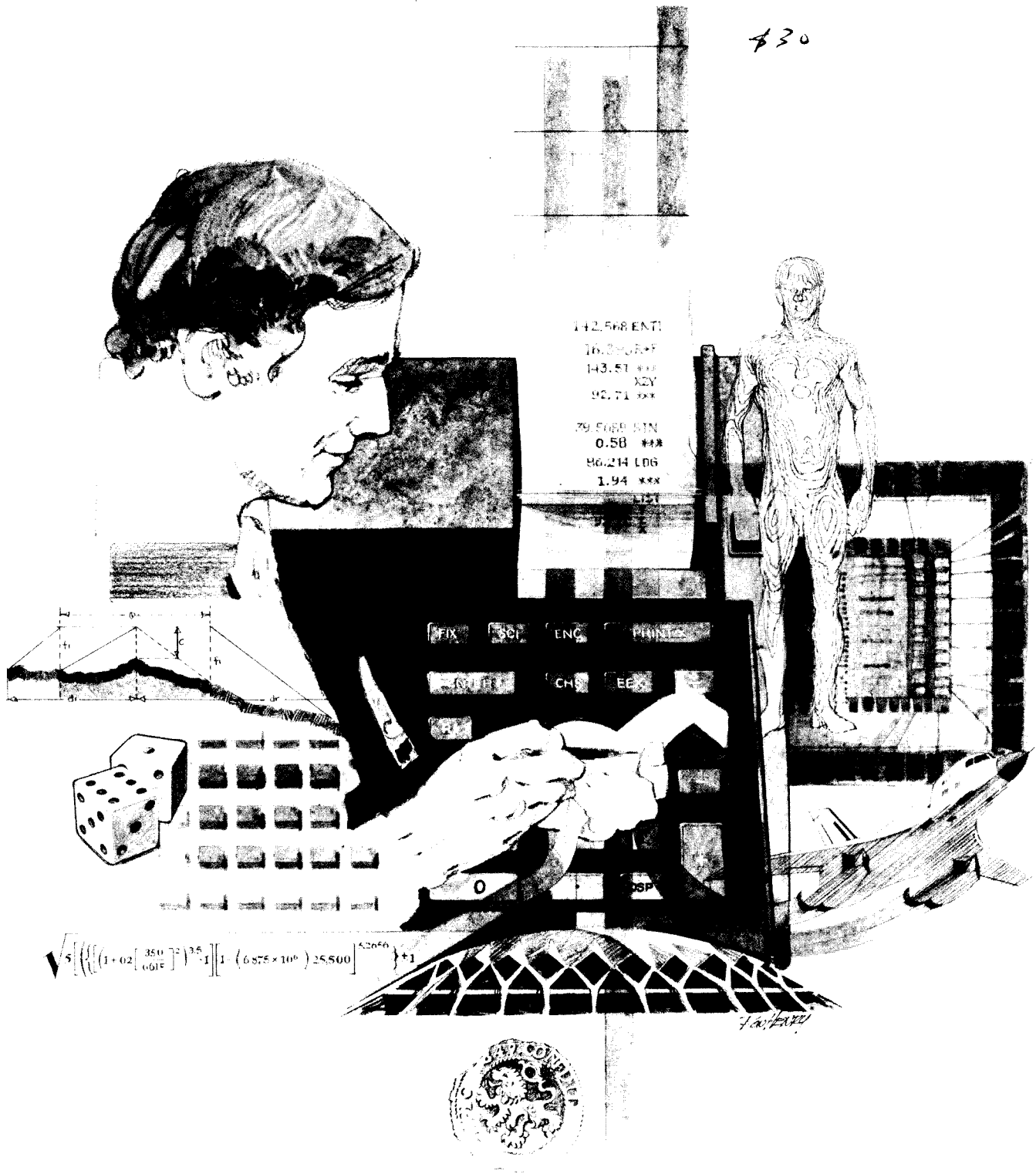


HEWLETT-PACKARD

HP67 HP97

Users' Library Solutions

Astrology



INTRODUCTION

In an effort to provide continued value to its customers, Hewlett-Packard is introducing a unique service for the HP fully programmable calculator user. This service is designed to save you time and programming effort. As users are aware, Programmable Calculators are capable of delivering tremendous problem solving potential in terms of power and flexibility, but the real genie in the bottle is program solutions. HP's introduction of the first handheld programmable calculator in 1974 immediately led to a request for program **solutions** — hence the beginning of the HP-65 Users' Library. In order to save HP calculator customers time, users wrote their own programs and sent them to the Library for the benefit of other program users. In a short period of time over 5,000 programs were accepted and made available. This overwhelming response indicated the value of the program library and a Users' Library was then established for the HP-67/97 users.

To extend the value of the Users' Library, Hewlett-Packard is introducing a unique service—a service designed to save you time and money. The Users' Library has collected the best programs in the most popular categories from the HP-67/97 and HP-65 Libraries. These programs have been packaged into a series of low-cost books, resulting in substantial savings for our valued HP-67/97 users.

We feel this new software service will extend the capabilities of our programmable calculators and provide a great benefit to our HP-67/97 users.

A WORD ABOUT PROGRAM USAGE

Each program contained herein is reproduced on the standard forms used by the Users' Library. Magnetic cards are not included. The Program Description I page gives a basic description of the program. The Program Description II page provides a sample problem and the keystrokes used to solve it. The User Instructions page contains a description of the keystrokes used to solve problems in general and the options which are available to the user. The Program Listing I and Program Listing II pages list the program steps necessary to operate the calculator. The comments, listed next to the steps, describe the reason for a step or group of steps. Other pertinent information about data register contents, uses of labels and flags and the initial calculator status mode is also found on these pages. Following the directions in your HP-67 or HP-97 **Owners' Handbook and Programming Guide**, "Loading a Program" (page 134, HP-67; page 119, HP-97), key in the program from the Program Listing I and Program Listing II pages. A number at the top of the Program Listing indicates on which calculator the program was written (HP-67 or HP-97). If the calculator indicated differs from the calculator you will be using, consult Appendix E of your **Owner's Handbook** for the corresponding keycodes and keystrokes converting HP-67 to HP-97 keycodes and vice versa. No program conversion is necessary. The HP-67 and HP-97 are totally compatible, but some differences do occur in the keycodes used to represent some of the functions.

A program loaded into the HP-67 or HP-97 is not permanent—once the calculator is turned off, the program will not be retained. You can, however, permanently save any program by recording it on a blank magnetic card, several of which were provided in the Standard Pac that was shipped with your calculator. Consult your **Owner's Handbook** for full instructions. A few points to remember:

The Set Status section indicates the status of flags, angular mode, and display setting. After keying in your program, review the status section and set the conditions as indicated before using or permanently recording the program.

REMEMBER! To save the program permanently, **clip** the corners of the magnetic card once you have recorded the program. This simple step will protect the magnetic card and keep the program from being inadvertently erased.

As a part of HP's continuing effort to provide value to our customers, we hope you will enjoy our newest concept.

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Program Description I

1

Program Title *ASTRO. I - MEAN OBLIQUITY OF THE ECLIPTIC
AND GREENWICH SIDEREAL TIME*

Contributor's Name *JAMES NEELY*

Address *P.O. Box 1902 (SECY CMA)*

City *CARMEL*

State *CA*

Zip Code *93921*

Program Description, Equations, Variables 1. *COMPUTE THE NUMBER OF DAYS FROM
JAN 0, 1900 FOR ANY DATE SINCE JAN 1, 4713 B.C. (DATES PRIOR TO
OCT. 15, 1582 ARE ASSUMED TO BE JULIAN CALENDER). THE CALENDER
ROUTINE IS AUTHORED BY RICHARD C. SINGLETON: $IM = 12(Y + 4800) + M - 3$,
THEN $JD(J) = \left\lfloor \frac{IM}{48} \right\rfloor + \left\lfloor \frac{365IM + 2 \text{MOD}(IM, 12) + 7}{12} \right\rfloor + D - 32083$.*

IF $JD(J) \geq 2299171$ (OCT 15, 1452), THE GREGORIAN CALENDER IS USED:

$$JD(G) = JD(J) + \left\lfloor \frac{IM}{4800} \right\rfloor - \left\lfloor \frac{IM}{1200} \right\rfloor + 38$$

*WHERE Y=YEAR, M=MONTH, D=DAY, AND $\lfloor ARG \rfloor$ IS THE INTEGER PART OF ARG.
THEN $JD_{1900} = J - 2415020$.*

*2. COMPUTE T, THE NUMBER OF JULIAN CENTURIES FROM GREENWICH MEAN NOON,
JAN 0, 1900: $T = (t_g/24 + JD_{1900} - 0.5)/36525$, WHERE t_g IS THE GREENWICH
MEAN TIME (GMT) OF THE OBSERVATION.*

3. COMPUTE THE MEAN OBLIQUITY OF THE ECLIPTIC: $e_0 = 23.452294 - 0.013013T$.

*4. COMPUTE THE GREENWICH MEAN SIDEREAL TIME: $R_g = t_g + 6.646066$
 $+ 2400.051262T + 26 \times 10^{-6} T^2 \pmod{24}$.*

*NOTE: THE RIGHT ASCENSION OF THE GREENWICH MERIDIAN, $\alpha_g = 15R_g$
DEGREES, IS COMPUTED AND STORED FOR FUTURE USE.*

Operating Limits and Warnings *B.C. DATES MUST BE ENTERED AS NEGATIVE
QUANTITIES: 1 A.D. = 1, 1 B.C. = 0, 2 B.C. = -1, 3 B.C. = -2, ETC.*

FOR EXAMPLE, JAN. 1, 6 B.C. IS ENTERED AS -1.010005

This program has been verified only with respect to the numerical example given in Program Description II. User accepts and uses this program material AT HIS OWN RISK, in reliance solely upon his own inspection of the program material and without reliance upon any representation or description concerning the program material.

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Program Description II

Sketch(es)

Sample Problem(s)

FOR 0148 HOURS GMT ON APRIL 20, 1976, CALCULATE:

1. JD_{1900}
2. G_c
3. R_G
4. T

Solution(s)

$$\begin{aligned}
 4.201976 \quad [A] \quad 27869.0000 &= JD_{1900} \\
 1.48 \quad [B] \quad 23.2633 &= G_c = 23^{\circ}26'33'' \\
 [R/G] \quad 15.4107 &= R_G = 15^h41^m07^s \\
 [R/S] \quad 0.7630 &= T
 \end{aligned}$$

Reference(s)

"EXPLANATORY SUPPLEMENT TO THE ASTRONOMICAL EPHEMERIS
AND THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC",
HER MAJESTY'S STATIONERY OFFICE, LONDON, 1961

3

[illegible]

67 Program Listing I

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	FLBL A	312511	UNPACK DATE		FINT	3183	TEST FOR JULIAN OR GREGORIAN CALENDAR
	↑	41			+	61	
	FINT	3183			3	03	
	STD 3	3303		060	2	02	
	-	51			0	00	
	EEX	43			8	08	
	2	02			3	03	
	X	71			-	51	
	↑	41			2	02	
010	FINT	3183			2	02	
	STD 4	3304	JULIAN DAY NUMBER COMPUTATION		9	09	STORE JD1900
	-	51			9	09	
	EEX	43		070	1	01	
	4	04			7	07	
	X	71			1	01	
	4	04			H X ≥ Y	3552	
	8	08			G X ≤ Y	3271	
	0	00			GTD 5	2209	
	0	00			RCL 6	3406	
020	STD 7	3307			RCL 7	3407	
	+	61	ENTER GMIT		÷	81	COMPUTE T
	1	01			FINT	3183	
	2	02			+	61	
	STD 5	3305		080	RCL 6	3406	
	X	71			4	04	
	RCL 3	3403			X	71	
	+	61			RCL 7	3407	
	3	03			÷	81	
	-	51			FINT	3183	
030	↑	41			-	51	
	STD 6	3306	STORE JD1900		3	03	ENTER GMIT
	RCL 5	3405			8	08	
	÷	81			+	61	
	FINT	3183		090	FLBL 9	312509	
	RCL 5	3405			2	02	
	X	71			4	04	
	-	51			1	01	
	↑	41			5	05	
	+	61			0	00	
040	7	07			2	02	
	+	61	COMPUTE T		0	00	COMPUTE T
	3	03			-	51	
	6	06			STD 2	3302	
	5	05		100	RIS	84	
	RCL 6	3406			FLBL B	312512	
	X	71			F H ←	3174	
	+	61			STD C	3313	
	RCL 5	3405			2	02	
	÷	81			4	04	
050	FINT	3183			÷	81	
	RCL 4	3404	COMPUTE T		RCL 2	3402	COMPUTE T
	+	61			+	61	
	RCL 6	3406			0	83	
	4	04		110	5	05	
	8	08			-	51	
	÷	81			3	03	

REGISTERS

0	1 J	2 JD1900	3 M	4 D	5 12	6 IM	7 4800	8	9
S0	S1	S2	S3	S4	S5	S6	S7	S8	S9
A	T	B	E ₀	C	t _G	D	α _G	E	I

67 Program Listing II

5

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS						
	6	06	STORE T		+	61							
	5	05		170	RCL C	34 13							
	2	02			+	61							
	5	05			2	02							
	÷	81			4	04							
	STD A	33 11			÷	81							
	•	83			G FRAC	32 83							
120	0	00			2	02							
	1	01			4	04							
	3	03			X	71							
	0	00	COMPUTE AND STORE E0	STD 4	33 04								
	1	01		180	0		00						
	3	03			G X≤Y		32 71						
	CHS	42			GTD 1		22 01						
	RCL A	34 11			2		02						
	X	71			4		04						
	2	02			STD + 4		33 61 04						
130	3	03			FLBL 1		31 25 01						
	•	83			RCL 4		34 04						
	4	04			1		01						
	5	05		5	05	COMPUTE AND STORE X6							
	2	02		190	X		71						
	2	02			STD D		33 14						
	9	09			FLBL 2		31 25 02						
	4	04			RCL B		34 12						
	+	61			G→HMS		32 74						
	STD B	33 12			R15		84						
140	2	02			RCL 4		34 04						
	6	06			G→HMS		32 74						
	EEX	43		COMPUTE AND STORE R6	R15		84	DISPLAY E0 DISPLAY R6 DISPLAY T					
	6	06			RCL A	34 11							
	CHS	42	200		R15	84							
	RCL A	34 11			GTD 2	22 02							
	X	71			R15	84							
	2	02				84							
	4	04											
	0	00											
150	0	00											
	•	83											
	0	00		210									
	5	05											
	1	01											
	2	02											
	6	06											
	2	02											
	+	61											
	RCL A	34 11											
160	X	71											
	6	06											
	•	83											
	6	06											
	4	04											
	6	06											
	0	00											
	6	06											
	6	06											
	6	06											
LABELS				FLAGS		SET STATUS							
A	✓	B	✓	C		E	0	FLAGS		TRIG		DISP	
a		b		c		d	e	1	ON OFF				
0		1	✓	2	✓	3	4	2	0 ☐ ☒	DEG ☒	FIX ☒		
									1 ☐ ☒	GRAD ☐	SCI ☐		
									2 ☐ ☒	RAD ☐	ENG ☐		
									3 ☐ ☒			n	4

Program Description I

Program Title *MOON'S ASCENDING NODE, NOTATION OF OBLIQUITY,
AND SYNETIC VERNAL POINT*

Contributor's Name *JAMES NEELY*

Address *P.O. BOX 1902 (SEC'Y CMA)*

City *CARMEL* State *CA* Zip Code *93921*

Program Description, Equations, Variables *THE MEAN LONGITUDE OF THE MOON'S
ASCENDING NODE $\Omega_0 = 259^\circ 10' 59''.79 - 5^\circ 13' 40'' 08' 31''.23 T + 7''.48 T^2$,
WHERE T IS THE NUMBER OF JULIAN CENTURIES FROM 1900
JAN. 0.5 E.T. LET $2L = 559^\circ 23' 36'' + 200^\circ 1' 32' 16'' T$, THEN
THE DIFFERENTIAL NOTATION OF THE OBLIQUITY IS
 $\delta E = 9''.21 \cos \Omega_0 + 0.55 \cos 2L$, SO THAT THE
CORRECTED OBLIQUITY IS $E = E_0 + \delta E$.
THE SYNETIC VERNAL POINT (SVP) IS GIVEN BY
 $SVP = -23^\circ 20' 38''.27 - \Delta \lambda$ WHERE
 $\Delta \lambda = (5025''.64 + 1''.11 T) T - 17''.23 \sin \Omega_0 - 1''.27 \sin 2L$
THE PRECESSION PLUS NOTATION OF THE ECLIPTIC LONGITUDE.
[THE QUANTITY $30^\circ + SVP$ IS DISPLAYED FOR COMPARISON
WITH A SVP EPHEMERIS].*

*E AND THE SVP ARE STORED FOR SUBSEQUENT
USE BY OTHER PROGRAMS IN THIS SERIES*

Operating Limits and Warnings

This program has been verified only with respect to the numerical example given in *Program Description II*. User accepts and uses this program material AT HIS OWN RISK, in reliance solely upon his own inspection of the program material and without reliance upon any representation or description concerning the program material.

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Program Description II

7

Sketch(es)

Sample Problem(s)

FOR 0148 HOURS GMT ON APRIL 20, 1976, CALCULATE:

1. δ_0 THE ASCENDING NODE
2. THE ZODIAC SIGN OF δ_0 (1 = ARIES, 2 = TAURUS, ETC.)
3. THE DEGREE-IN-SIGN OF δ_0
4. $30^\circ + SVP$

FINALLY, CORRECT THE MEAN OBLIQUITY ϵ_0 (OBTAINED FROM ASTRO. 1) FOR NUTATION.

Solution(s) FIRST, EXECUTE ASTRO. 1, THEN, USING ASTRO. 2:

- [A] $223.2603 = \delta_0 = 223^\circ 26' 03''$
[R/S] $8.0000 = 8TH\ SIGN (SCORPIO - MZ)$
[R/S] $13.2603 = DEG-IN-SIGN. \text{ THUS } \delta_0 \text{ IS AT } 13 MZ 26' 03''$
[R/S] $5.3516 = 30^\circ + SVP = 5^\circ 35' 16''$

TO CORRECT THE OBLIQUITY:

[F/E] $23.2626 = \epsilon_0 + \delta\epsilon = \epsilon = 23^\circ 26' 26''$

Reference(s) 1. "EXPLANATORY SUPPLEMENT TO THE ASTRONOMICAL EPHEMERIS AND THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC", HER MAJESTY'S STATIONERY OFFICE, LONDON 1961.

2. STAHL-ALLEN "SYNETIC VERNAL POINT EPHEMERIS", SOLAR RESEARCH PUBLICATIONS, BAY CITY, MICHIGAN, 1969

[illegible]

67 Program Listing I

9

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	F LBL A	31 25 11	START ϕ COMPUTATION		0	00	
	7	07			5	05	
	.	E3			5	05	
	4	04		060	3	03	
	8	08			6	06	
	RCL A	34 11			RCL A	34 11	
	X	71			X	71	
	6	06			2	02	
	9	09			0	00	
010	6	06			1	01	
	2	02			3	03	STORE 2L COMPUTE ϕ
	9	09			2	08	
	1	01			1	01	
	1	01		070	6	06	
	.	E3			+	61	
	2	02			RCL 3	34 03	
	3	03			$\div$	E1	
	-	51			STO 2	33 02	
	RCL A	34 11			F COS	31 63	
020	X	71			.	E3	
	9	09			5	05	STORE ϕ COMPUTE ϕ
	3	03			5	05	
	3	03			X	71	
	0	00		080	RCL 1	34 01	
	5	05			F COS	31 63	
	9	09			9	09	
	.	E3			.	E3	
	7	07			2	02	
	9	09			1	01	
030	+	61			X	71	
	3	03			+	61	STORE ϕ COMPUTE AA
	6	06			RCL 3	34 03	
	0	00			$\div$	E1	
	0	00		090	STO 5	33 05	
	STO 3	33 03			1	01	
	$\div$	E1			7	07	
	3	03			.	E3	
	6	06			X	02	
	0	00			3	03	
040	STO 4	33 04			RCL 1	34 01	
	$\div$	E1	ADD 360° IF ϕ NEGATIVE		F SIN	31 62	
	G FRAC	32 E3			X	71	
	RCL 4	34 04			1	01	
	X	71		100	.	E3	
	0	00			2	02	
	G X $\leq$ Y	32 71			7	07	
	GTO 1	32 01			RCL 2	34 02	
	RCL 4	34 04			F SIN	31 62	
	+	61			X	71	
050	F LBL 1	31 25 01			+	61	
	+	61	STORE ϕ COMPUTE 2L		1	01	
	STO 1	33 01			.	E3	
	2	02			1	01	
	5	05		110	1	01	
	9	09			RCL A	34 11	
	2	02			X	71	

REGISTERS

REGISTERS															
0	1	2	3	4	5	6	7	8	9						
	ϕ	2L	3600	360	ϕ										
S0	S1	S2	S3	S4	S5	S6	S7	S8	S9						
A	T		B	E		C	(t _G)		D	(x _G)		E	SVP		I

67 Program Listing II

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS		
	5	05	COMPUTE SUP		GTD 4	22 04	PROTECT FROM		
	0	00		170	GTD 3	22 03	EXTRANEON'S CORRECTION		
	2	02			FLBL 4	31 25 04			
	5	05			RCL B	34 12			
	.	83			RCL 5	34 05			
	6	06			+	61			
	4	04			STD B	33 12			
120	+	61			→ HMS	32 74	DISPLAY E = E + 8E		
	RCL A	34 11			R/5	84			
	X	71				84			
	-	51							
	8	08			180				
	4	04							
	0	00							
	3	03							
	8	08							
	.	83							
130	2	02	STORE SUP START DISPLAY DISPLAY 2						
	7	07							
	-	51							
	RCL 3	34 03							
	÷	81			190				
	STD E	33 15							
	FLBL C	31 25 13							
	RCL 1	34 01							
	G → HMS	32 74							
	R/5	84							
140	↑	41							
	↑	41							
	3	03							
	0	00							
	÷	81		200					
	F INT	31 83	DISPLAY SIGN DISPLAY DEG IN- SIGN						
	1	01							
	+	61							
	R/5	84							
	1	01							
150	-	51							
	3	03							
	0	00							
	X	71							
	-	51			210				
	R/5	84							
	RCL E	34 15							
	3	03							
	0	00							
	+	61							
160	G → HMS	32 74	DISPLAY 30° + SUP RE-DISPLAY ERROR ROUTINE CORRECT E ₀						
	R/5	84							
	GTD C	22 13							
	FLBL 3	31 25 03							
	0	00			220				
	÷	81							
	GTD 3	22 03							
	GLBL E	32 25 15							
	H F ? 2	35 71 02							
LABELS				FLAGS		SET STATUS			
A ✓	B	C ✓		D	E	0	FLAGS	TRIG	DISP
a	b	c		d	e ✓	1	ON OFF		
0	1 ✓	2	3 ✓	4 ✓	2 ✓	0 ☐ ☒	DEG ☒	FIX ☒	
5	6	7	8	9	3	1 ☐ ☒	GRAD ☐	SCI ☐	
						2 ☒ ☐	RAD ☐	ENG ☐	
						3 ☐ ☒		n 4	

Program Description I

Program Title *ASTRO 3: LOCAL SIDEREAL TIME, GEOCENTRIC LATITUDE, MIDHEAVEN, AND ASCENDANT*

Contributor's Name *JAMES NEELY*

Address *P.O. Box 1902 (SEC 4 CMA)*

City *CARMEL* State *CA* Zip Code *93921*

Program Description, Equations, Variables *1. LOCAL SIDEREAL TIME:*

a. RIGHT ASCENSION OF THE ZENITH MERIDIAN (MIDHEAVEN):

$\alpha_{MC} = \alpha_G + \lambda_N \text{ (MOD } 360) \text{ DEGREES, WHERE } \lambda_N \text{ IS THE GEOGRAPHIC LONGITUDE (+ FOR EAST, - FOR WEST)}$

b. LOCAL SIDEREAL TIME = $\alpha_{MC} / 15$ HOURS

2. GEOCENTRIC LATITUDE: $\phi_C = \tan^{-1}(0.993305 \tan \phi_G)$, WHERE ϕ_G IS THE GEOGRAPHIC LATITUDE (+ FOR NORTH, - FOR SOUTH). ϕ_G MUST BE AN INPUT; THE COMPUTATION OF ϕ_C IS OPTIONAL. HENCEFORTH, EITHER LATITUDE WILL BE DENOTED BY ϕ .

3. MIDHEAVEN (GEOCENTRIC ECLIPTIC LONGITUDE OF THE ZENITH MERIDIAN, λ_{MC}): $\lambda_{MC} = \tan^{-1} \left(\frac{\sin \alpha_{MC}}{\cos \alpha_{MC} \cos \epsilon} \right)$

4. ASCENDANT (GEOCENTRIC ECLIPTIC LONGITUDE OF THE EASTERN HORIZON, λ_{ASC}): $\lambda_{ASC} = \tan^{-1} \left(\frac{\cos \alpha_{MC}}{-\sin \alpha_{MC} \cos \epsilon - \tan \phi \sin \epsilon} \right)$

5. SIDEREAL LONGITUDES, λ_S , ARE COMPUTED FROM TROPICAL LONGITUDES, λ_T BY: $\lambda_S = \lambda_T + SVP$

Operating Limits and Warnings

α_G AND ϵ_0 ARE COMPUTED FROM ASTRO 1. (00210D)
 ϵ AND SVP ARE COMPUTED FROM ASTRO 2.

OPINION AND COMPUTATION VARIES ON λ_{MC} & λ_{ASC} IN THE POLAR LATITUDES. IN THESE REGIONS, λ_{ASC} AND/OR λ_{MC} MAY NEED A 180° (6 SIGN) CORRECTION.

This program has been verified only with respect to the numerical example given in Program Description II. User accepts and uses this program material AT HIS OWN RISK, in reliance solely upon his own inspection of the program material and without reliance upon any representation or description concerning the program material.

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Program Description II

Sketch(es)					
SIGN	GLYPH	DEGREE	SIGN	GLYPH	DEGREE
1	γ	0°	7	$\underline{\gamma}$	180°
2	δ	30°	8	$\mathcal{M}\nearrow$	210°
3	Π	60°	9	$\nearrow$	240°
4	$\odot$	90°	10	$\vee\mathcal{B}$	270°
5	$\mathcal{R}$	120°	11	$\underline{\underline{\vee}}$	300°
6	$\mathcal{M}$	150°	12	$\mathcal{H}$	330°

Sample Problem(s)

FOR 0148 HOURS GMT ON APRIL 20, 1976, GEOGRAPHIC LATITUDE $37^\circ N$ 20 AND LONGITUDE $121^\circ W$ 55, CALCULATE:

1. LOCAL SIDEREAL TIME
2. GEOCENTRIC LATITUDE
3. TROPICAL MIDHEAVEN, ΔMC
4. TROPICAL ASCENDANT, ΔASC
5. SIDEREAL MIDHEAVEN, ΔMC
6. SIDEREAL ASCENDANT, ΔASC

NOTE: USE THE TRUE OBLIQUITY AS COMPUTED BY ASTRO 2. ($\epsilon = 23^\circ 26' 26''$)

Solution(s) FIRST, EXECUTE ASTRO. 1, THEN EXECUTE ASTRO 2. THEN, WITH ASTRO 3:

1. -121.55 [A] $7.3327 = 7^h 33^m 27^s$ LOCAL SIDEREAL TIME
 2. 37.20 [B] $37.2000 =$ GEOGRAPHIC LAT; [R/A] $37.0652 = 37^\circ 08' 52''$ GEOCENTRIC LAT.
 3. ΔMC TROPICAL: [C] $111.3704 = 11^\circ 57' 04''$ [R/S] $4.0000 = 4^{th}$ SIGN [R/S] 21.3704 or $21^\circ 22' 04''$
 4. ΔASC TROPICAL: [D] $199.0722 = 199^\circ 07' 22''$ [R/S] $7.0000 = 7^{th}$ SIGN [R/S] 19.0722 or $19^\circ 07' 22''$
- CHANGE FROM TROPICAL MODE (DEFAULT) TO SIDEREAL [F/E]
5. ΔMC SIDEREAL: [C] $87.1220 = 87^\circ 12' 20''$ [R/S] $3.0000 = 3^{rd}$ SIGN [R/S] 27.1220 or $27^\circ 12' 20''$
 6. ΔASC SIDEREAL: [D] $174.4237 = 174^\circ 42' 37''$ [R/S] $6.0000 = 6^{th}$ SIGN [R/S] 24.4237 or $24^\circ 42' 37''$

Reference(s)

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STEP	INSTRUCTIONS	INPUT DATA/UNITS	KEYS		OUTPUT DATA/UNITS
1A	EXECUTE ASTRO 1 (00210D)				
B	EXECUTE ASTRO 2 IF CORRECTED OBLIQUITY AND/OR SIDEREAL ZODIAC IS DESIRED (00245D)				
2	ENTER PROGRAM				
3	ENTER GEOGRAPHIC LONGITUDE IN D.M.S. + FOR EAST, - FOR WEST	DD.MMSS	A		LOCAL SIDEREAL TIME IN HH.MMSS
4A	ENTER GEOGRAPHIC LATITUDE IN D.M.S. + FOR NORTH, - FOR SOUTH	DD.MMSS	B		GEOGRAPHIC LAT IN DEG.
B	IF REQUIRED, COMPUTE GEOCENTRIC LAT.	NONE	R/S		DD.MMSS
5A	SET MODE TO SIDEREAL OR		f	E	
B	SET MODE TO TROPICAL (DEFAULT)		f	A	
6A	COMPUTE MIDHEAVEN, MC		C		DDD.MMSS
	OPTIONAL - SIGN OF MC		R/S		SS.0000
	OPTIONAL - DEG-IN-SIGN OF MC		R/S		DD.MMSS
7A	COMPUTE ASCENDANT, ASC		D		DDD.MMSS
B	OPTIONAL - SIGN OF ASC		R/S		SS.0000
C	OPTIONAL - DEG-IN-SIGN OF AX		R/S		DD.MMSS
	NOTE: COMPUTATIONS 5, 6, & 7 MAY BE REPEATED IN ANOTHER MODE IF DESIRED.				

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STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	FLBL 1	312501	STORE ϵ_0 & α_0 IN A NEW LOCATION. KEY LOC. 0 WITH π		FLBL C	312513	COMPUTE dmc
	RCL C	3413			RCL D	3414	
	STD B	3308			I	01	
	RCL D	3414		060	F R $\leftarrow$	3172	
	STD 9	3309			RCL B	3412	COMPUTE dasc
	H π	3573			F COS	3163	
	STD 0	3300			X	71	
	H R $\uparrow$	3554			GTO 5	2205	
	H RTN	3522			FLBL D	312514	COMPUTE dasc
010	FLBL 3	312503	CONVERT NEGATIVE ANGLES TO POSITIVE		RCL D	3414	
	0	00			I	01	
	G X $\leftarrow$ Y	3271			F R $\leftarrow$	3172	
	GTO 4	2204			RCL B	3412	
	3	03		070	I	01	ROUTINE COMMON TO dmc & dasc
	6	06			F R $\leftarrow$	3172	
	0	00			H R $\uparrow$	3554	
	+	61			X	71	
	FLBL 4	312504			H X $\leftarrow$ Y	3552	TROPICAL OR SIDEREAL?
	+	61			RCL C	3413	
020	H RTN	3522	ENTER LONGITUDE & COMPUTE LOCAL SIDEREAL TIME		F TAN	3164	
	FLBL A	312511			X	71	
	H F? 2	357102			+	61	DISPLAY DEGREE
	F GSB 1	312201			CHS	42	
	F H $\leftarrow$	3174		080	FLBL 5	312505	
	RCL 9	3409			G $\rightarrow$ P	3272	TROPICAL OR SIDEREAL?
	+	61			H X $\leftarrow$ Y	3552	
	F GSB 3	312203			RCL E	3415	
	STD D	3314			H F? 0	357100	
	1	01			CL X	44	DISPLAY DEGREE
030	5	05			+	61	
	$\div$	61			F GSB 3	312203	
	G $\rightarrow$ HMS	3274			G $\rightarrow$ HMS	3274	
	R/S	84			R/S	84	DISPLAY SIGN
	GTO 0	2200	ERROR	090	$\uparrow$	41	
	FLBL B	312512	ENTER GEOGRAPHIC LATITUDE		$\uparrow$	41	
	H F? 2	357102			3	03	
	F GSB 1	312201			0	00	
	F H $\leftarrow$	3174			$\div$	61	DISPLAY SIGN
	STD C	3313			F INT	3183	
040	H LST X	3562			I	01	
	R/S	84			+	61	
	RCL C	3413	CONVERT GEOGRAPHIC LATITUDE TO GEOCENTRIC LATITUDE		R/S	84	DISPLAY DEG-IN SIGN
	F TAN	3164		100	I	01	
	.	83			-	51	
	9	09			3	03	
	9	09			0	00	SET TROPICAL
	3	03			X	71	
	3	03			-	51	
	0	00			R/S	84	
050	5	05	GEOCENTRIC LATITUDE		GTO 0	2200	ERROR
	X	71			GLBL A	322511	SET SIDEREAL
	G TAN $^{-1}$	3264			H SFO	355100	
	STD C	3313			R/S	84	
	G $\rightarrow$ HMS	3274		110	GTO 0	2200	
	R/S	84			GLBL E	322515	SET SIDEREAL
	GTO 0	2200			H CPO	356100	
			ERROR				

REGISTERS

0	π	1		2		3		4		5		6		7		8	ϵ_0	9	α_0
S0		S1		S2		S3		S4		S5		S6		S7		S8		S9	
A	T			B	E			C	ϵ_0 / ϕ			D	$\alpha_0 / \Delta MC$			E	SUP		

Program Description I

Program Title	MUNDOSCOPE, REGION MONTANUS		
Contributor's Name	JAMES NEELY		
Address	P.O. Box 1902 (SECY CMA)		
City	CARMEL	State	CA
		Zip Code	93921

Program Description, Equations, Variables THE PLANETARY POSITIONS ARE CONVERTED TO THE REGION MONTANUS MUNDO POSITIONS AS FOLLOWS:

COUNTERCLOCKWISE SYSTEM:

$$\lambda_{RM}^{\circ} = \tan^{-1} \left[\frac{\sin M}{\cos M + \tan \delta \tan \phi} \right]$$

THEN $\lambda_{RM} = \lambda_{RM}^{\circ} + Z_{MC}$ WHERE $M = -\text{HOUR ANGLE} = \alpha - \alpha_{MC}$,
 $\alpha = \text{RIGHT ASCENSION OF BODY}$, $\delta = \text{DECLINATION OF BODY}$, $\phi = \text{LATITUDE (GEOGRAPHIC)}$, $\alpha_{MC} = \text{RIGHT ASCENSION MC (LOCAL SIDEREAL TIME)}$, &
 $Z_{MC} = \text{ZENITH (MC) ORIGIN ANGLE}$.

CLOCKWISE SYSTEM: $\lambda_{RM} = 360^{\circ} - \lambda_{RM}^{\circ} + Z_{MC}$

IF THE BODY'S ECLIPTIC LONGITUDE λ & LATITUDE β ARE INPUT, THEN α & δ ARE COMPUTED FROM

$$\begin{pmatrix} \cos \delta \cos \alpha \\ \cos \delta \sin \alpha \\ \sin \delta \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 \\ 0 & \cos \epsilon & -\sin \epsilon \\ 0 & \sin \epsilon & \cos \epsilon \end{pmatrix} \begin{pmatrix} \cos \beta \cos \lambda \\ \cos \beta \sin \lambda \\ \sin \beta \end{pmatrix}$$

WHERE $\epsilon = \text{THE OBLIQUITY OF THE ECLIPTIC}$

Operating Limits and Warnings

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Program Description II

Sketch(es)

SIGN	GLYPH	SIGN	GLYPH
1	γ	7	Σ
2	δ	8	$\mu \nearrow$
3	II	9	$\nearrow$
4	$\odot$	10	$\nu \delta$
5	Ω	11	$\sim$
6	$\mu \zeta$	12	χ

Sample Problem(s) FOR 0148 HOURS GMT ON APRIL 20, 1976, GEOGRAPHIC LATITUDE 37N20 AND LONGITUDE 121W55, CALCULATE THE REGIOMONTANUS IN-MUNDO COORDINATES OF THE BODIES LISTED BELOW WHEN $Z_{MC} = 15^{\circ}00' = 105^{\circ}00'00''$. (NOTE: ASTRO 1, ASTRO 2, & ASTRO 3 WERE EXECUTED PRIOR TO THE REGIOMONTANUS MUNDOSCOPE. TO APPROXIMATE THESE RESULTS USE $\epsilon = 23^{\circ}26'26''$ [H.M.S. $\rightarrow$ STD B], $\phi = 37^{\circ}N20$, $\alpha_{MC} = 7^{\circ}33'27''$)

BODY	α	δ	λ	DEG-IN-SIGN & SIGN	β
SUN	1h 52m 04s	11°30'42"	30°06'41"	0°06'41"	0°00'00"
MOON	19h 04m 06s	-17°53'38"	285°16'59'	15°08'16"	4°42'02"
MERCURY	2h 57m 35s	19°10'23"	47°58'08"	17°05'08"	2°04'12"

Solution(s)

BODY	λ_{RM}	λ_{RM}
SUN	28°20'55"	161°39'05"
	28°20'55"	1 2 39'05"
MOON	274°06'41'	290°53'19"
	9°08'41"	20°08'53'19"
MERCURY	49°12'16"	160°47'44"
	19°02'16"	10 12 47'44"

Reference(s) 1. ARTHUR BLACKWELL, MID-POINTS IN MUNDO, THE CONSTELLATIONS, R.O.S.A., PLACENTIA, CA (VOL 1 NO. 1 PP 26-32)
 2. BUZ OVERBECK - PRIVATE COMMUNICATION

User Instructions

MUNDOSCOPE, REGIO MONTANUS				
RAMC →	LAT →	BMC D-INSTR →	HOURS? →	DEGS? →
$\delta \uparrow \alpha \rightarrow$	COUNTER CLOCKWISE	$\beta \uparrow D$ -IN-STS →	CLOCKWISE	$\beta \uparrow A \rightarrow$

STEP	INSTRUCTIONS	INPUT DATA/UNITS	KEYS		OUTPUT DATA/UNITS
1	EXECUTE ASTRO1 (00210.D) AND ASTRO3 (00249.D) NOTE: TO CORRECT OBLIQUITY FOR NUTATION, ASTRO2 (00245.D) MAY BE EXECUTED.				
2	READ PROGRAM CARD (BOTH SIDES)				
3	SET INPUT MODE: HOURS (DEFAULT) OR DEGREES	NONE NONE	F	D E	
4	INPUT α_{MC} IN HH.MMSS OR DD.MMSS *	α_{MC}	F	A	DDD.DDDD
5	INPUT GEOGRAPHIC LATITUDE ϕ *	DD.MMSS	F	B	DD.DDDD
6	INPUT ZENITH ORIGIN ANGLE z_{MC} : }	DEG-IN-SIGN SIGN	↑ F	 C	 DDD.DDDD
7	SET OUTPUT MODE: "CLOCKWISE" FOR α_{RM} OR "COUNTERCLOCKWISE" (DEFAULT) FOR α_{RM}	NONE NONE	D B	 	
8	INPUT DATA BY STEP A, B, OR C:				
A	DECLINATION δ IN HH.MMSS OR DD.MMSS GO TO STEP 9	δ α	↑ A	 	
B	LATITUDE λ DEG-IN-SIGN SIGN GO TO STEP 9	β DD.MMSS S	↑ ↑ C	 	
C	LATITUDE λ (360° CIRCLE) GO TO STEP 9	β DDD.MMSS	↑ E	 	
9	OUTPUT DISPLAY: α_{RM} OR λ_{RM} OPTIONAL: { SIGN DEG-IN-SIGN		 R/S R/S	 	DDD.MMSS SS.0000 DD.MMSS
10	REPEAT FROM STEP 8A, 8B, OR 8C FOR THE NEXT BODY				
	* NOT NEEDED IF ASTRO3 EXECUTED (IF α_{MC} & ϕ ARE KNOWN AND IF THE DATA INPUT IS VIA STEP 8A, THIS PROGRAM CAN OPERATE AS A "STAND-ALONE")				

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STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	*LBLd	21 16 14	INPUT HOURS	057	*R	44	
002	SF1	16 21 01		058	RCL2	36 02	
003	RTN	24		059	*P	34	
004	*LBLe	21 16 15	INPUT DEGREES	060	R↓	-31	
005	CF1	16 22 01		061	ST03	35 03	
006	RTN	24		062	R↓	-31	
007	*LBLa	21 16 11	INPUT α MC	063	SIN↑	16 41	
008	HMS+	16 36		064	ST04	35 04	
009	1	01		065	ST08	22 06	
010	5	05		066	*LBLA	21 11	INPUT α & δ
011	XZY	-41		067	XZY	-41	
012	F1?	16 23 01	CONVERT TO DEGREES	068	HMS+	16 36	
013	X	-35		069	ST04	35 04	
014	ST0D	35 14		070	R↓	-31	
015	RTN	24		071	HMS+	16 36	
016	*LBLb	21 16 12	INPUT LATITUDE	072	1	01	
017	HMS+	16 36		073	5	05	
018	ST0C	35 13	ϕ	074	XZY	-41	
019	RTN	24		075	F1?	16 23 01	CONVERT HOURS TO DEGREES
020	*LBLc	21 16 13	INPUT	076	X	-35	
021	1	01		077	ST03	35 03	
022	-	-45		078	*LBL8	21 08	
023	3	03		079	RCL3	36 03	
024	0	00		080	RCLD	36 14	
025	X	-35		081	-	-45	
026	+	-55		082	1	01	
027	HMS+	16 36		083	*R	44	
028	ST01	35 01		084	RCLC	36 13	
029	RTN	24		085	TAN	43	
030	*LBLC	21 13	LATITUDE β ,	086	RCL4	36 04	
031	1	01	DEG-INT-SEAN,	087	TAN	43	
032	-	-45	SIGN INPUT (1)	088	X	-35	
033	3	03		089	+	-55	
034	0	00		090	*P	34	
035	X	-35		091	XZY	-41	
036	+	-55		092	F0?	16 23 08	
037	HMS+	16 36		093	ST07	22 07	
038	ST09	22 09		094	CHS	-22	
039	*LBL E	21 15	LATITUDE β &	095	3	03	
040	HMS+	16 36	LONGITUDE λ	096	6	06	
041	*LBL9	21 09		097	0	00	
042	XZY	-41		098	+	-55	
043	HMS+	16 36		099	*LBL7	21 07	
044	1	01	CONVERT	100	RCL1	36 01	
045	*R	44		101	+	-55	
046	R↓	-31		102	3	03	
047	XZY	-41		103	6	06	
048	R↑	16-31		104	0	00	
049	*R	44		105	÷	-24	
050	ST02	35 02		106	LSTX	16-63	
051	R↓	-31		107	XZY	-41	
052	*P	34		108	FRC	16 44	
053	XZY	-41		109	1	01	
054	RCLB	36 12		110	+	-55	
055	+	-55		111	FRC	16 44	
056	XZY	-41		112	X	-35	

REGISTERS

0	1	2	3	4	5	6	7	8	9
	ZMC	TEMP	α	δ					
S0	S1	S2	S3	S4	S5	S6	S7	S8	S9
TT								LG	α
A	B	C	D	E	F	G	H	I	J
T	E	ϕ	α MC	SVP					

Program Description I

Program Title *MUNDOSCOPE, CAMPANUS*

Contributor's Name *JAMES NEELY*

Address *P. O. Box 1902 (SECY CMA)*

City *CARNIEL*

State *CA*

Zip Code *93921*

Program Description, Equations, Variables *THE PLANETARY POSITIONS ARE CONVERTED TO THE CAMPANUS MUNDO POSITIONS AS FOLLOWS:*

COUNTERCLOCKWISE SYSTEM:

$$\lambda_{CM}^0 = \tan^{-1} \left[\frac{\sin M}{\cos M \cos \phi + \tan \delta \sin \phi} \right]$$

THEN $\lambda_{CM} = \lambda_{CM}^0 + Z_{MC}$ WHERE $M = -\text{HOUR ANGLE} = \alpha - \alpha_{MC}$,
 $\alpha = \text{RIGHT ASCENSION OF BODY}$, $\delta = \text{DECLINATION OF BODY}$, $\phi = \text{LATITUDE (GEOGRAPHIC)}$, $\alpha_{MC} = \text{RIGHT ASCENSION MC (LOCAL SIDEREAL TIME)}$, &
 $Z_{MC} = \text{ZENITH (MC) ORIGIN ANGLE}$.

CLOCKWISE SYSTEM: $\lambda_{CM} = 360^\circ - \lambda_{CM}^0 + Z_{MC}$

IF THE BODY'S ECLIPTIC LONGITUDE λ & LATITUDE β ARE INPUT, THEN α & δ ARE COMPUTED FROM

$$\begin{pmatrix} \cos \delta \cos \alpha \\ \cos \delta \sin \alpha \\ \sin \delta \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 \\ 0 & \cos \epsilon & -\sin \epsilon \\ 0 & \sin \epsilon & \cos \epsilon \end{pmatrix} \begin{pmatrix} \cos \beta \cos \lambda \\ \cos \beta \sin \lambda \\ \sin \beta \end{pmatrix}$$

WHERE $\epsilon = \text{THE OBLIQUITY OF THE ECLIPTIC}$.

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Program Description II

Sketch(es)

SIGN	GLYPH	SIGN	GLYPH
1	T	7	<u>Ω</u>
2	♂	8	♊
3	♂	9	♊
4	♂	10	♊
5	♂	11	♊
6	♂	12	♊

Sample Problem(s) FOR 0148 HOURS GMT ON APRIL 20, 1976, GEOGRAPHIC LATITUDE 37N20 AND LONGITUDE 121W55, CALCULATE THE CAMPANUS MUNDO COORDINATES OF THE FOLLOWING BODIES (NOTE: ASTRO 1, ASTRO 2, & ASTRO 3 WERE EXECUTED PRIOR TO THE CAMPANUS MUNDOSCOPE. $E = 23^{\circ}26'26''$, $\phi = 37N20$, $\alpha_{MC} = 7^h33^m27^s$ WILL APPROXIMATE THESE RESULTS. TO ENTER $E = 23^{\circ}26'26''$ H.M.S. → 570 B)

BODY	α	δ	λ	β
SUN	$1^h52^m04^s$	$11^{\circ}30'42''$	$30^{\circ}06'41''$	$0^{\circ}00'00''$
MOON	$19^h04^m06^s$	$-17^{\circ}53'38''$	$285^{\circ}16'59''$	$4^{\circ}42'02''$
MERCURY	$2^h54^m35^s$	$19^{\circ}10'23''$	$47^{\circ}58'08''$	$2^{\circ}04'12''$

NOTE: USE $Z_{MC} = 15^{\circ}00' = 105^{\circ}00'00''$

Solution(s)

BODY	λ_{CM}	λ_{CM}
SUN	$25^{\circ}41'04''$	$184^{\circ}18'56''$
	$25^{\circ}41'04''$	$4^{\circ}18'56''$
MOON	$277^{\circ}36'33''$	$292^{\circ}23'27''$
	$70^{\circ}36'33''$	$22^{\circ}23'27''$
MERCURY	$43^{\circ}23'21''$	$166^{\circ}36'39''$
	$13^{\circ}23'21''$	$16^{\circ}36'39''$

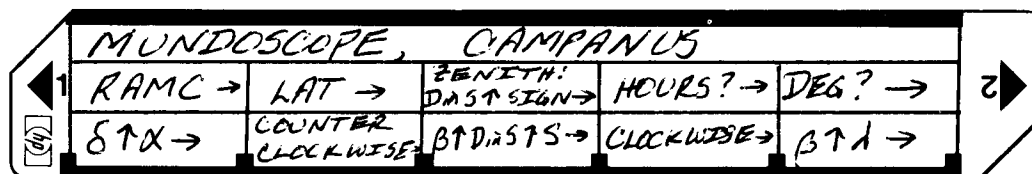
Reference(s) 1. CYRIL FAGAN, "AMERICAN ASTROLOGY", CLANCY PUBL., FEB. 1958, PP. 44-46.

2. ARTHUR BLACKWELL, MID-POINTS IN MUNDO, "THE CONSTELLATIONS", R.O.S.A., PLACENTIA, CA (VOL. 1 NO. 1 PP 26-32)

3. BOB OVERBECK - PRIVATE COMMUNICATION

User Instructions

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STEP	INSTRUCTIONS	INPUT DATA/UNITS	KEYS		OUTPUT DATA/UNITS
1	EXECUTE ASTRO 1 (00100D) AND ASTRO 3 (00249D) NOTE: TO CORRECT OBLIQUITY FOR NUTATION, ASTRO 2 (00145D) MAY BE EXECUTED				
2	READ PROGRAM CARD (BOTH SIDES)				
3	SET INPUT MODE: HOURS (DEFAULT) OR DEGREES	NONE NONE	F F	D E	
4	INPUT α_{MC} IN HH.MMSS OR DD.MMSS *	α_{MC}	F	A	DDD.DDDD
5	INPUT GEOGRAPHIC LATITUDE ϕ (NOT NEEDED IF ASTRO 3 EXECUTED)	DD.MMSS	F	B	DD.DDD
6	INPUT ZENITH ORIGIN ANGLE Z_{MC} : SIGN	DEG-IN-SIGN SIGN	↑ F	 C	 DDD.DDDD
7	SET OUTPUT MODE: "CLOCKWISE" FOR Δ_{CM} OR "COUNTERCLOCKWISE" (DEFAULT) FOR Δ_{CM}	NONE NONE	D B		
8	INPUT DATA BY STEP 8A, 8B, OR 8C:				
8A	DECLINATION δ IN HH.MMSS OR DD.MMSS GO TO STEP 9	δ α	↑ A		
8B	LATITUDE λ DEG-IN-SIGN SIGN GO TO STEP 9	β DD.MMSS S	↑ ↑ C		
8C	LATITUDE λ (360° CIRCLE) GO TO STEP 9	β DD.MMSS	↑ E		
9	OUTPUT DISPLAY: Δ_{CM} OR Δ_{CM} OPTIONAL: SIGN DEG-IN-SIGN		 R/S R/S		DDD.MMSS SS.C000 DD.MMSS
10	REPEAT FROM STEP 8A, 8B, OR 8C FOR THE NEXT BODY.				
	* NOT NEEDED IF ASTRO 3 EXECUTED (IF α_{MC} & ϕ ARE KNOWN AND IF THE DATA INPUT IS VIA STEP 8A, THIS PROGRAM CAN OPERATE IN A "STAND-ALONE" MODE)				

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	*LBLd	21 16 14	INPUT HOURS	057	+R	44	
002	SF1	16 21 01		058	RCL2	36 02	
003	RTN	24		059	+P	34	
004	*LBLe	21 16 15	INPUT DEGREES	060	R↓	-31	
005	CF1	16 22 01		061	STO3	35 03	
006	RTN	24		062	R↓	-31	
007	*LBLa	21 16 11	INPUT λ _M C	063	SIN↑	16 41	
008	HMS→	16 36		064	STO4	35 04	
009	1	01		065	GT08	22 08	
010	5	05		066	*LBLA	21 11	INPUT α & δ
011	XZY	-41		067	XZY	-41	
012	F1?	16 23 01		068	HMS→	16 36	
013	x	-35	CONVERT TO DEGREES	069	STO4	35 04	
014	STOD	35 14		070	R↓	-31	
015	RTN	24		071	HMS→	16 36	
016	*LBLb	21 16 12	INPUT LATITUDE	072	1	01	
017	HMS→	16 36	φ	073	5	05	
018	STOC	35 13		074	XZY	-41	
019	RTN	24		075	F1?	16 23 01	CONVERT HOURS TO DEGREES
020	*LBLc	21 16 13	INPUT Z _M C	076	x	-35	
021	1	01		077	STO3	35 03	
022	-	-45		078	*LBLB	21 08	
023	3	03		079	RCL3	36 03	COMMON ROUTINE TO COMPUTE λ _{CM}
024	0	00		080	RCLD	36 14	
025	x	-35		081	-	-45	
026	+	-55		082	1	01	
027	HMS→	16 36		083	+R	44	
028	STO1	35 01		084	RCLC	36 13	
029	RTN	24		085	COS	42	
030	*LBLC	21 13	LATITUDE, DEG-EX-SIGN, SIGN INPUT	086	x	-35	
031	1	01		087	RCLC	36 13	
032	-	-45		088	SIN	41	
033	3	03		089	RCL4	36 04	
034	0	00		090	TAN	43	
035	x	-35		091	x	-35	
036	+	-55		092	+	-55	
037	HMS→	16 36		093	+P	34	
038	GT09	22 09		094	XZY	-41	
039	*LBL E	21 15	LATITUDE, DEGREE INPUT	095	F0?	16 23 00	
040	HMS→	16 36		096	GT07	22 07	
041	*LBL9	21 09		097	CHS	-22	
042	XZY	-41		098	3	03	
043	HMS→	16 36		099	6	06	
044	1	01	CONVERT λ & β TO α & δ	100	0	00	
045	+R	44		101	+	-55	
046	R↓	-31		102	*LBL7	21 07	
047	XZY	-41		103	RCL1	36 01	ADD Z _M C
048	R↑	16-31		104	+	-55	
049	+R	44		105	3	03	
050	STO2	35 02		106	6	06	
051	R↓	-31		107	0	00	
052	+P	34		108	÷	-24	
053	XZY	-41		109	LSTX	16-63	
054	RCLB	36 12		110	XZY	-41	
055	+	-55		111	FRC	16 44	
056	XZY	-41		112	1	01	

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[illegible]

Program Description I

Program Title *HOUSE CUSPS - PLACIDUS METHOD (EXACT)*

Contributor's Name *JAMES NEELY*

Address *P.O. Box 1902 (SECY CMA)*

City *CARMEL* State *CA* Zip Code *93921*

Program Description, Equations, Variables *THE HOUSE CUSPS ARE COMPUTED BY THE EXACT METHOD OF PLACIDUS. LET λ_N DENOTE THE (TROPICAL) DEGREE (ECLIPTIC LONGITUDE) OF THE N^{TH} CUSP. COMPUTE*

$$f_N = (N-10)/3,$$

*SOLVE $\cos \xi_N = -\sin(\alpha_{MC} + f_N \xi_N) \tan \phi \tan \epsilon$
FOR ξ_N USING THE NEWTON-RAPHSON METHOD
THEN,*

$$\lambda_N = \tan^{-1} \left[\frac{\sin(\alpha_{MC} + f_N \xi_N)}{\cos(\alpha_{MC} + f_N \xi_N) \cos \epsilon} \right] \text{ FOR } N=7, 8, \dots, 12$$

ALSO, $\lambda_N = \lambda_{N+6} + 180^\circ$ FOR $N=1, 2, \dots, 6$

STELLAR LONGITUDES, λ_s , ARE COMPUTED FROM THE TROPICAL LONGITUDES ABOVE BY ADDING SUP TO λ_N

*NOTE: THIS PROGRAM MUST BE USED WITH ASTRO 1, 2, & 3.
 $\epsilon, \phi, \alpha_{MC}$, & SUP ARE DESCRIBED THEREIN.*

Operating Limits and Warnings

AN ERROR WILL FLASH IF A POLAR LATITUDE IS INPUT. PLACIDIAN CUSPS DO NOT EXIST IN THE POLAR REGIONS.

This program has been verified only with respect to the numerical example given in Program Description II. User accepts and uses this program material AT HIS OWN RISK, in reliance solely upon his own inspection of the program material and without reliance upon any representation or description concerning the program material.

NEITHER HP NOR THE CONTRIBUTOR MAKES ANY EXPRESS OR IMPLIED WARRANTY OF ANY KIND WITH REGARD TO THIS PROGRAM MATERIAL, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. NEITHER HP NOR THE CONTRIBUTOR SHALL BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH OR ARISING OUT OF THE FURNISHING, USE OR PERFORMANCE OF THIS PROGRAM MATERIAL.

Program Description II

Sketch(es)

SIGN	GLYPH	SIGN	GLYPH
1	♈	7	♌
2	♉	8	♍
3	♊	9	♎
4	♋	10	♏
5	♌	11	♐
6	♍	12	♑

Sample Problem(s) FOR 0146 HOURS GMT ON APRIL 20, 1976, GEOGRAPHIC LATITUDE 37°N 20' & LONGITUDE 121°W 55' (NOTE - EXECUTE THE SAMPLE PROBLEM IN ASTRO-3), COMPUTE TROPICAL & SIDEREAL CUSPS IN THE (STANDARD) PLACIDUS SYSTEM.

IN THE PLACIDUS SYSTEM

$$d_{10} = d_{MC} \quad \text{AND} \quad d_1 = d_{ASC}$$

Solution(s)

PARTIAL SOLUTION:

Cusp No.	TROPICAL ZODIAC			SIDEREAL ZODIAC		
	DEGREE	SIGN	DEG-IN-SIGN	DEGREE	SIGN	DEG-IN-SIGN
10	111°37'04"	4	21 ♋ 37'04"	87°12'20"	3	27 ♈ 12'20"
11	144°30'59"	5	24 ♌ 30'59"	120°06'14"	5	0 ♋ 06'14"
12	174°03'57"	6	24 ♍ 03'57"	149°39'13"	5	29 ♌ 39'13"
1	199°07'22"	7	19 ♎ 07'22"	174°42'37"	6	24 ♍ 42'37"
2	226°57'18"	8	16 ♏ 57'18"	202°32'33"	7	22 ♎ 32'33"
3	258°09'57"	9	18 ♐ 09'57"	233°45'13"	8	23 ♏ 45'13"

Reference(s)

M.E. HONE, "THE MODERN TEXTBOOK OF ASTROROLOGY",
L.N. FOWLER & Co. LTD, LONDON, 1968

User Instructions

PLACIDUS CUSPS - EXACT METHOD		
1	TROPICAL	SIDEREAL
2	COMPUTE	

[illegible]

67 Program Listing I

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STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS												
001	LBL 1	31 25 01	ERROR EXIT FOR POLAR LATITUDES		X	71													
	RCL C	34 13			RCL 3	34 03													
	ABS	35 64			SIN	31 62													
	9	09		060	+	61													
	0	00			X $\Rightarrow$ Y	35 52													
	RCL B	34 12			RCL 3	34 03													
	-	51			COS	31 63													
	X $\Rightarrow$ Y?	32 71			+	61													
	GTO 0	22 00			X $\Rightarrow$ Y	35 52													
010	RCL 0	34 00			$\div$	61													
	π	35 73			RCL 3	34 03													
	X $\Rightarrow$ Y?	32 51			+	61													
	P $\Rightarrow$ S	31 42			STO 3	33 03													
	STO 6	33 06		070	LST X	35 82													
	RCL B	34 12			-	51													
	1	01		ABS	35 64														
	R $\leftarrow$	31 72		EEX	43														
	STO 5	33 05		B	08														
	$\div$	61		CHS	42														
020	RCL C	34 13	START COMPUTATION		X $\Rightarrow$ Y?	32 71	CONVERGED? NO-LOOP BACK												
	TAN	31 64			GTO 3	22 03													
	X	71			RCL 3	34 03													
	STO 9	33 09			RCL 2	34 02													
	0	00		080	X	71													
	STO 7	33 07			RCL B	34 08													
	RCL D	34 14			+	61													
	G $\rightarrow$ R	32 73			RCL (i)	34 24													
	STO 8	33 08			+	61													
	RTN	35 22			1	01													
030	LBL A	31 25 11			R $\leftarrow$	31 72													
	F? 2	35 71 02			RCL 5	34 05													
	GSB 1	31 22 01			X	71													
	7	07			DEG	35 41													
	STO I	35 33		090	$\rightarrow$ P	32 72													
	1	01		X $\Rightarrow$ Y	35 52														
	0	00		RCL E	34 15														
	STO 1	33 01		F? 0	35 71 00														
	0	00		CLX	44														
	STO 2	33 02		+	61														
040	LBL 2	31 25 02	INITIAL GUESS		3	03													
	π	35 73			6	06													
	2	02			0	00													
	$\div$	61			+	61													
	STO 3	33 03		100	LST X	35 82													
	RAD	35 42			$\div$	61													
	LBL 3	31 25 03			LST X	35 82													
	RCL 2	34 02			X $\Rightarrow$ Y	35 52													
	RCL 3	34 03			FRAC	32 83													
	X	71			X	71													
050	RCL 6	34 08		BEGIN NEWTON- RAPHSON ITERATION		RCL 1		34 01	DISPLAY CUSP NO.										
	+	61				DSP 0		23 00											
	STO 4	33 04				R/S		84											
	RCL 9	34 09				R $\downarrow$		35 53											
	R $\leftarrow$	31 72			110	$\rightarrow$ HMS		32 74											
	RCL 2	34 02			DSP 4	23 04													
	CHS	42			R/S	84													
REGISTERS																			
0	1	2	3		4	5	6	7		8	9								
	N	f _N	S _N		$\alpha + f\beta$	COSE	π	0		$\alpha_{RADPHNS}$	tanPlane								
S0	π	S1	S2		S3	S4	S5	S6		S7	S8	S9							
											t _G	α_G							
A	T		B		E		C	ϕ		D	α_{MC}		E	SVP		F	USED		

[illegible]

Program Description I

Program Title *HOUSE CUSPS - REGIOMONTANUS METHODS*

Contributor's Name *JAMES NEELY*

Address *P.O. Box 1902 (SECY CMA)*

City *CARMEL* State *CA* Zip Code *93921*

Program Description, Equations, Variables *THE HOUSE CUSPS ARE COMPUTED IN ONE OF SEVERAL REGIOMONTANUS SYSTEMS. LET λ_N DENOTE THE (TROPICAL) DEGREE (ECLIPTIC LONGITUDE) OF THE N^{TH} CUSP. COMPUTE:*

- A. STANDARD SYSTEM $\Delta_N = 60^\circ + 30N$ FOR $N = 1, 2, \dots, 12$
 B. 8-FOLD SYSTEM $\Delta_N = 157\frac{1}{2} - 45N$ FOR $N = 1, 1\frac{1}{2}, \dots, 8\frac{1}{2}$
 C. 12-FOLD SYSTEM $\Delta_N = 45^\circ + 30N$ FOR $N = 1, 1\frac{1}{2}, \dots, 12\frac{1}{2}$

$$\text{THEN, } \lambda_N = \tan^{-1} \left[\frac{\sin(\alpha_{MC} + \Delta_N)}{\cos(\alpha_{MC} + \Delta_N) \cos \epsilon - \sin \Delta_N \tan \phi \sin \epsilon} \right]$$

SIDEREAL LONGITUDES, λ_s , ARE COMPUTED FROM THE ABOVE TROPICAL LONGITUDES BY ADDING SVP TO Δ_N .

NOTE: THIS PROGRAM MUST BE USED WITH ASTRO 1, 2, AND 3. ϵ , ϕ , α_{MC} AND SVP ARE DESCRIBED THEREIN.

Operating Limits and Warnings

THIS PROGRAM IS VALID FOR ALL NON-POLAR LATITUDES, THAT IS, $|\phi| < 90^\circ - \epsilon$. NO VALIDITY CHECKING IS PERFORMED.

This program has been verified only with respect to the numerical example given in Program Description II. User accepts and uses this program material AT HIS OWN RISK, in reliance solely upon his own inspection of the program material and without reliance upon any representation or description concerning the program material.

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Program Description II

Sketch(es)			
SIGN		GLYPH	
1		♂	
2		♂	
3		II	
4		♂	
5		♂	
6		♂	
SIGN		GLYPH	
7		♂	
8		♂	
9		♂	
10		♂	
11		♂	
12		♂	

Sample Problem(s) For 0146 Hours GMT on April 20, 1976, Geographic Latitude 37°N 20' and Longitude 121°W 55' (Nbk - Execute the Sample Problem in Astro3), Calculate Tropical & Sidereal Cusp & Medians in the Standard, 8-Fold & 12-Fold Systems. THE PARTIAL SOLUTIONS ARE:

	Cusp Number			TROPICAL			SIDEREAL		
	STAND- ARD	8- FOLD	12- FOLD	DEGREE	SIGN	DEG-IN-SIGN	DEGREE	SIGN	DEG-IN-SIGN
MC →	10	3 1/2	10 1/2	111°37'04"	4	21°37'04"	87°12'20"	3	27°12'20"
			11	129°32'41"	5	9°32'41"	105°07'57"	4	15°07'57"
		3		136°00'44"	5	18°00'44"	113°35'60"	4	23°35'60"
	11	2 1/2	11 1/2	146°03'51"	5	26°03'51"	121°39'06"	5	1°39'06"
			12	160°55'01"	6	10°55'01"	136°30'17"	5	16°30'17"
		2		174°42'05"	6	24°42'05"	149°57'20"	5	29°57'20"
	12	1	12 1/2	180°43'13"	7	0°43'13"	156°18'26"	6	6°18'26"
				186°54'58"	7	6°54'58"	162°30'13"	6	12°30'13"
		2		194°07'22"	7	14°07'22"	174°42'37"	6	24°42'37"
ASC →	1	1 1/2	1 1/2	211°33'24"	8	1°33'24"	187°08'40"	7	7°08'40"
			2	218°02'10"	8	8°02'10"	193°37'26"	7	13°37'26"
		1		224°46'59"	8	14°46'59"	200°22'14"	7	20°22'14"
	2	8 1/2	2 1/2	239°19'20"	8	29°19'20"	214°54'36"	8	4°54'36"
			3	255°30'25"	9	15°30'25"	231°05'41"	8	21°05'41"
		3		264°12'05"	9	24°12'05"	239°47'21"	8	29°47'21"
	3	4	3 1/2	273°12'20"	10	3°12'20"	246°47'36"	9	8°47'36"
		8							

Reference(s) 1. ALAN LEE, "CASTING THE HOROSCOPE," L.N. FOWLER & Co., LTD. LONDON, 1970

2. CARL W. STAHL, "STAHL'S OCTOSCOPE TABLES & HOUSES, CAMPANUS DEMNIFICATION, "SOLAR RESEARCH PUBLICATIONS, BAY CITY, MICH, 1974, FOR THE 8-FOLD & 12-FOLD METHODS & PRINCIPLES.

User Instructions

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REGIONAL CUSPS (STD, 8-FOLD, 12-FOLD & MEDIAN)			
TROPICAL ZODIAC			SIDEREAL ZODIAC
STANDARD;;	8-FOLD;;	12-FOLD;;	

STEP	INSTRUCTIONS	INPUT DATA/UNITS	KEYS	OUTPUT DATA/UNITS
1	EXECUTE ASTRO 1, 2 & 3			
2	ENTER PROGRAM CARD (BOTH SIDES)			
3	SET ZODIAC SYSTEM. EITHER			
A	TROPICAL (DEFAULT), OR		F A	
B	SIDEREAL		F E	
4	INITIALIZE CUSP SYSTEM. EITHER			
A	STANDARD CUSPS, OR		A	10.
B	8-FOLD CUSPS & MEDIAN, OR		B	3.5
C	12-FOLD CUSPS & MEDIAN		C	10.5
	THEN GO TO STEP 6			
5	DISPLAY NEW CUSP NUMBER		R/S	NN.N
6	DISPLAY A IN D.M.S		R/S	DD.MM.SS
7	DISPLAY SIGN		R/S	SS.0000
8	DISPLAY DEG-IN-SIGN		R/S	DD.MM.SS
9	REPEAT STEPS 5 THRU 8 FOR THE NEXT CUSP			
	NOTE: AT ANY TIME, THE COMPUTATIONS MAY BE REPEATED FROM STEP 3 OR FROM STEP 4			

67 Program Listing I

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	LBL 1	31 25 01	INITIALIZATION SUBROUTINE		DSP 1	23 01	12-FOLD CUSP ROUTINE: AN COMPUTATION
	RCL 0	34 00			1	01	
	π	35 73			2	02	
	$X=Y?$	32 51		060	.	83	
	$P \neq S$	31 42			5	05	
	RCL C	34 13			RCL 1	34 01	
	1	01			.	83	
	R $\leftarrow$	31 72			5	05	
	STD 4	33 04			+	61	
010	$\div$	81			$X>Y?$	32 81	
	RCL B	34 12	COS ϕ TAN ϕ COS ϵ SINE TAN ϕ SINE		1	01	8-FOLD CUSP ROUTINE: AN COMPUTATION
	1	01			STD 1	33 01	
	R $\leftarrow$	31 72			RCL 7	34 07	
	STD 5	33 05		070	X	71	
	R $\downarrow$	35 53			RCL 8	34 08	
	X	71			+	61	
	STD 6	33 06			STD 3	33 03	
	3	03			GTO 2	22 02	
	0	00			LBL 8	31 25 08	
020	STD 7	33 07			DSP 1	23 01	
	4	04	30		.	83	8-FOLD CUSP ROUTINE: AN COMPUTATION
	5	05			5	05	
	STD 8	33 08	45		RCL 1	34 01	
	1	01		080	.	83	
	5	05			5	05	
	7	07			-	51	
	.	83			$X \neq Y?$	32 61	
	5	05			GTO 6	22 06	
	STD 9	33 09	157 1/2		8	08	
030	0	00	0		.	83	
	STD 3	33 03			5	05	
	RTN	35 22			LBL 6	31 25 06	
	G LBL 9	31 25 11	TROPICAL ZODIAC		STD 1	33 01	STANDARD CUSP INITIALIZATION
	SFC	35 51 00		090	RCL 8	34 08	
	RIS	84			CHS	42	
	G LBL e	31 25 15			X	71	
	CF 0	35 61 00	SIDEREAL ZODIAC		RCL 9	34 09	
	RIS	84			+	61	
	LBL 9	31 25 09			STD 3	33 03	
040	DSP 0	23 00			GTO 2	22 02	
	1	01	STANDARD CUSP ROUTINE: AN COMPUTATION		LBL A	31 25 11	
	2	02			GSB 1	31 22 01	
	RCL 1	34 01			DSP 0	23 00	
	1	01		100	1	01	
	+	61			0	00	
	$X>Y?$	32 61			STD 1	33 01	
	1	01			9	09	
	STD 1	33 01			STD I	35 33	
	RCL 7	34 07			GTO 2	22 02	
050	X	71			LBL B	31 25 12	8-FOLD CUSP INITIALIZATION
	6	06			GSB 1	31 22 01	
	0	00			DSP 1	23 01	
	+	61			3	03	
	STD 3	33 03		110	.	83	
	GTO 2	22 02			5	05	
	LBL 7	31 25 07			STD 1	33 01	

REGISTERS

0	1	2	3	4	5	6	7	8	9
	N		AN	COS ϕ	COS ϵ	TAN ϕ SINE	30	45	157.5
S0	π	S1		S3	S4	S5	S6	S7	S8
								t_6	x_6
A	T		B	E		C	ϕ		D
							α_{MC}		E
							SVP		I
									7-12 FOLD
									8-8 FOLD
									6-STANDARD

67 Program Listing II

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STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS										
	8	08			1	01											
	STD I	35 33		170	-	51											
	GTO 2	22 02			RCL 7	34 07											
	LBL C	31 25 13			X	71											
	GSB 1	31 22 01	12-FOLD CUSP		-	51	DISPLAY										
	DSP 1	23 01	INITIALIZATION		R/S	84	DEGREE-IN-SIGN										
	1	01			GTO (i)	22 24	CONTINUE										
120	0	00			R/S	84											
	.	83															
	5	05															
	STD 1	33 01															
	7	07		180													
	STD I	35 33															
	LBL 2	31 25 02															
	RCL 3	34 03	AN														
	RCL D	34 14															
	+	61	XMC + AN														
130	1	01															
	R←	31 72															
	RCL 5	34 05															
	X	71	cos(XMC+AN)COS E														
	RCL 3	34 03		190													
	SIN	31 62															
	RCL 6	34 06	SIN AN TAN φ COS E														
	X	71															
	-	51															
	→ P	32 72															
140	R↓	35 53	AN														
	RCL E	34 15	SVP														
	F? 0	35 71 00															
	CL X	44	0														
	+	61		200													
	3	03	AN OR AS														
	6	06															
	0	00	MOD 360°														
	+	61															
	LST X	35 82															
150	÷	81															
	LST X	35 82															
	X⇌Y	35 52															
	FRAC	32 83															
	X	71		210													
	RCL 1	34 01															
	R/S	84	DISPLAY CUSP #														
	R↓	35 53															
	→HMS	72 74															
	DSP 4	23 04															
160	R/S	84	DISPLAY DEGREE														
	↑	41															
	↑	41															
	RCL 7	34 07															
	÷	81		220													
	INT	31 83															
	1	01															
	+	61															
	R/S	84	DISPLAY SIGN														
LABELS				FLAGS		SET STATUS											
A	/	B	/	C	/	D	/	E	/	0	/	FLAGS					
a	/	b	/	c	/	d	/	e	/	1	/	ON OFF					
0	/	1	/	2	/	3	/	4	/	2	/	0	☒	DEG	☒	FIX	☒
												1	☐	GRAD	☐	SCI	☐
												2	☐	RAD	☐	ENG	☐
												3	☐			n	2

Program Description I

Program Title

HOUSE CUSPS - CAMPANUS METHODS

Contributor's Name

JAMES NEELY

Address

P.O. Box 1902 (SECY CMA)

City

CARMEL

State

CA

Zip Code

93921

Program Description, Equations, Variables

THE HOUSE CUSPS ARE COMPUTED IN ONE OF SEVERAL CAMPANUS SYSTEMS. LET λ_N DENOTE THE (TROPICAL) DEGREE (ECLIPTIC LONGITUDE) OF THE N^{TH} CUSP. COMPUTE:

A. STANDARD SYSTEM $S_N = 60^\circ + 30N$ FOR $N = 1, 2, \dots, 12$.

B. 8-FOLD SYSTEM $S_N = 157\frac{1}{2} - 45N$ FOR $N = 1, 1\frac{1}{2}, \dots, 8\frac{1}{2}$.

C. 12-FOLD SYSTEM $S_N = 45^\circ + 30N$ FOR $N = 1, 1\frac{1}{2}, \dots, 12\frac{1}{2}$.

THEN, $\lambda_N = \tan^{-1}(\tan S_N \cos \phi)$

AND, $\lambda_N = \tan^{-1} \left[\frac{\sin(\chi_{MC} + \lambda_N)}{\cos(\chi_{MC} + \lambda_N) \cos \epsilon - \sin \lambda_N \tan \phi \sin \epsilon} \right]$

SIDEREAL LONGITUDES, λ_s , COMPUTED FROM THE ABOVE TROPICAL LONGITUDES BY ADDING SVP TO λ_N .

NOTE: THIS PROGRAM MUST BE USED WITH ASTRO 1, 2, and 3.

ϵ , ϕ , χ_{MC} AND SVP ARE DESCRIBED THEREIN.

Operating Limits and Warnings

THIS PROGRAM IS VALID FOR ALL NON-POLAR LATITUDES, THAT IS, $|\phi| < 90^\circ - \epsilon$. NO VALIDITY CHECKING IS PERFORMED.

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Program Description II

Sketch(es)

SIGN	GLYPH	SIGN	GLYPH
1	♈	7	♏
2	♉	8	♐
3	♊	9	♑
4	♋	10	♒
5	♌	11	♓
6	♍	12	♈

Sample Problem(s) FOR 0148 HOURS GMT ON APRIL 20, 1976; GEOGRAPHIC LATITUDE 37N20 & LONGITUDE 121W55 (NOTE-EXECUTE THE SAMPLE PROBLEM IN ASTRO3), CALCULATE TROPICAL & SIDEREAL CUSPS IN THE STANDARD, 8-FOLD, & 12-FOLD SYSTEMS. THE PARTIAL SOLUTIONS ARE:

SYSTEMS: THE TARTAN COLLECTION FIRE.										
	Cusp Number			TROPICAL			SIDEREAL			
	Stand- ard	8- FOLD	12- FOLD	DEGREE	SIGN	DEG-IN-SIGN	DEGREE	SIGN	DEG-IN-SIGN	
MC →	10	3½	10½	111°37'04"	4	21 ♎ 37'04"	87°12'20"	3	27 ♏ 12'20"	
			11	126°07'01"	5	6 ♏ 07'01"	101°42'17"	4	11 ♐ 42'17"	
		3		133°17'12"	5	13 ♏ 17'12"	108°52'28"	4	16 ♐ 52'28"	
	11	2½	11½	140°25'51"	5	20 ♏ 25'51"	116°01'07"	4	26 ♐ 01'07"	
			12	154°43'60"	6	4 ♐ 43'60"	130°19'16"	5	10 ♑ 19'16"	
	12	2	12½	169°12'00"	6	19 ♐ 12'00"	144°47'16"	5	24 ♑ 47'16"	
				176°32'30"	6	26 ♐ 32'30"	152°07'46"	6	2 ♒ 07'46"	
			1	183°58'22"	7	3 ♑ 58'22"	159°33'38"	6	9 ♒ 33'38"	
	ASC →	1	1½	1½	199°07'22"	7	19 ♑ 07'22"	174°42'37"	6	24 ♒ 42'37"
				2	214°37'16"	8	4 ♒ 37'16"	190°12'32"	7	10 ♓ 12'32"
2		2½	1	222°27'48"	8	12 ♒ 27'48"	198°03'04"	7	16 ♓ 03'04"	
			2	230°20'11"	8	20 ♒ 20'11"	205°53'26"	7	25 ♓ 53'26"	
3		8½	3	246°03'55"	9	6 ♓ 03'55"	221°39'11"	8	11 ♓ 39'11"	
			3½	261°36'03"	9	21 ♓ 36'03"	237°11'19"	8	27 ♓ 11'19"	
		8		269°14'50"	9	29 ♓ 14'50"	244°50'06"	9	4 ♓ 50'06"	
		4	276°47'56"	10	6 ♓ 47'56"	252°23'12"	9	12 ♓ 23'12"		

Reference(s) 1. ALAN LEO, "CASTING THE HOROSCOPE", L.N. FOWLER & CO LTD LONDON, 1970

2. CARL W. STAHL, "STAHL'S OCTOSCOPE TABLES OF HOUSES, CHIMARUS DOMINIFICATION", SOLAR RESEARCH PUBL. BNY CITY, MICH. 1974

User Instructions

CAMPANUS CUSPS (STD, 8-FOLD, 12-FOLD & MEDIAN)				
TROPICAL ZODIAC				STEREO ZODIAC
STANDARD;;	8-FOLD;;	12-FOLD;;		

[illegible]

67 Program Listing II

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS									
	B	08			↑	41										
	STD I	35 33		170	RCL 7	34 07										
	GTD R	22 02			÷	81										
	LBL C	31 25 13			INT	31 83										
	GSB 1	31 22 01			1	01										
	DSP 1	23 01			+	61										
	1	01			R/S	84	DISPLAY SIGN									
120	0	00			1	01										
	.	83			-	51										
	5	05			RCL 7	34 07										
	STD 1	33 01			X	71										
	7	07		180	-	51										
	ST I	35 33			R/S	84	DISPLAY DEG-IN SIGN									
	LBL 2	31 25 02			GTD (E)	22 24										
	RCL 3	34 03			R/S	84	CONTINUE									
	1	01														
	R←	31 72														
130	RCL 4	34 04														
	÷	81														
	→P	32 72														
	X⇌Y	35 52														
	STD 3	33 03		190												
	RCL D	34 14														
	+	61														
	1	01														
	R←	31 72														
	RCL 5	34 05														
140	X	71														
	RCL 3	34 03														
	SIN	31 62														
	RCL 6	34 06														
	X	71		200												
	-	51														
	→P	32 72														
	R↓	35 53														
	RCL E	34 15														
	F? 0	35 71 00														
150	CL X	44														
	+	61														
	3	03														
	6	06														
	0	00														
	+	61		210												
	LST X	35 82														
	+	81														
	LST X	35 82														
	X⇌Y	35 52														
160	FRAC	32 83														
	X	71														
	RCL 1	34 01														
	R/S	84														
	R↓	35 53		220												
	→HMS	32 74														
	DSP 4	23 04														
	R/S	84														
	↑	41														
LABELS				FLAGS		SET STATUS										
A	✓	B	✓	C	✓	D		E	0	✓	FLAGS		TRIG		DISP	
a	✓	b		c		d		e	✓	1	ON OFF		DEG	✓	FIX	✓
0		1	✓	2	✓	3		4		2	0	✓	GRAD		SCI	
5		6	✓	7	12 FOLD	8	8 FOLD	9	STANDARD	3	2	✓	RAD		ENG	
											3	0	✓		n	0

Program Description I

Program Title *HOUSE CUSPS - TOPOCENTRIC METHODS*

Contributor's Name *JAMES NEELY*

Address *P.O. Box 1902 (SECY CMA)*

City *CARMEL*

State *CA*

Zip Code *93921*

Program Description, Equations, Variables *THE HOUSE CUSPS ARE COMPUTED IN ONE OF SEVERAL TOPOCENTRIC SYSTEMS. LET Δ_N DENOTE THE (TROPICAL) DEGREE (ECLIPTIC LONGITUDE) OF THE N^{TH} CUSP. COMPUTE:*

A. STANDARD SYSTEM: $\Delta_N = 60^\circ + 30N$ FOR $N = 1, 2, \dots, 12$.

B. 8-FOLD SYSTEM: $\Delta_N = 15^\circ 1/2 - 45N$ FOR $N = 1, 1 1/2, \dots, 8 1/2$.

C. 12-FOLD SYSTEM: $\Delta_N = 45^\circ + 30N$ FOR $N = 1, 1 1/2, 2, \dots, 12 1/2$.

$$\text{THEN } F_N = \left| \left| \frac{\Delta_N}{90} - 1 \right| \bmod 4 - 2 \right| - 1,$$

$$\text{AND, } \lambda_N = \tan^{-1} \left[\frac{\sin(\Delta_{MC} + \Delta_N)}{\cos(\Delta_{MC} + \Delta_N) \cos \epsilon - F_N \tan \phi \sin \epsilon} \right]$$

SIDEREAL LONGITUDES, λ_s , ARE COMPUTED FROM THE ABOVE TROPICAL LONGITUDES BY ADDING SVP TO λ_N .

NOTE: THIS PROGRAM MUST BE USED WITH ASTRO 1, 2, & 3 (002490) ϵ , ϕ , Δ_{MC} AND SVP ARE DESCRIBED THEREIN.

Operating Limits and Warnings

THIS PROGRAM IS VALID FOR ALL NON-POLAR LATITUDES, THAT IS, $|\phi| < 90^\circ - \epsilon$. NO VALIDITY CHECKING IS PERFORMED.

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Program Description II

Sketch(es)

SIGN	GILYPH	SIGN	GILYPH
1	♈	7	♌
2	♉	8	♍
3	♊	9	♎
4	♋	10	♏
5	♌	11	♐
6	♍	12	♑

Sample Problem(s) FOR 0148 HOURS GMT ON APRIL 20, 1976; GEOGRAPHIC LATITUDE 37N 20 & LONGITUDE 121W 55 (NOTE - EXECUTE THE SAMPLE PROGRAM IN ASTRO 3), CALCULATE TROPICAL & SIDEREAL CUSPS & MEDIAN IN THE STANDARD, 8-FOLD, & 12-FOLD SYSTEMS. THE PARTIAL SOLUTIONS ARE:

	Cusp Number			TROPICAL			SIDEREAL		
	STAND- ARD	8- FOLD	12- FOLD	DEGREE	SIGN	DEG-IN-SIGN	DEGREE	SIGN	DEG-IN-SIGN
MC →	10	3 1/2	10 1/2	111°37'04"	4	21 ♈ 37'04"	87°12'20"	3	27 ♈ 12'20"
			11	126°19'01"	5	8 ♉ 19'01"	103°54'16"	4	13 ♉ 54'16"
		3		136°29'49"	5	16 ♊ 29'49"	112°05'05"	4	22 ♊ 05'05"
	11	11 1/2	11 1/2	144°30'02"	5	24 ♋ 30'02"	120°05'17"	5	0 ♋ 05'17"
			12	154°49'24"	6	9 ♌ 49'24"	135°24'40"	5	15 ♌ 24'40"
	12	12 1/2	12 1/2	174°03'57"	6	24 ♏ 03'57"	149°39'13"	5	29 ♏ 39'13"
			2	160°45'11"	7	0 ♐ 45'11"	156°26'27"	6	6 ♐ 26'27"
			1	187°09'07"	7	7 ♑ 09'07"	162°44'23"	6	12 ♑ 44'23"
	ASC →	1 1/2	1 1/2	199°07'22"	7	19 ♒ 07'22"	174°42'37"	6	24 ♒ 42'37"
			2	212°35'49"	8	2 ♏ 35'49"	188°11'04"	7	8 ♏ 11'04"
		1		219°40'57"	8	9 ♐ 40'57"	195°16'13"	7	15 ♐ 16'13"
	2	2 1/2	2 1/2	226°59'36"	8	16 ♑ 59'36"	202°34'52"	7	22 ♑ 34'52"
			3	242°15'07"	9	2 ♒ 15'07"	217°50'23"	8	7 ♒ 50'23"
	3	3 1/2	3 1/2	258°15'16"	9	18 ♐ 15'16"	233°50'31"	8	23 ♐ 50'31"
			8	266°26'38"	9	26 ♑ 26'38"	242°03'54"	9	2 ♑ 03'54"
			4	274°46'22"	10	4 ♏ 46'22"	250°23'37"	9	10 ♏ 23'37"

Reference(s) 1. W. POLICH & A.P. NELSON PAGE, "BRIEF OUTLINE OF THE TOPICENTRIC SYSTEM OF HOUSES", THE ASTROLOGICAL JOURNAL, VOL. V, No. 4, 1963, SPARTA PRESS LTD.

2. CARL W. STAHL, "STAHL'S OCTOSCOPE TABLES OF HOUSES, CANNIPANUS DOMINIFICATION", SOLUNAR RESEARCH PUBL., BAYCITY, MICH 1974

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[illegible]

97 Program Listing I

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS	TCPO
001	*LBL1	21 01	INITIALIZATION SUBROUTINE	057	DSP1	-63 01	12-FOLD CUSP ROUTINE: AN COMPUTATION N AN 8-FOLD CUSP ROUTINE: AN COMPUTATION ----- N AN STANDARD CUSP INITIALIZATION 8-FOLD CUSP INITIALIZATION	
002	RCL0	36 00		058	1	01		
003	Pi	16-24	059	2	02			
004	X=Y?	16-32	060	.	-62			
005	PzS	16-51	061	5	05			
006	RCLC	36 13	062	RCL1	36 01			
007	1	01	063	.	-62			
008	+R	44	064	5	05			
009	ST04	35 04	065	+	-55			
010	=	-24	066	X>Y?	16-34			
011	RCLB	36 12	067	1	01			
012	1	01	068	ST01	35 01			
013	+R	44	069	RCL7	36 07			
014	ST05	35 05	070	x	-35			
015	R4	-31	071	RCL8	36 08			
016	x	-35	072	+	-55			
017	ST06	35 06	073	ST03	35 03			
018	3	03	074	GT02	22 02			
019	0	00	075	*LBL8	21 00			
020	ST07	35 07	076	DSP1	-63 01			
021	4	04	077	.	-62			
022	5	05	078	5	05			
023	ST08	35 08	079	RCL1	36 01			
024	1	01	080	.	-62			
025	5	05	081	5	05			
026	7	07	082	-	-45			
027	.	-62	083	X*Y?	16-32			
028	5	05	084	GT06	22 06			
029	ST09	35 09	085	8	08			
030	0	00	086	.	-62			
031	ST03	35 03	087	5	05			
032	RTN	24	088	*LBL6	21 06			
033	*LBLa	21 16 11	089	ST01	35 01			
034	SF0	16 21 00	090	RCL8	36 08			
035	R/S	51	091	CHS	-22			
036	*LBLc	21 16 15	092	x	-35			
037	CF0	16 22 00	093	RCL9	36 09			
038	R/S	51	094	+	-55			
039	*LBL9	21 09	095	ST03	35 03			
040	DSP0	-63 00	096	GT02	22 02			
041	1	01	097	*LBLA	21 11			
042	2	02	098	GSB1	23 01			
043	RCL1	36 01	099	DSP0	-63 00			
044	1	01	100	1	01			
045	+	-55	101	0	00			
046	X>Y?	16-34	102	ST01	35 01			
047	1	01	103	9	09			
048	ST01	35 01	104	ST01	35 46			
049	RCL7	36 07	105	GT02	22 02			
050	x	-35	106	*LBLB	21 12			
051	6	06	107	GSB1	23 01			
052	0	00	108	DSP1	-63 01			
053	+	-55	109	3	03			
054	ST03	35 03	110	.	-62			
055	GT02	22 02	111	5	05			
056	*LBL7	21 07	112	ST01	35 01			

REGISTERS										
0	1	2	3	4	5	6	7	8	9	
	N		DN	COS ϕ	COSE	TAN SINE	30	45	157 1/2	
S0	π	S1		S3	S4	S5	S6	S7	S8	S9
								tG	ΔG	
A	T	B	E	C	ϕ	D	$\Delta \mu$	E	SVP	I 7-12-FOLD 8-FOLD 3TD

97 Program Listing II

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STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS	TOPO
113	8	08		169	x	-35		
114	STOI	35 46		170	RCL1	36 01		
115	GT02	22 02		171	R/S	51	DISPLAY CUSP II	
116	*LBLC	21 13		172	R↓	-31		
117	GSB1	23 01	12-FOLD CUSP	173	+HMS	16 35		
118	DSP1	-63 01	INITIALIZATION	174	DSP4	-63 04	DISPLAY DEGREE	
119	1	01		175	R/S	51		
120	0	00		176	ENT↑	-21		
121	.	-62		177	ENT↑	-21		
122	5	05		178	RCL7	36 07		
123	STOI	35 01		179	÷	-24		
124	7	07		180	INT	16 34		
125	STOI	35 46		181	1	01		
126	*LBL2	21 02	COMMON ROUTINE	182	+	-55	DISPLAY SIGN	
127	RCL3	36 03		183	R/S	51		
128	RCLD	36 14		184	1	01		
129	+	-55	ΔMC + ΔN	185	-	-45		
130	1	01		186	RCL7	36 07		
131	→R	44		187	x	-35		
132	RCL5	36 05		188	-	-45	DISPLAY	
133	x	-35	COS(ΔMC tan) COS E	189	R/S	51	DEG-IN-SIGN	
134	RCL3	36 03		190	GT01	22 45	CONTINUE	
135	9	09		191	R/S	51		
136	0	00						
137	÷	-24						
138	1	01						
139	-	-45						
140	ABS	16 31						
141	4	04						
142	÷	-24	COMPUTE					
143	FRC	16 44	FN					
144	4	04		200				
145	x	-35						
146	2	02						
147	-	-45						
148	ABS	16 31						
149	1	01						
150	-	-45						
151	RCL6	36 06						
152	x	-35						
153	-	-45						
154	→P	34		210				
155	R↓	-31	ΔN					
156	RCL6	36 15	SVP					
157	F0? 16 23 00							
158	CLX	-51						
159	+	-55						
160	3	03	Δ MOD 360°					
161	6	06						
162	0	00						
163	+	-55						
164	LSTX	16-63		220				
165	÷	-24						
166	LSTX	16-63						
167	XZY	-41						
168	FRC	16 44						
LABELS					FLAGS	SET STATUS		
A STD	B 8-FOLD	C 12-FOLD	D	E	0	FLAGS	TRIG	DISP
a TROPICAL	b	c	d	e SIDEREAL	1	ON OFF		
0	1 ✓	2 ✓	3	4	2	0 ☒ ☐	DEG ☒	FIX ☒
5	6 ✓	7 ✓	8 ✓	9 ✓	3	1 ☐ ☒	GRAD ☐	SCI ☐
						2 ☐ ☒	RAD ☐	ENG ☐
						3 ☐ ☒		n. <u>2</u>

Program Description I

Program Title

HOUSE CUSPS - KOCH (GOH) METHODS

Contributor's Name

JAMES NEELY

Address

P.O. Box 1902 (SEC 4 CMA)

City

CARMEL

State

CA

Zip Code

93921

Program Description, Equations, Variables

THE HOUSE CUSPS ARE COMPUTED IN ONE OF SEVERAL KOCH SYSTEMS. LET Λ_N DENOTE THE (TROPICAL) DEGREE (ECLIPTIC LONGITUDE) OF THE N^{TH} CUSP. COMPUTE:

A. STANDARD SYSTEM: $\beta_N = (60^\circ + 30N) \text{ MOD } 360^\circ$ FOR $N = 1, 2, 3, \dots, 12$

B. 8-FOLD SYSTEM: $\beta_N = (517\frac{1}{2} - 45N) \text{ MOD } 360^\circ$ FOR $N = 1, 1\frac{1}{2}, 2, \dots, 8\frac{1}{2}$

C. 12-FOLD SYSTEM: $\beta_N = (30N + 45) \text{ MOD } 360^\circ$ FOR $N = 1, 1\frac{1}{2}, 2, \dots, 12\frac{1}{2}$.

THEN, $\xi = \sin^{-1} [\sin \alpha_{MC} \tan \phi \tan \epsilon]$,

$\Gamma_N = \alpha_{MC} + \beta_N + \gamma_N \xi$,

$\gamma_N = \beta_N / 90 - 1$ FOR $0^\circ \leq \beta_N < 180^\circ$; $\gamma_N = \beta_N / 90 - 3$ FOR $180^\circ \leq \beta_N < 360^\circ$

AND, $\Lambda_N = \tan^{-1} \left[\frac{\sin \Gamma_N}{\cos \Gamma_N \cos \epsilon - K_N \tan \phi \sin \epsilon} \right]$,

WHERE $K_N = +1$ FOR $0^\circ \leq \beta_N < 180^\circ$ & $K_N = -1$ FOR $180^\circ \leq \beta_N < 360^\circ$.

SIDEREAL LONGITUDES ARE COMPUTED BY ADDING THE SVP TO THE ABOVE TROPICAL LONGITUDES.

NOTE: THIS PROGRAM MUST BE USED WITH ASTRO 1, 2, & 3 (00249D). ϵ , ϕ , α_{MC} AND SVP ARE DESCRIBED THEREIN.

Operating Limits and Warnings

THIS PROGRAM IS VALID FOR ALL NON-POLAR LATITUDES, THAT IS, $|\phi| < 90^\circ - \epsilon$. NO VALIDITY CHECKING IS PERFORMED.

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Program Description II

Sketch(es)

SIGN	GLYPH	SIGN	GLYPH
1	♈	7	♌
2	♉	8	♍
3	♊	9	♎
4	♋	10	♏
5	♌	11	♐
6	♍	12	♑

Sample Problem(s) FOR 0148 HOURS GMT ON APRIL 20, 1976, GEOGRAPHIC LATITUDE 37°N 20' AND LONGITUDE 121°W 55' (NOTE - EXECUTE THE SAMPLE PROBLEM IN ASTRO-3), CALCULATE TROPICAL & SIDEREAL CUSPS & MEDIAN IN THE STANDARD, 8-FOLD, & 12-FOLD SYSTEMS. THE PARTIAL SOLUTIONS ARE:

	Cusp Number			TROPICAL		SIDEREAL	
	STAND- ARD	8- FOLD	12- FOLD	DEGREE SIGN	DEG-IN-SIGN	DEGREE SIGN	DEG-IN-SIGN
MC →	10	3 1/2	10 1/2	111°37'04" 4	21 ♎ 37'04"	87°12'20" 3	27 ♊ 12'20"
			11	126°13'41" 5	6 ♌ 13'41"	101°48'57" 4	11 ♎ 48'57"
		3		133°26'36" 5	13 ♌ 26'36"	109°01'52" 4	19 ♎ 01'52"
	11	2 1/2	11 1/2	140°39'09" 5	20 ♌ 39'09"	116°14'25" 4	26 ♎ 14'25"
			12	155°08'22" 6	5 ♍ 08'22"	130°43'38" 5	10 ♌ 43'38"
	12	2	12 1/2	169°45'37" 6	19 ♍ 45'37"	145°20'53" 5	25 ♌ 20'53"
				177°06'25" 6	27 ♍ 06'25"	152°41'40" 6	2 ♍ 41'40"
			1	184°27'34" 7	4 ♋ 27'34"	160°02'50" 6	10 ♍ 02'50"
	ASC →	1 1/2	1 1/2	199°07'22" 7	19 ♋ 07'22"	174°42'37" 6	24 ♍ 42'37"
			2	213°39'44" 8	3 ♋ 39'44"	189°14'59" 7	9 ♋ 14'59"
		1		220°53'03" 8	10 ♋ 53'03"	196°28'19" 7	16 ♋ 28'19"
			2 1/2	226°05'32" 8	16 ♋ 05'32"	203°40'48" 7	23 ♋ 40'48"
		8 1/2	3	242°35'13" 9	2 ♎ 35'13"	218°10'26" 8	8 ♎ 10'26"
		3	3 1/2	257°31'20" 9	17 ♎ 31'20"	233°06'36" 8	23 ♎ 06'36"
			8	265°20'34" 9	25 ♎ 20'34"	240°55'49" 9	0 ♎ 55'49"
			4	273°32'17" 10	3 ♏ 32'17"	249°07'33" 9	9 ♎ 07'33"

Reference(s) 1. W. KOCH & E. SCHAECK, "GEBÜRTSORTES HAUSETABELLEN", SCHAECK VERLAG, SAARBRÜCKEN, GERMANY
 2. CARL W. STAHL, "STAHL'S CYCLOSCOPE TABLES OF HOUSES, CHAMMANUS DOMINIFICATION," SOLUNAR RESEARCH PUBL., BAY CITY, MICH 1974

97 Program Listing I

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STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	*LBL1	21 01	INITIALIZATION	057	X>Y?	16-34	
002	RCL0	36 00		058	1	01	
003	PI	16-24	SUBROUTINE	059	ST01	35 01	N
004	X=Y?	16-33		060	RCL7	36 07	
005	F25	16-51		061	X	-35	
006	RCL0	36 13		062	6	06	
007	1	01		063	0	00	
008	+R	44		064	+	-55	
009	ST04	35 04	COS ϕ	065	ST03	35 03	β_N
010	+	-24	TAN ϕ	066	GT02	22 02	
011	RCL8	36 12		067	*LBL7	21 07	
012	1	01		068	DSP1	-63 01	12-FOLD CUSP ROUTINE:
013	+R	44		069	1	01	β_N COMPUTATION
014	ST05	35 05	COS E	070	2	02	
015	R+	-31	SINE	071	.	-62	
016	X	-35		072	5	05	
017	ST06	35 06	TAN ϕ SINE	073	RCL1	36 01	
018	R+	16-31		074	.	-62	
019	+	-24	TAN ϕ TANE	075	5	05	
020	RCL0	36 14		076	+	-55	
021	SIN	41		077	X>Y?	16-34	
022	X	-35		078	1	01	
023	SIN+	16 41		079	ST01	35 01	N
024	ST02	35 02	ξ	080	RCL7	36 07	
025	3	03		081	X	-35	
026	0	00		082	RCL8	36 08	
027	ST07	35 07	30	083	+	-55	
028	4	04		084	ST03	35 03	β_N
029	5	05		085	GT02	22 02	
030	ST08	35 08	45	086	*LBL8	21 08	
031	5	05		087	DSP1	-63 01	8-FOLD CUSP ROUTINE:
032	1	01		088	.	-62	β_N COMPUTATION
033	7	07		089	5	05	
034	.	-62		090	RCL1	36 01	
035	5	05		091	.	-62	
036	ST09	35 09	517 1/2	092	5	05	
037	0	00		093	-	-45	
038	ST03	35 03	0	094	X>Y?	16-32	
039	3	03		095	GT06	22 06	
040	6	06		096	8	08	
041	0	00		097	.	-62	
042	ST00	35 00	360	098	5	05	
043	RTN	24		099	*LBL6	21 06	
044	*LBLa	21 16 11	TROPICAL	100	ST01	35 01	N
045	SF0	16 21 00	ZODIAC	101	RCL8	36 08	
046	R/S	51		102	CHS	-22	
047	*LBLc	21 16 15	SIDEREAL	103	X	-35	
048	CF0	16 22 00	ZODIAC	104	RCL9	36 09	
049	R/S	51		105	+	-55	
050	*LBL9	21 05	STANDARD CUSP ROUTINE:	106	ST03	35 03	β_N
051	DSP0	-63 00		107	GT02	22 02	
052	1	01		108	*LBLA	21 11	STANDARD CUSP
053	2	02	β_N	109	GSB1	23 01	INITIALIZATION
054	RCL1	36 01	COMPUTATION	110	DSP0	-63 00	
055	1	01		111	1	01	
056	+	-55		112	0	00	

REGISTERS

0	360	1	N	2	ξ	3	β_N	4	$\cos \phi$	5	$\cos E$	6	$\tan \phi \sin E$	7	30	8	45	9	7 1/2
S0	π	S1		S2		S3		S4		S5		S6		S7		S8	t_G	S9	α_G
A	T	B	E	C	ϕ	D	α_{MC}	E	SVP	I	7:	12-FOLD	J	8:	8-FOLD	K	9:	STD	

97 Program Listing II

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS	Koch
113	STOI	35 01		169	X	-35	$\cos P_N \cos E$	
114	9	09		170	RCL6	36 06		
115	STOI	35 46		171	F1?	16 23 01	$K_N = \pm 1?$	
116	GT02	22 02		172	CHS	-22		
117	*LBLB	21 12	8-FOLD CUSP	173	-	-45		
118	GSB1	23 01	INITIALIZATION	174	+P	34	A_N	
119	DSP1	-63 01		175	R↓	-31	SVP	
120	3	03		176	RCL6	36 06		
121	.	-62		177	F0?	16 23 00		
122	5	05		178	CLX	-51		
123	STOI	35 01		179	+	-55		
124	8	08		180	RCL0	36 00		
125	STOI	35 46		181	+	-55		
126	GT02	22 02		182	LSTX	16-63	$A \text{ MOD } 360$	
127	*LBLC	21 13	12-FOLD CUSP	183	÷	-24		
128	GSB1	23 01	INITIALIZATION	184	LSTX	16-63		
129	DSP1	-63 01		185	X≠Y	-41		
130	1	01		186	FRC	16 44		
131	0	00		187	X	-35		
132	.	-62		188	RCL1	36 01	DISPLAY CUSP#	
133	5	05		189	R/S	51		
134	STOI	35 01		190	R↓	-31		
135	7	07		191	+HMS	16 35		
136	STOI	35 46		192	DSP4	-63 04	DISPLAY DEGREE	
137	*LBL2	21 02		193	R/S	51		
138	RCLD	36 14	α_{MC}	194	ENT↑	-21		
139	RCL3	36 03		195	ENT↑	-21		
140	RCL0	36 00		196	RCL7	36 07		
141	÷	-24		197	÷	-24		
142	FRC	16 44		198	INT	16 34		
143	RCL0	36 00		199	1	01		
144	X	-35		200	+	-55		
145	+	-55	β_N	201	R/S	51	DISPLAY SIGN	
146	LSTX	16-63		202	1	01		
147	CF1	16 22 01		203	-	-45		
148	1	01		204	RCL7	36 07		
149	8	08		205	X	-35		
150	0	00		206	-	-45	DISPLAY DEG-TN-SIGN	
151	X≠Y?	16-35		207	R/S	51		
152	SF1	16 21 01		208	GT01	22 45	CONTINUE	
153	÷	-24		209	R/S	51		
154	LSTX	16-63		210				
155	X≠Y	-41						
156	FRC	16 44						
157	X	-35						
158	9	09						
159	0	00						
160	÷	-24						
161	1	01						
162	-	-45	γ_N					
163	RCL2	36 02						
164	X	-35						
165	+	-55	P_N	220				
166	1	01						
167	+R	44						
168	RCL5	36 05						

LABELS					FLAGS	SET STATUS		
A STD	B 8-FOLD	C 12-FOLD	D	E	0 ✓	FLAGS		
a TROPICAL	b	c	d	e SUDREAL	1 ✓	TRIG		
0	1 ✓	2 ✓	3	4	2	ON OFF	DEG	FIX
5	6 ✓	7 ✓	8 ✓	9 ✓	3	☒ ☐	☒ ☐	☒ ☐
						☐ ☒	GRAD ☐	SCI ☐
						☐ ☒	RAD ☐	ENG ☐
						☐ ☒		n 4

Program Description I

Program Title Astrological Horoscope Construction

Contributor's Name Michael Erlewine

Address 1041 N. Main St.

City Ann Arbor, Michigan **State**

Zip Code 48104

Program Description, Equations, Variables Program constructs complete NATAL HOROSCOPE using a series of conventional formulae..in particular SPHERICAL TRIGONOMETRY. PROGRAM OUTPUTS the sensitive points: Ascendant, Mid-heaven, Right Ascension of the Mid-heaven and Vertex (all non-linear). The program also will use either conventional NOON or MIDNIGHT ephemerides of PLANETARY POSITIONS to determine precise GEOCENTRIC positions. I will sketch the flow of the formulae (please ask for more detailed instructions if needed).

A. Uses adaption JULIAN DAY NUMBER (encode) routine as given in the HP-67 STANDARD PAC (04-01) to work with dates.

B. Figures SIDEREAL TIME (in degrees) for NOON of EVENT DATE using this equation: S.T. NOON Greenwich = $18h38m45.836s + 8640184.542sT$ where T = # days elapsed since NOON Jan. 0, 1900/ 36525

C. Figures Local RIGHT ASCENSION OF MIDHEAVEN by:

$$R.A.M.C. = ST + GMT(1+C) - \lambda$$

where: λ = longitude of observer(+ if West, "-" if East)

ST = Mean Sidereal Time Greenwich Noon

GMT = Interval NOON GREENWICH to time Event.

C = Correction to convert GMT interval into sidereal units.

D. Computes Ecliptic Intercept or Mid -heaven by:

$$M.C. = \tan R.A.M.C. / \cos \text{Obliquity of the Ecliptic (1950 used)}$$

E. Computes non-linear Acendant by:

$$\tan \text{Ascendant} = \frac{\cos \phi \cdot \sin R.A.M.C. \cdot \cos \epsilon + \sin \phi \cdot \sin \epsilon}{\cos \phi \cdot \cos R.A.M.C.} + 90$$

(contREVERSE SIDE)

Operating Limits and Warnings LABEL(STEP) A must precede Label B...and Label D must precede Label E.

PROGRAM WORKS for dates March 1, 1900 thru Feb. 28, 2100
(this can be adjusted for other dates)

This program has been verified only with respect to the numerical example given in *Program Description II*. User accepts and uses this program material AT HIS OWN RISK, in reliance solely upon his own inspection of the program material and without reliance upon any representation or description concerning the program material.

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DESCRIPTION(continued)

- E. Where ϕ = Latitude of place(positive if North, negative if South)
 RAMC= Right Ascension of the Mid-heaven
 ϵ = Obliquity of the Ecliptic for year (1950 used)
 (more or less a constant)

F. Formula for VERTEX by:

$$\tan \text{Vertex} = \frac{\cos \text{RAMC}}{(\sin \epsilon \div \tan \phi) - (\sin \text{RAMC} \cdot \cos \epsilon)}$$

Legend as above.

G. Coefficient for finding planets places by:

$$x = \text{GREENWICH MEAN TIME} / 24$$

H. Planets longitudes by: (used with Ephemerides Planets Positions)

Longitude = Daily motion $\times$ coefficient PLUS earlier planet listing

Program Description II

Sketch(es)

NO SKETCH but LIST HERE OUTPUT FROM EXAMPLE GIVEN BELOW :

```
#1 Sidereal Time or Right Ascension Midheaven = 175.7252269
#2 Midheaven Zodiac Degree                     = 175.3421498
#3 Ascendant Zodiac Degree                     = 248.0128522
Vertex                                           = 112.1149333
Coefficient in STORAGE 0                       = 0.377083333
```

PLEASE NOTE: All Zodiac Longitudes given in their ABSOLUTE LONGITUDE equivalents from the Equinox (0° Aries) point thru all 360 degrees.

Sample Problem(s) Erect a Horoscope given the following standard birth information (the authors): Born July 18, 1941 at 4:03 P.M. Eastern Standard Time at Lancaster, Pa. (geographic coordinates 76° West 18' longitude and 40° North 02' latitude). The information should be ordered for ENTRY into calculator as follows:

```
ADD B+C (A) BIRTHDATE & Year      (T stack) 7.181941
        (B) TIME ZONE            (Z stack) 5.000000
        (C) Time from NOON       (Z stack) 4.030000 HH.MMSS
        (D) Longitude            (Y stack) 76.180000 DD.MMSS (D = degrees)
        (E) Latitude             (X stack) 40.020000 DD.MMSS
```

NOTE: If a MORNING birth you will use DATE PRIOR to BIRTHDAY (In this example..if the BIRTHTIME were A.M. the date used would be 7.171941) AND you will ADD 12 hours. (If BIRTH was at 4:03 A.M. you would use date 7.171941...AND ADD 4.03 + 12.00 PLUS 5.00 (TIME ZONE FACTOR). This program always works from a NOON position. There are additional notes on the USER INSTRUCTION PAGE.

Solution(s) ENTER DATA as explained above: (T) 7.181941 date in MM.DDYYYY
(Z) 9.030000 time + zone HH.MMSS
NOTE: ANSWERS GIVEN TOP OF PAGE. (Y) 76.180000 longitude DD.MMSS
(X) 40.020000 latitude DD.MMSS

PUSH LABEL A will give: (1) Sidereal Time (in degrees or RAMC)
[NOTE: LABEL B may be pushed pause (2) MidHeaven Zodiac Degree (0° to 360°)
ONLY after LABEL A to find the pause (3) Nonlinear Ascendant (0° to 360°)
VERTEX (0° to 360°)]

NEXT: LABEL D will set up ROUTINE for PLANET's PLACES for a NOON EPHEMERIS (If you are using a MIDNIGHT EPHEMERIS push LABEL E only after LABEL D has been PUSHED). A FLASHING PAUSE after either LABEL D or E indicates that you are to use SUBSEQUENT ephemeris listings (SEE USER INSTRUCTIONS for more complete EXPLANATION) (SEE PAGE 2 of this sheet)

Reference(s) ERLIOWINE, Michael PUSH BUTTON ASTROLOGY, Heart Center/Circle Books Publication, 1977 (section on Natal Construction)

PROGRAM DESCRIPTION II (page 2)

It is advisable to ADD this page to make clear (1) possible cases and their ENTRY and (2) Adjustments to personal requirements of the User.

The ASTROLOGER will note that this program generates its own SIDEREAL TIME without recourse to an Ephemeris. (accurate to within 1/10th of a second of time). In order to make clear just HOW this program may be used to fit the various possible cases of North/South latitude and East/West longitude we include here ENTRY PROCEDURE. NOTE: A minus sign "-" indicates that the value ENTERED is NEGATIVE (use the CHS KEY). Letters = stack location.

<u>North latitude</u>	<u>South latitude</u>	<u>North Latitude</u>	<u>South Latitude</u>
<u>East longitude</u>	<u>East longitude</u>	<u>West Longitude</u>	<u>West Longitude</u>
(T) Birthdate & Year	(T) Birthdate/Year	(T) Birthdate/Year	(T) Birthdate/Y.
(Z) Event time	(Z) Event time	(Z) Event Time	(Z) Event Time
(Z) - Time Zone	(Z) - Time Zone	(Z) Time Zone	(Z) Time Zone
(Y) - Longitude	(Y) - Longitude	(Y) Longitude	(Y) Longitude
(X) Latitude	(X) - Latitude	(X) Latitude	(X) -Latitude

Please Note: In ALL cases above the TWO Z VALUES are to be ADDED together algebraically.

SUGGESTIONS FOR ADJUSTMENT TO PERSONAL REQUIREMENTS

As you will note, all 224 steps have been used. However, if you do not feel you need VERTEX OUTPUT...you may remove steps 207 thru 224 and replace them with others. Examples of desirable ADDITIONS might be: Output in DEGREES/MINUTES/SECONDS...rather than DEGREES/DECIMAL FRACTIONS.

Others may want to ADD the slight adjustment to convert Universal to Ephemeris Time (the ΔT correction). This would be inserted after STEP-70 of the program...by a R/S instruction, at which time you would manually enter the ΔT correction and see that it is converted to DECIMALS and ADDED to the Y register.

Another desirable feature would be the use of LABEL B for the entry of the value of the OBLIQUITY OF THE ECLIPTIC (ϵ) for the year of the Event in question. A small program would take the value for ϵ and store the sine in STO 1 and the cosine in STO 2. As the program stands the value for ϵ used is that for the EPOCH 1950.0 and as this value changes only very slowly...for most purposes will be accurate enough.

DATA CARD VALUES

We will list here the VALUES used in the DATA CARD for this program:

STO A = 2415020 (JDN Jan. 0, 1900)	STO I = 360
STO B = .065709822 (increment S.T.)	STO 5 = 365.25 (# Julian Days in Year)
STO C = 18.64606555 (S.T. NOON 1900.0)	STO 6 = 30.6001 (JDN Routine)
STO D = 1.002737812 (9.58"/hr corr.)	STO 1 = 0.397881203 $\sin \epsilon 1950.0$
STO E = 1720982 (Julian Day Master #)	STO 2 = 0.917436945 $\cos \epsilon 1950.0$

A NOTE ON "FLASHING PAUSE" IN PLANET'S PLACES (LABELS D & E)

As most of you well know, the various additions/subtractions of time can send us either forward or backward to a later or earlier DATE from which to determine PLANET's PLACES. All you need know to use this program is that if AFTER LABEL D or E is pushed...you encounter a FLASHING PAUSE: If the flashing value is POSITIVE, THEN proceed to the next or subsequent DATE for planets places. If the FLASHING PAUSE is NEGATIVE (that is: there is a "-" sign in DISPLAY), THEN proceed to previous date or DAY-BEFORE the DATE ENTERED in STEP 3 of USER INSTRUCTIONS)...for the calculation of the PLANET's PLACES.

User Instructions

* SEE ADDITIONAL PAGE PROGRAM DESCRIPTION FOR MORE DETAILS

1 2	HOROSCOPE CONSTRUCTION Sidereal Time Mid-Heaven Vertex Ascendant	March 1, 1900/Feb. 28, 2100 NOON MIDNIGHT EPHEMERIS EPHEMERIS
--	--	--

STEP	INSTRUCTIONS	INPUT DATA/UNITS	KEYS	OUTPUT DATA/UNITS
1	LOAD SIDE 1 and SIDE 2		☐ ☐	
2	LOAD DATA CARD		☐ ☐	
3	Enter Birth or Event MONTH/DAY/YEAR		ENTER	
	for DATE: MM.DDYYYY		☐	
	(always enter DATE for NOON before Event)			
4	ENTER Event TIME in HOURS/MINUTES/SEC.		ENTER	
	format = HH.MMSS			
	(If A.M. birth...ADD 12 hours to the BIRTHTIME and use DAY-OF-THE-MONTH before birthdate in STEP-3)			
5	ADD MANUALLY to TIME in STEP-4 the TIME-ZONE factor in HOURS for section of the country where birth takes place. (In USA this will be 5,6,7 or 8 hours depending on EST=5h,CST=6h,MST=7h,PST=8h)		+	
6	ENTER Geographic Longitude of place in DEGREES/MINUTES/SECONDS DD.MMSS		ENTER	
7	ENTER Geographic Latitude of place in DEGREES/MINUTES/SECONDS DD.MMSS			
8	PUSH LABEL A will give:		A	
	(1) Right Ascension of Midheaven (or Sidereal Time) in WHOLE DEGREES and DECIMAL FRACTIONS from 0°(0°Aries) to 360°. (program pauses to display RAMC)			RAMC
	(2) Zodiac Degree of MIDHEAVEN in WHOLE DEGREES/DECIMALS (0° to 360°) (program again pauses)			M.C.
	(3) non-linear ASCENDANT in WHOLE DEGREES/DECIMALS (0° to 360°) PROGRAM STOPS. (Label B will give VERTEX in WHOLE DEGREES/DECIMALS...after label A is pushed...if desired)			ASCENDANT
9	PUSH LABEL D: set-up a routine to find the PLANET'S PLACES using a NOON ephemeris. (note: FLASHING PAUSE after D indicates you have crossed a NOON-DATE line and should use EPHEMERIS LISTINGS for day SUBSEQUENT to that entered in STEP 3) SEE PAGE 3 for more DETAILS Ephemeris Routine as follows:			
	(1) ENTER EARLY DATE PLANET LISTING		ENTER	
	(2) ENTER LATER DATE PLANET LISTING			
	PUSH R/S			PLANET
10	REPEAT parts 1&2 of STEP 9 for all planets			
	(NOTE: If using MIDNIGHT EPHEMERIS: PUSH label E only AFTER label D and proceed with parts 1&2 of STEP 9. FLASHING PAUSE AGAIN INDICATES DATE CHANGE)			

67 Program Listing I

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	*LBL A	31 25 11	Decimal Conversion and storage of initial values	057	RCLB	34 12	between 1900.0 & Event and from this the Sidereal Time at NOON Greenwich calculation is formed.
002	CF 1	35 61 01		058	X	71	
003	CF 0	35 61 00		059	2	02	
004	HMS →	31 74		060	4	04	
005	STO3	33 03		061	STO8	33 08	
006	R ↓	35 53		062	÷	81	
007	HMS →	31 74		063	FRC	32 83	
008	STO4	33 04		064	RCL8	34 08	
009	R ↓	35 53		065	X	71	
010	HMS →	31 74		066	RCLC	34 13	
011	STO 0	33 00	----- Julian Day Number Encode This is an adapt- ation of a portion of the routine in CALENDAR FUNCTIONS section of the Standard Pac issued with the HP-67	067	+	61	----- ADDS to Greenwich Sidereal Angle the adjustment to the locality. stores constant 9.56"/hr. correct. conversion degrees Right Ascension & Subtracts Long.
012	R ↓	35 53		068	RCL 0	34 00	
013	ENT	41		069	ENT	41	
014	INT	31 83		070	ENT	41	
015	STO7	33 07		071	RCL 8	34 08	
016	-	51		072	÷	81	
017	EEX	43		073	STO 0	33 00	
018	2	02		074	R ↓	35 53	
019	X	71		075	RCLD	34 14	
020	ENT	41		076	X	71	
021	INT	31 83		077	+	61	----- display R.A.M.C.--- determines M.C. Zodiac degree from the R.A.M.C.
022	STO8	33 08		078	1	01	
023	-	51		079	5	05	
024	EEX	43		080	X	71	
025	4	04		081	RCL4	34 04	
026	X	71		082	-	51	
027	STO9	33 09		083	GSB9	31 22 09	
028	RCL7	34 07		084	R ↓	35 53	
029	1	01		085	STO9	33 09	
030	+	61		086	PRTX	31 84	
031	ENT	41		087	TAN	31 64	----- used in Ascendant Routine.
032	1/x	35 62		088	RCL 9	34 09	
033	.	83		089	2	02	
034	7	07		090	7	07	
035	+	61		091	0	00	
036	CHS	42		092	X<Y?	32 71	
037	INT	31 83		093	SF2	35 51 02	
038	STO+9	33 61 09		094	3	03	
039	1	01		095	÷	81	
040	2	02		096	X<Y?	32 71	
041	X	71	determines # days	097	F3?	35 71 03	
042	-	51		098	R ↓	35 53	
043	RCL6	34 06		099	R ↓	35 53	
044	X	71		100	RCL2	34 02	
045	INT	31 83		101	F2?	35 71 02	
046	RCL 9	34 09		102	GT08	22 08	
047	RCL 5	34 05		103	F3?	35 71 03	
048	X	71		104	GT0a	22 31 11	
049	INT	31 83		105	GT01	22 01	
050	+	61		106	*LBL7	31 25 07	
051	RCL8	34 08		107	F0?	35 71 00	
052	+	61		108	RTN	35 22	
053	RCL E	34 15		109	9	09	
054	+	61		110	0	00	
055	RCLA	34 11		111	+	61	
056	-	51		112	GSB9	31 22 09	

REGISTERS

REGISTERS										
⁰ coeff.	¹ sin ϵ	² cos ϵ	³ latitude	⁴ longit.	⁵ constant	⁶ const.	⁷ used	⁸ used	⁹ used	
S0	S1	S2	S3	S4	S5	S6	S7	S8	S9	
A JDN 1900.0		B increment S.T.		C S.T. 1900.0		D 9.56"/hr. cst.		E master JDN		I 360

67 Program Listing II

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STEP KEY ENTRY KEY CODE COMMENTS			STEP KEY ENTRY KEY CODE COMMENTS				
113	R ↓	35 53	determines the Ascendant.	169	PRTX	31 84	checks if motion coefficient has moved ahead or behind one full day.
114	R/S	84		170	GTOC	22 13	
115	*LBLC	31 25 13		171	*LBLD	31 25 14	
116	F1?	35 71 01		172	RCL0	34 00	
117	GT07	22 07		173	1	01	
118	SF1	35 51 01		174	X<Y?	32 71	
119	RCL9	34 09		175	GTO 0	22 00	
120	COS	31 63		176	X↔Y	35 52	
121	RCL3	34 03		177	X>0?	31 81	
122	COS	31 63		178	GT06	22 06	
123	X	71	179	X↔Y	35 52	FLASHES PAUSE	
124	ST04	33 04	180	CHS	42		
125	RCL3	34 03	181	*LBL0	31 25 00		
126	COS	31 63	182	PRTX	31 84		
127	RCL9	34 09	183	ST0-0	33 51 00		
128	SIN	31 62	184	*LBL6	31 25 06		
129	RCL2	34 02	185	R/S	84		
130	X	71	186	HMS→	31 74		
131	ST07	33 07	187	X↔Y	35 52		
132	X	71	188	HMS→	31 74		
133	RCL3	34 03	189	-	51	routine for planets positions. converts two positions to decimals ...finds daily motion and adds the correct portion of that motion to the Earlier Planet's Listing.	
134	SIN	31 62	190	LSTX	35 82		
135	RCL1	34 01	191	X↔Y	35 52		
136	X	71	192	RCL0	34 00		
137	+	61	193	X	71		
138	RCL4	34 04	194	+	61		
139	X<0?	31 71	195	GT06	22 06		
140	GT01	22 01	196	*LBL5	31 25 15		
141	X↔Y	35 52	197	.	83		
142	X<0?	31 71	198	5	05		
143	GT02	22 02	199	ST0+0	33 61 00	routine for Mid-night Ephemeris. ..adds .5 day to coefficient and checks by FLASHING.	
144	X↔Y	35 52	200	GT0D	22 14		
145	*LBLa	32 25 11	201	*LBL9	31 25 09		
146	GSB4	31 22 04	202	RCL 1	35 34		
147	GSB3	31 22 03	203	X>Y?	32 81		
148	*LBL1	31 25 01	204	RTN	35 22		
149	GSB4	31 22 04	205	-	51		
150	1	01	206	GT09	22 09		
151	8	08	207	*LBLB	31 25 12		
152	0	00	208	SF0	35 51 00		
153	+	61	209	RCL9	34 09	determines the Vertex and sorts for quadrant. This section is the one most dispensable..and can be replaced by program modifications specified by the User's taste.	
154	GT03	22 03	210	COS	31 63		
155	*LBL2	31 25 02	211	RCL1	34 01		
156	X↔Y	35 52	212	RCL3	34 03		
157	*LBL8	31 25 08	213	TAN	31 64		
158	GSB4	31 22 04	214	÷	81		
159	RCL1	35 34	215	RCL7	34 07		
160	+	61	216	-	51		
161	GT03	22 03	217	X<0?	31 71		
162	*LBL4	31 25 04	218	GT05	22 05		
163	÷	81	219	GT01	22 01		
164	TAN ⁻¹	32 64	220	*LBL5	31 25 05		
165	RTN	35 22	221	X↔Y	35 52		
166	*LBL3	31 25 03	222	X<0?	31 71		
167	F1?	35 71 01	223	GT04	22 04		
168	GT07	22 07	224	GT08	22 08		
LABELS				FLAGS		SET STATUS	
A START	B Vertex	C Ascend.	D Planets	E Midnight	0 used	FLAGS	
a used	b	c	d	e	1 used	TRIG	
0 Warning	1 quadrant	2 used	3 used	4 trig	2 used	DISP	
5 quadrant	6 planets	7 quadrant	8 quadrant	9 quadrant	3 used	ON OFF	
					0	☐	☐
					1	☐	☐
					2	☐	☐
					3	☐	☐
					DEG ☒		
					GRAD ☐		
					RAD ☐		
					FIX ☒		
					SCI ☐		
					ENG ☐		
					n _____		

NOTES

Hewlett-Packard Software

In terms of power and flexibility, the problem-solving potential of the Hewlett-Packard line of fully programmable calculators is nearly limitless. And in order to see the practical side of this potential, we have several different types of software to help save you time and programming effort. Every one of our software solutions has been carefully selected to effectively increase your problem-solving potential. Chances are, we already have the solutions you're looking for.

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Mechanical Engineering
Surveying
Civil Engineering
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Hewlett-Packard recently added a unique problem-solving contribution to its existing software line. The new series of software solutions are a collection of programs provided by our programmable calculator users. Hewlett-Packard has currently accepted over 6,000 programs for our Users' Libraries. The best of these programs have been compiled into 40 Library Solutions Books covering 39 application areas (including two game books).

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Portfolio Management/Bonds & Notes
Real Estate Investment
Taxes
Home Construction Estimating
Marketing/Sales
Home Management
Small Business
Antennas
Butterworth and Chebyshev Filters
Thermal and Transport Sciences
EE (Lab)
Industrial Engineering
Aeronautical Engineering
Control Systems
Beams and Columns
High-Level Math
Test Statistics
Geometry
Reliability/QA

Medical Practitioner
Anesthesia
Cardiac
Pulmonary
Chemistry
Optics
Physics
Earth Sciences
Energy Conservation
Space Science
Biology
Games
Games of Chance
Aircraft Operation
Aviation
Calendars
Photo Dark Room
COGO-Surveying
Astrology
Forestry

ASTROLOGY

These programs should provide the user with the ability to compute basic astrological values and also five methods for calculating house cusp positions. These programs should certainly save time and effort for the astrologer, whether amateur or expert.

ASTRO 1 — MEAN OBLIQUITY OF THE ECLIPTIC AND GREENWICH
SIDEREAL TIME

ASTRO 2 — MOON'S ASCENDING NODE, NUTATION, AND SVP

ASTRO 3 — LOCAL SIDEREAL TIME, GEOCENTRIC LATITUDE, MC
AND ASCENDANT

MUNDOSCOPE, REGIONMONTANUS

MUNDOSCOPE, CAMPANUS

HOUSE CUSPS — PLACIDUS METHOD (Exact)

HOUSE CUSPS — REGIONMONTANUS METHOD

HOUSE CUSPS — CAMPANUS METHOD

HOUSE CUSPS — TOPOCENTRIC METHOD

HOUSE CUSPS — KOCH (GOH) METHOD

ASTROLOGICAL HOROSCOPE CONSTRUCTION



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