

## PROGRAM DESCRIPTION I

Program Title DATA PACKING (41C)

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**Program Description, Equations, Variables** This program tackles the problem of data packing in a way that is both convenient and flexible. The user specifies a format which will divide each data register up into a number of 'mini' registers ( we'll refer to these as MR ). Each successive data register beginning with R06 will be divided in the same way. For instance, a format of 4.2222 would mean that each register was divided into 4 MR, and that each MR had 2 digits. 2.55, 3.333, 5.22222, 9.111111111 are other possibilities - the limiting factor is the 10 digit capacity of the data registers. The MRs do not have to be of the same length, so that 3.523 is quite valid for a format - each data register divided into 3 MR, the first with 5 digits, the second 2 and, the third 3 digits.

Three functions are provided: store, recall and, exchange. When 'S' (store) and 'X' (exchange) are called the number to be stored should be in the Y reg., and the MR number in X. In both these cases the number that was in Y before keying in the MR will be returned to Y. This is also the case with 'R' (recall) though of course it is only necessary to key in the MR number before executing 'R'. This saving of the 'last Y' helps in chain calculations. 'S', 'R', & 'X' will function properly when called as subroutines. Line 86 specifies the first register used for packing and can be changed to a higher one if needed.

Negatives can be packed, but trying to mix positive & negative numbers in the same register will not work. Any fractional part of a number will be lost by any of the operations.

**Necessary Accessories** NONE

**Operating Limits and Warnings** FIX/SCI/ENG 9 should not be used as this can cause errors. Trying to store a number longer than the length specified by the format will cause more significant digits to be lost; attempting to store 45379 when a 3 digit number was specified for that 'mini' register would actually result in 379 being stored.

**Reference(s)** A TI 58/59 program translated and adapted.

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

## Sample Problem (Sketch if Desired)

Load program PK, set SIZE 015, and make sure that the functions 'S', 'R', & 'X' are assigned to the Sin, Cos and, Tan keys respectively.

Using a format of 3.333, store these numbers in the first ten 'mini' registers. Recall the first and exchange the contents of MR 10 with this.

Use FIX 9 and the VIEW function to examine the contents of R06 - R09.

Numbers to store: 147, 258, 369, 555, 159, 357, 212, 317, 793, 909.

## SOLUTION:

Input	Function	Display	Comments
Make sure you are not using FIX/SCI/ENG 9			
FIX 2			
XEQ CLRG ( not an essential step but just to make sure there are no 'old' data in the registers we'll be VIEWing )			
Enter format			
3.333	XEQ PK	3.33	3 MRs of 3 digits each
147	Enter ↑	147.00	
1	'S' (Sin)	147.00	
258	Enter ↑	258.00	
2	'S'	258.00	
and so on.....			
909	Enter ↑	909.00	
10	'S'	909.00	All stored
1	'R' (Cos)	147.00	Recall MR 1
10	'X' (Tan)	909.00	Exchange MR 10
1	'X' (Tan)	147.00	Exchange MR 1
FIX 9		147.0000000	
	VIEW 06	0.909258369	MR 1 - MR 3
	View 07	0.555159357	Next 3
	View 08	0.212317793	Next 3
	View 09	0.147000000	MR 10 - MR 12
FIX 2		147.00	

# USER INSTRUCTIONS

				SIZE: (HP-41C) 015
STEP	INSTRUCTIONS	INPUT	FUNCTION	DISPLAY
1	Set SIZE 015 (or as needed)			
2	Read magnetic card (User on if you want the key assignments to operate) <u>or</u> key in program from listing.			
3	Key in format (see page 1)	N.N...	XEQ PK	N.N...
4	Make sure you are not using FIX/SCI/ ENG 9			
5	To store a number			
	Key in the number	N	Enter	N
	Key in mini register (MR) number	m	'S'	N
6	To recall a number			
	Key in MR number	m	'R'	Contents of m
7	To exchange a number with the contents of a MR			
	Key in the number	N	Enter	N
	Key in MR number	m	'X'	Contents of m
	If the number to be exchanged is the result of some operation then it is only necessary to key in the MR no.			

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## PROGRAM LISTING

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STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS	STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
	01♦LBL "PK"				44 INT		
	02 SF 27				45 ST- IND		
	03 STO 01		Store format		02		
	04 RTN				46 X<> 00		
	05♦LBL "S"		STORE		47 10		
	06 X<>Y				48 *		
	07 STO 04				49 INT		
	08 RDN				50 10↑X		
	09 XEQ 09				51 ST* 00		
	10 XEQ 10				52 ST* IND		
	11 ENTER↑				02		
	12 X<> 00				53 ST* 03		
	13 +				54 1/X		
	14 RCL IND				55 ENTER↑		
02	15 FRC				56 X<> 04		
	16 +				57 *		
	17 STO IND				58 FRC		
02	18 RCL 03				59 RCL 04		
	19 ST/ IND				60 /		
02	20 RCL 00				61 INT		
	21 RCL 05		Last Y		62 RTN		
	22 X<>Y				63♦LBL 09		
	23 RTN				64 RDN		
	24♦LBL "X"		EXCHANGE		65 STO 05		Save 'Last Y'
	25 X<>Y				66 R↑		
	26 STO 04				67 1		
	27 RDN				68 -		
	28 XEQ 09				69 RCL 01		
	29 XEQ 10				70 STO 00		
	30 RCL IND				71 INT		
02	31 FRC				72 ST- 00		
	32 +				73 /		
	33 RCL 00				74 STO 02		
	34 +				75 FRC		
	35 RCL 03				76 RCL 01		
	36 /				77 INT		
	37 X<> IND				78 *		
02	38 INT				79 1		
	39 RCL 05		Last Y		80 +		
	40 X<>Y				81 RND		
	41 RTN				82 STO 03		
	42♦LBL 10				83 6		1st register for packed data
	43 RCL IND				84 ST+ 02		
02					85 RCL IND		
					02		
					86 FRC		
					87 STO IND		
					02		

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# PROGRAM LISTING

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[illegible]

**Note:** Refer to "HP-41C OWNER'S HANDBOOK AND PROGRAMMING GUIDE" for specific information on keystrokes. The Function Index is found at the very back of the Handbook. Refer to Appendix E in 67 or 97 "OWNER'S HANDBOOK AND PROGRAMMING GUIDE" for exact keystrokes.

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DATA REGISTERS		STATUS		
00 Used		SIZE 015	TOT. REG. 41	USER MODE
01 Format		ENG	FIX SCI	ON X OFF
02 Indirect		DEG	RAD GRAD	
03 Used		FLAGS		
04 X		# INIT S/C	SET INDICATES	CLEAR INDICATES
05 Last Y		27 S	User mode on	
06 First reg. for packed data.				
		ASSIGNMENTS		
		FUNCTION	KEY	FUNCTION KEY
		'S'(Store)	SIN	
		'R'(Recall)	COS	
		'X'(Exchange)	TAN	

PROGRAM REGISTERS NEEDED: 26

ROW 1 (1 : 5)



ROW 2 (5 : 12)



ROW 3 (12 : 21)



ROW 4 (22 : 28)



ROW 5 (29 : 37)



ROW 6 (38 : 47)



ROW 7 (47 : 56)



ROW 8 (56 : 68)



ROW 9 (69 : 80)



ROW 10 (81 : 90)



ROW 11 (91 : 100)



ROW 12 (100 : 106)



ROW 13 (107 : 114)



ROW 14 (115 : 123)

