURS-NG4

INPUT GRID REFERENCE & HEIGHT OF VIEWPOINT (OBSERVING STATION) & SIMILAR DETAILS FOR SELECTED POINTS OF THE TERRAIN POSSIBLY IN VIEW. PROGRAM COMPUTES PANORAMIC CO-ORDINATES REFERRED TO GRID NORTH AS AZIMUTH AND THE TANGENT PLANE AT THE OBSERVATION POINT AS ALTITUDE, ALSO THE DISTANCE. ACCOUNT IS TAKEN OF CURVATURE. USEFUL FOR BOTH OLDER 1 ETC MAPS (HEIGHTS IN FEET) OR METRIC MAPS.

112PROGRAM STEPS
DAVID ARTHUR HATCHER
GB-LONDON.

52191D 97-OSCILLATIONS COMPOSITION

THIS PROGRAM PLOTS THE GRAPH OF A VIBRATION WHICH IS COMPOSED BY UP TO 09 SINE OSCILLATIONS, EACH OSCILLATION BEING DEFINED BY ITS PERIOD OR FREQUENCY, AMPLITUDE AND PHASE ANGLE. IT IS ALSO ABLE TO COMPUTE A VIBRATION COMPOSED BY A FUNDAMENTAL OSCILLATION AND ITS HARMONICS.

172PROGRAM STEPS
MICHEL SIQUET
B-PLANCENOIT.

52192D 97-SYMMETRIC TRI-DIAGONAL MATRIX EQUATIONS 3-8 UNKNOWNS

THE PROGRAM SOLVES A SYSTEM OF N NON-HOMOGENEOUS EQUATIONS IN N UNKNOWNS FOR VALUES OF N FROM 1 TO 8 IN THE CASE OF A SYMMETRIC TRI-DIAGONAL MATRIX. FOR N EQUATIONS THE NUMBER OF DATA ENTRIES IS 3N-1. A DATA ENTRY SUB-PROGRAM IS INCLUDED WHICH PROVIDES FOR DATA TO BE ENTERED ON "PAUSE". THE PROGRAM DETERMINES THE ORDER N OF THE PROBLEM SUBMITTED BY COUNTING DATA ENTRY.

046PROGRAM STEPS
WILLIAM PRICE BROWN
N.IR.-PORTAFERRY.

52193D 97-DENSITY & THERMAL EXPANSION FROM HYDROSTATIC WEIGHTS.

HYDROSTATIC WEIGHTS ARE EVALUATED TO CALCULATE DENSITY (IN THE CASE OF SOLIDS ALSO VOLUME) AND OPTIONALLY VOLUMETRIC THERMAL EXPANSION RELATIVE TO A REFERENCE DENSITY. CORRECTION FOR ATMOSPHERIC BUOYANCY

52193D (CONTD)

AND TEMPERATURE VARIANCE IS PROVIDED. SERIES CAN BE EVALUATED FOR MEAN AND STANDARD DEVIATION.

210PROGRAM STEPS
ED. CALLAHAN
D-DUESSELDORF.

52194D 67-HIGH-LOW

YOU OR YOUR CALCULATOR THINK OF A SECRET NUMBER BETWEEN 1 AND 1023. THE OTHER HAS TO DISCOVER THIS NUMBER IN AS FEW GUESSES AS POSSIBLE.

109PROGRAM STEPS
JAN VOERINCKX
B-AARSCHOT.

52195D 67-MAGNETIC INDUCTION CURVE

THE PROGRAM IS A MATHEMATIC DESCRIPTION OF THE MAGNETIC INDUCTION CURVE. YOU CAN COMPUTE THE MAGNETIC INDUCTION IF YOU KNOW THE MAGNETIC FIELD INTENSITY AND REVERSE.

151PROGRAM STEPS
REINHARD KLEINHAENTZ
A-VIENNA.

52196D 67-LOHMANN-RUECHTI PROCESS

LOHMANN-RUECHTI PROCESS CONCERNS A CUMULATIVE PHENOMENA OF INDUSTRIAL SELF FINANCING INDUCED BY AN APPROPRIATE POLICY OF DEPRECIATION ANNUITIES WHEN TIME OF DEPRECIATION IS FAIRLY SHORT. (PRACTICALLY T<=9)

159PROGRAM STEPS
ALBERT BOISRAYON
F-LE BEAUSSET.

52197D 67-TRUE RECTANGULAR RANDOM NUMBERS

PROGRAM GIVES TRUE RECTANGULAR RANDOM NUMBERS THAT IS THEY REPRESENT SUCCESSIVE DRAWS FROM A POPULATION OF NUMBERS IN WHICH EACH DIGIT, ZERO THROUGH NINE, APPEARS WITH EQUAL FREQUENCY.

180PROGRAM STEPS
ALBERT BOISRAYON
F-LE BEAUSSET.

52198D 97-STAR-POLYGON TRANSFORMATION WITH LOADED STARPOINT.

PROGRAM TRANSFORMS A N-ARMED STAR INTO A EQUIVALENT POLYGON WITH STARPOINT ELIMINATED. THE STARPOINT MAY BE LOADED WITH AN ADMITTANCE OR A CURRENT, INDIFFERENCE WITH SOME OTHER PROGRAMS.

171PROGRAM STEPS
VICTOR DE CAUTER
B-EDEGEM

52199D 67-KOLMOGOROV-SMIRNOV TEST

THE KOLMOGOROV-SMIRNOV TEST IS A TEST OF GOODNESS OF FIT. IT IS CONCERNED WITH THE DEGREE OF AGREEMENT BETWEEN THE DISTRIBUTION OF A SET OF SAMPLE VALUES AND NORMAL DISTRIBUTION. IT DETERMINES WHETHER THE SCORES IN THE SAMPLE CAN REASONABLY BE THOUGHT TO HAVE COME FROM A POPULATION HAVING THE THEORETICAL DISTRIBUTION.

224PROGRAM STEPS
GERARD BEAUSIRE
B-BRUXELLES.

52200D 67-DAY OF WEEK

THIS PROGRAM WORKS FOR ANY DATE FROM JANUARY 1ST, 1500 TO DECEMBER 31ST, 2699. GIVEN A DATE, THE PROGRAM WILL FIND THE DAY OF THE

52200D (CONTD)

WEEK, TAKING INTO ACCOUNT THE FACT THAT THE YEAR COULD BE NORMAL OR LEAP BY THE CHOICE OF THE CORRESPONDING DATA CARD.

045PROGRAM STEPS
CLAUDE COLLE
F-MONTPELLIER.

52201D 67-EPHEMERIS TRANSIT

THIS PROGRAM COMPUTES FOR ANY PLACE IN THE WORLD THE SEMI-ARC, THE TIME OF TRANSIT, THE RISING AND SETTING TIME OF ANY PLANET OF THE SOLAR SYSTEM, USING THE LONGITUDE AND LATITUDE OF THE USER'S PLACE, THE DECLINATION OF THE PLANET OF THE DAY THE OBSERVATION TAKES PLACE, AND "THE ASTRONOMICAL EPHEMERIS" FROM H.M.S.O. OR ANY OTHER ALMANAC GIVING TRANSIT TIME AND DECLINATION FOR GREENWICH.

071PROGRAM STEPS
CLAUDE COLLE
F-MONTPELLIER.

52202D 67-EXPOSURE TIME FOR ASTROPHOTOGRAPHY

THIS PROGRAM COMPUTES THE EXPOSURE TIME TO TAKE A PHOTOGRAPHE OF A CELESTIAL BODY USING A REFLEX CAMERA AND A TELESCOPE. IT COMPUTES ALSO THE MAGNIFICATION OF THE TELESCOPE ACCORDING TO THE EYEPIECE USED, THE SIZE OF THE MOON'S IMAGE, THE SYSTEM FOCAL LENGTH, THE EYEPIECE FOCAL LENGTH, THE FOCAL LENGTH OF THE CAMERA LENS, THE TELESCOPE APERTURE, THE SPEED OF THE FILM USED AND THE BRIGHTNESS VALUE OF THE CELESTIAL BODY TO BE PHOTOGRAPHED.

080PROGRAM STEPS
CLAUDE COLLE
F-MONTPELLIER.

52203D 67-GAUSSIAN METHODS FOR INTEGRATION

THIS PROGRAM CALCULATES THE INTEGRAL OF F(X) OVER A FINITE OR INFINITE INTERVAL. FIVE DIFFERENT GAUSSIAN METHODS CAN BE USED: LEGENDRE (10 POINTS), LOBATTO (10 POINTS) AND CHEBYCHEV (9 POINTS) FOR FINITE INTERVALS; LAGUERRE (7 POINTS) AND HERMITE (10 POINTS) FOR INFINITE INTERVALS. PROGRAM IS STORED IN ONE CARD AND CONSTANTS FOR ALL FIVE METHODS IN TWO OTHER CARDS. YOU CAN EASILY TRY DIFFERENT METHODS TO COMPARE RESULTS.

129PROGRAM STEPS
FERNANDO DEL REY
E-MADRID.

52204D 67-INTERPOLATING POLYNOMIALS

GIVEN A SET OF N+1 EQUISPACED POINTS (N<=20), THIS PROGRAM CALCULATES THE POLYNOMIAL OF DEGREE N PASSING THROUGH ALL N+1 POINTS. NEWTON-GREGORY FORWARD METHOD FOR EQUISPACED POINTS IS USED. PROJECTIONS OF Y VALUES CAN BE MADE WITH THE CALCULATED POLYNOMIAL. AN AUTOMATIC DATA ENTRY ROUTINE IS INCLUDED.

112PROGRAM STEPS
FERNANDO DEL REY
E-MADRID.

52205D 67-REAL AND/OR COMPLEX ROOTS OF F(Z)=0

GIVEN AN INITIAL APPROXIMATION, PROGAM WILL FIND A ROOT (REAL OR COMPLEX) OF F(Z)=0, BY MEANS OF A COMPLEX VERSION OF THE NEWTON'S METHOD; F(Z) IS NOT RESTRICTED TO BE A POLYNOMIAL, IT CAN BE ANY USER'S DEFINED FUNCTION. FOR THE PURPOSE OF DEFINING F(Z), THE FOLLOWING

52205D (CONTD)

SUBROUTINES (FOR REAL OR COMPLEX ARGUMENTS) ARE ACCESSIBLE EITHER FROM KEYBOARD OR PROGRAM : SIN (Z), ARCSIN (Z), EXP(Z), LN(Z),+,-,*,:, Z1 RAISED TO Z2, PLUS 2 COMPLEX STORAGE REGISTERS. 50 STEPS & 15 REGISTERS LEFT TO DEFINE F(Z).

174PROGRAM STEPS
VALENTIN ALBILLO
E-MADRID.

52206D 67-A CHESS GAME

THIS IS A PROGRAM CHESS GAME BETWEEN YOU AND HP-67/97. THE CALCULATOR WILL PLAY A SUITABLE CLEVER CHESS WITH ALL ITS 16 WHITE CHESSMEN AGAINST YOUR BLACK KING ALONE. STARTING FROM THE ORDINARY ARRANGEMENT OF THE PIECES AS FOR A GAME, CALCULATOR'S AIM IS TO PLAY AND CHECKMATE IN A MAXIMUM OF 6 MOVES. THIS IS, SHOULD YOU PLAY IN SUCH A WAY AS TO AVOID BEING CHEKMATED IN SIX MOVES OR LESS, YOU WILL BE CONSIDERED THE WINNER, AS YOU WILL IF YOU CAN FORCE A STALEMATED POSITION OTHERWISE, HP WILL TRIUMPH.

208PROGRAM STEPS
VALENTIN ALBILLO
E-MADRID.

52207D 67-MINIMAX POLYNOMIAL APPRIXIMATION OF DEGREE 3

GIVEN 5 POINTS (X,Y), THE PROGRAM FINDS A 3RD DEGREE POLYNOMIAL THAT MISSES THEM ALL BY EQUAL AMOUNTS OF ALTERNATING SIGNS. THE MINIMUM ERROR IS ALSO COMPUTED, AND PROJECTIONS OF Y VALUES CAN BE PERFORMED. AN ITERATIVE PROCESS WHICH CAN BE USED TO DETERMINE A SEQUENCE OF SUCCESSIVE IMPROVEMENTS TO AN INITIAL APPROXIMATION IS INDICATED, PERMITTING THE DETERMINATION OF AN APPROXIMATION TO A GIVEN F(X) ARBITRARILY CLOSE TO THE OPTIMUM ONE. ALL DATA ARE SAVED BY THE PROGRAM FULLY DOCUMENTED.

221PROGRAM STEPS
VALENTIN ALBILLO
E-MADRID.

52208D 67-REAL ROOTS OF F(X)=0 : 4 DIFFERENT METHODS

THIS PROGRAM HAS BEEN WRITTEN TO SOLVE ANY KIND OF EQUATION IN THE LEAST POSSIBLE AMOUNT OF TIME; IT INCLUDES 4 METHODS: A FAST ITERATIVE METHOD, A QUADRATIC NEWTON'S METHOD, A CUBIC CHEBYSHEV'S METHOD (THE ERROR OF THE IMPROVED APPROXIMATION IS PROPORTIONAL TO THE CUBE OF THE PREVIOUS ONE), AND A PARTIAL NEWTON'S METHOD OF VARIABLE SPEED, PLUS AN AUTOMATIC PLOTTING SUBROUTINE TO HELP YOU LOCATE THE ROOTS. 80 STEPS & 22 REGISTERS LEFT TO DEFINE F(X). FULLY DOCUMENTED.

144PROGRAM STEPS
VALENTIN ALBILLO
E-MADRID.

52209D 67-"JASS"/SCOREKEEPER

FOR EITHER 67 OR 97 USE, THIS PROGRAM CALCULATES THE SCORE OF BOTH TEAMS, UPDATE THEM SEPARATELY AND KEEPS TRACK OF THE TOTAL-RESULT. IT COMPUTES ALSO AT ANY TIME MISSING POINTS. PROGRAM TAKES INTO ACCOUNT SPECIAL EVENTS, SUCH AS "WYSS", "MATCH" OR "STUECK". ERROR CORRECTION IS PROVIDED AS WELL AS AUTOMATIC CLEAR FOR A NEW GAME.

224PROGRAM STEPS
MARK MAURON
CH-FRIBOURG.

52210D 67-PHOTO FLASH EXPOSURE-1: GUIDE NUMBERS & CONVERSIONS.

52210D (CONTD)

GUIDE NUMBERS ARE CONVENIENT FOR FIGURING FLASH PHOTOGRAPHY EXPOSURES. THIS PROGRAM CALCULATES GUIDE NUMBERS FROM BEAM CANDLE POWER SECOND (ELECTRONIC FLASH, FLASH CUBES ETC.) OR LUMEN-SEC. (FLASH BULBS) OUPUT AND FILM SPEED OR OUPUT FROM GUIDE NO. ETC., ALSO INDICATES EXPOSURE (F-STOP) AT DIFFERENT DISTANCES AND RECALCULATES GUIDE NUMBERS FOR DIFFERENT ASA FILM SPEEDS AND FOR METERS AND FEET

173PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

52211D 67-PHOTO FLASH EXPOSURE-2: MULTIPLE FLASH

FLASH EXPOSURE DETERMINATION BECOMES DIFFICULT WHEN YOU HAVE SEVERAL FLASH SOURCES OF DIFFERENT POWER, AT DIFFERENT DISTANCES AND ANGLES LIGHTING THE SAME SUBJECT. THIS PROGRAM THEREFORE COMPUTES THE CORRECT F-STOP (LENS APERTURE) SETTING WITH UP TO 5 FLASH SOURCES; YOU ONLY INPUT THE GUIDE NUMBER, DISTANCE AND LIGHTING ANGLE FOR EACH. ALSO INCLUDED IS F-STOP ADJUSTMENT FOR DIFFERENT FILM SPEEDS IN ASA OR DIN AND A METERS/FEET INTERCONVERSION.

087PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

52212D 67-BINOCULAR PARAMETERS

FOR A PAIR OF BINOCULARS THE PROGRAM CALCULATES THE MAGNIFICATION, OBJECTIVE DIAMETER, PUPIL DIAMETER AND TWILIGHT FACTOR IF ANY TWO OF THESE PARAMETERS ARE KNOWN. IT ALSO CALCULATES THE LIGHT TRANSMITTING POWER FROM THE PUPIL DIAMETER.

151PROGRAM STEPS
GB-L. ANDREW MANNHEIM
GB-RICHMOND.

52213D 67-VELOCITY CONVERSIONS

THIS PROGRAM CONVERTS ANY ONE OF VARIOUS VELOCITY UNITS-KM/H, MPH, FEET/SECOND, FEET/MIN., METERS/SECOND, METERS/MIN, INCHES/SECOND AND CM/SECOND - INTO ANY ONE OR ALL OF THE OTHERS. IT ALSO CALCULATES THE LINEAR SPEED AT THE CIRCUMFERENCE OF A ROTATING BODY (E.G. WHEEL) FROM THE RPM SPEED AND RADIUS, OR RPM FROM RADIUS AND LINEAR SPEED AT CIRCUMFERENCE.

209PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

52214D 67-PRESSURE AND STRESS CONVERSIONS-1: NORMAL PRESSURES

NUMEROUS PRESSURE AND STRESS MEASURING UNITS EVOLVED OVER THE YEARS IN DIFFERENT FIELDS PRESENT A CONFUSING ARRAY. THIS PROGRAM UNRAVELS THEM BY CONVERTING ANY ONE OF N/CM**2, KP/CM**2, PSI, STD. ATMOSPHERE, METERS HEIGHT OF H20, BAR, MILLIBAR, INCHES AND MM OF MERCURY AND FEET OF WATER HEAD INTO ANY OR ALL OF THE OTHERS. A SIMILAR PROGRAM-PRESSURE/STRESS CONVERSIONS 2-HANDLES VERY LOW AND VERY HIGH PRESSURES.

218PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

52215D 67-PRESSURE & STRESS CONVERSIONS-2: V. LOW & V. HIGH PRESSURES

TO UNRAVEL NUMEROUS PRESSURE AND

52215D (CONTD)

STRESS MEASURING UNITS EVOLVED OVER THE YEARS IN VARIOUS FIELDS, THIS PROGRAM CONVERTS ANY ONE OF N/CM**2 MILLIBAR, TORR, DYNES/CM**2, MMH2O, PASCAL (N/M**2), LBF/FT**2, TONS (LONG)/IN.**2, TONS (SHORT,US)/IN.**2, AND TONNES/CM**2 INTO ANY OR ALL OF THE OTHERS. A SIMILAR PROGRAM - PRESSURE/STRESS CONVERSIONS 1 - HANDLES PRESSURE UNITS DESIGNED FOR NORMAL RANGES.

215PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

52216D 67-MULTIPLE 2-VARIABLE INTERCHANGEABLE SOL. CONTROL LOGIC

THIS SKELETON PROGRAM CONTAINS ALL THE CONTROL LOGIC FOR A SEQUENCE OF MULTI-WAY 2-VARIABLE FUNCTIONS OF THE GENERAL FROM A=F(B)=F(C)=F(D)=F(E) AND SO ON, WITH INTERCHANGEABLE SOLUTIONS, WHERE ANY ONE OF A, B,C ETC. CAN BE EVALUATED FROM ANY ONE OF THE OTHERS. USER ONLY HAS TO INSERT ACTUAL FUNCTION KEY-STROKES TO COMPLETE PROGRAM. TWO VERSIONS FOR FUNCTIONS INSERTED AS LABELS OR ADDED AS SUBROUTINES, ACCOMODATING UP TO 10 AND 7 VARIABLES RESPECTIVELY.(INCLUDING A 86 STEPS VERSION)

116PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

52217D 67-GELFILTRATION G-25

ON INPUT OF VES AND H, PROGRAM CALCULATES COLUMN PARAM. VO, VT, VI. THIS DONE, ON INPUT OF VE, CALCULATION OF VE/VO, R, VE/VT, KD, DAV. ON OPTINAL INPUT OF VS, CALCULATION OF DF. VES=ELUTION VOLUME STANDARD. H=BED HEIGHT. VO=VOID VOLUME. VT=TOTAL VOLUME. VI=INNER VOLUME. VE=ELUTION VOL SAMPLE. VE/VO=RELAT. ELUT. VOL. KD=PARTITION COEFF. KAV=PART. COEFF. LIQUID/GEL. VS=SAMPLE VOL. DF=DILUTION FACTOR.

054PROGRAM STEPS
JOHAN DECAT
B-GENT.

52218D 67-RUSSIAN PEASANT ALGORITHM

PROGRAM USES THE "RUSSIAN PEASANT ALGORITHM" TO MULTIPLY 2 INTEGERS. I.E. IT ONLY USES DIVIS. AND MULT. BY 2 AND ADDIT. IT ALSO SORTS THE INPUT TO GET THE RESULT THE QUICKEST.

028PROGRAM STEPS
JOHAN DECAT
B-GENT.

52219D 67-8 FUNCTIONS AND DISTRIBUTIONS

FUNCTIONVALUES ARE PROVIDED FOR :
1) THE INCOMPLETE GAMMA FUNCTION AND THE DERIVATIVE.
2) THE CHI-SQUARE DISTRIBUTION AND DENSITY FUNCTION.
3) THE NORMAL DISTRIBUTION AND DENSITY FUNCTION FOR REAL VALUES OF MA AND SIGMA.
4) THE ERROR FUNCTION AND THE DERIVATIVE.

THE COMMON SERIES EXPANSION USED, IS MINIMIZED TO 12 LINES AND ALSO INDIRECT BRANCHING IS USED IN ORDER TO CUT DOWN THE RUN-TIME.

195PROGRAM STEPS
SOREN VIDEBEK NIELSEN
DK-STRUER.

52220D 97-SPACE HUNT

TRY TO FIND THE FIVE HIDDEN ENEMY-SPUCE SHIPS AND DESTROY THEM. THEY ARE HIDDEN IN NINE DIFFERENT GALAXIES AND PERHAPS BEHIND A STAR. YOU CAN GO FROM ONE GALAXY TO ANOTHER,

52220D (CONTD)

BUT IF YOU MOVE OVER TWO GALAXIES WITHOUT SHOOTING SOME DOWN, A NEW ENEMYSHIP WILL APPEAR. UNFORTUNATELY YOU MIGHT GET SURROUNDED, DO NOT WORRY, YOU CAN HANDLE THEM. USE THE "PHASER" TO DEMATRIALIZE THEM.

224PROGRAM STEPS
LENNART JOHANSSON
S-V. FROELUNDA.

52221D 67-ZETA FUNCTION FIRST AND SECOND ELLIPTIC INTEGRALS AND AMPLITUDE

THIS COMPACT PROGRAM, IN ONLY A CARD, ALLOWS TO OBTAIN, WITH PERFECT ACCURACY, EVERY FUNCTION OF THE "PROGRAM TITLE". MOREOVER, WITH AMPLITUDE OF UPSIL., ALL JACOBIAN ELLIPTIC FUNCTIONS.

224PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52222D 67-COMPUTATION AND DISPLAY MANAGEMENT OF TWO VARIABLE FUNCTIONS

PROGRAM PROVIDES LOGICAL ARCHITECTURE TO COMPUTE AND PRINT TWO VARIABLE FUNCTIONS WITHIN ANY INTERVAL AT FIXED LINEAR INGREMENTS. USER DEFINED FUNCTIONS CAN EXTEND UP TO 135 PROGRAM STEPS, 17 REGISTERS AND 12 LABELS.

089PROGRAM STEPS
PIERRE GRANIER
F-VANVES

52223D 67-WATER LINE PLANE-NAVAL ARCHITECTURE

COMPUTES THE AREA, THE LONGITUDINAL POSITION OF THE CENTER OF GRAVITY, AND THE LONGITUDINAL AND TRANSVERSAL MOMENTS OF INERTIA OF THE BOAT'S WATER LINE PLANE

101PROGRAM STEPS
ROBERT FREDERIC MENZI
CH-GENEVA.

52224D 67-HULL VOLUMETRY-CENTER OF BUOYANCY-NAVAL ARCHITECTURE

COMPUTES THE VOLUME OF THE HULL AND THE LONGITUDINAL POSITION OF THE CENTER OF BUOYANCY, FOR UNEQUALLY SPACED STATIONS.

063PROGRAM STEPS
ROBERT FREDERIC MENZI
CH-GENEVA.

52225D 67-E TO 215 SIGNIFICANT FIGURES

THIS PROGRAM CALCULATES THE FIRST 215 DIGITS OF E (THE BASE OF NATURAL LOGARITHMS). IT TAKES ABOUT 3 HOURS.

106PROGRAM STEPS
STEFAN TROEK
D-PFORZHEIM.

52226D 97-COX-ANTOINE CURVE FITTING

FOR A SET OF EXPERIMENTAL OR TABULAR DATA POINTS (TEMPERATURE, VAPOR PRESSURE), THIS PROGRAM FITS THE DATA TO THE COX-ANTOINE EQUATION IN P=A-B/(T+C) BY THE LEAST SQUARES METHOD. P=F(T) AND T=F(P) MAY BE CALCULATED BASED ON THE FIT.

200PROGRAM STEPS
OVE TORBEN VILSTRUP
DK-SONDERBORG.

52227D 97-THREE DIMENSIONAL

FOR A SET OF DATA POINTS (X,Y,Z) THIS PROGRAM FITS A LINEAR EQUATION OF THE FORM Z=A+BX+CY BY THE LEAST SQUARES MEHTOD. THE PROGRAM IS BASI

52227D (CONTD)

CALLY THE SAME AS ST1-13A (00113D), BUT THE ROUTINES FOR INPUTTING THE DATA POINTS IS CHANGED, SO THAT INPUT TIME PER SET IS REDUCED FROM 10 TO 2 SECS.

167PROGRAM STEPS
OVE TORBEN VILSTRUP
DK-SONDERBORG.

52228D 97-STRONG BY WEAK PH TITRATION

THIS PROGRAM COMPUTES PH TITRATION CURVE WHEN A STRONG ACID OR BASE IS TITRATED BY WEAK BASE OR ACID. VALID FOR DILUTE SOLUTION.

091PROGRAM STEPS
MICHEL SIQUET
B-PLANCENOIT.

52229D 67-TRIDIAGONAL SYSTEMS (N<=12)

THIS PROGRAM FINDS THE SOLUTION OF A SYSTEM OF N EQUATIONS WITH N UNKNOWNS (3<=N<12), IF THE COEFFICIENT MATRIX A IS TRIDIAGONAL (A(I.J)=0 WHEN J>I+1 OR J<I-1). COEFFICIENTS HAVE TO BE ENTERED ONLY ONCE AND ZERO COEFFICIENTS NEED NOT BE ENTERED.SOLUTION IS CALCULATED VERY FAST (25 SECONDS FOR 12X12). THIS KIND OF SYSTEMS APPEARS IN MANY PROBLEMS : CUBIC SPLINE INTERPOLATION, FINITE DIFFERENCES, ETC...

133PROGRAM STEPS
FERNANDO DEL REY
E-MADRID.

52230D 67-RATIONAL APPROXIMATION OF 2ND/2ND DEGREE

GIVEN 5 DATA POINTS (X,Y) (NOT NECESSARILY EQUALLY SPACED) PROGRAM WILL FIND A RATIONAL APPROXIMATION OF THE FORM Y(X)=A0X*X+A1X+A2/X*X+B1X+B2 (THIS IS, THE RATIO OF TWO 2ND DEGREE POLYNOMIALS) THAT PASSES THROUGH ALL 5 POINTS. THIS IS VERY USEFUL IF F(X) HAS POLES AND/OR TENDS TO A FINITE LIMIT WHEN X TENDS OT INFINITE. DATA POINTS ARE SAVED BY THE PROGRAM AND PROJECTIONS OF Y VALUES CAN BE PERFORMED. RUNNING TIME DOES NOT EXCEED 13 SECONDS. 7 PAGES OF DOCUMENTATION.

215PROGRAM STEPS
VALENTIN ALBILLO
E-MADRID.

52231D 67-CLOCK WITH ALARM AND CALENDAR

WITH THIS PROGRAM YOUR HP IS AN ALARM CLOCK, WITH A CALENDAR. IT IS ALSO A CHRONO AND A TIMER. AT 12 HOURS AM, THE DATE AND THE DAY OF WEEK CHANGE.

223PROGRAM STEPS
JEAN REIBEL
F-FONTENAY AUX ROSES.

52232D 97-NETWORK, CRITICAL PATH

PROGRAM FINDS CRITICAL PATH, EITHER MAXIM OR MINIMUM, IN AN ACYCLIC NETWORK OF MAXIMUM 23 NODES.

170PROGRAM STEPS
BART ONKENHOUT
E-ALICANTE.

52233D 97-DURBIN-WATSON TEST OF AUTOCORRELATION

DW STATISTIC TESTS WHETHER RESIDUALS OF REGRESSION ARE AUTOCORRELATED. GIVEN EQUATION, R**2 AND BASIC VALUES OF REGRESSION, DW. COEFFICIENT IS COMPUTED. EQUATION MAY HAVE UP TO FOUR INDEPENDENT VARIABLES. ORIGINAL VALUES CAN OPTIONALLY BE LOADED BYDATA CARD(S).

121PROGRAM STEPS

52233D (CONTD)

PETER PESCHEL
D-ESSEN.

52234D 67-TAPE COUNTER POSITION TO TIME CONVERSIONS

PROGRAM CONVERTS TAPE COUNTER POSITIONS TO TIME AND VICE VERSA.

153PROGRAM STEPS
WALTER LUTZ
D-FRANKFURT.

52235D 97-MULTI-PLANE MOTION OF ROSTRUM CAMERA

TO CALCULATE CO-ORDINATES FOR ZOMM, NORTH/SOUTH,EAST/WEST, AND ROTATION ON ROSTRUM CAMERA. MOVING TO A LINEAR LAW. ANY REQUIRED ACCELERATION/DECELERATION.

206PROGRAM STEPS
ALLAN WOODS
LANARK-DOUGLAS.

52236D 97-PRIME NUMBERS' LIST

GIVEN A NUMBER N, THIS PROGRAM PRINTS WITH A GREAT RAPIDITY A LIST OF PRIME NUMBERS SINCE N; IT IS A FAST PROGRAM WHICH HAS ONLY ONE LIMITATION : N MUST BE <OR=2.10**9. THIS PROGRAM IS ESPECIALLY FOR THE HP-97.

212PROGRAM STEPS
PASCAL FAIVRE
CH-DELEMONT.

52237D 97-INTEGRATION WITH NEWTON-COTES, ORDER 3

THIS PROGRAM (ONE OF A SUITE) ESTIMATES THE VALUE OF AN INTEGRAL OVER A FINITE RANGE USING THE NEWTON-COTES' (ORDER 3) FORMULA, WHICH IS MORE PRECISE THAN SIMPSON' METHOD (GENERALLY). THE RESULTS ARE EXACT FOR POLYNOMIALS UP TO 3RD DEGREE. THIS PROGRAM IS RATHER FAST. 169 STEPS ARE AVAILABLE FOR THE F(X)'S SUBROUTINE.

055PROGRAM STEPS
PASCAL FAIVRE
CH-DELEMONT.

52238D 67-FIBONACCI NUMBERS TO F480

A) PROGRAM GIVES AN INDICATION OF THE SIZE OF THE FIBONACCI NUMBER <10**8. I.E F 10**5 = 2,597 X 10**20898.
B) COMPUTES FI NO TO ALL FIGURES FOR N<=480 TYPICAL EXECUTION TIMES F100 (21 FIG) 3,5 MIN F480 (100F16) 75 MIN.

223PROGRAM STEPS
KENT A WIGSTROM
S-FLODA.

52239D 97-INTEGRATION WITH NEWTON-COTES, ORDER 7

THIS PROGRAM (ONE OF A SUITE) ESTIMATES THE VALUE OF AN INTEGRAL OVER A FINITE RANGE USING THE NEWTON-COTES (ORDER 7) FORMULA, WHICH IS A LOT MORE PRECISE THAN SIMPSON' METHOD. THE RESULTS ARE EXACT FOR POLYNOMIALS UP TO 7TH DEGREE. THIS PROGRAM IS RATHER FAST. 136 STEPS ARE AVAILABLE FOR THE F(X)'S SUBROUTINE.

088PROGRAM STEPS
PASCAL FAIVRE
CH-DELEMONT.

52240D 67-CURVE FITTING

PROGRAM FITS A SET OF SIX DATA POINTS TO THE POWER CURVE FIT Y=A X M + B X N + C, WHERE THE

52240D (CONTD)

COEFFICIENTS A,B,C AND THE EXPONENTS M, N ARE OPTIMATED AND COMPUTED USING THE LEAST SQUARES METHOD IN SEVERAL CYCLES.

224PROGRAM STEPS
JOSE MARIA DEL RIO IGLESIA
E-BARCELONA.

52241D 67-GAUSS-LAGUERRE QUADRATURE

PROGRAM COMPUTES QUADRATURES FROM X=A AND INFINITE UPPER BOUND BY THE GAUSS-LAGUERRE METHOD. THE INTEGRAND SHOULD HAVE THE FORM F(X)/E** X. THE ORDER OF COMPUTATION IS ONLY LIMITED BY THE NUMBER OF USED CARDS IF SEQUENCE COEFFICIENT CARDS ARE NECESSARY, THE PROGRAM SHOWS THE NUMBER OF NEXT CARD AND FINALLY THE RESULT. AVAILABLE ARE THE K VALUES 9,10,20,28,32.

056PROGRAM STEPS
BERND ROTHMAIER
D-DURMERSHEIM.

52242D 67-GAUSS-HERMITE QUADRATURE

PROGRAM COMPUTES QUADRATURES OVER FUNCTIONS OF THE TYPE F(X)/E**X**2 OVER ALL REAL X. THE ORDER OF THE COMPUTATION IS ONLY LIMITED BY THE NUMBER OF USED COEFFICIENT CARDS. IF A SEQUENCE COEFFICIENT CARD IS NECESSARY, THE PROGRAM SHOWS ITS NUMBER AND FINALLY THE RESULT. AVAILABLE ARE THE K VALUES K=18,20, 32,48.

067PROGRAM STEPS
BERND ROTHMAIER
D-DURMERSHEIM 2

52243D 97-BELGIAN INCOME TAX 1979

THIS PROGRAM CALCULATES THE TAX THAT MUST BE PAYED (IN BELGIAN FRANCS) WHEN THE NET-INCOME (IN THE YEAR 1978) AND THE NUMBER OF FAMILY PARTS IS GIVEN. THE PROGRAM USES NO PRINT INSTRUCTIONS SO IT CAN ALSO BE USED FOR THE 67.

308PROGRAM STEPS
PETER DE WILDE
B-MELLE.

52244D 97-FINDING THE AVERAGE THE MEDIAN THE MODE(S) OF A SET OF DATA.

A SET OF REAL NUMBERS (UP TO 25 VALUES) RANDOMLY GIVEN IS STORED IN THE CALCULATOR REGISTERS. THE PROGRAM SORTS THE NUMBERS IN A CRESENT ORDER, PRINTING AT THE END, THEIR AVERAGE AND MEDIAN VALUES. ADDITIONALLY, IF AMONG THE DATA THERE ARE ANY MODES, THE PROGRAM GIVES AN INDICATION WHERE AND WHICH THEY ARE.

163PROGRAM STEPS
ERMINIO SANTI
I-SANGUINETTO.

52245D 67-BEST FIT RECTANGLE

PROGRAM COMPUTES BEST FIT RECTANGLE FOR FOUR GIVEN COORDINATE POINTS IN THE X/Y PLANE. VERTICLES, SLOPES OF SIDES AND INTERCEPTS ON THE X/Y AXES CAN BE RECALLED.

224PROGRAM STEPS
D.T. RANSUM
GB-KENT.

52246D 67-ACID/BASE-AND METALCOMPLEX-EQUILIBRIUM.

PROGRAM CALCULATES EQUILIBRIUM CONCENTRATIONS OF METALCOMPLEXES AND LIGANDPROTONATIONS WITH GIVEN STABILITY CONSTANTS AND PK VALUES.

222PROGRAM STEPS

52246D (CONTD)

URS BEKNER
CH-BADEN.

52247D 67-MULTIFACTORIAL DESIGN

THIS PROGRAM COMPUTES THE EFFECTS OF UP TO 7 FACTORS ACCORDING TO PLACKETT AND BURMAN AND TESTS THE SIGNIFICANCE OF THE EFFECTS.

194PROGRAM STEPS
MANFRED SOEFFTGE
D-WEINHEIM.

52248D 67-COBALT-60 CENTRAL RAY DOSE CALCULATIONS

BASED UPON A PRESCRIBED TUMOR DOSE GIVEN OVER SOME GIVEN TREATMENT PERIOD IN SO MANY FRACTIONS PER WEEK, THIS PROGRAM CALCULATES THE DAILY TREATMENT TIME IN MINUTES AND SECONDS AS WELL AS DAILY GIVEN DOSE

166PROGRAM STEPS
OON WREDE
SA-RIYADH.

52249D 97-MULTIPLE LINEAR REGRESSION 20R3 INDEPENDENT VARIABLES

GIVES LEAST SQUARES FIT OF A+BX+CY+ DZ=T TO A SET OF (X,Y,Z,T) OR (X,Y, T) DATA. AFTER FITTING THE EQUATION THE CORRELATION COEFFICIENT R**2 MAY BE CALCULATED AND ALSO T ESTIMATED FOR GIVEN (X,Y,Z) OR (X,Y) IF Z=0. HAS SEVERAL ADVANTAGES OVER 00162D, THESE INCLUDE MUCH QUICKER ENTRY OF DATA AND THE OPTION TO SPECIFY A=0 BEFORE SOLVING FOR B,C AND D. THE SOLUTION IS BY GAUSSIAN ELIMINATION.

413PROGRAM STEPS
MICHAEL CABLE
GB-SHEFFIELD.

52250D 67-THE TWO KUMMER'S CONFLUENT HYPERGEOMETRIC FUNCTIONS

THIS PROGRAM GIVES THE TWO "M AND U KUMMER'S CONFLUENT HYPERGEOMETRIC FUNCTIONS" A ROUTINE FOR GAMMA FUNCTION WITH REAL ARGUMENT IS PROVIDED. MANY A FUNCTION CAN BE OBTAINED WITH KUMMER FUNCTIONS. AN ANNEX WITH APPLICATIONS IS UNITED.

224PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52251D 67-GAUSSIAN HYPERGEOMETRIC AND M-KUMMER'S CONFLUENT FUNCTIONS

THESE TWO FUNCTIONS ARE GIVEN. EVERY PARAMETER AND ARGUMENT CAN BE REAL COMPLEX NUMBERS. AN ANNEX WITH APPLICATIONS IS UNITED AND FOUR AUXILIARY ROUTINES ARE PROVIDED : GAMMA FUNCTION OF REAL ARGUMENT, MULTIPLICATION AND DIVISION BETWEEN COMPLEX NUMBERS AND EXPONENTIAL IX.

224PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52252D 67-ALL FIGURES OF N-FACTORIAL WITH N<=141

KEY N BEFORE START, 0<=N<=141. THEN PROGRAM WILL STOP AT N-FACTORIAL AND WILL GIVE ALL FIGURES (76 HOURS IF N=141) IT TAKES MANY PROGRAM STEPS TO MAKE THE RIGHT STOP IF N=137 TRU 141

224PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52253D 67-ALL FIGURES OF N-FACTORIAL WITH N<=123

52253D (CONTD)

KEY N BEFORE START, 0<= N<=123
WITH A YOU WILL GET ALL FIGURES OF N-FACTORIAL (1 HOUR 17 MIN. IF N = 123)
WIHT B YOU WILL GET ONLY THE FIRST FIGURES AND THE EXPONENT, N>=0 (10 MIN. 10 SEC. IF N=521)

195PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52254D 67-CONICAL HELICAL SPRING DESIGN

THIS PROGRAM COMPUTES ALL DATA REQUIRED TO DESIGN CONICAL HELICAL SPRINGS OF ROUND WIRE IN THE PROPORTIONAL AND IN THE UNPROPORTIONAL RANGE.

376PROGRAM STEPS
KONRAD SCHARRER
D-MONHEIM-BAUMBERG.

52255D 67-METHODS-TIME MEASUREMENT (MTM) STATISTICS

THE PROGRAM PROVIDES, FROM A STATISTIC MODEL, THE CONDITIONS ON WHICH THE USE OF MTM IS BASED. THE MTM-SYSTEMS: MTM1, MTM2, MTM3 AND MTMV ARE INCORPORATED IN THE PROGRAM. INVOLVED VARIABLES ARE : THE MTM-SYSTEM NUMBER 0 THROUGH 4, THE TIME-ELEMENT, THE ELEMENT FREQUENCE, THE DEVIATION ON THE ELEMENT, THE ELIMINATION TIME, THE CYCLE FREQUENCE AND THE DEVIATION ON THE ELIMINATION TIME. INTERCHANGEABLE SOLUTIONS ARE PROVIDED, SO WHEN ANY SIX VARIABLES ARE GIVEN, THE REMAINING ONE MAY BE CALCULATED

172PROGRAM STEPS
SOREN VIDEBEK NIELSEN
DK-STRUER.

52256D 67-WOEHLER-LINES

STATISTICAL ANALYSIS OF FATIGUE STRENGTH VALUES FOR FINITE LIFE (WOEHLER-TEST).
S-N DIAGRAM (STRESS-CYCLE DIAGRAM) IS CALCULATED AND CAN BE DRAWN.

354PROGRAM STEPS
FRANZ SAGMUELLER
A-HOHENBERG.

52257D 67-THE AMAZON GAME

SPACE DOES NOT PERMIT A FULL DESCRIPTION HERE. THE GAME IS PLAYED ON A CHESSBOARD INVOLVING SOME MARKERS AND TWO PIECES - THE AMAZONS - WHICH CAN ATTACK LIKE A QUEEN AND A KNIGHT. TAKING ONE AMAZON EACH YOU AND THE CALCULATOR MAKE ALTERNATE MOVES BY PUTTING THE AMAZON ON UNTHREATENED UNMARKED SQUARES AND LEAVING THE MARKERS ON PREVIOUSLY OCCUPIED SQUARES. WHOEVER RUNS OUT OF MOVES FIRST LOSES THE GAME.

202PROGRAM STEPS
ALEXANDER GRUZA
GB-LONDON.

52258D 67-INCOME PROPERTY PROJECTION ANALYSIS BEFORE TAXES

MAKE A PROJECTION FOR X YEARS INCOME PROPERTY ANALYSIS (BEFORE ANY TAXATION), KNOWING THE FOLLOWING VARIABLES : GROSS INCOME, EXPENSES (CHARGES), LOAN AMOUNT, PERIODIC LOAN PAYMENT, AMOUNT OF EQUITY, PERIODIC INTEREST LOAN RATE, EXPECTED INFLATION RATE. THIS PROGRAM IS PROGRAMMED TO GIVE A 10 YEAR PROJECTION. HOWEVER, IT MAY BE STOPPED AT ANY TIME OR GIVE A PROJECTION OF MORE THAN 10 YEARS.

189PROGRAM STEPS
CHRISTIAN H. MARYSSAEL
B-BRUSSELS.

52259D 67-PROPERTY RESALE AFTER X YEARS

THIS PROGRAM FOLLOWS THE PROGRAM "INCOME PROPERTY PROJECTION ANALYSIS BEFORE TAXES". IT GIVES THE PROFIT ON A RESALE OF A PROPERTY AFTER A CERTAIN NUMBER OF YEARS, THE YEARLY RETURN AVERAGE YIELD (SIMPLE INTEREST AND COMPOUNDED INTEREST), INCLUDING THE CASH FLOWS RECEIVED DURING THE OWNERSHIP OF THE PROPERTY.

118PROGRAM STEPS
CHRISTIAN H. MARYSSAEL
B-BRUSSELS.

52260D 67-TELEPHONE : TIME & CHARGES INTERNATIONAL CALLS FROM BELGIUM

PROGRAM USES A TEN SECOND LOOP TO TIME A TELEPHONE CALL (INTERNATIONAL CALL, FROM BELGIUM OR ANY COUNTRY USING THIS SYSTEM OF TELEPHONE CHARGES). THE LOOP PAUSES FIRST TO DISPLAY TENS OF SECONDS, THEN FIVE PAUSES DISPLAY MINUTE ONE IS INTO LEFT OF DECIMAL POINT AND CHARGE IN FRANCS TO THE RIGHT. IT MAY STOCK ASUB-TOTAL OF ALL INTERNATIONAL CALLS ON A DATA CARD.

119PROGRAM STEPS
CHRISTIAN H. MARYSSAEL
B-BRUSSELS.

52261D 97-DENSITY & THERMAL EXPANSION FROM PYKNOMETER WEIGHTS

PYKNOMETER WEIGHTS ARE EVALUATED TO CALCULATE DENSITY (IN THE CASE OF SOLIDS ALSO VOLUME) AND OPTIONALLY VOLUMETRIC THERMAL EXPANSION RELATIVE TO A REFERENCE DENSITY. CORRECTION FOR ATMOSPHERIC BOUYANCY AND TEMPERATURE VARIANCE IS PROVIDED. SERIES CAN BE EVALUATED FOR MEAN AND STANDARD DEVIATION (COROLLARY TO PROGRAM 52193D).

223PROGRAM STEPS
ED. CALLAHAN
D-DUESSELDORF.

52262D 67-CHAPO 10

UP TO 10 PLAYERS CAN PLAY THIS GAME OF POKER DICE. AT THE BEGINNING, EACH PLAYER HAS 3 COUNTERS. THE GAME IS DIVIDED IN PARTIAL GAMES BETWEEN TWO CONSECUTIVE PLAYERS. EACH PLAYER MUST, WHEN IT IS HIS TURN AND AFTER HAVING ROLLED THE DICE UNDER THE CHAPO (HAT) OR HAVING MADE THE CHAPO PARTIALLY BETTER, OUTBLUFF THE PREVIOUS PLAYER. HIS BLUFF MAY BE CALLED BY THE NEXT PLAYER IN THE GAME LOSES THE GAME.

223PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52263D 67-EQUAL BIRTHDAYS

THIS PROGRAM CALCULATES THE PROBABILITY THAT IN A GROUP OF N PERSONS TAKEN RANDOMLY, AT LEAST TWO HAVE THE SAME BIRTHDAY. YOU CAN TAKE A YEAR OF EITHER 365 OR 366 DAYS. A SUBROUTINE ALLOWS YOU TO MAKE THE NECESSARY DATA-CARD.

104PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52264D 67-B-BLACKJACK

IN THIS BLACK-JACK-GAME, AGAINST MAC ACTING AS BANK, CARDS ARE DEALT FROM A QUASI REAL DECK OF 52 CARDS AND NO NEW DECK IS ALLOWED BEFORE THE LAST CARD OF THE FIRST DECK HAS BEEN USED. ANOTHER INNOVATION IS THE 7 CARDS-RULE AND THE FACT THAT KING, QUEEN AND VALET ARE SHOWN AS

52264D (CONTD)

13,12,11, BUT COUNTED AS 3,2,1 ACCORDING TO THE B-RULES. AN ACE COUNTS FOR 1 OR 11 AND THE PROGRAM TAKES THE MORE PROFITABLE SCORE FOR BOTH PLAYERS.

224PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52265D 67-FOUR MARRIED COUPLES BEFORE A RIVER

FOUR MARRIED COUPLES HAVE TO CROSS A RIVER WITH A BOAT THAT CAN HOLD ONE OR TWO PERSONS. ONLY THE MEN CAN ROW. IN THE MIDDLE OF THE RIVER IS AN ISLAND. NO MAN WANTS HIS WIFE TO BE NEAR ANOTHER MAN, WHILE HE HIMSELF IS ABSENT. YOUR HP CAN SHOW YOU HOW THE COUPLES NEVERTHELESS CAN GET TO THE OTHER SIDE.

181PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52266D 67-SMALL FACTORS FOR LARGE INTEGERS

THIS PROGRAM FINDS ALL FACTORS SMALLER THAN 1000, FOR GIVEN INTEGERS WITH UP TO 73 DIGITS.

194PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52267D 67-PAIRS OF PRIMES WITH GIVEN DIFFERENCE

THIS PROGRAM GIVES A LIST OF PAIRS OF PRIMES WITH GIVEN DIFFERENCE, STARTING FROM A GIVEN LIMIT.

135PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52268D 67-PAIRS OF PRIMES AND 2P+1

THIS PROGRAM GIVES A LIST OF PAIRS OF PRIMES (P, 2P+1), STARTING FROM A GIVEN LIMIT.

131PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52269D 67-MOEBIUS TRANSFORMATION

GIVEN 4 COMPLEX NUMBERS A,B,C,D, THIS PROGRAM FINDS THE IMAGE OR THE ORIGINAL OF A GIVEN COMPLEX NUMBER Z IN THE COMPLEX PLANE, BY THE MOEBIUS TRANSFORMATION Z=(AZ+B):(CZ+D).

111PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52270D 67-BEST CONIC WITH GIVEN CENTER THROUGH GIVEN POINTS

THIS PROGRAM FINDS THE BEST ELLIPSE OR HYPERBOLA WITH CENTER IN THE ORIGIN, THROUGH AN ARBITRARY NUMBER OF GIVEN POINTS.

192PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52271D 67-BEST CONIC WITH GIVEN FOCUS THROUGH GIVEN POINTS

THIS PROGRAM FINDS THE BEST CONIC (ELLIPSE OR HYPERBOLA) WITH FOCUS IN THE ORIGIN, THROUGH AN ARBITRARY NUMBER OF POINTS.

223PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52272D 67-BEST CONIC THROUGH GIVEN POINTS

THIS PROGRAM FINDS THE BEST CONIC THROUGH AN ARBITRARY NUMBER OF GIVEN POINTS.

384PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52273D 67-EULER'S INHERITANCE PROBLEM

GIVEN TWO INTEGERS A AND N (A>0, N>1), THE CONSECUTIVE HEIRS OF AN INHERITANCE, NUMBERED FROM 1 UP, EACH RECEIVE AS THEIR PART A SUM OF A TIMES THEIR SEQUENCE NUMBER, PLUS ONE N-TH OF THE REMAINING INHERITANCE. STRANGELY ENOUGH, THIS WAY OF DIVIDING THE INHERITANCE RESULTS IN EQUAL PARTS FOR EACH HEIR. CAN YOU FIND THE AMOUNT OF THE INHERITANCE, THE AMOUNT OF EACH PART, THE TWO COMPONENTS (I.A AND ONE N-TH OF THE REST) FOR EACH HEIR, AND THE NUMBER OF HEIRS ? YOUR HP CAN !

045PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52274D 67-OPTIMUM VESSEL SIZE

PROGRAM QUICKLY ESTIMATES, IN METRIC, SI OR ENGLISH UNITS, OPTIMUM SIZE (DIAMETER D, LENGTH L, THICKNESS, ETC...) FOR CYLINDRICAL PRESSURE VESSELS.

224PROGRAM STEPS
GIUSEPPE LIGATO
I-MILANINO.

52275D 67-CHESS MOVE STORE

WITH THIS PROGRAM YOU CAN STORE, RECALL, CLEAR AND REPLACE UP TO 60 4-DIGIT CHESS MOVES PER CARD. THE NUMBER OF CARDS IS UNLIMITED. CALCULATOR LETS YOU KNOW WHEN NEW CARD IS NEEDED. PROPOSED BUT NOT OBLIGATORY CODE IS VERY EASY TO UNDERSTAND.

179PROGRAM STEPS
BERTRAM FEUERBACHER
D-PFORZHEIM

52276D 67-97-NEW TABULATOR

PROGRAM HELPS TO SUM UP TO 1 TO 25 DATA-FILES BY SHOWING YOU ALTERNATING THE NUMER OF REGISTER (FILE) FROM 1 TO A CHOSEN NUMBER (MAX. 25) YOU CAN PRINT OUT SUMS.

090PROGRAM STEPS
FRITZ MAREK
A-EISENTRATTEN.

52277D 97-CRITICAL DESATURATION IN N2 TIME FOR TISSUES

THIS PROGRAM CALCULATES FOR FOUR TISSUES OF 120, 60, 30 AND 7 MINUTES PERIOD,, THE TIME TO HAVE SPENT AT A DEPTH D+DD TO DESATURATE NITROGEN AT D DEPTH, AND THE MINIMUM TIME TO HAVE SPENT AT D+DD TO NEED A DECOMPRESSION STOP IF THE TISSUES ARE TO RETURN AT THE SURFACE LEVEL. THAT, WHEN YOU SCUBA DIVE, RESPIRATING AIR.

126PROGRAM STEPS
MICHEL SIQUET
B-PLANCENOIT.

52278D 67-DEFINITE INTEGRAL 4 SIMPSON

WITH A CONTINUOUS AREA BETWEEN THE GIVEN LIMITS THE PROGRAM APPROXIMATES :
1. THE AREA UNDER THE CURVE.
2. THE VOLUME TRACED OUT BY THAT AREA, REVOLVED.
3. THE CENTROIDS OF THAT AREA.
4. THE CENTER OF GRAVITY OF THE VOLUME TRACED OUT... USING

52278D (CONTD)

"SIMPSONS RULE"

077PROGRAM STEPS
LAWRENCE B. HARTLEY
GB-BRIERFIELD.

52279D 67-AIRY FUNCTIONS, DERIVATIVES AND INTEGRALS WITH COMPLEX VARIABLE

THIS PROGRAM GIVES AI(Z) AND BI(Z), DERIVATIVES AND INTEGRALS FOR ANY REAL OR COMPLEX ARGUMENT.

202PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52280D 67-A-HOE-A

THIS IS AN OLD AFRICAN GAME IN WHICH TWO PLAYERS TRY TO TAKE AS MUCH SHELLS AS POSSIBLE.
AT THE START YOU AND THE HP HAVE BOTH SIX PILES OF FOUR SHELLS. TO MOVE THE SHELLS TAKE THEM OUT OF A PILE AND DEAL ONE BY ONE IN A COUNTERCLOCK MANNER. TO TAKE THE SHELLS TRY TO STOP IN YOURS (OR HIS) PILE NUMBER ONE.

222PROGRAM STEPS
HERMAN PEETERS
B-BOECHOUT.

52281D 67-INTEGER SOLUTIONS AND CONTINUED FRACTIONS

THIS PROGRAM WILL CONVERT FRACTIONS (OR DECIMAL FORMS) TO CONTINUED FRACTIONS AND THE REVERSE.
IT GIVES YOU SUCCESIVE APPROXIMATIONS. THE PROGRAM CAN SOLVE ONE (OR TWO) LINEAR EQUATION(S) IN TWO (OR THREE) UNKNOWNS WITH INTEGER SOLUTIONS. THERE IS ALSO A LABEL TO FIND THE G.C.D.

224PROGRAM STEPS
HERMAN PEETERS
B-BOECHOUT.

52282D 67-CONTINUOUS BEAMS SUPPORT MOMENTS

THIS PROGRAM IS AN EXTENSION OF 51934D AND CALCULATES THE EFFECT OF AN APPLIED MOMENT AT ANY SUPPORT ON THE OTHER SUPPORTS OF A CONTINUOUS BEAM. THE MAXIMUM NUMBER OF SPANS IS NOT TO EXCEED 9.

187PROGRAM STEPS
AGHA MUNIR SHERWANI
U.A.E.-SHARJAH.

52283D 67-CORRELATION PROBLEMS

THE PROGRAM COMPUTES THE CORRELATIONS COEFFICIENT OF A SAMPLE OF A BIVARIATE NORMAL POPULATION, FURTHERMORE A CONFIDENCE INTERNAL FOR THE CORRELATION COEFFICIENT OF THE POPULATION CAN BE OBTAINED.

214PROGRAM STEPS
GUIDO PETZ
S-SOLNA.

52284D 67-VARIATIONS ON QUEEN GAME

SIMILAR TO QUEEN GAME YOU AND MAC MUST MOVE A CHESSMAN TO THE LOWER LEFT HAND CORNER OF THE BOARD. SIZE (NXN N = 99999). THERE ARE TWO INDEPENDENT CARDS. YOUR CHESSMAN IS A COMBINATION OF: KING AND HORSE (KNIGHT) KING AND BISHOP - KING AND CASTLE - KING AND HORSE AND CASTLE OR KING AND HORSE AND BISHOP. THE MACHINE IS A MASTER PLAYER SO IT IS DIFFICULT TO BEAT IT.

399PROGRAM STEPS
HERMAN PEETERS
B-BOECHOUT.

52285D 67-POLYNOMIAL SET UP

52285D (CONTD)

THIS PROGRAM FACILITATES DATA ENTRY FOR PROGRAM MA1-06 "POLYNOMIAL SOLUTIONS". NOW THE USER CAN LOAD ALL THE EQUATION'S COEFFICIENTS, REGARDLESS OF THE RULE : LEADING COEFFICIENT MUST BE 1.

094PROGRAM STEPS
JIMMY PLATONIS
GR-ATHENS.

52286D 67-SCHWARZSCHILD CORRECTION 2

PROGRAM CALCULATES CORRECT EXPOSURE TIME IN THE REGION WHERE THERE IS NO MORE A LINEAR RELATIONSHIP BETWEEN EXPOSURE TIME, INTENSITY OF LIGHT (I.E. FOR EXP. TIMES > 1S), DUE TO THE SCHWARZSCHILD EFFECT. PROGRAM DESIGNED FOR AGFACOLOR CT 18.

012PROGRAM STEPS
JOHAN DECAT
B-GENT.

52287D 67-DIRECT REDUCTION LOAN-SINKING FUND ANNUITIES AND COMPOUND AMOUNTS

THIS PROGRAM SOLVES A LOT OF PROBLEMS OF LOANS, MORTGAGES, SAVINGS AND LEASES, WHEN PAYMENTS ARE MADE AT THE END OR BEGINNING OF COMPOUNDING PERIODS. IT GIVES ALSO THE CONSTANT RATE, REMAINING BALANCE AT ANY TIME, IT SOLVES BALLON MORTGAGES. IT ALSO CALCULATES ALL VARIABLES IN COMPOUND INTEREST SITUATION. IN ONE PROGRAM AND ONE MAGNETIC CARD, IT SOLVES ALL THE PROBLEMS SOLVED BY THE THREE PROGRAMS WRITTEN ABOVE.

223PROGRAM STEPS
CHRISTIAN H. MARYSSAEL
B-BRUSSELS.

52288D 67-EXACT SOLUTION OF RATIONAL LINEAR SYSTEM IN 4 UNKNOWNS

GIVING A LINEAR SYSTEM IN 1,2,3 OR 4 UNKNOWNS IN WHICH ALL COFFICIENTS ARE INTEGERS, THE PROGRAM GIVES THE EXACT SOLUTION : EACH UNKNOWN IS GIVEN IN A RATIONAL FRACTION.

187PROGRAM STEPS
ALI AMRAOUI
MOROCCO-CASABLANCA.

52289D 97-TURNING CLOTHOIDE

THE TURNING CLOTHOIDE CONSISTS OF TWO SIMPLE CLOTHOIDES OF OPPOSITE DIRECTIONS. THE PARAMETER OF EACH SIMPLE CLOTHOIDE IS PRESUMED TO BE KNOWN, AS WELL AS THE RADIUS OF THE CIRCULAR ARC AT THE END OF EACH SIMPLE CLOTHOIDE. THE PROGRAM COMPUTES THE PRINCIPAL ELEMENTS OF THE TURNING CLOTHOIDE.

219PROGRAM STEPS
CHRITIAN SCHLEIFER
D-HAMBURG.

52290D 67-RELATIONSHIP BETWEEN STOCK, AVERAGE AND PRICE

FOR TEN ARTICLES BY CARD, COMPUTES PERCENTAGE VALUE BETWEEN STOCK AND AVERAGE. LIST THEM AND PRICES. SUM (AND STORE IN REGISTER E) STOCK OR AVERAGE. MULTIPLY STOCK BY PRICE FOR EACH ARTICLE AND SUM THEM (IN REGISTER E). A MERGE MODE IS POSSIBLE FOR IMPUTE VARIOUS CARDS IN ACCUMULATIVE SUM OR MULTIPLICATION. ALSO STORES AND LIST VALUES FOR STOCK, AVERAGE AND PRICE.

224PROGRAM STEPS
JOSE FONT
E-BARCELONA.

52291D 67-BLACK BOX

52291D (CONTD)

YOU SEARCH FOUR "PLANETS" HIDDEN BY THE CALCULATOR IN THE HUNDRED CENTRAL SQUARES OF A 12X12 SQUARES BOARD. TO LOCATE THEM, YOU CAN SEND LASER RAYS HORIZONTALLY OR VERTICALLY CROSS THE BOARD : A RAY MAY BE ABSORBED OR DRIFTED BY THE PRESENCE OF A PLANET IN OR NEAR ITS WAY ; YOU MUST FIND WITH AS FEW RAYS AS POSSIBLE. AT THE END THE CALCULATOR SHOWS THE 2 COORDINATES OF EACH PLANET FOR YOU TO TEST YOUR HYPOTHESIS.

189PROGRAM STEPS
JEAN-CLAUDE DUFOURD
F-METZ.

52292D 67-INTERCEPTION

FROM WIND, SPEED OF INTERCEPTOR, TRACK & SPEED OF AIM, BEARING & DISTANCE BETWEEN THEM, COORDINATES OF STARTING POINT (OPTION) PROGRAM COMPUTES DATAS TO ACHIEVE INTERCEPTION (TRUE HDG, TIME, TRUE TRACK, GROUND SPEED, DISTANCE FLOWN, POSITION OF INTERCEPTION).

179PROGRAM STEPS
PIERRE TALMANT
F-PARIS.

52293D 67-WEIBULL DISTRIBUTION

THIS PROGRAM CAN BE USED TO FIND :
1) PARAMETERS A AND B THE WEIBULL DISTRIBUTION APPLIED TO ANALYSIS FOR FAILURE, WHEN INCREASING TIMES TO FAILURE ARE KNOWN;
2) COEFFICIENT OF CORRELATION
3) THE DENSITY FUNCTION;
4) MTTF (MEAN TIME TO FAILURE)

217PROGRAM STEPS
ARNALDO MUSA
I-SESTO S. GIOVANNI.

52294D 97-COLD STORAGE ROOM I

PROGRAM CALCULATES COLD STORAGE ROOM ABOVE 0 DEGREE HEAT BALANCE ACCORDING WITH ROOM TEMPERATURE, GOODS TEMPERATURE, DAILY STORAGE IN KGS, SPECIFIC HEAT AND ROOM EXTERNAL DIMENSIONS. PROGRAM DISPLAYS : SURFACE ISOLATION (M2); ROOM INTERNAL VOLUME (M3); OPERATING DATA COMPRESSOR CAPACITY IN KCAL/H FOR 15, 16, 17, 18 AND 19 HOURS PER DAY. THIS PROGRAM SELECTS ISOLATION THICKNESS AND HEAT AIR-CHANGE ACCORDING WITH INTERNAL TEMPERATURE; ALSO SELECTS HEAT FANS IN PERCENTAGE OF HEAT BALANCE.

222PROGRAM STEPS
JUAN LUIS GARCIA LAGO
E-MURCIA.

52295D 97-FREEZE STORAGE ROOM II

PROGRAM CALCULATES FREEZE STORAGE ROOM (BELOW 0 DEGREE) HEAT BALANCE ACCORDING WITH ROOM TEMPERATURE, GOODS TEMPERATURE, DAILY STORAGE KGS, POSITIVE SPECIFIC HEAT, LATENT HEAT, NEGATIVE SPECIFIC HEAT AND ROOM EXTERNAL DIMENSIONS. PROGRAM DISPLAYS: ROOM INTERNAL VOLUME (M3) SURFACE ISOLATION (M2); OPERATING DATA COMPRESSOR CAPACITY IN KCAL/H FOR 16 AND 18 HOURS PER DAY. THIS PROGRAM SELECTS ISOLATION THICKNESS AND HEAT AIR-CHANGE ACCORDING WITH INTERNAL TEMPERATURE.

223PROGRAM STEPS
JUAN LUIS GARCIA LAGO
E-MURCIA.

52296D 97-TCHEBYCHEFF POLYNOMIALS

THIS PROGRAM CALCULATES TN(X) FOR A GIVEN X. IT DOES NOT USE AN ITERATIVE PROCESS SO EXECUTION TIME DOES NOT DEPEND ON N. IT ALSO FINDS THE

52296D (CONTD)

ROOTS OF TN - NTH ORDER TCHEBYCHEFF POLYNOMIAL - PROVIDES THE INFORMATION FOR A NEAR-OPTIMUM INTERPOLATION.

092PROGRAM STEPS
BERNARD SIRET
F-SAINT-CLOUD.

52297D 97-TRIANGLE SOLUTION

PROGRAM FINDS THE SIDES, THE RADIUS OF THE OUTER CIRCLE AND OF THE INNER CIRCLE, THE AREA AND THE ANGLES OF A TRIANGLE, IF THE COORDINATES OF THE THREE POINTS IN A 2 DIMENSIONAL COORDINATE SYSTEM ARE GIVEN.

180PROGRAM STEPS
MICHAEL TARNOWSKI
D-WIESBADEN.

52298D 97-CURVE SOLUTION

PROGRAM FINDS 1) ARC OF CIRCLE, 2) AREA OF CIRCLE, 3) RADIUS, 4) ANGLE OF CENTRAL POINT AND MORE PARAMETERS OF THE CIRCLE SEGMENT, IF TWO PARAMETERS ARE GIVEN.

153PROGRAM STEPS
MICHAEL TARNOWSKI
D-WIESBADEN.

52299D 67-IMPROVED NUMBER TRANSFORMATION

THIS PROGRAM CONVERTS ANY INTEGER NUMBER, POSITIVE OR NEGATIVE WITH ANY BASE BETWEEN 1 AND 100, TO ANOTHER NUMBER WITH ANY BASE BETWEEN 1 AND 100. THE MOST COMMON BASES; BINARY (2), OCTAL (8), DECIMAL (10) AND HEXADECIMAL (16) ARE CONVERTED AUTOMATICALLY WITHOUT ENTERING THE BASES. THE CONVERTING TIME IS BETWEEN 5 AND 14 SECONDS.

108PROGRAM STEPS
ALM GUNNAR
S-FARSTA.

52300D 67-NON-PARAMETRIC RUN-TEST

YOU CAN TEST IF TWO SAMPLES COME FROM POPULATIONS HAVING THE SAME DISTRIBUTION. (ONE TREATMENT IS BETTER THAN ANOTHER). ARRANGE THE OBSERVATIONS OF THE TWO SAMPLES ACCORDING TO SIZE. YOU CAN ALSO TEST IF A SAMPLE IS DRAWN AT RANDOM FROM ONE POPULATION. THE PROGRAM CALCULATES THE DISTRIBUTION OF RUNS EXACT AND/OR WITH NORMAL APPROXIMATION.

224PROGRAM STEPS
STEN SUNDBERG
S-OREBRO.

52301D 67-TREND ANALYSIS

WITH THIS PROGRAM YOU CAN COMPUTE THE FOLLOWING OF A TREND WHEN IS GIVEN A NUMBER OF VALUES AND THE SPAN OF THE MOVING AVERAGE (SPAN MAX=22). BECAUSE THIS IS A SMALL PROGRAM, IT CAN BE USEFULL AS SUBROUTINE.

055PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52302D 67-FAREY SEQUENCE

GIVEN A POSITIVE INTEGER N, THIS PROGRAM GIVES AN ORDERED LIST OF IRREDUCIBLE FRACTIONS FROM 0/1 TO 1/1, HAVING N AS HIGHEST DENOMINATOR.

046PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52303D 67-REVERSE WITH AUTOMATIC SOLUTION

GIVEN A POSITIVE INTEGER WITH NINE DIFFERENT DIGITS (NO ZERO), YOU MUST TRY TO GET THEM IN NATURAL ORDER BY REVERSING THE ORDER OF THE DIGITS IN CHOSEN LEFT PARTS OF THE NUMBER. YOU CAN TRY AND ACHIEVE THIS ALONE, OR YOU CAN LET MAC DO IT FOR YOU AUTOMATICALLY.

111PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52304D 67-FIBONIM

TWO PLAYERS (YOU AND MAC) ALTERNATIVELY TAKE A NUMBER OF OBJECTS FROM A GIVEN PILE, AT LEAST ONE, AND AT MOST TWICE THE PREVIOUS NUMBER TAKEN. THE FIRST PLAYER CAN TAKE ANY NUMBER OF OBJECTS, BUT NOT ALL. WINNER IS HE WHO TAKES LAST OBJECT. FALSE MOVES ARE REJECTED.

092PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52305D 67-HALVING A TRIANGLE

THROUGH A GIVEN POINT, ONE HAS TO DRAW A STRAIGHT LINE, CUTTING A GIVEN TRIANGLE INTO TWO PART, THE TRIANGULAR PART OF WHICH IS EXACTLY 1/2 (OR MORE GENERALLY 1/K) OF THE GIVEN TRIANGLE.

111PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52306D 67-BROCARD POINTS

GIVEN THE COORDINATES OF THE VERTICES OF A TRIANGLE IN AN ORTHONORMAL BASE, THIS PROGRAM FINDS THE SIDES, THE ANGLES, BROCARD'S ANGLE AND THE TWO BROCARD POINTS OF THE TRIANGLE.

187PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52307D 67-PLUCKER'S HYPERBOLAS

GIVEN THE EQUATION OF A CONIC IN AN ORTHONORMAL BASE, THIS PROGRAM FINDS THE EQUATIONS OF THE TWO HYPERBOLAS OF PLUCKER. SUBROUTINES PERMIT TO FIND ANY NUMBER OF POINTS EITHER FOR THE GIVEN CONIC, OR FOR THE TWO HYPERBOLAS.

217PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52308D 67-HYPERBOLA OF APOLLONIUS

GIVEN THE EQUATION OF A CONIC IN AN ORTHONORMAL BASE, THIS PROGRAM FINDS THE EQUATION OF THE HYPERBOLA OF APOLLONIUS FOR A GIVEN POINT. SUBROUTINES PERMIT TO FIND ANY NUMBER OF POINTS EITHER FOR THE GIVEN CONIC, OR FOR THE HYPERBOLA.

207PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52309D 67-CONIC TRANSFORMED BY HOMOLOGY

GIVEN THE EQUATION OF A CONIC AND THE ELEMENTS OF A HOMOLOGY (WITH THE ORIGIN AS CENTER), THIS PROGRAM FINDS THE EQUATION OF THE TRANSFORMED CONIC. SUBROUTINES PERMIT TO FIND POINTS OF THE GIVEN CONIC AND CORRESPONDING POINTS OF THE TRANSFORMED CONIC, OR TO FIND THE IMAGES OF GIVEN POINTS IN GENERAL.

187PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52310D 67-RECIPROCAL POLAR CONIC OF GIVEN CONIC FOR GIVEN BASE-CONIC

GIVEN A BASIC CONIC C AND A SECOND CONIC C', THIS PROGRAM FINDS THE RECIPROCAL POLAR CONIC OF C' WITH RESPECT TO C.

215PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52311D 67-STANDARD SUMMARY OF A PROPERTY OFFERING

INPUTING A PURCHASE PRICE OF A PROPERTY, DOWN PAYMENT, YEARLY INTEREST RATE AND TERM OF THE MORTGAGE, THIS PROGRAM GIVES THE FOLLOWING SCHEDULE: PERCENTAGE OF CASH DOWN REGARDING THE TOTAL PURCHASE PRICE AMOUNT, MORTGAGE AMOUNT, PERCENTAGE OF THE MORTGAGE REGARDING THE TOTAL PURCHASE PRICE AMOUNT, MONTHLY INTEREST RATE, TERM (MONTHS), CONSTANT REIMBURSEMENT RATE OF THE MORTGAGE (MONTHLY AND YEARLY), MONTHLY AND YEARLY PAYMENTS.

116PROGRAM STEPS
CHRISTIAN H. MARYSSAEL
B-BRUSSELS.

52312D 67-INTEGRATION BY EULER MAC/LAURIN METHOD

WITH THIS PROGRAM ONE CAN FIND RAPIDLY THE DEFINITE INTEGRAL OF A FUNCTION F(X) OF ONE REAL VARIABLE X ON A FINITE INTERVAL WITH VERY GOOD ACCURACY FOR LITTLE NUMBER OF SUMMATION STEPS. PROGRAM USES THE SO CALLED EULER/MAC LAURIN METHOD WHICH REQUIRES CALCULUS OF DERIVATIVE FUNCTION F'(X) AND EVENTUALLY F'''(X) WHEN HIGH ACCURACY IS REQUIRED.

141PROGRAM STEPS
ALBERT LOUIS BOISRAYON
F-LE BEAUSSET.

52313D 97-PROBABILITY INTEGRAL

THE VALUE OF THE PROBABILITY INTEGRAL IS USUALLY OBTAINED FROM TABLES. IT CAN, HOWEVER, READILY BE CALCULATED FROM A CONVERGENT INFINITE SERIES. THIS PROGRAM PERFORMS AN INFINITE SERIES CALCULATION, FOR ANY GIVEN X, AND DISPLAYS (IN PRINT, OR, IF WANTED, DURING A "PAUSE") THE VALUE OF THE SUMMED SERIES INCLUDING THE LAST TERM CALCULATED UP TO THAT MOMENT. THE CALCULATOR MAY BE INTERRUPTED AS SOON AS THE DESIRED PRECISION HAS BEEN REACHED.

048PROGRAM STEPS
WALTER H. OETTINGER
A- VIENNA.

52314D 97-SCREW THREADS (METRIC AND SO CALLED UNIFIED BRITISH-U.S)

GIVEN DIAMETER AND PITCH (OR "THREADS PER INCH") OF A SCREW THREAD (METRIC, OR "UNIFIED AND AMERICAN STANDARD"), PROGRAM WILL CALCULATE AND PRINT THREAD DEPTH (THEORETICAL AND ACTUAL), PITCH AND ROOT DIAMETERS, ROOT RADIUS, AND ROOT AND STRESS AERAS. OUTPUT MAY OPTIONALLY BE IN THE SAME SYSTEM OF MEASUREMENTS AS INPUT (METRIC OR IN INCHES) OR CONVERTED TO THE OTHER. PROGRAM ALSO HANDLES THE "NUMBERED" THREAD SIZES OF THE "UNIFIED AND AMERICAN STANDARD" SERIES.

223PROGRAM STEPS
WALTER H. OETTINGER
A-VIENNA.

52315D 67-SPHERICAL AND MODIFIED SPHERICAL BESSEL FUNCTIONS

52315D (CONTD)

THIS PROGRAM GIVES EVERY SPHERICAL OR MODIFIED SPHERICAL BESSEL FUNCTION, BEING Z REAL OR COMPLEX VARIABLE AND N ZERO, NEGATIVE OR POSSITIVE INTEGER.

224PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52316D 67-PERSPECTIVE OF A DRAWING

FOR ANY POINT GIVEN BY COORDINATES X,Y,Z, IN A REFERENCE SYSTEM OF AXES CHOOSEN BY THE USER, THE PROGRAM CALCULATES THE COORDINATES (U, V) OR (RHO,THETA) OF THE PERSPECTIVE OF THIS POINT. THE PROJECTION CAN BE CHOOSEN CLASSICAL (ON A PLANE) OR SPHERICAL, (LIKE "FISH-EYE" OBJECTIVES IN PHOTOGRAPHY). POSITION OF THE WATCHER, DIRECTION OF THE SIGHT AND THE SCALE OF THE DRAWING CAN BE CHOOSEN AND EASY CHANGED IF DESIRED.

090PROGRAM STEPS
BENOIT LEMERCIER
B-BRUSSELS.

52317D 67-FIVE HIDDEN PAWNS

ON A 9X9 GRID THE HP OR A HUMAN OPPONENT WILL HIDE FIVE PAWNS. YOUR POINT IS TO LOCATE THEM. BECAUSE EACH PAWN IS SURROUNDED BY FOUR WALLS, YOU CAN DETECT THEM BY SENDING A RAY INTO THE GRID. WHENEVER THE RAY REACHES THE WALLS IT WILL TURN OFF IF IT IS A CORNER OR IT WILL COME BACK TO THE INITIAL POSITION. THIS GAME IS ALSO KNOWN AS KO CODE.

224PROGRAM STEPS
HERMAN PEETERS
B-BOECHOUT.

52318D 97-CHROMATIC ABERRATION AS A PATH DIFFERENCE; PARAXIAL SPACE

THE PROGRAM DETERMINES THE PARAXIAL CHROMATIC ABERRATION OF AN OPTICAL SYSTEM AS A PATH DIFFERENCE. THE OUTPUT IS THE PATH DIFFERENCE CONTRIBUTION OF EACH SURFACE FOLLOWED BY THE TOTAL PATH DIFFERENCE FOR THE COMPLETE SYSTEM. THE SPECIFICATION OF THE SYSTEM MAY BE IN INCH OR MILLIMETERS UNITS AND THE OUTPUT IS GIVEN IN UNITS OF WAVE LENGTH.

126PROGRAM STEPS
JAMES HOUGHTON
GB-TETBURY.

52319D 67-SINK THE BATTLESHIP

YOU HAVE 30 SHOOTS TO SINK DOWN THE ENEMY BATTLESHIP THAT IS MENACE TO THE CARGO SHIPS IN YOUR AREA. DETECTORS TELLS YOU BY HOW MANY COORDINATE UNITS EACH SHOOT MISSES THE TARGET. AFTER FIVE MINOR HITS SHIP IS NOT DESTROYED AS IT IS IN SIMILAR GAMES BUT IS SENT TO NEARBY SUPPORT VESSEL WHERE IT IS REPAIRED AND IMMEDIATELY RETURNED TO ACTION. SHIP MAKES EVASIVE MANEUVERS EACH TIME YOU FIRE AT IT. FIVE LEVELS OF DIFFICULTY ARE PROVIDED : NOVICE, AMATEUR, TRAINEE, GRADUATE AND PROFESSIONAL.

221PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

52320D 67-MICROPROCESSOR APPLICATIONS

THIS PROGRAM HELPS TO WORK WITH MICROCOMPUTERS SUCH AS KIM-1, SC-NR, APPLE, NASCOM ETC.. IF THE WORD LENGTH OF A MICROCOMPUTER IS GIVEN IT WILL CHANGE THE BINARY OR HEXADECIMAL CONTENTS OF THAT WORD IN DECIMAL OR VICE VERSA. IT WILL ALSO CONVERT BINARY TO HEXADECIMAL

52320D (CONTD)

NUMBER (AND VICE VERSA) AND INTEGERS IN ANY BASE (2<=B<=99) TO BINARY OR HEXADECIMAL BASE. BINARY RESULTS COULD BE DISPLAYED AS 4-FOUR BIT OR 2-EIGHT BIT WORDS.

208PROGRAM STEPS
BRANKO SPOLJARIC
YU-ZAGREB.

52321D 67-COMPUTATION OF CONIC EQUATION FROM PARAMETERS

THIS PROGRAM COMPUTES THE EQUATION OF AN ELLIPSE OR HYPERBOLA, GIVEN THE COORDINATES OF THE CENTER, THE ANGLE TO THE X-AXIS ANGLE AND THE PARAMETER.

182PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

52322D 67-POINTS AND STRAIGHT LINES IN THE PLANE

THIS PROGRAM COMPUTES THE INTERSECTION POINT OF 2 STRAIGHT LINES, THE CONNEXION LINE OF 2 POINTS, THE DISTANCE OF TWO POINTS OR OF A POINT AND A LINE, THE ANGLE BETWEEN 2 LINES, THE DISTANCE OF TWO PARALLEL LINES, THE LINE PARALLEL OR PERPENDICULAR TO A LINE AND THROUGH A POINT. THE POINTS AND STRAIGHT LINES BELONG TO THE 2 DIMENSIONAL PLANE.

223PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

52323D 67-SUM OF FOUR SQUARES

THIS PROGRAM COMPUTES ALL REPRESENTATIONS AS A SUM OF FOUR SQUARES FOR ANY INTEGER N<=13381631. THE SOLUTIONS ARE RECORDED ON DATA CARDS (15 SOL. PER SIDE) AND CAN BE INSPECTED LATER. HENCE, THE HP-67 USER NEEDS NOT ALWAYS BE PRESENT DURING THE CALCULATION.

287PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

52324D 67-TANGENTS TO A CONIC THROUGH A POINT

THIS PROGRAM COMPUTES THE TANGENTS TO A CONIC GIVEN BY ITS EQUATION THROUGH A POINT GIVEN BY ITS COORDINATES. BY INTERSECTING THE CONIC AND THE POLAR LINE OF THE POINT, THE (AT MOST 2) POINTS OF CONTACT ARE INVESTIGATED. THE POLAR LINES OF THESE POINTS ARE THE WANTED TANGENTS.
PROGRAM 51897D IS NECESSARY FOR THE COMPUTATION OF INTERSECTION POINTS.

093PROGRAM STEPS
WOLFGANG SEEWALD
CH-ZUERICH.

52325D 67-HI-LO 10000

CALCULATOR GENERATES A RANDOM NUMBER WHICH YOU HAVE TO GUESS. CALCULATOR GIVES YOU CLUES BY TELLING YOU IF GUESS IS HIGH OR LOW. IF GUESS IS HIGH 1 IS DISPLAYED. IF GUESS IS LOW 1 IS DISPLAYED. IF GUESS IS CORRECT 0 IS FLASHED AND NUMBER OF GUESSES IS DISPLAYED. CALCULATOR CAN ALSO PLAY ITSELF. RANDOM NUMBER IS BETWEEN 0 AND 10000.

101PROGRAM STEPS
BARRY GERALD FREEMAN
GB-CHIGWELL.

52326D 67-BCD-CODER AND DECODER

THIS PROGRAM CAN CODE A NUMBER

52326D (CONTD)

(LESS THAN 10E10) IN THE 5 MOST USED BCD-CODES. THE CODES ON THIS PROGRAM ARE : 8-4-2-1-CODE;4-2-2-1-CODE;2-4-2-1-CODE;5-4-2-1-CODE AND THE O'BRIEN II-CODE. PROGRAM ALSO DECODES A GIVEN BINARY CODED DECIMAL.

222PROGRAM STEPS
JEAN SCHANNES
L-BETTEMBOURG.

52327D 67-SURVIVAL:HALDANE'S METHOD (ANIMAL MARKING, BIRD BANDING)

CALCULATE MEANS ANNUAL SURVIVAL RATE WITH STANDARD DEVIATION OF MARKED ANIMALS FROM THE NUMBERS RECOVERED UNDER THE CONDITION THAT BOTH SURVIVAL AND RECOVERY RATE ARE INDEPENDENT OF AGE AND CALENDAR YEAR. RECENT MARKING YEARS (FROM WHICH STILL RECOVERIES ARE TO BE EXPECTED) ARE INCLUDED. MAXIMUM LIKELIHOOD ESTIMATION. NEWTON-RAPHSON ITERATIVE SOLUTION. DUE TO STORAGE IN PROGRAM STEPS LARGE SERIES CAN BE USED.

094PROGRAM STEPS
ALBERT C. PERDECK
NL-ARNHEM.

52328D 67-FIBONACCI NUMBERS TO F480

A) PROGRAM GIVES AN INDICATION OF THE SIZE OF THE FIBONACCI NUMBERS <10**8 I.E F10**5=2,597X 10**20898
C) COMPUTES FI NO TO ALL FIGURES FOR N<=480 TYPICAL EXECUTION TIMES F100 (21 FIG) 3.5 MIN F480 (100FIG) 75 MIN.

223PROGRAM STEPS
KENT A WIGSTROM
S-FLODA.

52329D 67-TRIANGLE AND CIRCLES

GIVEN TWO SIDES AND AN INCLUDED ANGLE OF A TRIANGLE, PROGRAM CALCULATES RADIUS AND SURFACE OF EXCLUDED AND INCLUDED CIRCLE. THE THREE INPUTS CAN BE CALCULATED FOR ANY TRIANGE WITH A PROGRAM OF THE PROGRAM OF THE STANDARD PAC.

046PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52330D 67-DATA SORTING (FAST VERSION)

PROGRAM CAN SORT DATA IN TWO WAYS :
1) IMMEDIATE SORTING AFTER INPUT
2) SORTING OF DATA STORED IN REGISTERS (ROUTINE PROVIDED TO STORE DATA).
YOU CAN ALWAYS DELETE A NUMBER AND REVIEW ALL INPUTS SORTED. THIS PROGRAM RUNS TWICE AS FAST AS PROGRAM 51870D.

121PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52331D 67-BIQUADRATIC EQUATION

PROGRAM GIVES ALL REAL AND / OR COMPLEX ROOTS OF AN EQUATION AX**4+BX**2+C=0 WITHOUT ITERATION.

094PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52332D 67-MATRICES: ADDITION AND MULTIPLICATION WITH A NUMBER

GIVEN TWO MXN MATRICES (A AND B) AND TWO REAL NUMBERS (K AND L), PROGRAM COMPUTES KA+LB. PROGRAM CAN ALSO COMPUTE PRODUCT OF A MATRIX WITH A REAL NUMBER AND ADDITION OF TWO MATRICES. INPUT

52332D (CONTD)

ERRORS CAN BE CORRECTED. (LIMIT : MXN=<24).

106PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52333D 67-VELOCITY OF A MOLECULE OF A GAS

PROGRAM CALCULATES AVERAGE VELOCITY OF A MOLECULE OF A GAS AFTER YOU HAVE ENTERED THE TEMPERATURE IN KELVIN AND THE MOLAR WEIGHT IN GRAMS. THERE ARE ROUTINES PROVIDED TO CONVERT DEGREES.

036PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52334D 67-DISTANCES IN A PLANE

PROGRAM COMPUTES DISTANCES BETWEEN TWO POINTS, A POINT AND A STRAIGHT LINE AND BETWEEN TWO STRAIGHT LINES IN A PLANE.

102PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52335D 67-ORDER OR A 3X3 MATRIX

PROGRAM FINDS ORDER OF A 3X3 MATRIX (=GREATEST POSSIBLE NON-SINGULAR PARTIAL MATRIX) BY CALCULATING ALL DETERMINANTS. IT IS ALSO POSSIBLE TO FIND THE ORDER OF A 2X2 MATRIX.

145PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52336D 67-ERROR CALCULATION

PROGRAM CALCULATES THE FOUR BASIC ARITHMETIC FUNCTIONS AND RAISES INTO POWERS AND TAKES ROOTS. WITH THESE CALCULATIONS IT DETERMINES THE ABSOLUTE ERROR ON THE RESULT. THE DISPLAY IS AUTOMATICALLY ROUNDED AND FIXED.

128PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52337D 67-IRRATIONAL EQUATIONS

PROGRAM SOLVES IRRATIONAL EQUATIONS OF THE FORM (AX+B)**1/2 = (CX+D)** 1/2 + (EX+F)**1/2 AND CHECKS IF THE RESULTS ARE VALID OR NOT. EASY INPUT MODES.

202PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52338D 67-LABYRINT

ON A 10X10 GRID, THE PROGRAM MAKES A LABYRINT FOR YOU AND GIVES YOU A POSITION ON THE LEFT SIDE. NOW YOU HAVE TO GET TO THE RIGHT SIDE WITH MAKING AS FEW MISTAKES AS POSSIBLE. WHEN YOU HAVE REACHED THE RIGHT SIDE, THE PROGRAM TELLS YOU THE NUMBER OF ERRORS YOU HAVE MADE. BUT BE CAREFUL, WHEN YOU ARE ON A WRONG TRACK, YOU MUST GO BACK.

159PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52339D 67-CIRCLE FROM THREE GIVEN POINTS

GIVEN THREE NON-COLLINEAR POINTS IN A PLANE, THE PROGRAM COMPUTES THE CENTER OF THE CIRCLE THROUGH THESE POINTS, THE RADIUS AND THE SURFACE OF THIS CIRCLE.

137PROGRAM STEPS
KRIS HENDRIECKX

52339D (CONTD)

B-DEURNE.

52340D 67-SCALAR PRODUCT OF TWO 12-DIMENSIONAL VECTORS

THE PROGRAM COMPUTES THE SCALAR PRODUCT OF TWO VECTORS WITH A DIMENSION SMALLER THAN OR EQUAL TO 12. THE TWO VECTORS ARE ENTIRELY SAVED BY THE PROGRAM. THERE ARE ALSO ROUTINES PROVIDED TO REVIEW THESE VECTORS AND MAKE CORRECTIONS WHERE NECESSARY.

079PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52341D 67-RAISING A 2X2 MATRIX INTO AN INTEGER POWER

THE PROGRAM RAISES A 2X2 MATRIX INTO AN INTEGER POWER. THE RESULT CAN IMMEDIATELY BE USED AGAIN.

112PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52342D 67-LOCATE THE MOVING SHIP

A SHIP IS RANDOM HIDDEN ON A 100X100 FIELD. YOU GUESS EACH TIME WHERE YOU THINK IT IS AND THE CALCULATOR TELLS YOU HOW FAR YOU ARE AWAY FROM THE SHIP WITH YOUR GUESS. BUT BE CAREFUL : EVERY TWO GUESSES THE SHIP CAN MOVE ONE PLACE RANDOMLY.

085PROGRAM STEPS
KRIS HENDRIECKX
B-DEURNE.

52343D 67-HUMANBODY GRAVITYCENTER

PROGRAM FINDS THE X- AND THE Y-COORDINATES OF THE CENTER OF GRAVITY TO A GIVEN BODY-POSITION (FOR INSTANCE: ONE POSITION OUT OF A SPORTING SKILL GIVEN BY A PHOTO). NECESSARY ARE THE X- AND THE Y-COORDINATES FOR FOLLOWING POINTS: GRAVITYCENTER OF HEAD, AND GRAVITY-CENTER OF BOTH HANDS (APPRECIATED), AND THE POINTS OF SHOULDER-JOINTS, HIPJOINTS, KNEEJOINTS, FOOTJOINTS, FOOTTIPS, ELBOWS AND WRIST.

407PROGRAM STEPS
HERTHA WAPPLER
D-MARBURG/LAHN.

52344D 67-SEVEN INCOMPLETE GAMMA FUNCTIONS WITH COMPLEX VARIABLE

PROGRAM GIVES SEVEN INCOMPLETE GAMMA FUNCTIONS, WITH COMPLEX VARIABLE, BEING THE PARAMETER AN INTEGER.

223PROGRAM STEPS
FELIPE LANDA
E-CODOBA.

52345D 67-VARIATIONS WITH REPLACEMENT

GIVEN N ELEMENTS K OF WHICH ARE TO BE SAMPLED WITH REPLACEMENT (N,K<10) THIS PROGRAM CALCULATES THE NUMBER OF VARIATIONS, THE ORDER NUMBER OF A GIVEN VARIATION, IT DISPLAYS OR PRINTS ALL POSSIBLE VARIATIONS, OR ALL VARIATIONS BETWEEN TWO GIVEN VARIATIONS OR A NUMBER OF ACCIDENTAL VARIATIONS, AND SOME OTHER THINGS. THIS PROGRAM IS SIMILAR TO PROGRAM 50954D, BUT IT IS SMALLER AND COMPUTES MORE THINGS.

191PROGRAM STEPS
PETER BURGEY
D-MAXDORF.

52346D 67-A TEST FOR HOMOSCEDASTICITY

52346D (CONTD)

THIS PROGRAM PERFORMS A TEST FOR HOMOSCEDASTICITY OF THE ERROR TERM BY A GOLDFELD, QUANDT METHOD.

112PROGRAM STEPS
EVERT CARLSSON
S-GOTEBORG.

52347D 67-TEST OF RANDOM NUMBER GENERATOR WITH POKER-METHOD

THE PROGRAM GENERATES A SIMPLE PSEUDORANDOM GENERATOR AND TESTS THE RANDOMNESS. THE PROGRAM USES A "POKER-TEST" WHICH MEANS THAT THE LINE OF RANDOM INTEGERS IS DIVIDED INTO 5-DIGITS SEQUENCES. THE SEQUENCES COMPOSITIONS ARE EVALUATED ACCORDING TO THE POKER RULES AND COMPARED WITH THE THEORETIC PROBABILITIES. AS AN OPTION THE SUCCESSION OF RANDOM INTEGERS CAN BE DIVIDED INTO 4-DIGITS SEQUENCES.

216PROGRAM STEPS
FRISK OLOF
S-HANDEN.

52348D 67-REINFORCEMENT OF CONCRETE SLABS

BEING GIVEN TWO OF THE THREE FOLLOWING VALUES: 1) AREA OF REINFORCEMENT, AS 2) DISTANCE BETWEEN REINFORCEMENT BARS, E, AND 3) DIAMETER OF BARS,#, THE PROGRAM CALCULATES THE THIRD VALUE, TAKING INTO CONSIDERATION THE ALLOWED MAXIMUM DISTANCE BETWEEN BARS ACCORDING TO GERMAN REGULATION DIN 1045

099PROGRAM STEPS
CLAUS M. DACHSELT
D-WITTEN-ANNEN.

52349D 97-REFRIGERANT PIPELINES (VI)

PROGRAM DETERMINES THE CORRECT SIZE FOR LIQUID LINES ON REFRIGERANT PLANTS. STEEL TUBE. AVAILABLE ONLY FOR R-717 AMMONIA.

223PROGRAM STEPS
JUAN LUIS GARCIA LAGO
E-MURCIA.

52350D 97-REFRIGERANT PIPELINES (V)

PROGRAM DETERMINES THE CORRECT SIZE FOR LIQUID LINES ON REFRIGERANT & AIRCONDITIONING PLANTS. COOPER TUBE AVAILABLE ONLY FOR R-502.

224PROGRAM STEPS
JUAN LUIS GARCIA LAGO
E-MURCIA.

52351D 97-REFRIGERANT PIPELINES (IV)

PROGRAM DETERMINES THE CORRECT SIZE FOR LIQUID LINES ON REFRIGERANT & AIRCONDITIONING PLANTS. COOPER TUBE AVAILABLE ONLY FOR R-22.

224PROGRAM STEPS
JUAN LUIS GARCIA LAGO
E-MURCIA.

52352D 97-REFRIGERANT PIPELINES (III)

PROGRAM DETERMINES THE CORRECT SIZE FOR LIQUID LINES ON REFRIGERANT & AIRCONDITIONING PLANTS. COOPER TUBE AVAILABLE ONLY FOR R-12.

224PROGRAM STEPS
JUAN LUIS GARCIA LAGO
E-MURCIA.

52353D 97-REFRIGERANT PIPELINES (II)

PROGRAM DETERMINES THE CORRECT SIZE FOR SUCTION AND DELIVERY LINES ON REFRIGERANT & AIRCONDITIONING PLANTS. STEEL TUBE REFRIGERANTS : R-12; R-22; R-502 AND R-717

52353D (CONTD)

AMMONIA.

219PROGRAM STEPS
JUAN LUIS GARCIA LAGO
E-MURCIA.

52354D 97-REFRIGERANT PIPELINES (I)

PROGRAM DETERMINES THE CORRECT SIZE FOR SUCTION AND DELIVERY LINES ON REFRIGERANT & AIRCONDITIONING PLANTS. COOPER TUBE REFRIGERANTS : R-12; R-22; R-502; (COOPER TUBE IS NOT VALID FOR R-717).

218PROGRAM STEPS
JUAN LUIS GARCIA LAGO
E-MURCIA.

52355D 97-AIRCONDITIONING CALCULATION

THIS PROGRAM CALCULATES HEAT BALANCE FOR AIRCONDITIONING SYSTEM SUMMER AND WINTER, AND DISPLAYS EFFECTIVE SENSIBLE HEAT, EFFECTIVE LATENT HEAT, AIR-CHANGE HEAT AND TOTAL HEAT.
ALSO CALCULATES HEAT BALANCE FOR WINTER HEATING AND DISPLAYS KCAL/HOUR FOR DAILY RUNNING AND NIGHT/DAY RUNNING.

224PROGRAM STEPS
JUAN LUIS GARCIA LAGO
E-MURCIA.

52356D 67-CONCRETE DOSES (I)

THIS PROGRAM OBTAIN MEASURE OUT DOSES CONCRETE FOR ONE M3, KNEW; CHARACTERISTIC STRENGTH CONCRETE, GRANULOMETRIE OF GRAVELS, BREAK GRAVEL OBTAINING IN QUARRY OR ROLLING STONES, TYPE OF CEMENT COMPARED WITH USUAL PORTLAND CEMENT QUANTITY OF WATER, HUMIDITY OF GRAVEL (PERCENTAGE IN WEIGHT). DOSES IT IS POSSIBLE FOR TWO SIZE GRAVELS ONLY.

224PROGRAM STEPS
LORENZO PORTILLO MORO
E-CASTELLON.

52357D 67-CONCRETE DOSES (II)

THIS PROGRAM IS THE CONTINUATION OF CONCRETE DOSES (I) FOR AERATED CONCRETE, OR TRANSFORMATION UNITS OF WEIGHT IN VOLUME UNITS.

057PROGRAM STEPS
LORENZO PORTILLO MORO
E-CASTELLON.

52358D 67-RENDEZVOUS POINT FOR 2 VESSELS UNDER SPEED.

PROGRAM FITS IF A VESSEL NEEDS A HELP OR ASSISTANCE; COURSE AND TIME FOR THE RENDEZVOUS WILL BE GIVEN. TO KEEP A VESSEL FROM ANOTHER TARGET/SHIP OFF-A DISTANCE/ DIRECTION MUST BE GIVEN = SO COURSE AND TIME WILL BE GIVEN. TO OVERTAKE A VESSEL ALWAYS WITH THE SAME DISTANCE TO THE OTHER SHIP, DIFFERENT COURSES ARE NECESSARY = COURSES, TIMES OF CHANGES WILL BE AS OUTPUT.

224PROGRAM STEPS
CAPT. LUTZ LEWKE
D-HAMBURG.

52359D 97-LOGIC TRAINER

TO GIVEN INPUT-SIGNALS THE PROGRAM COMPUTES THE OUTPUT-SIGNAL WHICH RESULTS BY USING A AND-, OR-, NOT-, NAND-, NOR-, OR EXOR-TTL- CIRCUIT. THEREFORE, THE PROGRAM IS SUITABLE FOR BEGINNERS IN DIGITAL-ELECTRONIC AS A LOGIC-TRAINER AND FOR UNDERSTANDING DIGITAL CIRCUITS.

128PROGRAM STEPS
KARL-LUDWIG BUTTE

52359D (CONTD)

D-MARBURG.

52360D 67-OHM'S LAW PARALLEL R U OVER SERIAL R POWER SUPPLY

PROVIDED IS : OHM'S LAW WITH I; U; R; P;. RESISTANCE OF TWO PARALLEL R'S; VOLTAGE OVER TWO SERIAL R'S; CALCULATION OF CURRENT LIMITOR RESISTOR IN ZENER POWER SUPPLY.

143PROGRAM STEPS
ALEX SLAETS
B-MECHELEN.

52361D 67-MULTISTORY SINGLERAY SYMMETRICAL FRAME LATERAL LOAD.

THIS PROGRAM CALCULATES MOMENTS IN BEAMS AND COLUMNS OF A MULTISTORY SINGLE-BAY SYMMETRICAL FRAME DUE TO LATERAL LOADS. THE TOTAL NUMBER OF STORIES MUST NOT EXCEED 15. THE PROGRAM CAN ALSO BE UTILIZED FOR FRAME ANALYSIS OF MULTI-BAY BUILDINGS BY LUMPING THE COLUMNS AND BEAMS SO THAT A FRAME OF SEVERAL BAYS IS REPRESENTED AND ANALYSED AS A SINGLE-BAY FRAME.

278PROGRAM STEPS
AGHA MUNIR SHERWANI
U.A.E.-SHARJAH.

52362D 67-SUN AND PLANETS SRT WITH AUTOMATIC SAILING CORRECTION

THE PROGRAM REDUCES SIGHTS FROM SUN OR PLANET OBSERVATIONS. ALL DR AND ALMANAC DATA IS NEEDED. GMT OF OBSERVATION WILL GIVE ZN AND HS WILL GIVE DIFFERENTIAL ALTITUDE FOR MORE OBS. OF SAME OBJECT, ONLY NEW GMT & NEW HS IS NEEDED. FOR A NEW OBJECT, THE ALMANAC DATA MUST FIRST BE UPDATED. THIS CARD MAY BE USED WITH THE STAR AND MOON CARDS. THE PROGRAMS WILL FIT THE "MULTI-FIX" PROGRAM.

205PROGRAM STEPS
JAN DIDR. ANDERSEN
N-BERGEN.

52363D 67-STAR SRT WITH AUTOMATIC SAILING CORRECTION

THE PROGRAM REDUCES SIGHTS FROM STAR OBSERVATIONS. ALL DR AND ALMANAC DATA IS NEEDED. GMT OF OBSERVATION WILL THEN GIVE ZN AND HS WILL GIVE A. FOR A NEW STAR ENTER SHA* AND DEL*, AND CONTINUE WITH GMT & HS. THE PROGRAM MAY BE USED WITH THE SUN & PLANETS AND THE MOON PROGRAMS. THE PROGRAMS WILL FIT THE "MULTI-FIX" PROGRAM.

178PROGRAM STEPS
JAN DIDR. ANDERSEN
N-BERGEN.

52364D 67-LOAN AMORTIZATION ACCUMULATED INTEREST, REM. BALANCE

THIS PROGRAM EXTENDS THE SCOPE OF PROGRAM 00126D (BD1-05A) BY (1) PERMITTING CALCULATION OF PERIOD OF LOAN, PERIODIC PAYMENT, PRESENT VALUE IF ANY TWO OF THESE AND INTEREST RATE ARE KNOWN; (2) AN OPTION OF LISTING ACCUMULATED INTEREST DURING SCHEDULE GENERATION OR AT END OF IT; (3) OPTIONAL SCHEDULE LISTING AT MULTIPLE PERIOD INTERVALS; (4) ERROR SIGNALS IF PAYMENT PERIODS J,K EXCEED TOTAL LOAN PERIOD. ACCUMULATED PAYMENTS TO PRINCIPAL ARE ALSO LISTED, MAKING AMORTIZATION SCHEDULES MORE COMPLETE.

217PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

52365D 67-FLUID VOLUME CONVERSIONS

52365D (CONTD)

FLUID MEASURES ARE CONFUSED NOT ONLY BY THE EXISTANCE OF METRIC AND ENGLISH UNITS BUT ALSO BY SEPARATE BRITISH AND US SYSTEMS. THIS PROGRAM CONVERTS ANY ONE OF MILLILITERS, LITERS, MINIMS, FL.OZ, QUARTS, GALLONS AND CUBIC INCHES INTO ANY OR ALL OF THE OTHERS. AN OPTION CONVERTS TO OR FROM BRITISH OR US UNITS OR EVEN BETWEEN THEM.

217PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

52366D 67-MASS/WEIGHT UNIT CONVERSION

THIS PROGRAM INTERCONVERTS ANY ONE OF THE FOLLOWING UNITS OF MASS/WEIGHT INTO ANY OR ALL OF THE OTHERS: KILOGRAM, GRAM, METRIC TON, BRITISH IMPERIAL TON, US (SHORT) TON, AVOIRDUPOIS GRAINS, AVOIRD. OUNCE, TROY OUNCE, IB, STONE; THUS COVERING VIRTUALLY ALL COMMONLY USED MASS UNITS IN THE SI SYSTEM AND THE BRITISH AND US SCENE.

214PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

52367D 67-CUBIC VOLUME CONVERSIONS

TO PERMIT EASY SWITCHING BETWEEN METRIC AND ENGLISH VOLUME UNITS, THE PROGRAM CONVERTS ANY ONE OF DM**3 (LITERS), CM**3, IN.**3, FEET**3, YARDS**3, IMPERIAL GALLONS AND US GALLONS INTO ANY OR ALL OF THE OTHERS. THIS PROGRAM COVERS MAINLY CUBIC VOLUME AS DISTINCT FROM FLUID VOLUME; A SIMILAR PROGRAM - FLUID VOLUME CONVERSIONS - DEALS WITH THE LATTER. GALLONS ARE HOWEVER ADDED HERE FOR COMPARISON.

174PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

52368D 67-AREA CONVERSIONS

THIS PROGRAM INTERCONVERTS ANY ONE OF THE FOLLOWING UNITS OF AREA IN METRIC, SI OR ENGLISH UNITS INTO ANY OR ALL OF THE OTHERS: M**2, CM**2, MM**2, HECTARES, KM**2, INCH**2, FEET**2, YARDS**2, ACRES AND MILES**2. THIS THUS COVERS AREAS ON A GEOGRAPHICAL SCALE AS WELL AS FOR EVERYDAY AND LABORATORY USE.

203PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

52369D 67-DEFINITE INTEGRAL 5 SIMPSON

WITH A CONTINUOUS AREA BETWEEN THE GIVEN LIMITS THE PROGRAM APPROXIMATES:
1) THE AREA UNDER THE CURVE.
2) THE VOLUME TRACED OUT BY THAT AREA, REVOLVED.
3) THE CENTROIDS OF THAT AREA.
4) THE CENTRE OF GRAVITY OF THE VOLUME TRACED OUT.
5) THE LENGTH OF THE CURVE BETWEEN THE GIVEN LIMITS... USING "SIMPSONS RULE".

093PROGRAM STEPS
LAWRENCE B. HARTLEY
GB-BRIERFIELD.

52370D 67-REGRESSION OF DEGREE 4

THIS PROGRAM FINDS THE BEST FOURTH DEGREE POLYNOMIAL, THE GRAPHIC REPRESENTATION OF WHICH PASSES THROUGH ANY NUMBER OF GIVEN POINTS, EITHER WITH EQUIDISTANT ABSCISSAS, OR NOT.

223PROGRAM STEPS

52370D (CONTD)

RAYMOND BROECKX
B-WILRIJK.

52371D 67-LINEAR, QUADRATIC AND CUBIC REGRESSION

GIVEN ANY NUMBER OF POINTS (X,Y), EITHER WITH EQUIDISTANT ABSCISSAS OR NOT, THIS PROGRAM FINDS THE CORRESPONDING LINEAR, QUADRATIC AND CUBIC REGRESSION LINES.

178PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52372D 67-PHYSICAL STATISTICS WITH URNS

PROGRAM CALCULATES PROBABILITIES FOR SINGLE AND COMBINED EVENTS AT THE STATISTICS OF MAXWELL-BOLTZMANN BOSE-EINSTEIN AND FERMI-DIRAC.

093PROGRAM STEPS
HORST VOELZ
D-BERLIN.

52373D 67-AUTOMATIC FEED-BACK CALCUALTIONS (REAL)

A TRANSISTOR, TUBE OR AMPLIFIER MAY BE DESCRIBED BY S,D,RI. WITH AN OUTPUT-RESISTOR RA EXISTS AN AMPLIFICATION V. BY FEED-BACK WITH CURRENT AND/OR VOLTAGE IT HAS GOT DATES S*, D*, RI* AND V*. YOU PUT SOME VALUES IN AND THEN ASK FOR OTHERS.

224PROGRAM STEPS
HORST VOELZ
D-BERLIN.

52374D 67-MATRIX-PARAMETERS FOR FOUR-TERMINAL-CIRCUITS

AT FOUR-TERMINAL-CIRCUITS EXISTS 12 MATRIX-FORMS MULTIPLIED BY 3 BASE-MODIFICATIONS. ALL PARAMETERS FOR THE 36 EQUATIONS YOU CAN CHANGE WITH THIS ONE-CARD-PROGRAM + DATA-CARD EACH TO THE OTHER ONLY WITH ONE STEP.

311PROGRAM STEPS
HORST VOELZ
D-BERLIN.

52375D 67-POLYNOMIAL-ARITHMETIC

FROM TWO POLYNOMS P AND Q EACH UP TO DEGREE EQUAL <7 PROGRAM CALCULATES THE COEFFICIENTS OF THE POLINOMS: P+Q, P-Q, P*Q, P/Q, Q/P, P**N Q**N (N REAL NUMBER) AND FOR THE VALUES ONLY P(Q(X)).

224PROGRAM STEPS
HORST VOELZ
D-BERLIN.

52376D 67-MORE REGISTERS

IT IS POSSIBLE WITH THIS PROGRAM TO STORE 36 VALUES WITH AN ACCURACY OF 4 DIGITS IN RANGE FROM 10**-50 TO 9,999*10**49.

112PROGRAM STEPS
HORST VOELZ
D-BERLIN.

52377D 67-LENGTH AND AREA OF POLYGONS CIRCLES AND OTHERS

PROGRAM CALCULATES AREA AND LENGTH OF POLYGONS POINT BY POINT, OF CIRCLES AND OTHERS BY ITS EQUATIONS WITH SMALL STEPS.

110PROGRAM STEPS
HORST VOELZ
D-BERLIN.

52378D 67-GERMAN INCOME TAX AND CHURCH

52378D (CONTD)

00000D RATE SINCE 1979

PROGRAM CALCULATES NEW GERMAN INCOME TAX AND CHURCH RATE (VALID SINCE JANUARY 1979) FOR GROUND AND SPLIT TARIF AS AMOUNT, % AND % ON TOP.

222PROGRAM STEPS
HEINZ RECHMANN
D-LEVERKUSEN.

52379D 67-MAX AND MIN OF FUNCTIONS

PROGRAM CALCULATES MAXIMUM OR MINIMUM OF MATHEMATICAL FUNCTIONS. CAN ALSO BE USED FOR EQUATIONS WHICH CAN NOT BE SOLVED EXPLICITLY BY MATHEMATICAL ANALYSIS.

096PROGRAM STEPS
CHRISTIAN W. HIRSCH
N-OSLO.

52380D 67-97-POSITIVE AND NEGATIVE NUMBERS CONVERTER TABULATOR

THIS PROGRAM CONVERTS AND TABULATES IN A PRESELECTED SEQUENCE, WHOLE POSITIVE OR NEGATIVE DEC. NUMBERS TO THE EQUIVALENT OCTAL, HEXADECIMAL AND SIGNED BINARY NUMBERS. IF NEGATIVE NUMBERS ARE TO BE CONVERTED, THE SIGNED BINARY NUMBERS ARE CODED AS THE TWO COMPLEMENT OF THEIR POSITIVE COUNTER PARTS. THE PROGRAM PROCESSES SIGNED BINARY NUMBERS WITH A MAXIMUM OF 20 BITS, AND CALCULATES THE DECIMAL RANGE AS A FUNCTION OF THE NUMBER OF BITS.

221PROGRAM STEPS
ERNST E. SIE
D-EMMENDINGEN

52381D 97-DISCONTINUITY IN A MEASURED CURVE

GIVEN THE EXPERIMENTAL VALUES OF A (GENERALLY) TIME-DEPENDENT QUANTITY, THE PROGRAM REDUCES THE STEADY CURVE TA AN IDEALIZED STEP-LIKE SHAPE, AS NEEDED IN THE EVALUATION OF TEMPERATURE-TIME PLOTS FOR THE DETERMINATION FOR SPECIFIC HEATS OR OTHER PHYSICO-CHEMICAL QUANTITIES. IT IS THEN POSSIBLE TO DEFINE UNIQUELY THE MAGNITUDE AND POINT OF ALTERATION.

099PROGRAM STEPS
BERND DUMBACHER
D-FRANKFURT.

52382D 97-LINEAR REGRESSION WITH CONVENIENT HANDLING

PROGRAM CALCULATES THE REGRESSION COEFFICIENTS, THEIR STANDARD DEVIATIONS AND THE CORRELATION COEFFICIENT. BY MEANS OF LEAST SQUARE METHOD PROGRAM ENABLES FITTING OF A GIVEN SET OF POINTS (X,Y) OR ANY FUNCTIONS OF THEM TO A STRAIGHT LINE. THE HANDLING OF THE PROGRAM IS MADE VERY COMFORTABLY (CORRECTION OF INPUT ERRORS, INTERMEDIATE CALCULATIONS, OUTPUT FORMAT, FUNCTIONS OF X AND Y).

187PROGRAM STEPS
BERND DUMBACHER
D-FRANKFURT.

52383D 67-HULL AREA-WEIGHT-CENTRE OF GRAVITY-NAVAL ARCHITECTURE

COMPUTES THE AERA, WEIGHT, LONGITUDINAL AND VERTICAL CENTRE OF GRAVITY OF THE HULL.

110PROGRAM STEPS
ROBERT FREDERIC MENZI
CH-GENEVA.

52384D 97-TRANSFORMING TIME SERIES 1*2

52384D (CONTD)

DATA SERIE OF E.G. MONTHLY VALUES IS SUBSEQUENTLY TRANSFORMED TO OTHER SERIES OF FOR INSTANCE
A) 3-,6- OR 12 MONTH AVERAGES
B) INDICES OF FREE CHOSEN BASE PERIOD
C) PERCENTUAL CHANGE WITHIN 12-MONTH PERIOD
D) STANDARDIZED VALUES KEYING ORIGINAL DATA ONLY ONCE (DATA CARD) UNLIMITED LENGTH OF DATA FILE.

112PROGRAM STEPS
PETER PESCHEL
D-ESSEN.

52385D 67-CIRCLE SEGMENT/CURVE SOLUTIONS

GIVEN ANY TWO OF THE THREE CIRCLE SEGMENT DATA - CENTRAL ANGLE, CHORD LENGTH AND RADIUS - THE PROGRAM CALCULATES AND THEN DISPLAYS (IN THIS ORDER) THE CHORD LENGTH, RADIUS, CENTRAL ANGLE, SEGMENT LENGTH, TANGENT LENGTH, SEGMENT HEIGHT, SECTOR TRIANGLE HEIGHT, TANGENT TRIANGLE LENGTH, SEGMENT AREA, SECTOR AREA, SECTOR TRIANGLE AREA. OUTPUT SEQUENCE IS NUMERICALLY CODED; ALL RESULTS CAN ALSO BE CALLED UP INDIVIDUALLY.

192PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

52386D 67-ETERNAL DAY-OF-WEEK CALENDAR

THIS PROGRAM CALCULATES THE DAY OF THE WEEK FOR ANY DATE FROM DISTANT ANTIQUITY TO THE INFINITE FUTURE IN THE JULIAN OR GREGORIAN CALENDARS. IT ACCEPTS INPUT IN EITHER THE DD.MMYYYY OR THE MM.DDYYYY NOTATION DATES BEFORE ABOUT 300 AD AND BC DATES NECESSARILY YIELD NOTIONAL DOW INDICATIONS, AS 7-DAY WEEK WAS NOT INTRODUCED IN JULIAN CALENDAR UNTIL ABOUT THEN.

116PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

52387D 67-BRITISH & COMMONWEALTH HOLIDAYS, BANK HOLIDAYS ETC.

THE PROGRAM CALCULATES THE DATE EACH YEAR OF ENGLISH, SCOTTISH ETC. SPRING AND SUMMER BANK HOLIDAYS, ALSO REMEMBRANCE SUNDAY, ADVENT SUNDAY, AUSTRALIA DAY, AND CANADIAN HOLIDAYS OF VICTORIA DAY, LABOR DAY AND THANKSGIVING DAY (=US COLUMBUS DAY). THE PROGRAM COVERS DATES FROM THE START OF THE GREGORIAN CALENDAR TO YEAR 9999 AND BEYOND ACCORDING TO CURRENT DEFINITION OF ABOVE HOLIDAYS. PROGRAM LISTINGS ARE GIVEN FOR EUROPEAN DD.MMYYYY AS WELL AS MM.DDYYYY NOTATIONS. (OR 173 STEPS).

170PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

52388D 67-INTERNATIONAL DAYLIGHT SAVING TIME DATES

PROGRAM CALCULATES BEGINNING AND END DATES OF DAYLIGHT SAVING PERIODS IN SOME 17 COUNTRIES OF THE WORLD (INCLUDING MUCH OF EUROPE, USA, AUSTRALIA, NEW ZEALAND ETC.) ACCORDING TO CURRENT DEFINITIONS OF DAYLIGHT SAVING TIME. COVERS DATES FROM PRESENT TO AT LEAST YEAR 9999 (AS LONG AS CURRENT DEFINITIONS REMAIN VALID), AND GIVES PROGRAM LISTINGS IN BOTH EUROPEAN DD.MMYYYY AND AMERICAN MM.DDYYYY NOTATIONS. (OR 149 STEPS)

150PROGRAM STEPS
L. ANDREW MANNHEIM
GB-RICHMOND.

52389D 67-OVERCAPACITY, BACKLOG DEPENDENT OF CAPACITY, ORDERS RECEIVED

IF A CERTAIN CAPACITY IS GIVEN WITH AN UPPER AND A LOWER LIMIT AND A CERTAIN PATTERN OF ORDERS RECEIVED, THEN THE PROGRAM CALCULATES THE CUMULATED OVERCAPACITY AND THE CUMULATED BACKLOG OF UNFULFILLED ORDERS OVER A PERIOD OF UP TO 30 TIME SECTIONS. THE PROGRAM TRANSFERS A BACKLOG FROM ONE TIME SECTION TO THE FOLLOWING ONE AND COUNTS THE SECTIONS WITH OVERCAPACITY AND THOSE WITH BACKLOG.

224PROGRAM STEPS
DIETER SOINE
D-HANNOVER.

52390D 67-ROOT OF A SPECIAL FUNCTION

GIVEN THE FUNCTION EXP(-LAMBDA)= LAMBDA-1, THIS PROGRAM COMPUTES THE ONLY ROOT LAMBDA* DIRECTLY FOR ANY N OR FOR ALL N'S, STEP BY STEP.

042PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52391D 67-BESSEL'S DIFFERENTIAL EQUATION

GIVEN THE DIFFERENTIAL EQUATION X**2Y"+XY'+(X**2-P**2)Y=0, THIS PROGRAM COMPUTES Y, Y' AND Y" IN X, WHEN IS GIVEN P AND N.

096PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52392D 67-A SPECIAL PROBLEM

GIVEN THE FUNCTION EXP AT WITH A=A SQUARE MATRIX AND T ANY NUMBER, THIS PROGRAM EXAMINES THE EVOLUTION OF THE INFINITE SERIE, TERM BY TERM TO OBTAIN A SOLUTION.

100PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52393D 67-PROBLEM OF DOUBLE SPRING

GIVEN TWO MASSES M1 AND M2, SEPARATED BY A SPRING FOR WHICH K=K2 N M**-1 AND M1 IS ATTACHED TO A SUPPORT BY A SPRING FOR WHICH K=K1 N M**-1. AFTER THE SYSTEM IS BROUGHT TO REST, THE MASSES ARE DISPLACED A METRES DOWNWARD AND RELEASED. THIS PROGRAM COMPUTES THE MOTION OF BOTH MASSES, EVERY 1/10 SEC.

152PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52394D 67-POTENTIAL BETWEEN TWO CONCENTRIC CHARGES

GIVEN TWO CONCENTRIC SPHERES OF RADII R, AND R2 (R1<R2), CARRIED AN ELECTRIC CHARGE OF SUCC. V1 AND V2, THE PROGRAM COMPUTES THE POTENTIAL V AT ANY POINT BETWEEN THE GIVEN SPHERES.

036PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52395D 67-POSITION OF A PARTICULAR

THIS PROGRAM COMPUTES THE POSITION OF A PARTICULAR OF MASS M, REPELLED FROM AN ORIGIN (O) WITH A FORCE EQUAL TO (K>0) TIMES DISTANCE FROM O, IF THIS PARTICULAR STARTS FROM REST AT A DISTANCE P FROM O, T(SEC) LATER, OR SECOND BY SECOND.

051PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52396D 67-MOTION OF A PROJECTILE

A PROJECTILE OF MASS M IS FIRED INTO THE AIR WITH INITAL VELOCITY VO AT AN ANGLE X WITH THE GROUND. THIS PROGRAM FINDS THE POSITION (X,Y) OF THE PROJECTILE, DELTA T BY DELTA T. (DELTA T IS CHOSEN BY YOURSELF). THE RESISTANCE OF THE AIR (K) MUST ALSO BE GIVEN.

080PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52397D 67-STURM-LIOUVILLE PROBLEM

PROGRAM COMPUTES TN=E**X IN TERMS OF THE EIGENFUNCTIONS OF THE STURM-LIOUVILLE PROBLEM Y"+LAMBDA Y=0 IF Y'(O)=0 AND Y(PI)=0

045PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52398D 67-FOURIER SIN AND COS SERIES FOR EXP X

PROGRAM COMPUTES STEP BY STEP THE EVOLUTION OF A FOURIER SIN OR COS SERIE OF EXP X.

075PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52399D 67-A DYNAMIC PROBLEN

A BODY OF MASS M IS THROWN VERTICALLY INTO THE AIR WITH AN INITIAL VELOCITY VO. THE BODY ENCOUNTERS AN AIR RESISTANCE K PROPORSIONAL TO THIS VELOCITY.THIS PROGRAM COMPUTES DIFFERENT HEIGHT'S HN FOR DELTA T'S TO MAKE A GRAPH OF THE EVOLUTION.

048PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52400D 67-STORE, ORDER AND RECALL (1)

WITH B: STORE UP TO 25 ARBITRARY NUMBERS. WITH C: REARRANGE THEM IN INCREASING ORDER. SPECIAL DEVICES : 1) A FLAG FOR EARLY GOOD ORDER AND 2) A DECREASING OF THE NUMBER OF REGISTERS AFTER EACH STROKE.
MAX. CALCULATION TIME : 6 MINUTES.

065PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52401D 67-STORE, ORDER AND RECALL (2)

WITH B : STORE UP TO 50 POSITIVE INTEGERS, EACH OF MAX 5 FIGURES. WITH C : REARRANGE THEM IN INCREASING ORDER. SPECIAL DEVICES : 1) A FLAG FOR EARLY GOOD ORDER AND 2) A DECREASING OF THE NUMBER OF REGISTERS AFTER EACH TWO STROKES. MAX. CALCULATION TIME : 61 MINUITES.

149PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52402D 67-STORE, ORDER AND RECALL (3)

WITH B: STORE UP TO 75 POSITIVE INTEGERS, EACH OF MAX. 3 FIGURES. WITH C: REARRANGE THEM IN INCREASING ORDER. SPECIAL DEVICES : 1) A FLAG FOR EARLY GOOD ORDER AND 2) A DECREASING OF THE NUMBER OF REGISTERS AFTER EACH THREE STROKES MAX. CALCULATION TIME : 4 HOURS 17 MINUTES.

222PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52403D 67-STORE, ORDER AND RECALL (4)

WITH B: STORE UP TO 125 POSITIVE INTEGERS, EACH OF MAX. 2 FIGURES. WITH C: REARRANGE THEM IN INCREASING ORDER. SPECIAL DEVICES : 1) A FLAG FOR EARLY GOOD ORDER AND 2) A DECREASING OF THE NUMBER OF REGISTERS AFTER EACH 5 STROKES. MAX. CALCULATION TIME : 15 HOURS 47 MIN.

223PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52404D 67-STORE, ORDER AND RECALL (5)

WITH B: STORE UP TO 250 POSITIVE INTEGERS OF 1 FIGURE . WITH C : REARRANGE THEM IN INCREASING ORDER SPECIAL DEVICES : 1) A FLAG FOR EARLY GOOD ORDER AND 2) A DECREASING OF THE NUMBER OF REGISTERS AFTER EACH 10 STROKES.
MAX. CALCULATION TIME : 115 HOURS.

207PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52405D 67-ALL PERMUTATIONS OF THE NUMBERS 1,2,...N ; 2<=N<=25

THIS PROGRAM IS THE SPEEDED UP VERSION OF A BASE PROGRAM OF 48 PROGRAMSTEPS (CARD INCLUDED) AND SHOWS ALL PERMUTATIONS OF THE FIRST POSITIVE INTEGERS 1,2,...,N WITH 2<=N<25 (19 MIN 15 SEC IF N=5).

223PROGRAM STEPS
HANS AUSEMS
NL-BREDA.

52406D 67-CRITICAL REVOLUTIONS IN TORSIONAL VIBRATIONS

THIS PROGRAM COMPUTES NATURAL FREQUENCIES OF MACHINES. NEEDED INPUT DATA ARE REDUCED MASS AND TORSION SPRING RATE. THESE MAY BE OBTAINED WITH PROGRAMS "REDUCTION OF MASS" AND "REDUCTION OF LENGTH".

190PROGRAM STEPS
WERNER HINTZE
D-HAMBURG.

52407D 67-REDUCTION OF LENGTH FOR CRITICAL SPEED CALCULATION

THIS PROGRAM COMPUTES REDUCTED LENGTH OF MACHINE AND ENGINE PARTS, AS NEEDED FOR EVALUATION OF TORSIONAL STRESS DUE TO CRITICAL ROTATION SPEED.

194PROGRAM STEPS
WERNER HINTZE
D-HAMBURG.

52408D 67-REDUCTION OF MASS FOR CRITICAL SPEED CALCULATION

THIS PROGRAM REDUCES THE MASS OF ENGINE AND MACHINE PARTS, FOR USE IN CALCULATION OF CRITICAL ROTATION SPEED.

179PROGRAM STEPS
WERNER HINTZE
D-HAMBURG.

52409D 67-GEOGRAPHIC CLIMATS

GIVE FOR EACH MONTH THE AVERAGE TEMPERATURE (CELCIUS) AND THE TOTAL RAINFALL (MM) AND THIS PROGRAM WILL CALCULATE THE GEOGRAPHIC CLIMAT AND THE TYPICAL PARAMETERS. WITH EXPLANATION AND A FLOW CHART OF THE USED METHOD.

191PROGRAM STEPS
HERMAN PEETERS
B-BOECHOUT.

52410D 67-ALGEBRAIC COMBINATION OF TWO

52410D (CONTD)

00000D DATACARDS AND REGISTER-SUM

24 REGISTERS OF A DATACARD WILL BE COMBINED (ADDED OR SUBTRACTED OR MULTIPLIED OR DIVIDED) WITH 24 REGISTERS OF ANOTHER DATACARD: R0 WITH R0, R1 WITH R1 AND SO ON. RESULTS WILL BE STORED ON A NEW DATACARD. PROGRAM SIMPLIFIES THAT WAY COMPLICATED STATISTICAL CALCULATIONS IN RESPECT TO DATA ENTRY. IT ALSO ALLOWS SUMMARIZATION OF 26 REGISTERS OF THE CALCULATOR WITHOUT CHANGING ANY REGISTERCONTENT.

197PROGRAM STEPS
HEINZ RECHMANN
D LLVERRUSLN.

52411D 67-97-STRESS-STRAIN RELATIONS IN A PRESSURIZED CYLINDER

IN A PRESSURIZED THICK WALLED CYLINDER, SIX QUANTITIES ARE OF IMPORTANCE: INNER AND OUTER PRESSURE, TANGENTIAL STRESS AT THE BORE AND AT THE EXTERNAL WALL, RADIAL DEFORMATION AT THE BORE AND EXTERNAL WALL. ONCE THE CYLINDER HAS BEEN DEFINED, THE PROGRAM COMPUTES FROM ANY TWO OF THESE VALUES THE FOUR REMAINING ONES.

661PROGRAM STEPS
FRANCOIS HAENSSLER
CH-GENEVA.

52412D 67-UNIVERSAL UNIT CONVERSION PROGRAM

THIS PROGRAM CONVERTS A QUANTITY FROM ANY ONE TO ANY OTHER OF UP TO FIVE DIFFERENT UNITS. FROM A MAXIMUM OF FOUR CONVERSION FACTORS, THE PROGRAM GENERATES THE CONVERSION TABLE WHICH CAN BE STORED ON ONE SIDE OF A DATA CARD. SEVERAL EXAMPLES ARE GIVEN FOR PHYSICAL AND MONETARY QUANTITIES.

212PROGRAM STEPS
FRANCOIS HAENSSLER
CH-GENEVA.

52413D 97-LAME-CLAPEYRON EQUATIONS

THE PROGRAM COMPUTES AXIAL, TANGENTIAL AND RADIAL STRESSES AS WELL AS RADIAL DEFORMATIONS AT ANY POINT IN THE WALLS OF A THICK STEEL CYLINDER SUBMITTED TO INTERNAL AND/OR EXTERNAL HYDROSTATIC PRESSURES. FACILITY IS ALSO GIVEN FOR TABULATING THESE VALUES BETWEEN INTERNAL AND EXTERNAL RADIUS OF THE CYLINDER.

185PROGRAM STEPS
FRANCOIS HAENSSLER
CH-GENEVA.

52414D 67-PROBLEM OF THE DOUBLE SPRING 2

GIVEN TWO MASSES M1 AND M2, SEPARATED BY A SPRING FOR WHICH K=K2 N M**-1 AND M1 IS ATTACHED TO A SUPPORT BY A SPRING FOR WHICH K=K1 N M**-1. AFTER THE SYSTEM IS BROUGHT TO REST, THE MASSES ARE DISPLACED A METRES DOWNWARD AND RELEASED. THIS PROGRAM COMPUTES THE MOTION OF BOTH MASSES, EVERY 1/10 SEC.

143PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52415D 67-A BALLISTIC PROBLEM A

A PROJECTILE OF MASS M IS FIRED INTO THE AIR (AIR-RESISTANCE =K) WITH INITIAL VELOCITY V0 AT AN ANGLE ALPHA WITH THE GROUND. THIS PROGRAM COMPUTES : A) THE POSITION OF THE PROJECTILE (X,Y) DELTA T BY DELTA T TO MAKE A GRAPH, B) GIVEN THE DISTANCE OF THE TARGET TO (0,0) AND THE WANTED TIME T, THE NECESSARY ANGLE ALPHA, C) GIVNE THE DISTANCE AND ALPHA, THE EXACT TIME.

097PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52416D 67-A BALLISTIC PROBLEM B

A PROJECTILE OF MASS M IS FIRED INTO THE AIR (AIR RESISTANCE = K) WITH INITIAL VELOCITY V0 AT AN ANGLE ALPHA WITH THE GROUND. THIS PROGRAM COMPUTES THE DISTANCE BETWEEN THE START AND THE FALL ON THE GROUND, AND THE TIME T BETWEEN BOTH EVENTS. YOU CAN ALSO COMPUTE THE EXACT TIME WHEN THE DISTANCE IS GIVEN.

103PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52417D 67-HORIZONTAL BEAMS I

A HORIZONTAL BEAM OF LENGTH L METRES IS FIXED AT ONE END AND FREELY SUPPORTED AT THE OTHER END. THE BEAM CARRIES A UNIFORM LOAD Q(NM**-1) OF LENGTH AND A WEIGHT P AT THE MIDDLE.
WITH THIS PROGRAM YOU CAN LOCATE THE POINT OF MAXIMUM DEFLECTION AND THIS DEFLECTION IN METRES, WHEN ALSO GIVEN IS I AND E.

147PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52418D 67-HORIZONTAL BEAMS 2

A HORIZONTAL BEAM OF LENGTH L METRES IS FREELY SUPPORTED AT BOTH ENDS. THE BEAM HAS A LOAD OF PN BETWEEN BOTH ENDS, AT 5 METRES FROM LEFT.
THIS PROGRAM COMPUTES : A) THE LOCATION OF THE POINT OF MAXIMUM DEFLECTION AND B) THIS MAXIMUM DEFLECTION.

061PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52419D 67-ECCENTRIC FORCING-CONE CIRCLE RECTANGLE

THIS PROGRAM ALLOWS TO DESIGN THE DEVELOPMENT OF AN ECCENTRIC FORCING CONE CIRCLE RECTANGLE.

147PROGRAM STEPS
EDUARD STOESSEL
CH-DUEBENDORF.

52420D 67-CIRCLE, ANGLE, ARC AND SEGMENTS

THIS PROGRAM CALCULATES FOUR OF THE SIX FOLLOWING QUANTITIES WHEN THE TWO OTHERS ARE GIVEN: THE SIX QUANTITIES ARE (ALL FOR THE SAME CIRCLE) : RADIUS, HALF OF THE ANGLE AT THE CENTER, ARC CHORD, DISTANCE BETWEEN CENTER AND CHORD, AND DISTANCE BETWEEN MIDDLE OF ARC AND CHORD.

224PROGRAM STEPS
BENOIT LEMERCIER
B-BRUXELLES.

52421D 67-CUBE ROOT WITH NEWTON-RAPHSON-METHOD

PROGRAM FINDS THE CUBE ROOT OF X BY NEWTON-RAPHSON-METHOD. USER DEFINED LEVEL OF ACCURACY AND IF THE VALUE SHOULD BE ROUNDED OFF OR UP.

068PROGRAM STEPS
MICHAEL TARNOWSKI
D-WIESBADEN.

52422D 97-BIORHYTHM WITH PLOTTING OF CYCLES

THIS PROGRAM GIVES BY GIVEN BIRTHDAY AND A STARTING DATE A PRINTOUT OF ALL THREE BIORHYTHM-CYCLES FOR THE GIVEN DATE OR A PERIOD OF TIME. THE TWO DATES MUST OCCUR BETWEEN MARCH 1, 1900 AND FEBRUARY 28 2100. PART TWO OF THE PROGRAM PRINTS A GRAPHICAL OUTPUT OF ALL CYCLES.

224PROGRAM STEPS
MICHAEL TARNOWSKI
D-WIESBADEN.

52423D 67-NAVIGATORS NOON DATA 1

THIS PROGRAM COMPUTES DR NOON POSITION AND THE TIME WHEN THE SUN IS PASSING THE MERIDIAN. AFTER THE TIME IS OBTAINED, IT CALCULATES THE DR POSITION AND EXPECTS SEXTANT ALTITUDE FOR THE MERIDIAN PASSAGE.

192PROGRAM STEPS
RUDOLF KREUTZER
D-TANGSTEDT/HAMBURG.

52424D 67-SUN CULMINATION

THIS PROGRAM COMPUTES THE GREENWICH TIME OF SUN CULMINATION. THEN GIVING THE SEXTANT HEIGHT OF THE SUN IT COMPUTES THE LATITUDE OF POSITION. SEXTANT READING IS CORRECTED FOR DIP OF THE HORIZON, MEAN REFRACTION AND SEMI DIAMETER OF THE SUN.

221PROGRAM STEPS
FRANCOIS SAINT-BLANCAT
F-LE VESINET.

52425D 67-TIDE CALCULATION FOR FRENCH TYPE TABLES AND CHARTS.

FROM TIDE DATA IN STANDARD PORT AND TIDE CORECTIONS IN SECONDARY PORT, PUTING IN TWO PARAMETERS, COMPUTES THE THIRD ONE. PARAMETERS : DEPTH OF WATER UNDER SHIP, CHART HEIGHT AT SHIP POSITION AND TIME. THIS PROGRAM WORKS INDIFERENTLY DURING EBB OR FLOOD AND WITH TIME LIMITS IN SAME DAY OR IN TWO CONSECUTIVE DAYS (FRENCH UNITS, TABLES AND CHART SYSTEM).

149PROGRAM STEPS
ERIC BEROUD
F-LYON.

52426D 67-HIP

HIP, A GAME INVENTED BY MARTIN GARDNER, IS PLAYED ON A 6X6 TYPE CHESSBOARD. YOU AND THE CALCULATOR HAVE 18 BLACK AND WHITE PIECES RESPECTIVELY. THESE ARE PUT ON THE BOARD ALTERNATELY. WHOEVER PUTS DOWN 4 PIECES FIRST SUCH THAT THEY FORM A SQUARE OF ANY KIND (I.E. WITH SIDES NOT NECESSARILY PARALLEL TO THOSE OF THE BOARD) LOSES THE GAME. OPTIONALLY THE PROGRAM WILL CHECK WHETHER YOU HAVE PUT DOWN A SQUARE.

216PROGRAM STEPS
ALEXANDER GRUZA
GB-LONDON.

52427D 67-FILON'S RULE FOR FOURIER COEFFICIENTS UP TO 9 FUNCTIONS

FILON'S INTEGRATION FORMULA IS THE ONLY PROCEDURE TO OBTAIN AT OR BT FOURIER COEFFICIENT WHEN ITS ORDER IS HIGH. ANOTHER NUMERICAL INTEGRATION AS PER SIMPSON'S RULE, IS UNABLE. THE ACCURACY OF FILON'S IS ESTIMABLE. MOREOVER THIS PROGRAM ALLOWS A PERIOD PARTITION UP TO 9 DIVISIONS AND THESE CAN BE UNLIKE. LIMITS CAN BE PI(N) OR RATIONAL NUMBERS, INDISCRIMINATELY THERE ARE 46 OR 63 STEPS TO INPUT FUNCTIONS.

179PROGRAM STEPS

52427D (CONTD,

FELIPE LANDA
E-CORDOLA.

52428D 67-WORM CONVEYER

THIS PROGRAM CALCULATES THE LEADING DIMENSIONS WITH INTERCHANGEABLE IN- AND OUTPUT OF THE THROUGHPUT PER UNIT OF TIME, SPEED OF ROTATIONS AND DIAMETER OF THE WORM CONVEYER. BESIDES YOU MAY CALCULATE THE MOST EXTERNAL DIAMETER OF ITS BRACING TUBE, SKETCH THE DEVELOPMENT OF THE SCREW THREAD, AND ROUND THE DIMENSIONS ACCORDING TO THE E20-ROW.

317PROGRAM STEPS
EDUARD STOESSEL
CH-DUEBENDORF.

52429D 67-HIGH ACCURACY TIMER WITH PERMANENT TIME DISPLAY.

WITH THIS PROGRAM YOUR HP-67/97 WILL BECOME A HIGH ACCURACY TIMER (MINIMUM INTERVAL ABOUT 5/100 SEC) WITH PERMANENT TIME DISPLAY | (IN SECONDS).

224PROGRAM STEPS
ARNOUD TEN CATE
NL-AMSTERDAM.

52430D 67-SQUARE ROOTS OF ANY 2X2 MATRIX

THIS PROGRAM CALCULATES WITHOUT ITERATION :
1) ALL THE REAL SQUARE ROOTS OF A REAL 2X2 MATRIX.
2) ALL THE SQUARE ROOTS OF A REAL 2X2 MATRIX
3) ALL THE SQUARE ROOTS OF A COMPLEX MATRIX OF DIMENSION 2.

224PROGRAM STEPS
PHILIPPE LEMAIRE
B-CHENEE.

52431D 67-97-BINARY HEXADECIMAL CONVERTER

THIS PROGRAM CONVERTS SIGNED BINARY NUMBERS, UP TO A MAXIMUM OF 20 BITS TO HEXADECIMAL AND VICE-VERSA. PROGRAM ACCEPTS AND DISPLAYS/PRINTS HEXADECIMAL NUMBERS WITHOUT THE CONVENTIONAL ALLOCATION OF TWO PLACES FOR EACH NON ALPHA NUMERIC DIGIT. A SPECIAL MARKER DISTINGUISHES THE ALPHANUMERIC DIGITS FROM THE OTHER NON ALPHA DIGITS.

223PROGRAM STEPS
ERNST E. SIE
D- EMMENDINGEN.

52432D 67-POLYNOMIAL REAL ROOT AUTOMATIC TRACKING

THIS PROGRAM COMPUTES AUTOMATICALLY ALL REAL ROOTS OF A REAL COEFFICIENT POLYNOMIAL WITHIN ANY GIVEN INTERVAL BY NEWTON'S ITERATION METHOD AND WITHOUT DUPLICATION. MOREOVER THE VALUES OF THE POLYNOMIAL AND OF ITS FIRST DERIVATIVE CAN BE COMPUTED WITHIN THE SAME INTERVAL AT VARIABLE SAMPLES DISTRIBUTED IN LINEAR INCREMENTS.

189PROGRAM STEPS
PIERRE GRANIER
F-VANVES.

52433D 67-CAUER 1 AND 2 REALIZATIONS-ROUTH TEST FOR STABILITY

THE PROGRAM REALIZES REACTANCE ONE-PORTS FROM A REACTANCE FUNCTION OF ORDER N<=20 WHICH IS ALPHA RATIO OF ALPHA FULL ODD (EVEN) TO A FULL EVEN (ODD) POLYNOMIAL OF S, BY EXPANDING IT INTO ALPHA CONTINUED FRACTION ALPHA ROUND INFINITY (COVER 1 REALIZATION) OR ALPHA ROUND ZERO (COVER 2 REALIZATION). MOREOVER, THE PROGRAM MAY EXAMINE IF ALPHA FULL POLYNOMIAL OF DEGREE

52433D (CONTD)

N<= 20 IS STRICTLY HURWITZ, USING THE ROUTH TEST.

130PROGRAM STEPS
HERAKLES DIMOPOULOS
GR-ATHENS.

52434D 97-SORTED DATA AND THEIR INDICES

A FILE OF MAX. 48 DATA IS TRANSFORMED TO A SERIE OF INCREASING VALUES OUTPUT OF TOTAL AND AVG, OF DATA WITH THEIR NEW AND THEIR ORIGINAL INDEX. NEW INDEX PERMITS QUICK IDENTIFICATION OF MEDIAN, ORIGINAL INDEX IDENTIFIES SUBJECTS THAT DATA REPRESENT.

196PROGRAM STEPS
PETER PESCHEL
D-ESSEN.

52435D 67-UP TO 5 FUNCTIONS IN STORED 5X12 TABLE AND INTERPOLATION

PROGRAM GIVES EASY POSSIBILITIES OF STORING UP TO 5 FUNCTIONS GIVEN IN A TABLE OF UP TO 60 Y-VALUES ACCORDING TO 12 X-VALUES AND LINEAR INTERPOLATION FOR ANY X-VALUE IN TABLE RANGE. WITH 72 STORED VALUES 24 REGISTERS ARE USED AND ONLY REGISTER 0 AND I ARE FREE FOR PROCEDING CALCULATION. THE X-AND 3 Y-VALUES MAY HAVE 3 VALID DIGITS, TWO Y-VALUES MAY HAVE 4 VALID DIGITS.

106PROGRAM STEPS
RALPH BEAUCAMP
D-MUENSTER.

52436D 67-AERIAL BATTLE

A TWO PLAYER'S GAME : EACH PLAYER IS IN A PLANE AND MUST DESTROY THE OTHER ONE. YOU MUST FIND YOUR ENNEMY IN A 2 DIMENSIONS AREA AND SHOOT HIM BEFORE HE DOES IT. BE CAREFUL : SAVE YOUR GAS AND DO NOT DECREASE YOUR SPEED TOO MUCH IF YOU DO NOT WANT TO SCRATCH.

221PROGRAM STEPS
PHILIPPE SAUVAN-MAGNEI
F-MARLY LE ROI.

52437D 67-RCL AND RESONANCE CIRCUIT

THIS PROGRAM CALCULATES THE IMPEDANCE Z PHI(DEG), PHI(RAD), C,L,R AND FREQUENCY, RESONANT VALUE PHI N L AND C KNOWING 2,3 OR 4 DATA F(R,L,C,F,Z). IT SOLVES MANY KIND OF PROBLEMS FA(RLC) SERIAL CIRCUITS

139PROGRAM STEPS
PHILIPPE SAUVAN MAGNET
F-MARLY LE ROI.

52438D 67-AUTOMOBILE RACE

YOU HAVE TO TRAVERSE A SQUARE FROM THE LOWER LEFT TO THE UPPER RIGHT DIAGONAL POINT. THE SQUARE IS DIVIDED IN FIVE REGIONS EACH OF THEM WITH A SPECIFIC VELOCITY. GIVE IN EACH REGION THE ANGLE OF TRAVERSE AND REACH THE END POINT AS QUICK AS POSSIBLE. THERE IS ALSO A ROUTINE TO CALCULATE THE BEST TIME AND THE CORRESPONDING BEST ANGLES.

221PROGRAM STEPS
HERMAN PEETERS
B-BOECHOUT.

52439D 67-CONTINUOUS MEMORY

WITH THIS PROGRAM YOU PRESERVE YOUR PROGRAM : THE REGISTERS R0 TO R25 ARE A CARD; THE REGISTERS RX, RY, RZ, RT AND LAST X ; THE FLAGS, THE NOTATION, TRIG AND DSP ON A SIDE OF THE OTHER CARD.

112PROGRAM STEPS

52439D (CONTD)

JEAN REIBEL
F-FONTENAY AUX ROSES.

52440D 97-DATA FREQUENCY REGISTRATION & PERCENTILE CALCULATION

PROGRAM STORES DATA FREQUENCIES IN USER DEFINED CLASSES AND EXECUTES CALCULATION OF ANY PERCENTILE AND ITS CONFIDENCE LIMITS. AN ADDITIONAL PRINT OUT OF CLASS LIMITS, CLASS FREQUENCY & CUMULATED FREQUENCY IS POSSIBLE AT ANY MOMENT OF DATA INPUT PROCEDURE.

224PROGRAM STEPS
ROBERT F.J VAN DAMME
B-TIENEN.

52441D 97-COORDINATES FROM DIFFERENCE IN HEIGHT

PROGRAM CALCULATES COORDINATES OF POINTS AROUND RESERVOIR/LAKE WATER LEVEL FROM DIFFERENCE IN HEIGHT OF HEIGHT OF COLLIMATION AND WATER LEVEL, USING ONE THEODOLITE AND OBERVING ONLY HORIZONTAL AND VERTICAL ANGLES.

089PROGRAM STEPS
BRIAN LASEBY
GB-BANGOR.

52442D 67-DEFINITE INTEGRAL 6 SIMPSON

WITH A CONTINUOUS AREA BETWEEN THE GIVEN LIMITS THE PROGRAM APPROXIMATES : 1) AREA UNDER THE CURVE. 2) VOLUME TRACED OUT BY THAT AREA REVOLVED. 3) CENTROIDS OF THAT AREA 4) CENTRE OF GRAVITY OF THE VOLUME TRACED OUT.5) LENGTH OF THE CURVE. 6) SURFACE AREA TRACED OUT BY THE CURVE.... USING "SIMPSONS RULE".

099PROGRAM STEPS
LAWRENCE B. HARTLEY
GB-BRIERFIELD.

52443D 67-A SPECIAL DISTRIBUTION 2

PROGRAM COMPUTES THE SPECIAL DISTRIBUTION, POINT AFTER POINT, OR DIRECTLY.

050PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52444D 67-QUANTUM-MECHANICS I

GIVEN AN HOMOGENIUS INTEGRAL-EQUATION OF THE TYPE, THIS PROGRAM FINDS THE EIGENFUNCTIONS AFTER COMPUTING THE EIGENVALUES.

060PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52445D 67-BAIRSTOW METHOD FOR POLYNOMIALS OF DEGREE 1 TO 10

GIVEN A POLYNOMIAL OF DEGREE 1 TO 10 WITH REAL COEFFICIENTS, THIS PROGRAM CALCULATES ITS ROOTS WITH THE BAIRSTOW METHOD. FOR DEGREE LARGER THAN 2, A QUADRATIC FACTOR WITH REAL COEFFICIENTS AND THE CORRESPONDING QUOTIENT ARE GIVEN FIRST, THEN THE ROOTS OF THE FACTOR.

224PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52446D 67-BAIRSTOW METHOD FOR POLYNOMIALS OF DEGREE 4 TO 9

GIVEN A POLYNOMIAL OF DEGREE 4 TO 9 WITH REAL COEFFICIENTS, THIS PROGRAM USES THE BAIRSTOW METHOD TO FIND QUADRATIC FACTORS WITH REAL COEFFICIENTS. HAVING FOUND ONE,

52446D (CONTD)

YOU ALSO GET THE QUOTIENT, WITH WHICH YOU CAN REPEAT THIS PROCEDURE A SUBROUTINE ALLOWS YOU TO FIND OUT HOW ACCURATE CALCULATIONS WERE, BY RECALCULATING THE ORIGINAL POLYNOMIAL FROM ITS FACTORS.

223PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52447D 67-QUATRINIM

TWO PLAYERS, YOU AND MAC, ALTERNATIVELY TAKE A NUMBER OF OBJECTS FROM A GIVEN PILE, AT LEAST ONE AND AT MOST FOUR TIMES THE PRECEDING NUMBER TAKEN. THE FIRST PLAYER CAN TAKE ANY NUMBER OF OBJECTS, BUT NOT ALL IN THE POSITIVE VERSION OF THE GAME, AND NOT ALL BUT ONE IN THE NEGATIVE VERSION. HE WHO TAKES LAST OBJECT WINS THE GAME IN THE POSITIVE VERSION, AND LOSES IN THE NEGATIVE VERSION. MAC REFUSES YOUR FALSE MOVES.

128PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52448D 67-TRINIM

TWO PLAYERS, YOU AND MAC, ALTERNATIVELY TAKE A NUMBER OF OBJECTS FROM A GIVEN PILE, AT LEAST ONE AND AT MOST THREE TIMES THE PRECEDING NUMBER TAKEN. THE FIRST PLAYER CAN TAKE ANY NUMBER OF OBJECTS, BUT NOT ALL IN THE POSITIVE VERSION OF THE GAME, AND NOT ALL BUT ONE IN THE NEGATIVE VERSION. HE WHO TAKES LAST OBJECT WINS IN THE POSITIVE VERSION AND LOSES IN THE NEGATIVE VERSION. MAC REFUSES YOUR FALSE MOVES.

121PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52449D 67-BINIM

TWO PLAYERS, YOU AND MAC, ALTERNATIVELY TAKE A NUMBER OF OBJECTS FROM A GIVEN PILE, AT LEAST ONE AND AT MOST TWICE THE PRECEDING NUMBER TAKEN (AS IN FIBONIM). THE FIRST PLAYER CAN TAKE ANY NUMBER OF OBJECTS, BUT NOT ALL IN THE B***-VERSION OF THE GAME (I.E. FIBONIM) AND NOT ALL BUT ONE IN THE B**--VERSION OF THE GAME. HE WHO TAKES LAST OBJECT WINS IN B*** AND LOSES IN B**-. MAC REFUSES FALSE MOVES.

112PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52450D 67-CHARACTERISTIC EQUATION OF 4.4 MATRIX

THIS ONE CARD PROGRAM CALCULATES THE COEFFICIENTS OF THE CHARACTERISTIC EQUATION OF A 4.4 MATRIX.

214PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52451D 67-OSCULATING CIRCLES OF GIVEN CONIC

GIVEN THE EQUATION OF A CONIC IN AN ORTHONORMAL BASE, THIS PROGRAM FINDS THE COODINATES OF THE CENTER AND THE RADIUS OF THE OSCULATING CIRCLE IN ANY POINT OF THIS CONIC.

204PROGRAM STEPS
RAYMOND BROECKX
B-WILRIJK.

52452D 67-CHESS 6.7

IN THIS GAME, YOUR HP BECOMES AN ACTUAL CHESS PLAYER. WITH THAT

52452D (CONTD)

PROGRAM YOU CAN PLAY CHESS AGAINST IT, WITH A KING, A QUEEN, CASTLES, BISHOPS, KNIGHTS, PAWNS. IT IS SURPRISING, BUT THE HP HAS AN ACTUAL CHANCE TO WIN AGAINST A BEGINNER.

161PROGRAM STEPS
JEAN-PIERRE FAISAN
F-PARIS.

52453D 67-COMPUTE YOUR NET SALARY VS PROPORTIONAL FIXED DEDUCTIONS

GIVEN TEN RATES OF DEDUCTIONS AND FOUR FIXED DEDUCTIONS (MAXIMUM) THIS PROGRAM COMPUTES NET SALARY. RATES MAY BE APPLIED EITHER TO TOTAL AMOUNT OR TO PARTIAL AMOUNT THROUGH A VERSATILE CODE WORD. DEDUCTIONS AND CODE WORD MAY BE DEFINED BY USER AND RECORDED ON SIDE NO 1 OF MAGNETIC CARD IF NOT SECURED.

112PROGRAM STEPS
PIERRE GRANIER
F-VANVES.

52454D 67-CONVERSION OF INTEGERS FROM ONE BASE TO ANOTHER

PROGRAM WILL CONVERT AN INTEGER FROM ONE BASE TO ANOTHER. THE TWO BASES MAY BE ANY FROM 2 TO (AND INCLUDED) 10. CONVERSION MAY BE DONE IN BOTH DIRECTIONS.

146PROGRAM STEPS
KAI VIGGO MUNCH
N-RYKKINN.

52455D 67-PRINCIPAL STRESSES

COMPUTATION OF PRINCIPAL STRESSES FROM A GENERAL TRIAXIAL (OR BIAXIAL) STRESS STATE.

146PROGRAM STEPS
KAI VIGGO MUNCH
N-RYKKINN.

52456D 67-TEST OF EQUALITY BETWEEN REGRESSORS OF TWO REGRESSIONS

THIS PROGRAM TESTS THE EQUALITY BETWEEN THE REGRESSORS BY USING A CHOW-METHOD.

132PROGRAM STEPS
EVERT CARLSSON
S-GOETEBORG.

52457D 67-CALCULATOR EXTENSION, GENERAL FINANCE

THIS PROGRAM WORKS LIKE PROGRAM NO 51760D, BUT IT INCLUDES FINANCIAL FUNCTIONS. THE FUNCTIONS ARE : N-I-PV-PMT-FV, BEGIN-END SWITCH AND A LIST-FUNCTION. THE PROGRAM IS ALSO USABLE, WHEN MORE THAN ONE PAYMENT OCCUR IN EACH INTERESTING PERIOD. THE PROGRAM USES THE SAME CASH-FLOW-SIGN CONVENTION AS THE HP FINANCIAL CALCULATORS DO. STACK AND LAST X CHANGE AND ERROR DISPLAY COMES UP LIKE THEY DO FOR BUILD-IN FUNCTIONS. CARD 2 IS USED ONLY WHEN SOLVING FOR INTEREST RATE WITH PAYMENTS INVOLVED.

431PROGRAM STEPS
BJORN ENGSIG
DK-ALLEROD.

52458D 67-GERMAN INCOME-TAX SINCE 1979

ACCORDING TO "STEUERAENDERUNGS-GESETZ 1979 VOM 30.11.1978" THIS PROGRAM CALCULATES YEARLY TAX WHEN YEARLY INCOME IS ENTERED.

190PROGRAM STEPS
HANS FLORIAN HOYER
D-STUTTGART.

52459D 67-DIMENSIONING OF STEEL PROFILES FOR BENDING

YOU CHOOSE TYPE OF PROFILE (HE-A, HE-B, HE-M, I) STORE MOMENT, SPAN, ADMISSIBLE BENDING TENSION AND DEFORMATION, AND THE PROGRAM RETURNS TO YOU THE NECESSARY HEIGHT OF CHOSEN PROFILE. NO DATA CARDS ARE NEEDED.

223PROGRAM STEPS
HANS FLORAIN HOYER
D-STUTTGART.

52460D 67-APPROXIMATION OF OMEGA NUMBERS ACCORDING TO DIN 4114

THIS PROGRAM GIVES YOU TWO SUBPROGRAMS FOR OWN USE. FOR BOTH ST 37 AND ST 52 THESE SUBPROGRAMS RETURN YOU THE APPROX. AMEGA NUMBER FOR THE LAMBDA YOU SPECIFIED. MAXIMUM MISTAKE IS 4.3% ON SAFE SIDE AND 1.8% ON UNSAFE SIDE. FOR LAMBDA GREATER 110, MISTAKE IS LESS THAN ONE PERCENT.

064PROGRAM STEPS
HANS FLORIAN HOYER
D-STUTTGART.

52461D 97-STAR EQUATORIAL COORDINATES VS EARTH PRECESSION

PROGRAM PERFORMS EXACT CONVERSION OF EQUATORIAL COORDINATES OF STARS BETWEEN TWO DATES DUE TO EARTH PRECESSION. INPUTS ARE: - JED'S - EITHER RIGHT ASCENSION (HMS OR DMS) OR SHA (DMS), AND DECLINATION (DMS) WITH OR WITHOUT PROPER MOTIONS. ALLOWS CONVERSION FOR NEW DATA OR STAR, ENTERING ONLY MODIFIED ELEMENTS. PROGRAM USES NEW 1976-77 SYSTEM OF ASTRONOMICAL CONSTANTS, AND INCLUDES CONVERSION TO JED OF ANY DATE OF JULIAN OR GREGORIAN CALENDAR.

220PROGRAM STEPS
JEAN THIBERGE
F-CHERBOURG.

52462D 67-RESISTIVE ATTENUATOR AND MATCHMAKER DESIGN

I) CALCULATES THE VALUES OF THE RESISTANCES YIELDING SYMETRICAL ATTENUATOR WITH DIFFERENT PATTERN (T,PI,ETC...). THE INPUTS DATA ARE ZC AND THE VOLTAGE ATTENUATION FACTOR IN DB.
II) THE SAME FOR MATCHMAKER. THE DATA INPUTS ARE ZC1 AND ZC2 AND THE VOLTAGE ATTENUATION FACTOR CALCULATES THE SMALLEST ATTENUATION AT EITHER END OF THE NETWORK.

202PROGRAM STEPS
MICHEL PIERQUIN
F-THIAIS.

52463D 67-GENERAL E-DISTRIBUTION

PROGRAM COMPUTES THE LIMIT IF P=N+N1 FOR N=I TO N=INFINI, POINT AFTER POINT.

038PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52464D 67-ORBIT OF AN ELECTRON IN AN ELECTRIC AND MAGNETIC FIELD

GIVEN F IN V/M AND B IN OERSTED, THIS PROGRAM COMPUTES THE ORBIT OF AN ELECTRON IN THOSE FIELDS, IN X-Y-STYLE, FOR EVERY DELTA T.

073PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52465D 67-GENERAL BALLISTIC PROBLEM

AFTER THE INPUT OF VO, ALPHA, K AND

52465D (CONTD)

DELTA T, THIS PROGRAM COMPUTES THE ORBIT OF A PROJECTILE IN X-Y-STYLE. BECAUSE THE AIR-RESISTANCE K AND THE G DEPEND ON THE DISTANCE BETWEEN THE PROJECTILE AND THE EARTH, SOME CORRECTIONS ARE MADE WITH A FEED-BACK CONTROLE SYSTEM.

193PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52466D 67-ZETA-FUNCTION OR RIEMANN 2

PROGRAM COMPUTES A ZETA-FUNCTION OF RIEMANN WHEN A AND B ARE GIVEN.

048PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52467D 67-ZETA-FUNCTION OF RIEMANN 3

PROGRAM COMPUTES A ZETA-FUNCTION OF RIEMANN WHEN A AND B ARE GIVEN.

048PROGRAM STEPS
JOHN VAN THIELEN
B-STABROEK.

52468D 97-RAILWAY TIMETABLE ANALYZER

GIVEN TIMES OF DEPARTURE AND ARRIVAL, AND DISTANCE COORDINATES OF STATIONS, PROGRAM COMPUTES :
1) DISTANCE, TRAVELLING TIME, AVERAGE SPEED FOR A SINGLE SECTION;
2) TOTAL DISTANCE, TOTAL NET TIME (EXCL. STOPS), TOTAL GROSS TIME (INCL. STOPS) AND THE 2 AVERAGE SPEEDS FOR AN UNLIMITED SEQUENCE OF SECTIONS; 3) CROSSING POINT AND CROSSING TIME WITH A TRAIN COMING FROM THE OPPOSITE DIRECTION.
OPTIONS: INPUT DATA PRINT, SECTIONS LONGER THAN 24 HOURS, 3 DIFFERENT DATA INPUT MODES.

213PROGRAM STEPS
HANS STOECKLMAIR
A-KLAGENFURT.

52469D 67-BULK MATERIAL CAPACITY OF RECTANGULAR BINS

THE PROGRAM EVALUATES THE TOTAL CAPACITY OF RECTANGULAR BINS WHEN STORING BULK MATERIALS, GIVEN THE ANGLE OF REPOSE AND THE GEOMETRICAL CHARACTERISTICS OF THE BIN. ANY CONSISTENT SET OF UNITS CAN BE USED.

075PROGRAM STEPS
GIUSEPPE LIGATO
I-MILANINO.

52470D 67-THREAD MECHANICS (ISO)

THIS PROGRAM COMPUTES THE NEEDED MOMENT TO ASSEMBLE A SCREW TO A GIVEN AXIAL FORCE, AND THE INVERSE. THE PROGRAM ALSO COMPUTES A MORE EXACT MOMENT. IT NOW TAKES CARE OF THE SETTLEMENT IN THE THREAD AND THE CONTACT SURFACES AND AT LAST IT COMPUTES THE AXIAL AND TORSIONAL STRESS IN THE SCREW. ALL CALCULATIONS FOR ISO-SCREWS.

170PROGRAM STEPS
ERLING PEDERSEN
S-GOETEBORG.

52471D 67-LINEAR EQUATIONS IN 6 UNKNOWNS

THIS PROGRAM GIVES YOU THE SOLUTION OF A SYSTEM OF 6 LINEAR EQUATIONS IN 6 UNKNOWNS UNTIL :
- THE MATRIX IS SYMETRIC
- A(I,J)=0 IF I>J+3 OR J>I+3,
BY THE METHOD OF CHOLESKY.

348PROGRAM STEPS
DIDIER DE BRUYN
B-BRUXELLES.

52472D 67-SPERICAL HARMONICS WITH ANY REAL PARAMETERS AND ARGUMENTS

THIS PROGRAM COMPUTES SPHERICAL HARMONICS FOR ANY REAL PARAMETERS AND ARGUEMNTS IN DEGREES. A FACTORIAL FUNCTION FOR A REAL ARGUMENT IS PROVIDED. SINCERELY THE PROGRAM IS COMPLETELY DIFFERENT THAT 50220D BUT BOTH ARE OF SAME MATTER.

223PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52473D 67-97-MULTIPURPOSE CONVERTER

THIS PROGRAM CONVERTS SIGNED BINARY NUMBERS TO DECIMAL OR OCTAL AND VICE-VERSA. ALSO BINARY TO TWO COMPLEMENTS AND VICE-VERSA. THE PROGRAM ACCEPTS, PROCESSES AND DISPLAYS SIGNED BINARY NUMBERS UP TO A MAXIMUM OF 20 BITS. PROGRAM, IN ADDITION, CONVERTS POSITIVE OR NEGATIVE OCTAL NUMBERS TO DECIMAL.

220PROGRAM STEPS
ERNST E. SIE
D-EMMENDINGEN.

52474D 97-TRIGONOMETRICAL CALCULATION OF OPTICAL PATH DIFFERENCE

AN AXIAL RAY IS TRACED TRIGONOMETRICALLY AND THE OPTICAL PATH DIFFERENCE AT EACH SURFACE IS FOUND AND PRINTED, TOGETHER WITH THE OPTICAL PATH DIFFERENCE FOR THE COMPLETE OPTICAL SYSTEM. THE OUTPUT IS IN UNITS OF WAVE LENGTHS OF BRIGHTEST LIGHT. THE UNITS USED TO DEFINE THE OPTICAL SYSTEM MAY BE INCHES OR MILLIMETRES.

188PROGRAM STEPS
JAMES HOUGHTON
GB-TETBURY.

52475D 97-OPTICAL PATH DIFFERENCE FOR PARAXIAL RAYS

GIVEN THE SPECIFICATION OF AN OPTICAL SYSTEM THE PROGRAM DETERMINES THE OPTICAL PATH DEFFERENCE CONTRIBUTED BY EACH SURFACE TOGETHER WITH TOTAL OPTICAL PATH DIFFERENCE FOR THE COMPLETE SYSTEM. THE CALCULATION IS CONFINED TO THE PARAXIAL REGION. THE SPECIFICATION OF THE SYSTEM MAY BE IN INCH OR MILLIMETRE UNITS AND THE OUTPUT IS GIVEN IN UNITS OF WAVELENGTH.

122PROGRAM STEPS
JAMES HOUGHTON
GB-TETBURY.

52476D 67-AREAS-PERIMETERS

THIS PROGRAM COMPUTES THE AREA AND THE PERIMETER OF A RECTANGLE, A PARALLELOGRAM, A TRIANGLE A TRAPEZIUM AND A REGULAR POLYGON.

104PROGRAM STEPS
GILLES SAUVAGNAT
F-BRON.

52477D 67-MERSENNE'S NUMBERS

THE PROGRAM FINDS FACTORS OF MERSENNE'S NUMBERS I.E. OF NUMBERS OF THE TYPE 2**P-1 WHERE P IS A PRIME.

072PROGRAM STEPS
ATTILIO FARINA
I-TURIN.

52478D 97-VARIABLES SAMPLING INSPECTION PLANS

LET AN OBJECT BE ACCEPTABLE IF A CERTAIN CHARACTERISTIC IS GREATER (OR SMALLER) THAN A PRESENT LIMIT. THIS PROGRAM WILL COMPUTE THE SAMPLE SIZE AND THE LIMIT OF ACCEP-

52478D (CONTD)

TABILITY FOR THE SAMPLE MEAN AS A FUNCTION OF THE PRODUCER'S RISK FOR REJECTING A LOT HAVING AN ACCEPTABLE PROPORTION OF DEFECTIVES AND THE CONSUMER'S RISK FOR ACCEPTING A LOT HAVING AN UNACCEPTABLE PROPORTION OF DEFECTIVES.

100PROGRAM STEPS
CLAUDIO BENSKI
F-CLAIX.

52479D 67-II. GEODETIC PROBLEM FOR ELLIPSOID NSU1

PROGRAM CALCULATES, FOR GIVEN LONGITUDE AND LATITUDE OF TWO POINTS, THE AZIMUT, COUNTERAZIMUT AND DISTANCE. ELLIPTIC CALCULATION WITH GAUSSIAN MEAN LATITUDE FORMULA FOR DISTANCE SMALLER THAN 150 KM. USING OF DATA SET II.

219PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

52480D 67-LENGTH OF ELLIPTIC MERIDIAN NSU2

PROGRAM CALCULATES, FOR GIVEN LATITUDE, THE LENGTH OF THE ELLIPTIC MERIDIAN FROM EQUATOR TO THE POINT OR THE LENGTH DIFFERENCE OF TWO GIVEN LATITUDES.

054PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

52481D 67-I. GEODETIC PROBLEM FOR ELLIPSOID NSU3

PROGRAM CALCULATES, FOR GIVEN LATITUDE AND LONGITUDE OF A POINT AND DISTANCE AND AZIMUT TO A SECOND POINT, LATITUDE AND LONGITUDE OF THIS NEWPOINT AND THE COUNTERAZIMUT ELLIPTIC CALCULATION WITH LEGENDRIAN SERIES FOR DISTANCES SMALLER THAN 100 KM. USING OF DATA SET II.

718PROGRAM STEPS
JOHANNES GRUSS
D-WIESBADEN.

52482D 67-LARGE LEAST POSITIVE RESIDUES

THIS PROGRAM CALCULATES THE LEAST POSITIVE REMAINDER OF X**N, WHEN DIVIDED BY M. THIS IS OFTEN TERMED "THE RESIDUE OF X**N MODULO M". LIMITS ARE X,N<10**11, M<10**10. PROGRAM CAN BE USED TO QUICKLY DETERMINE IF A NUMBER IS COMPOSITE BY MEANS OF FERMAT'S THEOREM, OR TO APPLY SIMPLE VERSIONS OF SUCH EXPONENTIAL CRYPTOSYSTEMS AS HAVE BEEN DESCRIBED IN SCIENTIFIC AMERICAN.

224PROGRAM STEPS
ROLAND N. ANDERSON
S-STOCKHOLM.

52483D 67-TWO-PASS HEAT EXCHANGER PERFORMANCE

THIS PROGRAM COMPUTES TWO-PASS HEAT EXCHANGERS PERFORMANCES - WHEN HEAT EXCHANGERS ARE NOT STRICTLY COUNTER OR CO-CURRENT, IT IS HARD TO SOLVE THEIR EQUATIONS BY CALCULUS - HERE IT IS SOLVED BY SUCCESSIVE SUMMATION AND APPROXIMATIONS - WHEN ENTERING IN AN OUT TEMPERATURES FOR BOTH FLUIDS AND THE FLOWRATE OF ONE OF THEM, IT COMPUTES THE HEAT TRANSFER COEFFICIENT AND FROM THAT IT COMPUTES, FOR ANY FLOWRATE AND INLET TEMPERATURES, THE OUTLET TEMPERATURES AND HEAT TRANSFER.

222PROGRAM STEPS
PIERRE DELRUELLE
B-BRUXELLES.

52484D 67-CAPACITORS

THIS PROGRAM COMPUTES THE VOLTAGE OF A CAPACITOR AFTER A SPECIFIED TIME OF CHARGING. IT ALSO COMPUTES THE TIME NECESSARY TO REACH A SPECIFIED VOLTAGE. FURTHERMORE IT CAN COMPUTE THE TIME-CONSTANT, THE VALUE OF THE RESISTOR AND THE CAPACITOR, AND THE CURRENT THROUGH THE CAPACITOR. AN ERROR FUNCTION IS INCLUDED TO PREVENT FAULTY RESULTS BECAUSE OF DATA MISSING.

140PROGRAM STEPS
OLE THOFT JENSEN
DK-AARHUS.

52485D 67-DILOGARITH, PLANCK'S RADIATION & FOUR EINSTEIN'S FUNCTIONS

THIS PROGRAM GIVES DILOGARITHM (SPENCE'S INTEGRAL), PLANCK'S RADIATION FUNCTION AND FOUR EINSTEIN'S FUNCTIONS.

130PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52486D 67-DEBYE FUNCTIONS

THIS PROGRAM GIVES DEBYE'S INTEGRALS FROM ZERO TO INFINITE, FROM ZERO TO X SURPASSING ZERO AND FROM X TO INFINITE. THE PARAMETER N IS AN INTEGER SURPASSING 1. THREE DIFFERENT PROCEDURES ARE USED IN ORDER TO OBTAIN A GREATER CERELITY

223PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52487D 67-F(X) AND THE FIRST FOUR DERIVATIONS OF F(X)

THIS PROGRAM COMPUTES APPROXIMATELY Y=F(X), Y=F'(X), Y=F"(X), Y=F"'(X), Y=F""(X) OF A FUNCTION F(X).

152PROGRAM STEPS
BURKHARD KASTEN
D-SAARBRUECKEN.

52488D 67-SYSTEM DYNAMICS

SYSTEM DYNAMICS IS AN ALGORITHMIC METHOD FOR SIMULATING THE EVOLUTION IN TIME OF DYNAMIC, STATE-DETERMINED SYSTEMS - PHYSICAL OR GENERAL. ALTHOUGH SYSTEM SIMULATION IN GENERAL REQUIRES REAL COMPUTERS, THIS SIMPLE METHOD CAN BE USED ON PROGRAMMABLE CALCULATORS AND WILL SHOW THE QUALITATIVE BEHAVIOUR OF A GREAT MANY SYSTEMS IN WHICH THE SOLUTION OF THE DYNAMIC EQUATIONS IS BEYOND REACH.

055PROGRAM STEPS
BO JENSEN
DK-COPENHAGEN.

52489D 67-BELT DRIVE

THIS PROGRAM COMPUTES THE LENGTH OF TAG BELT OR THE DISTANCE BETWEEN THE AXES OF TWO PULLEYS. THEN IT ALSO COMPUTES THE REQUISITED PRESTRESSING FORCE TO TRANSMIT A GIVEN POWER AND AT LAST YOU CAN COMPUTE THE MAXIMUM TENSION IN THE BELT.

224PROGRAM STEPS
ERLING PEDERSON
S-GOTTHENBURG.

52490D 67-DISC BRAKES

WITH THIS PROGRAM YOU CAN CALCULATE THE RADIUS ON WICH A FORCE SHALL BE ASSEMBLED TO GET AN EVEN WEAR, THE NEEDED FORCE, THE TIME TO STOP FOR EXAMPLE A CAR WITH A GIVEN VELOCITY, THE INCREASE IN TEMPERATURE ON A BRAKE DURING THE BRAKE OPERATION AND THE KINETIC ENERGY A

52490D (CONTD)

VEHICLE CAN HAVE. IT CAN BE STOPPED AFTER A GIVEN TIME.

106PROGRAM STEPS
ERLING PEDERSEN
S-GOTHENBURG.

52491D 67-97-CHARACTER OF GRAIN

PROGRAM CALCULATES THE MESH-LINE MIXED TOGETHER FROM 1 TO 5 ADDITIONS TO CONTROL CONCRETE MIXING PLANTS.

166PROGRAM STEPS
A-FRITZ MAREK
A-VIENNA.

52492D 97-WINDING LINE BETWEEN TWO PARALLEL LINES

PROGRAM LISTS THE COORDINATES OF THE MAIN-POINTS OF THE WINDIND-LINE AND THE DATES OF THE CURVES FOR GAUGE.

224PROGRAM STEPS
GERHARD KRIZSANITS
A-LEOBERSDORF.

52493D 67-MOON SIGHT REDUCTION WITH AUTOMATIC SAILING CORRECTION

THE PROGRAM REDUCES SIGHTS FROM MOON OBERVATIONS. ALL DR AND ALMANAC DATA IS NEEDED. GMT OBS WILL THEN GIVE ZN AND HS WILL GIVE ALTITUDE INTERCEPT. THE PROGRAM MAY BE USED IN COMBINATION WITH THE SUN AND THE STAR PROGRAMS. IN BOTH CASES ONLY ALMANAC DATA IS NEEDED. THE PROGRAM WILL ALSO FIT THE "MULTI-FIX" PROGRAM.

217PROGRAM STEPS
JAN ANDERSEN
N-GERGEN.

52494D 67-MOODY'S DIAGRAM IN PIPE HYDRAULICS

THE PROGRAM IS AN APPLICATION OF MOODY'S DIAGRAM IN CIRCULAR PIPE HYDRAULICS, AND WILL CALCULATE ENERGY LOSS, DEBIT OR DIAMETER OF THE PIPE, PROVIDE THE NECESSARY INPUT.

213PROGRAM STEPS
STELIO VOYATZOPOULOS
GR-ATHENS.

52495D 67-BOOLEAN SIMULATION SUBROUTINES

SUBROUTINES FOR SIMULATION OF DIFFERENT LOGICAL STANDARD-GATES. INCLUDED ARE 2,3 AND 4 INPUT NAND AND NOR GATES, INVERTERS, JK-FLIP-FLOP AND N-BIT, N LESS EQUAL 9, PARALLEL-ACCESS SHIFTREGISTER. SUBROUTINES ARE GROUPED IN COMPLETELY INDEPENDENT GROUPS IN ORDER TO INCREASE FLEXIBILITY.

083PROGRAM STEPS
HANS EMLID
S-GOETEBORG.

52496D 67-CLAUSEN'S INTEGRAL AND SIX RELATED SUMMATIONS

THIS PROGRAM GIVES THE CLAUSEN'S INTEGRAL AND SIX RELATED SUMMATIONS IN THE CHOSEN PERIOD 0 TO PI.

219PROGRAM STEPS
FELIPE LANDA
E-CORDOBA.

52497D 67-ROOTS OF CUBIC EQUATIONS

PROGRAM CALCULATES THE REAL AND/OR COMPLEX ROOTS OF THIRD (OR SECOND) DEGREE EQUATION, USING ONLY ONE MEMORY REGISTER.
THIS PROGRAM IS APPLICABLE IN THE

52497D (CONTD)

MULTICARD PROGRAMS WHERE OTHER MEMORY REGISTERS SHOULD BE INTACT, OR INDEPENDENTLY.

127PROGRAM STEPS
FRANC TOMSIC
YU-LJUBLJANA.

52498D 67-97-SECTORED DISK

WHEN A CIRCULAR PIECE IS RADICALLY CUT INTO A NUMBER N>2 OF EQUAL SECTORS, THESE CAN FIT WHEN THEY ARE STUCKED TOGETHER INSIDE A CIRCLE WHOSE DIAMETER IS A FUNCTION OF INITIAL DIAMETER, N, AND CUT'S WIDTH. THE PROGRAM COMPUTES ALL THE INTERESTING DIMENSIONS OF THE ASSEMBLY IN FUNCTION OF THE CONTAINING CIRCLE.

211PROGRAM STEPS
FRANCOIS HAENSSLER
CH-GENEVA.

52499D 97-DUCTS (I)

PROGRAM CALCULATES RIGHT-ANGLED DUCTS SIDES A AND B (INTERNAL DIMENSIONS) AND TOTAL SURFACE OF MATERIAL USED. THIS PROGRAM IS AVAILABLE FOR AIRCONDITIONING, VENTILATION AND OTHER. MEASURES SIDES A AND B ARE IN CENTIMETER MEASURES TOTAL SURFACE MATERIAL ARE IN SQUARE METER. SIDES A AND B IN CM ARE ROUND FIVE IN FIVE CENTIMETER. TOTAL M2 SURFACE ADD A PERCENTAGE OF REMAINDER IF FIBERGLASS OR SIMILAR IS USED.

143PROGRAM STEPS
JUAN LUIS GARCIA LAGO
E-MURCIA.

52500D 97-DUCTS (II)

PROGRAM CALCULATES RIGHT-ANGLED DUCTS (AS PROGRAM DUCTS (I)), BUT BOTH SIDES, A AND B (INTERNAL DIMENSIONS) ARE NOT DETERMINATES BY CALCULATOR. YOU INPUT SIDE A AND CALCULATOR DISPLAY SIDE B, THIS ONE CAN BE INPUT OR CHANGE THIS ONE VALUE. CALCULATOR REMEMBERS ONLY SIDES INPUT FOR YOU, THEN CALCULATES TOTAL SURFACE OF MATERIAL USED. MEASURES SIDES A AND B ARE IN CENTIMETER. MEASURES TOTAL SURFACE MATERIAL ARE IN SQUARE METER.

112PROGRAM STEPS
JUAN LUIS GARCIA LAGO
E-MURCIA.

Part II

HP-67/97 Users' Club-Europe Contributor's Guide

HEWLETT hp PACKARD

INTRODUCTION

The purpose of the HP-67/97 Users' Club is to provide a means by which HP-67/97 calculator users can obtain application programs meeting common needs. Through this service, these programs are made available to all HP-67/97 users for a nominal handling charge. Active participation on your part, as a contributor, is the key to providing needed and useful programs. We urge you to document and submit those programs you feel might be of value to others.

In appreciation for any accepted program, you may select one of two options: (1) two free programs of your choice, or; (2) one free programs of your choice and ten blank magnetic cards; plus those you send with your program submittal. In addition, you will receive full author credit in the "HP-67/97 Program Catalog", a periodic publication containing abstracts of every program in the library.

Documenting A Program

This section explains the proper documentation procedures. Two sets of standard documentation forms are included in this package. The complete program submittal package consists of:

1. Program Submittal
2. Program Description I
3. Program Description II
4. User Instructions
5. Program Listings
6. Recorded Magnetic Card(s)

When submitted, the above documentation package becomes the property of the Club and is retained by it for testing and reviewing purposes.

In order to make the Club's services available to HP-67/97 users at the lowest possible cost, program orders are filled by photocopying forms 2 through 5 above. For this reason, it is important that:

1. All documentation be typed or legibly printed in black or blue-black ink. (See instructions on the Program Listing Form on using the paper tape print-out from the HP-97.)
2. You submit your programs on original forms. Documentation on photocopies of the forms or on other forms is not acceptable and will be rejected.

Please read carefully through the completed sample forms shown in this section for further detailed instructions on documenting your program.

Program Acceptance

The Club's staff reviews all submittals, checking for duplicate entries, duplication of existing programs from HP Application Pacs, clear and complete documentation in English, legibility, and ability to perform sample problem(s). Inasmuch as your fellow HP-67/97 owners expect a significant program for their money, we reserve the right to reject programs which do not represent a significant addition to othes users. If a program is not accepted, the complete submittal package is returned with a letter of explanation. If accepted, we notify you by letter and give you the assigned program number. At this time, you will also receive the complimentary option you have selected.

Sample Documentation

PROGRAM SUBMITTAL

Note: *Please type or print neatly using black or blue-black ink only. This form is retained by us and used to input catalog information into a computer. It is not shipped with program orders and is not to be numbered with Program pages.*

1 New Program
Check this box if submittal is new to the program library.

2 Revision to Program Number
Check this box if submittal is a revision to an already existing program. Write in number of program being revised (five digits followed by the letter D).

3 HP-67/97 Serial Number
Write in the serial number of the HP-67/97 calculator used to record your magnetic card(s). You will find this number permanently stamped on the underside of your calculator.

4 Program Title
Enter program title, preceded by a 6 or 9 to specify the model number of your calculator. Underline one or two keywords. Abbreviate where necessary so that title does not exceed the spaces provided.

5 Keyword(s)
Write in the keyword(s) underlined in your program's title.

6 Number of Steps
Enter the total number of program steps used on the Program Form(s) to list your program.

7 Category Number
Turn to the Application Category Table in this guide and identify the most appropriate category into which your program fits. Classify as specifically as possible. Write in the respective category number here.

8 Category Name
Enter the category name corresponding to the number shown above.

9 Abstract
Provide a brief description of your program. Do not exceed the 75-word maximum (or 750 total characters and spaces). If your program is similar to one already in the catalog, highlight the unique features of yours.

Since your abstract will be printed by a computer using a standard character set, no lower case letters, subscripts, or superscripts can be used and special characters are limited to those shown below:

$ @ * ( ) + = − / & c < > ! : ; " ' ? . ,

Do not use symbols in your abstract. Use the following examples as guidelines:

Symbol	How to Write	Symbol	How to Write	Symbol	How to Write	Symbol	How to Write
x^a	X**A	$n\sqrt{x}$	X**1/N	$x \div y$	X/Y	R_2	R2
$2\sqrt{x}$	X**½	$x \cdot y$	X*Y	e^x	EXP(X)	X_i	XI

10 Contributor's Name and Address
Write in your name and mailing address.

11 Acceptance Choice
Check the option you wish to receive if your program is accepted. List the numbers of the programs you wish in the spaces provided.

12 Submittal Checklist
Use this checklist to make sure you have completed each of the necessary items for program submittal. Mark the box to the left of each listed item before mailing. Cards (program and data) must be included for your program to be reviewed.

13 Acknowledgement and Agreement
Please read this statement carefully. It must be signed and dated before a program can be considered as a contribution to the Club.

Program Submittal

(1) → ☑ New Program

(2) → ☐ Revision to Program No. _____

(3) → HP-67 Serial No. _____ HP-97 Serial No. 1 6 1 0 A 0 0 0 0 1

(4) → Program Title: 9 7 - C U R V E F I T T I N G

Underline 1 or 2 Keywords: _____

(5) → Keyword(s) Underlined in Title: 1 C U R V E

2 F I T T I N G

(6) → No. of Steps: 1 8 3

(7) → Category No.: 0 4 0 4

(8) → Category Name: C U R V E F I T / R E G R E S S I O N / C O R R E L .

(9) → Abstract- 75 Word Maximum: Program fits a set of data points to: Straight lines, exponential curves, logarithmic curves, power curves.

(10) → Name: John (First) Doe (Last)

Address: 111 Main Street

City: Anytown, Country: ANY Postal Code: 12345

(11) → Acceptance Choice: ☐ Two Programs or ☐ One Program and 10 blank cards

0 0 1 7 9 D 0 0 1 8 5 D

(12) → Submittal Checklist: Please use the checklist below to insure submittal of all the proper program documentation.

- ☑ Program Submittal
- ☑ Program Description I
- ☑ Program Description II
- ☑ User Instructions
- ☑ Program Form(s)
- ☑ Magnetic Card(s)

ACKNOWLEDGMENT AND AGREEMENT

To the best of my knowledge, I have the right to contribute this program material without breaching any obligation concerning nondisclosure of proprietary or confidential information of other persons or organizations. I am contributing this program material on a nonconfidential nonobligatory basis to Hewlett-Packard Company ("HP") for inclusion in its program library, and I agree that HP may use, duplicate, modify, publish, and sell the program material, and authorize others to do so without obligation or liability of any kind. HP may publish my name and address, as the contributor, to facilitate user inquiries pertaining to this program material.

(13) → Signature _____ Date _____

PROGRAM DESCRIPTION I

Note: *Please type or print neatly using black or blue-black ink only. Programs are not retyped by HP personnel. The purchaser of your program will receive a photocopy of the page you submit.*

1 **Page Number**
Beginning with this form, sequentially number the pages of your program documentation package.

2 **Program Title**
Enter program title as shown on the Program Submittal form.

3 **Contributor's Name and Address**
Enter your name and mailing address.

4 **Program Description, Equations, Variables**
Provide a detailed description of your program. Since the abstract given on the Program Submittal form is not shipped with program orders, you may wish to duplicate all or part of it here. Make sure you include such information as program application, basic logic used, equations used, and any special considerations which should be pointed out, e.g., is program linked to another program.

5 **Operating Limits and Warnings**
Note any limits to your program's operating ability or accuracy. Also, warn users of any problems that may be encountered during program usage.

Additional Program Description I pages may be used to allow for more complete documentation of your program. Limits and Warnings should be written on the final Description I page, when more than one is used.

Program Description I

(2) **Program Title** Curve Fitting

Contributor's Name John Doe

(3) **Address** 111 Main Street

City Anytown **Country** ANY **Postal Code** 12345

(4) **Program Description, Equations, Variables**

Program fits a set of data points to: straight lines, exponential curves, logarithmic curves, power curves. It calculates the coefficient of determination and regression coefficients. Projections of x and y values may be made based on the curve fit.

Equations used are:

Linear regression	$y = a + bx$
Exponential Curve Fit	$y = ae^{bx}$
Logarithmic Curve Fit	$y = a + b \ln x$
Power Curve Fit	$y = ax^b$

(5) **Operating Limits and Warnings** Do not attempt to change from one type of fit to another after data input has begun because the summation registers are cleared when the type of curve fit is selected.

PROGRAM DESCRIPTION II

Note: *Please type or print neatly using black or blue-black ink only. Programs are not retyped by HP personnel. The purchaser of your program will receive a photocopy of the page you submit.*

1 **Page Number**
Continue the sequential numbering of your program documentation.

2 Draw a sketch(es) (if applicable) that might help the user understand the logic of your program. This sketch may be used in conjunction with your program description and/or sample problem. For example, the sketch shown on the adjacent page depicts data fit to a linear regression.

3 **Sample Problem(s)**
Provide a sample problem(s) that can be solved using your program. If more than one sample is given, sequentially number each of them.

4 **Solution(s)**
Given the keystroke solution(s) for the sample problem(s) stated above. Number solution(s) as in 3 above. Include intermediate results that may help the user follow through the problem(s).

5 **Reference(s)**
Direct the user to helpful reference material, e.g., texts from which mathematical formulas or algorithms were obtained. List reference(s) in bibliographic format, i.e., name of author, title of publication, edition, volume, page, publisher, and copyright year.

Additional Program Description II pages may be used to allow for more complete documentatin of your program. Write your references on the final Description II page, when more than one is used.

Program Description 11

(2) **Sketch(es)**

(3) **Sample Problem(s)**

Listed are the sales data for the first 6 months of a product's life. According to a linear projection, what should sales be after 12 months? When would sales reach the 150 unit per month mark assuming constant linear growth?

Month	1	2	3	4	5	6
Sales	15	37	52	59	83	92

(4) **Solution(s)**

Keystrokes			
[f] [B]	→	1.00	
15 [A] 37 [A] 52 [A] 59 [A] 83 [A] 92 [A]	→	7.00	
[C]	→	0.98 ***	(r^2)
	→	3.33 ***	(a)
	→	15.14 ***	(b)
12 [E]	→	185.05	units
150 [D]	→	9.69	months

(5) **Reference(s)**

Note: *Please type or print neatly using black or blue-black ink only. Programs are not retyped by HP personnel. The purchaser of your program will receive a photocopy of the page you submit.*

This form is the only part of your program documentation the user will continually refer to when running your program. For this reason, please be sure that all information given on this form is complete and concise.

1 **Page Number**
Continue the sequential numbering of your program documentation.

2 **Magnetic Card(s)**
Label the pictured card(s) exactly as you have your recorded magnetic card(s) included with your submittal. When submitting a program using two or more cards, label each card accurately, and supply the corresponding User Instructions as needed. Be sure to protect your recorded card(s) by clipping the corners as shown in the diagram.

3 **Steps**
Use the following rules-of-thumb for numbering the operational steps:

A. Number and list each step in order of execution.

B. If the user has a choice in what he does, number these choices with the same step number and separate these operations with the word "or".

C. If an instruction is "optional", or not an essential step to perform, it does not have to be numbered. In our example, a projected x value may be made by pressing E. However, this step is not essential to solving the problem.

4 **Instructions**
Briefly describe the action required in each step. Use the following rules-of-thumb when completing this portion.

A. Step 1 should always instruct the user to "Enter Program" or "Load Side ___" as in the adjacent sample.

B. If the user must "initialize" the calculator to run your program, e.g., clear the stack, registers, store constants, etc., Step 2 should then instruct him in how to do so.

C. Include helpful explanatory notes, e.g., how to correct erroneous inputs, which step to return to for a new case, etc. (see sample).

5 **Input Data/Units**
Write in the variable names for input data and the appropriate units (when applicable) in which this data should be entered.

6 **Keys**
Show which keys should be pressed to execute each step. Write key symbols exactly as they appear on the calculator keyboard.

7 **Output Data/Units**
Write in variable names for output data and the appropriate units (when applicable) in which this data appears.

User Instructions

(2) →

CURVE FITTING

1 2

(4) [

P?	LIN?	EXP?	LOG?	PWR?
x_i↑y_i (+)	x_i↑y_i (−)	→r^2, a, b	y→$\hat{x}$	x→$\hat{y}$

(3) →

(7) ↓

STEP	(4) → INSTRUCTIONS	(5) → INPUT DATA/UNITS	(6) → KEYS	OUTPUT DATA/UNITS
1	Load side 1 and side 2.			
2	Optional: Select pause input mode.		f A	1.00/0.00
3	Select type of regression			
	for linear fit		f B	1.00
	for exponential fit		f C	1.00
	for logarithmic fit		f D	1.00
	for power fit		f E	1.00
4	Input x value*.	x_i	ENTER↑	$\hat{x}_i$
5	Input y value.	y_i	A	i + 1
6	Repeat steps 4 and 5 for all data pairs**.			
7	Compute and output coefficient of determination r^2 and a and b.		C	r^2, a, b
8	Optional: Make projections based on a known y value.	y	D	$\hat{x}$
9	Optional: Make projection based on a known x value.	x	E	$\hat{y}$
10	For a new case go to step 3.			
	*Note that this step may be skipped if the x value equals the			
	displayed counter (i + 1).			
	**The last set of data pairs may be deleted by pressing [h] [R↓]			
	then [B]. Any set of data pairs may be deleted by entering them			
	as in steps 4 and 5 and pressing [B].			

PROGRAM LISTING I

Note: *Please type or print neatly using black or blue-black ink only. Programs are not retyped by HP personnel. The purchaser of your program will receive a photocopy of the page you submit.*

This form shows the program steps required to key your program into memory. Each Program Listing Form, parts I and II combined, documents a program up to 224 steps in length (one magnetic card, both tracks). Programs exceeding 224 steps require additional form(s).

1 **Page Number**
Continue the sequential numbering of your program documentation.

2 **Key Entry***
List each step number and the instruction mnemonic or abbreviation for that step number (e.g., 10^x, STO + 3, SIN, etc.).

3 **Code Shown***
Enter the keycode corresponding to 2 above. Always write the code directly across from the instruction to which it pertains.

*HP-97 ONWERS: YOU MAY ATTACH YOUR PAPER PRINTOUT TO THE FORM WITH CELLOPHANE TAPE. CAREFULLY ALIGN THE PROGRAM STEPS TO THE CORRESPONDING LINES. PLEASE BE SURE THAT THE TAPE DOES NOT COVER ANY PRINTING ON THE PAPER.

4 **Comments**
To assist the user in understanding operational steps or routines within your program, provide enough explanatory comments to indicate what is taking place within the program.

5 **Registers**
List the variables or constants retained by each register. If the contents of a register change frequently throughout the program, you may write in the word "used".

Program Listing I

STEP	KEY ENTRY	KEY CODE	COMMENTS
001	*LBLa	21 16 11	
002	0	00	
003	F2?	16 23 02	
004	RTN	24	
005	1	01	
006	SF2	16 21 02	
007	RTN	24	
008	*LBLb	21 16 12	
009	CF0	16 22 00	
010	CF1	16 22 01	
011	P≷S	16-51	
012	CLRG	16-53	
013	P≷S	16-51	
014	1	01	
015	RTN	24	
016	*LBLc	21 16 13	
017	GSBb	23 16 12	
018	SF1	16 21 01	
019	RTN	24	
020	*LBLd	21 16 14	
021	GSBb	23 16 12	
022	SF0	16 21 00	
023	RTN	24	
024	*LBLe	21 16 15	
025	GSBd	23 16 14	
026	SF1	16 21 01	
027	RTN	24	
028	*LBLA	21 11	
029	CF3	16 22 03	
030	*LBL8	21 08	
031	F2?	16 23 02	
032	GSB9	23 09	
033	STOD	35 14	
034	F1?	16 23 01	
035	LN	32	
036	x≷y	-41	
037	STOC	35 13	
038	F0?	16 23 00	
039	LN	32	
040	F3?	16 23 03	
041	GTO0	22 00	
042	Σ+	56	
043	*LBL7	21 07	
044	ENT↑	-21	
045	1	01	
046	+	-55	
047	RCLC	36 13	
048	x≷y	-41	
049	RCLD	36 14	
050	x≷y	-41	
051	RTN	24	
052	*LBL0	21 00	
053	Σ-	16 56	
054	GTO7	22 07	
055	*LBL9	21 09	
056	SPC	16-11	
057	x≷y	-41	
058	PRTX	-14	
059	x≷y	-41	
060	PRTX	-14	
061	SF2	16 21 02	
062	RTN	24	
063	*LBLB	21 12	
064	SF3	16 21 03	
065	F2?	16 23 02	
066	GSB3	23 03	
067	GTO8	22 08	
068	*LBLC	21 13	
069	P≷S	16-51	
070	SPC	16-11	
071	RCL8	36 08	
072	RCL4	36 04	
073	RCL6	36 06	
074	x	-35	
075	RCL9	36 09	
076	÷	-24	
077	-	-45	
078	ENT↑	-21	
079	ENT↑	-21	
080	RCL4	36 04	
081	x^2	53	
082	RCL9	36 09	
083	÷	-24	
084	RCL5	36 05	
085	x≷y	-41	
086	-	-45	
087	÷	-24	
088	STOB	35 12	
089	x	-35	
090	RCL6	36 06	
091	x^2	53	
092	RCL9	36 09	
093	÷	-24	
094	CHS	-22	
095	RCL7	36 07	
096	+	-55	
097	÷	-24	
098	PRTX	-14	
099	RCL6	36 06	
100	RCL4	36 04	
101	RCLB	36 12	
102	x	-35	
103	-	-45	
104	RCL9	36 09	
105	÷	-24	
106	F1?	16 23 01	
107	e^x	33	
108	STOA	35 11	
109	PRTX	-14	
110	RCLB	36 12	
111	PRTX	-14	
112	P≷S	16-51	

(5)

REGISTERS

0	1	2	3	4	5	6	7	8	9
S0 0	S1 0	S2 0	S3 0	S4 Σx	S5 Σx^2	S6 Σy	S7 Σy^2	S8 Σxy	S9 n

A	B	C	D	E	I
a	b	x_i	y_i	x, y	0

PROGRAM LISTING II

Note: *Please type or print neatly using black or blue-black ink only. Programs are not retyped by HP personnel. The purchaser of your program will receive a photocopy of the page you submit.*

This form continues the listing of program steps begun on Program Listing I. See previous instructions for Key Entry, Code Shown, and Comments.

1 **Page Number**
Continue the sequential numbering of your program documentation.

2 **Labels**
Indicate the function of each label key.

3 **Flags**
Indicate what, if anything, each of the four flags is used for in the program.

4 **Set Status**
Indicate the status of flags, angular mode, and display setting as set by the card when it is read in.

HP-67 OWNERS: PLEASE DOUBLE CHECK YOUR LISTING AGAINST YOUR RECORDED MAGNETIC CARD BY READING YOUR CARD INTO THE CALCULATOR AND SINGLE STEPPING THROUGH YOUR PROGRAM.

Program Listing II

STEP	KEY ENTRY	KEY CODE	COMMENTS
113	RTN	24	
114	*LBLE	21 15	
115	STOE	35 15	
116	RCLA	36 11	
117	RCLB	36 12	
118	RCLE	36 15	
119	F1?	16 23 01	
120	GTO1	22 01	
121	F0?	16 23 00	
122	LN	32	
123	x	−35	
124	+	−55	
125	F2?	16 23 02	
126	GTO9	22 09	
127	RTN	24	
128	*LBL1	21 01	
129	F0?	16 23 00	
130	GTO2	22 02	
131	x	−35	
132	e^x	33	
133	x	−35	
134	F2?	16 23 02	
135	GTO9	22 09	
136	RTN	24	
137	*LBL2	21 02	
138	$x \rightleftarrows y$	−41	
139	y^x	31	
140	x	−35	
141	F2?	16 23 02	
142	GTO9	22 09	
143	RTN	24	
144	*LBL3	21 03	
145	SPC	16−11	
146	1	01	
147	CHS	−22	
148	PRTX	−14	
149	SF2	16 21 02	
150	R↓	−31	
151	RTN	24	
152	*LBLD	21 14	
153	STOE	35 15	
154	RCLB	36 12	
155	1/x	52	
156	RCLA	36 11	
157	RCLE	36 15	
158	$x \rightleftarrows y$	−41	
159	F1?	16 23 01	
160	GTO1	22 01	
161	−	−45	
162	x	−35	
163	F0?	16 23 00	
164	e^x	33	
165	F2?	16 23 02	
166	GTO9	22 09	
167	RTN	24	
168	*LBL1	21 01	

STEP	KEY ENTRY	KEY CODE	COMMENTS
169	÷	−24	
170	F0?	16 23 00	
171	GTO1	22 01	
172	LN	32	
173	x	−35	
174	F2?	16 23 02	
175	GTO9	22 09	
176	RTN	24	
177	*LBL1	21 01	
178	$x \rightleftarrows y$	−41	
179	y^x	31	
180	F2?	16 23 02	
181	GTO9	22 09	
182	RTN	24	
183	R/S	51	

(2) → LABELS

A $x_i \uparrow y_i$ (+)	B $x_i \uparrow y_i$ (−)	C $\rightarrow r^2$, a b	D $y \rightarrow \hat{x}$	E $x \rightarrow \hat{y}$
a P?	b LIN?	c EXP?	d LOG?	e PWR?
0 Σ−	1 Used	2 Power	3 Print	4
5	6	7 display	8 Σ−	9 Print

(3) FLAGS

0	Log
1	Exp
2	Print
3	Σ−

(4) SET STATUS

FLAGS

	ON	OFF
0	☐	☒
1	☐	☒
2	☐	☒
3	☐	☒

TRIG

DEG ☒
GRAD ☐
RAD ☐

DISP

FIX ☒
SCI ☐
ENG ☐
n 2

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