

00925C

## PROGRAM DESCRIPTION I

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Program Title	DATA PACKING (41C)			
Contributor's Name	NEIL M HUNTER - BLAIR			
Address	c/o 230 LUNETA DRIVE			
City	SAN LUIS OBISPO	State/Country	CA	Zip Code
				93401

**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, 9.11111111 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	

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## USER INSTRUCTIONS

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STEP	INSTRUCTIONS	INPUT	FUNCTION	SIZE: (HP-41C) 015
				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 Key in mini register (MR) number	N m	Enter 'S'	N 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 Key in MR number If the number to be exchanged is the result of some operation then it is only necessary to key in the MR no.	N m	Enter 'X'	N Contents of m

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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				56	X<> 04		
15	FRC			57	*		
16	+			58	FRC		
17	ST/ IND			59	RCL 04		
02				60	/		
18	RCL 03			61	INT		
19	ST/ IND			62	RTN		
02				63	♦LBL 09		
20	RCL 00			64	RDN		
21	RCL 05			65	STO 05		Save 'Last Y'
22	X<>Y			66	R↑		
23	RTN			67	1		
24	♦LBL "X"		EXCHANGE	68	-		
25	X<>Y			69	RCL 01		
26	STO 04			70	STO 00		
27	RDN			71	INT		
28	XEQ 09			72	ST- 00		
29	XEQ 10			73	/		
30	RCL IND			74	STO 02		
02				75	FRC		
31	FRC			76	RCL 01		
32	+			77	INT		
33	RCL 00			78	*		
34	+			79	1		
35	RCL 03			80	+		
36	/			81	RND		
37	X<> IND			82	STO 03		
02				83	6		1st register for packed data
38	INT			84	ST+ 02		
39	RCL 05			85	RCL IND		
40	X<>Y			02			
41	RTN			86	FRC		
42	♦LBL 10			87	STO IND		
43	RCL IND			02			
02							

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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
88	0			51			
89	LBL	03		60			
90	X≠0?			70			
91	+			80			
92	DSE	03		90			
93	GTO	04		00			
94	10↑X						
95	STO	03					
96	ST* IND						
02							
97	RTN						
98	LBL	04					
99	RCL	00					
100	10						
101	*						
102	STO	00					
103	INT						
104	ST- 00						
105	GTO	03					
106	LBL "R"						
107	XEQ 09						
108	RCL IND						
02							
109	FRC						
110	RCL 03						
111	ST/ IND						
02							
112	RDN						
113	RCL 00						
114	10						
115	*						
116	INT						
117	10↑X						
118	*						
119	INT						
120	RCL 05						
121	X<Y						
122	RTN						
40							
50				00			

## REGISTERS, STATUS, FLAGS, ASSIGNMENTS

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				

DATA PACKING

USERS' LIBRARY  
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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)

