

DATA INPUT 13

TITLE: 6-Bit Floating Point Data Input Routine

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ABSTRACT:

This 5-track routine for use with ERF format No. 2 will read in decimal numbers in 6-bit mode with the decimal point properly placed. The input consists of 9 decimal digits, plus the decimal point (and the minus sign, if negative) input as two 5-character words. If negative, the minus sign is included as a sixth character in the first word. There is no limitation as to the decimal point except that it lie within the permissible range of the ten characters. Accuracy of conversion is assured by a pre-scaling normalization of the numbers, thus permitting any relative position of the decimal point. The instructional words, "Group" and "Exit" have the same meaning as in Program 11.5. The output of the program is the number in floating point form stored in memory in two consecutive locations -- the first for the fraction and the second for the exponent.

A last minute addition to the program makes an automatic test for the position of the six-bit button. If not depressed, the program will refuse to continue.

DISCLAIMER:

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Title: 6-Bit Floating Point Data Input Routine

Author: R.A. Koenig, National Lead Company

Function:

The function of this routine is to input, convert, and store nine decimal digit numbers in proper floating point form of ERFP Format No. 2. To allow for direct placing of the decimal point, the six-bit input mode is used. This routine is compatible with ERFP Format No. 2 and can be used to replace Subroutine No. 11.5 if Format No. 2 is used.

Calling Sequence:

To use this routine, the following changes must be made to the ERFP routine (Prog. 24.1).

<u>Location</u>	<u>New Contents</u>
0900	Y 1560
0901	U 1446

This routine will not affect the contents of the floating point accumulator.

NOTE: If it is desired to take advantage of the two additional tracks available for data storage (this routine occupies five tracks as compared to seven tracks for Program No. 11.5), the following additional changes should be made to Program 24.1

<u>Location</u>	<u>New Contents</u>
0732	R 1847
0733	U 1663

Loading Sequence:

This program must be loaded as follows:

	<u>Start Fill</u>	<u>Set Modifier</u>
24.1	Lo	Lo
6-Bit Input	Lo + 1100	Lo + 1100

Input:

Three types of words are used by this routine.

- a. Initial address.
- b. First half of number or "group" and "exit" instructional words.
- c. Second half of number.

The initial address word is a 4-digit decimal address at which sequential storage is to begin. Sequential storing will continue until either an "EXIT" or "GROUP" word appears in the first half of the number.

The first half of the word can contain the following:

- a. "EXIT" - The reading of the word "EXIT" will cause a carriage return to be executed and the routine to return to the next sequential interpretative order following the I0000 order.

- b. "GROUP" - The reading of the word "GROUP" will cause the routine to read a new initial address word.
- c. First half of number - The first half of a number can consist of five or less "acceptable" characters plus the minus sign if the number is negative. An "acceptable" character is defined as a decimal digit or the decimal point itself. If the number is positive, the positive sign must not be used. In the event that the number is negative, leading zeroes must be supplied. (See examples below.)

The second half of the word consists of five or less acceptable characters, as defined above.

Data Tape Preparation:

Any number containing nine decimal digits, plus the decimal point (and with a minus sign, if negative), is acceptable. These ten acceptable characters are read in two 5-character words.

Example: It is desired to place the following numbers into the specified locations.

Number	0.0	0.1435	768.976456	-0.000465712	100.0	100,000,000
Location	6200	6202	6204	6206	6220	6230

12.35	-4.0	.000000001	-60.00
6232	6234	6236	6250

DATA LOAD SHEET

Address Word				Stop	+	First Word					Stop	Second Word					Stop
6	2	0	0	'							'						'
						.	1	4	3	5	'						'
						7	6	8	.	9	'	7	6	4	5	6	'
					-	.	0	0	0	4	'	6	5	7	1	2	'
						G	R	O	U	P	'						
											'						
6	2	2	0	'							'	1	0	0	.	'	
						G	R	O	U	P	'						
6	2	3	0	'		1	0	0	0	0	'	0	0	0	0	.	'
											'	1	2	.	3	5	'
					-	4	.	0	0	0	'						'
						.	0	0	0	0	'	0	0	0	0	1	'
						G	R	O	U	P	'						
6	2	5	0	'	-	6	0	.	0	0	'						'
						E	X	I	T	'							

(Read New Address)

(Read New Address)

(Read New Address)

(End of Input)

Note: Words consisting of all zeroes need not be punched. A Stop Code is sufficient. The number zero can be input by using two Stop Codes.

It is immaterial to the accuracy of conversion as to the relative position of the decimal point. For example, the number 12.34 can be punched in any of the following ways.

12.34' ' 12,3'40000' 12,'34000' 12',3400'
 1'2.340' '12.34'

Similarly -12.34 can be punched as:

-12.34' ' -012.3'40000' -0012,'34000' -00012',34000'
 -00001'2.340' -00000'12.34'

Note that leading zeroes must be supplied for the negative situation.

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Special Notes:

If the number consists of five or less characters (4 digits plus decimal point), the routine will load faster if these are in entirely the first word. The reason for this is discussed in the section on conversion method used.

Storage:

5 tracks of instructions and constants.
The following sectors of Track 63 are used as temporary storage.
00, 01, 02, 04, 05, 06, 07, 08, 10, 20, 21, 22, 27, 31, 32, 35,
37, 40, 43, 44, 47, 50, 63.

Time: Approximately 30 words/minute.

Accuracy: Integers are converted exactly.
Fractional numbers will be in error by less than 1 in the 29th bit regardless of relative position of decimal point.

Method of Conversion:

To guarantee maximum accuracy in conversion of the number, a normalizing operation is used. After binarization at $q = 30$ is completed, a normalizing loop is entered (provided $N \neq 0$). Since N is a nine-digit number it must be $< 10^{10}$. The normalizing routine scales N such that $8 \times 10^7 \leq N < 10^{10}$, counting the number of multiplying shifts (by 10 at 31) required to do this. Call the number of left shifts R and the resulting shifted number N^* . Having already determined P ($0 \leq P \leq 9$), N^* is scaled by two successive divide operations -- one to account for P , the decimal point location and the other to account for the R shifts. By this method, therefore, a number such as 0.1 will be accurately converted regardless of the position of the "." and "1" within the two words. If the significant characters are all placed in the first word, the R loop will not require as many iterations; hence the routine will require less time than if the significant characters are all placed in the second word. All numbers are standardized prior to storage. The number zero is represented as zero fraction and zero exponent.

Special Applications:

This routine also contains a special one word fill that leaves the fractional part of the number in L_0 and the exponent (at 29) in $L_0 + 1$. This can not be used in conjunction with ERFP system.

The calling sequence for single word fill is:

R0460

U0461

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Using this mode operation, only the two halves of the number are used as input. Upon completion of storing the fraction in Lo and exponent in Lo + 1 the routine will exit.

Program Stops

0244 6-bit button not depressed. Depress 6-bit button and press start to continue.

Addenda

A programmed check for depression of 6-bit button has been included in the program. The effect of this is to give a dummy print order followed by an I0000 and testing the amount of shifting caused by the I order. (This was adopted per a suggestion from J. Rayna of Lehigh University.) All necessary changes have been made in the coding sheets and tape copies.

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JOB NO.	PROGRAM NO. J2-106	PROGRAM PREPARED BY: R.A. Koenig	PROGRAM CHECKED BY: POOL Review
PROBLEM: 6-Bit F.P. Input (ERFP Format 2)			DATE 2-9-59
			TRACK 00

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION		STOP	CONTENTS OF ADDRESS	NOTES
			OPERATION	ADDRESS			
	/						
	/	<input checked="" type="checkbox"/>					
, 0 0 0 0 0 0 4	'	0 0 0 0	[]	Fr	Word stored in
		0 1	[]	Exp @ 29	single fill mode
		0 2	1 2 J	0 8 K F		"Exit" 6-Bit in 4 bit	(0337)
		0 3				<input checked="" type="checkbox"/>	
		0 4	X C	6 3 4 7		R Ctr	
		0 5	X P	0 0 2 0		} Read 2nd word	
		0 6	X I	0 0 0 0			
		0 7	N	0 4 3 6		<input checked="" type="checkbox"/> 1 @ 30	Shift Left
		0 8	R	0 0 5 8		} Enter 6-Bit Binarize	
		0 9	U	0 0 1 9			
		1 0	M	0 0 6 0		1 @ 2	
		1 1	X H	6 3 4 0		<input checked="" type="checkbox"/> Store lower half	
		1 2	U	0 1 2 2		→ Assemble Word	
, 0 0 0 0 0 0 6	'	1 3		7 J		31 @ 29	(0148)
		1 4					
		1 5		9 J 4		<input checked="" type="checkbox"/> 10,000 @ 33	(0150)
		1 6	8 3 2 0	0 0 0 0		-3996 @ 12	(0044)
		1 7	8 0 1 3	8 8 0 0		-16,677,216 @ 24	(0052)
		1 8	7 9 Q 7	9 Q 7 8		Mask	(0032)
		1 9	X H	6 3 0 5		<input checked="" type="checkbox"/> N in 6-Bit Enter 6-Bit Binarize	
		2 0	S	0 1 6 3		1 @ 30	
		2 1	T	0 3 2 2		→ N = 0	
		2 2	A	0 0 3 7		1 @ 30	
		2 3	E	0 0 5 9		<input checked="" type="checkbox"/> 2082082 Save only 6th channels	
		2 4	S	0 0 4 6		1 @ 30	
		2 5	T	0 0 3 2		→ No "." in word	
		2 6	U	0 3 3 2		→ To dec. Pt. Exit	
, 0 0 0 0 0 0 5	'	2 7	4 2 0	J 4 0 0		<input checked="" type="checkbox"/> 1 @ 5 + 2 @ 11 + 3 @ 17 + 4 @ 23	(0155)
		2 8					
		2 9	3 W	8 0 0 0		Mask	(0043)
		3 0	7 J	0 0 0 0 0 0		Mask	(0051)
		3 1		1 4		<input checked="" type="checkbox"/> 5 @ 29	(0116)

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PROBLEM: 6-Bit F.P. Input (ERFP Format 2)				TRACK 00	

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION		STOP	CONTENTS OF ADDRESS	NOTES
			OPERATION	ADDRESS			
	/						
	/	0,0,3,2	B	0018	/	79Q79Q78	
		3,3	XE	6305	/	N in 6-bit	Trim To BCD
		3,4	XH	6306	/	N ₁	
		3,5	U	0039	/	<input checked="" type="checkbox"/>	
,000 0003	'	3,6	12J	Q8K8	/	"Exit" -1 @ 30	
		3,7		2	/	1 @ 30	(0022)
		3,8		2	/	1 @ 30	(0409)
		3,9	E	0161	/	<input checked="" type="checkbox"/> 1Q01Q00	
		4,0	M	0162	/	-54 @ 6	
		4,1	XA	6306	/	N ₁	
		4,2	XH	6307	/	N ₂	
		4,3	E	0029	/	<input checked="" type="checkbox"/> 3W8000	
		4,4	M	0016	/	-3996 @ 12	
		4,5	U	0049	/		
,000 0003	'	4,6		2	/	1 @ 30	(0024)(0403)
		4,7		10	/	<input checked="" type="checkbox"/> 4 @ 29	(0204)
		4,8		2	/	1 @ 30	(0126)(0405)
		4,9	XA	6307	/	N ₂	
		5,0	XH	6308	/	N ₃	
		5,1	E	0030	/	<input checked="" type="checkbox"/> 7J000000	
		5,2	M	0017	/	-16,677,216 @ 24	
		5,3	U	0057	/		
,000 0013	'	5,4		2	/	1 @ 30	(0232)
		5,5	W ₃	JW ₃ J	/	<input checked="" type="checkbox"/> Mask	(0240)
		5,6		4	/	1 @ 29	(0327)
		5,7	A	3w,20	/	N ₃	XA6308 in hex
		5,8	U	[]	/	Exit from binarize	
		5,9	Z08	208,2	/	<input checked="" type="checkbox"/> 6 bit mask	(0023)
		6,0	Z000	000,0	/	1 @ 2	(0010)
		6,1	W	J000	/	Mask	(0318)
		6,2	8200	000,0	/	- 63/64 @ 0	(0319)
		6,3	200	000,0	/	<input checked="" type="checkbox"/> 1 @ 6	(0227)

CARRIAGE RETURN
/ = CONDITIONAL STOP CODE

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PROBLEM: 6-Bit F.P. Input (ERFP Format 2)			DATE: 2-9-59
			TRACK: 01

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION		STOP	CONTENTS OF ADDRESS	NOTES
			OPERATION	ADDRESS			
	/						
	/	01010		61F8	/	100,000 @ 33	(0114)
		01	949	6800	/	8 x 10 ⁷ @ 30	(0215)
		02			/		
		03	E	0132	/	WOOO	Continue Add Bin.
		04	M	0133	/	-54 @ 6	
		05	X,A	6327	/	N1	
		06	U	0313	/		
		07	E	0129	/	7WWWWWQ	Drop Sign Here: N Neg
		08	R	0058	/	Set up Exit	in Bin.
		09	U	0111	/		
		10	U	0146	/		
		11	R	0333	/	Set Up "."	in 1st word
		12	U	0019	/	→ Enter 6 bit	bin.
		13	X,H	6335	/	Dec. Pt. Loc	Here "." in 1st word
		14	B	0100	/	100,000 @ 33	
		15	X,C	6337	/	ML	
		16	B	0031	/	5 @ 29	
		17	U	0152	/		
		18	X,P	1604	/	C.R.	Here to Exit
		19	U	0460	/		
		20	X,P	1600	/	Carr. Ret.	Here: 4-bit mode
		21	U	0207	/		
		22	X,B	6337	/	M, < 100,000 @ 33 10,000 @ 33	Here: assemble word
		23	U	0124	/		
		24	X,N	6332	/	1st word @ 28	Shift to q = 30
		25	X,A	6340	/	2nd word @ 30	
		26	S	0048	/	1 @ 30	
		27	T	0341	/	→ N = 0	
		28	U	0213	/	→ To normalize	
, 000 0006	/	29	7WWW	WWWQ	/	Mask	(0107)
		30		28	/	10 @ 29	(0308)
		31		28	/	10 @ 29	(0302)

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JOB NO.	PROGRAM NO. J2-106	PROGRAM PREPARED BY: R.A. Koenig	PROGRAM CHECKED BY: POOL Review	DATE 2-9-61
PROBLEM: 6-Bit F.P. Input (ERFP Format 2)				TRACK

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION		STOP	CONTENTS OF ADDRESS	NOTES
			OPERATION	ADDRESS			
	/						
	/	<input checked="" type="checkbox"/>					
		0 1 3 2	W	0 0 W 0 0	/	Mask	(0103)
		3 3	9	4 0 0 0 0 0 0	/	-54 @ 6	(0104)
		3 4			/	1 @ 29	(0219)
		3 5	X, B	6 3 5 0	/	<input checked="" type="checkbox"/> N @ 30	
		3 6	M	0 3 1 5	/	1 @ 1	
		3 7	D	[]	/	P Divide	
		3 8	D	[]	/	R Divide	
		3 9	U	0 1 4 0	/	<input checked="" type="checkbox"/>	
		4 0	X, C	6 3 2 2	/	N*	
		4 1	B	0 0 1 3	/	31 @ 29	
		4 2	S	[]	/	q for R Shifts	
		4 3	U	0 2 4 6	/	<input checked="" type="checkbox"/>	
		4 4			/		
		4 5	X, C	6 3 3 1	/	Here if word [*] 1 = 0	(0406)
		4 6	X, C	6 3 3 2	/	Store 1st word Bin. @ 28	(0110)
		4 7	R	0 3 3 3	/	<input checked="" type="checkbox"/> Set Exit for "." in 2nd word	
		4 8	U	0 0 0 4	/	→ Read 2nd Word	
		4 9	X, H	6 3 3 5	/	Dec. Pt. Here "." in 2nd word	
		5 0	B	0 0 1 5	/	10,000 @ 33	
		5 1	X, C	6 3 3 7	/	<input checked="" type="checkbox"/> M ₁	
		5 2	X, C	6 3 1 0	/	P Ctr (Temp)	
		5 3	U	0 1 5 5	/		
		5 4			/		
		5 5	B	0 0 2 7	/	<input checked="" type="checkbox"/> 420J400 1@ 5 + 2@11 + 3@17 +4 @ 23	
		5 6	X, M	6 3 3 5	/	Dec. Pt.	
		5 7	E	0 2 4 3	/	XZ0007 Save Loc. @ 29	
		5 8	X, H	6 3 4 4	/	Dec. Pt. Loc.	
		5 9	X, A	6 3 1 0	/	<input checked="" type="checkbox"/> Temp P Ctr	
		6 0	U	0 2 0 0	/		
, 0 0 0 0 0 0 0 3	/	6 1	1	Q 0 1 Q 0 0	/	Mask	(0039)
		6 2	9	4 0 0 0 0 0 0	/	-54 @ 6	(0040)
		6 3			/	<input checked="" type="checkbox"/> 1 @ 30	(0020)(0213)

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PROBLEM: 6-Bit F.P. Input (ERFP Format 2)			TRACK 02	

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION		STOP	CONTENTS OF ADDRESS	NOTES
			OPERATION	ADDRESS			
	/						
	/	0200	X,C	6343		P Ctr.	
		001	X,B	6344		Dec. Pt. Loc.	
		002	A	0224		(Z0437) Lo	Mask #2 table
		003	Y	0225	/	Set Mask # 2	
		004	A	0047		4 @ 29	
		005	Y	0234		Set Mask #	1
		006	U	0225			
		007	X,Z	0022	/	Delay	
		008	X,P	2623		"6"	
		009	U	0230			
		10	R	0253			Here: N Neg
		11	U	0107	/		
		12	U	0449			
		13	A	0163		1 @ 30	Enter Normalize
		14	X,H	6350			
		15	S	0101	/	$8 \times 10^7 @$	30
		16	T	0218		→N not normalized	
		17	U	0263		→N normalized	
		18	X,B	6347		R Ctr	
		19	A	0134	/	1 @ 29	
		20	X,H	6347		R Ctr	
		21	X,B	6350		n @ 30	
		22	N	0230		10 @ 31	
		23	U	0214	/		
		24	Z	0437		Lo Mask Table	(0202)
		25	B	[]		Mask # 2	
		26	X,E	6305		N	
		27	M	0063	/	1 @ 6	
		28	X,H	6307		Save L.H. Portion	
		29	U	0233			
,000 0002	/	30		F		10 @ 31	Delay & (0222)
		31	8	070J	/	"_"	

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PROBLEM: 6-Bit F.P. Input (ERFP Format 2)				TRACK 02

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION		STOP	CONTENTS OF ADDRESS	NOTES
			OPERATION	ADDRESS			
	/						
	/	<input checked="" type="checkbox"/>					
		0, 2, 3, 2	U	0, 3, 1, 5	/		
		3, 3	X, B	6, 3, 0, 5	/	N	
		3, 4	E	[, ,]	/	Save R.H. Portion	
		3, 5	X, A	6, 3, 0, 7	/	<input checked="" type="checkbox"/> L.H. Portion	
		3, 6	U	0, 0, 3, 4	/	→ Return to Bin.	
		3, 7	X, C	6, 3, 0, 2	/		
		3, 8	X, P	0, 0, 0, 3	/	} Read Add.	
		3, 9	X, I	0, 0, 0, 4	/		<input checked="" type="checkbox"/>
		4, 0	E	0, 0, 5, 5	/	W3JW3J Trim to BCD	
		4, 1	X, H	6, 3, 2, 7	/		
		4, 2	U	0, 1, 0, 3	/		
		4, 3	X, Z	0, 0, 0, 7	/	<input checked="" type="checkbox"/> Mask	Delay (0157)
		4, 4	X, Z	0, 0, 0, 0	/		Stop: 6-Bit not down
		4, 5	U	0, 3, 5, 9	/	→ Test 6-bit again	
		4, 6	S	[, ,]	/	q from P shifts	
		4, 7	U	0, 2, 4, 9	/	<input checked="" type="checkbox"/>	
		4, 8	Z	0, 4, 2, 4	/	Lo q table	(0305)
		4, 9	X, H	6, 3, 2, 1	/	q @ 29	
		5, 0	X, B	6, 3, 2, 2	/	N*	
		5, 1	N	0, 2, 5, 9	/	<input checked="" type="checkbox"/> 1 @ 30	Shift Left
		5, 2	U	0, 2, 5, 3	/		
		5, 3	T	[, ,]	/	→ N Standardized Exit	Pos Neg
		5, 4	X, C	6, 3, 2, 2	/	N*	
		5, 5	S	0, 1, 3, 4	/	<input checked="" type="checkbox"/> 1 @ 29	
		5, 6	X, A	6, 3, 2, 1	/	q @ 29	
		5, 7	U	0, 2, 4, 9	/	→ Return	
0, 0, 0, 0, 0, 0, 0, 5	/	5, 8	5, G, 3, W	8, G, Q, 8	/	"Group"-	"Exit" (0336)
		5, 9		2	/	<input checked="" type="checkbox"/> 1 @ 30	(0251)
		6, 0			/		
		6, 1	5, G, 3, W	8, G, Q, 6	/	"Group"-	"Exit" - 1 @ 30 (0411)
		6, 2			/		
		6, 3	B	0, 3, 3, 5	/	<input checked="" type="checkbox"/> (Z0414)	Lo 10 ^k Table

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PROBLEM: 6-Bit F.P. Input (ERFP Format 2)			TRACK 03	

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION		STOP	CONTENTS OF ADDRESS	NOTES
			OPERATION	ADDRESS			
	/						
	/	<input checked="" type="checkbox"/>					
		0 3 0 0	X A	6 3 4 3	/	P Ctr	
		0 1	Y	0 1 3 7	/	Set "P" Divide	
		0 2	A	0 1 3 1	/	(XZ0010)	
		0 3	Y	0 2 4 6	/	<input checked="" type="checkbox"/> Set Up "P" Shift of q	
		0 4	X B	6 3 4 7	/	R Ctr	
		0 5	A	0 2 4 8	/	Lo q table (Z0424)	
		0 6	Y	0 1 4 2	/	Set Up "R" adj of q	
		0 7	U	0 3 0 8	/	<input checked="" type="checkbox"/>	
		0 8	S	0 1 3 0	/	(XZ0010) Generate Add of R Divide	
		0 9	Y	0 1 3 8	/	Set "R" Divide	
		1 0	U	0 1 3 5	/	→ Convert N to N*	
		1 1	X Z	0 0 0 1	/	<input checked="" type="checkbox"/> 1 @ 29 (0325)	
		1 2			/		
		1 3	X H	6 3 6 3	/	N ₂	Add Bin (0106)
		1 4	U	0 3 1 8	/		
0 0 0 0 0 0 2	/	1 5	4 0 0 0	0 0 0 0	/	<input checked="" type="checkbox"/> 1 @ 1	Delay (0136)
		1 6	8	0 5 0 8	/	"B"	
		1 7	U	0 2 4 3	/		
		1 8	E	0 0 6 1	/	WJ000	
		1 9	M	0 0 6 2	/	<input checked="" type="checkbox"/> -63/64 @ 0	
		2 0	X A	6 3 6 3	/	N ₂	Add Bin. @ 29
		2 1	U	0 3 2 6	/		
		2 2	X C	6 3 0 8	/	Dump	Here: N=0 in Bin.
		2 3	U	0 0 5 8	/	<input checked="" type="checkbox"/> → To exit from Bin	
		2 4	B	0 3 5 7	/	C[]	Here: Modify store
		2 5	A	0 3 1 1	/	1 @ 29	
		2 6	Y	0 3 5 5	/	C[] Fr.	
		2 7	A	0 0 5 6	/	<input checked="" type="checkbox"/> 1 @ 29	
		2 8	Y	0 3 5 7	/	C[] Exp.	
		2 9	X C	6 3 0 1	/	Dump	
		3 0	U	0 4 0 0	/	→ RW 1	
		3 1			/	<input checked="" type="checkbox"/>	

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JOB NO.	PROGRAM NO. J2-106	PROGRAM PREPARED BY: R.A. Koenig	PROGRAM CHECKED BY: POOL Review	DATE 2-9-59
PROBLEM: 6-Bit F.P. Input (ERFP Format 2)				TRACK 03

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION		STOP	CONTENTS OF ADDRESS	NOTES
			OPERATION	ADDRESS			
	/						
	/	0 3 3 2	A	0 0 5 4	/	1 @ 30	
		3 3	U	[]	/	Exit from Bin. with Dec. Pt.	
		3 4			/		
		3 5	Z	0 4 1 4	/	<input checked="" type="checkbox"/> Lo 10 ^k table	(0263)
		3 6	A	0 2 5 8	/	"Group"- "Exit"- 1 @ 30	
		3 7	A	0 0 0 2	/	"Exit"	
		3 8	R	0 2 5 3	/	Set up ps. exit from standardization	
		3 9	U	0 1 0 8	/	<input checked="" type="checkbox"/>	
		4 0	U	[]	/	Exit on seq. or single word fill	
		4 1	X C	6 3 2 0	/	Dump Here: N=0 after assem.	
		4 2	X C	6 3 2 1	/	Exp.	
		4 3	X C	6 3 2 2	/	<input checked="" type="checkbox"/> Fr.	
		4 4	U	0 3 4 0	/	→ To proper exit	
, 0 0 0 0 0 0 1	/	4 5	8 0 0	0 0 0 0	/	Text word	(0359)
		4 6	R	0 3 6 3	/	Enter here sequential fill	
		4 7	U	0 3 5 9	/	<input checked="" type="checkbox"/> → To 6-bit test	
		4 8	R	0 3 4 0	/	Set exit from word read	
		4 9	U	0 2 3 7	/	→ Read Add.	
		5 0	X B	6 3 2 2	/	Fraction	
		5 1	U	0 3 5 5	/	<input checked="" type="checkbox"/>	
		5 2			/		
		5 3			/		
		5 4			/		
		5 5	C	[]	/	<input checked="" type="checkbox"/> Store fr.	
		5 6	X B	6 3 2 1	/	Exp.	
		5 7	C	[]	/	Store exp.	
		5 8	U	0 3 2 4	/	→ Modify addresses	
		5 9	B	0 3 4 5	/	<input checked="" type="checkbox"/> Text Word	
		6 0	X P	6 3 1 1	/	Dummy print	
		6 1	X I	0 0 0 0	/		
		6 2	T	0 1 2 0	/	→ 4-bit mode	
		6 3	U	[]	/	<input checked="" type="checkbox"/> → o.k. on 6-bit	

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JOB NO.	PROGRAM NO. J2-106	PROGRAM PREPARED BY: R.A. Koenig	PROGRAM CHECKED BY: POOL Review	DATE 2-9-59
PROBLEM: 6-Bit F.P. Input (ERFP Format 2)			TRACK 04	

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION		STOP	CONTENTS OF ADDRESS	NOTES
			OPERATION	ADDRESS			
	/						
	/	<input checked="" type="checkbox"/>					
		0,4,0,0	X,C	6,3,4,3	/	P Ctr	Here: Read 1st Word
		0,1	X,P	0,0,1,6	/		
		0,2	X,I	0,0,0,0	/		
		0,3	N	0,0,4,6	/	<input checked="" type="checkbox"/> 1 @ 30	
		0,4	T	0,2,1,0	/	→ N Neg.	
		0,5	S	0,0,4,8	/	1 @ 30	
		0,6	T	0,3,3,8	/	→ N=0	First word
		0,7	S	0,0,3,6	/	<input checked="" type="checkbox"/> "Exit"	-1 @ 30
		0,8	T	0,3,3,7	/	→ Pos No. <	"Exit"
		0,9	S	0,0,3,8	/	1 @ 30	
		1,0	T	0,1,1,8	/	→ Word = "Exit"	
		1,1	S	0,2,6,1	/	<input checked="" type="checkbox"/> "Group"-"Exit" -1 @ 30	
		1,2	T	0,3,3,6	/	→ Pos Number	
		1,3	U	0,2,3,7	/	→ Word= "Group"	Read New Add.
,000 0035		1,4	7,WWW	WWW,Q	/	10 ⁰ @ 0	
		1,5	5,000	000,0	/	<input checked="" type="checkbox"/> 10 ¹ @ 4	
		1,6	6,400	000,0	/	10 ² @ 7	
		1,7	7,K00	000,0	/	10 ³ @ 10	
		1,8	4,Q20	000,0	/	10 ⁴ @ 14	} 10 ^K Table
		1,9	6,1F8	000,0	/	<input checked="" type="checkbox"/> 10 ⁵ @ 17	
		2,0	7,F12	000,0	/	10 ⁶ @ 20	
		2,1	4,J4G	400,0	/	10 ⁷ @ 24	
		2,2	5,W5Q	100,0	/	10 ⁸ @ 27	
		2,3	7,735	940,0	/	<input checked="" type="checkbox"/> 10 ⁹ @ 30	
		2,4		0	/	0 @ 29	} q Table
		2,5		1,0	/	4 @ 29	
		2,6		1,J	/	7 @ 29	
		2,7		2,8	/	<input checked="" type="checkbox"/> 10 @ 29	
		2,8		3,8	/	14 @ 29	
		2,9		4,4	/	17 @ 29	
		3,0		5,0	/	20 @ 29	
		3,1		6,0	/	<input checked="" type="checkbox"/> 24 @ 29	

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PROBLEM: 6-Bit F.P. Input (ERFP Format 2)				TRACK 04

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION		STOP	CONTENTS OF ADDRESS	NOTES
			OPERATION	ADDRESS			
	/						
	/	Q 4,3 2		6 J	/	27 @ 29	} q table (con't)
	/	3 3		7 8	/	30 @ 29	
	/	3 4			/		
	/	3 5		2	/	1 @ 30	(0020)
	/	3 6		2	/	1 @ 30	(0007)
	/	3 7	7 9 Q 7	9 Q 0 0	/		} Masks - L.H. Portion of word with dec. pt.
	/	3 8	7 9 Q 7	8 0 0 0	/		
	/	3 9	7 9 Q 0	0 0 0 0	/		
	/	4 0	7 8 0 0	0 0 0 0	/		} Masks - R.H. Portion
	/	4 1		0	/		
	/	4 2		7 8	/		
	/	4 3		1 Q 7 8	/		} Complement Neg. N.
	/	4 4		7 9 Q 7 8	/		
	/	4 5	1 Q 7	9 Q 7 8	/		
	/	4 6			/		} To seq. or single word exit
	/	4 7			/		
	/	4 8			/		} Dump
	/	4 9	X C	6,3 0 0	/		
	/	5 0	X S	6,3 2 2	/		} Read 1st word
	/	5 1	X H	6,3 2 2	/		
	/	5 2	U	0 3 4 0	/		} Expt
	/	5 3	X C	6,3 0 4	/		
	/	5 4	R	0 3 4 0	/		} Fraction
	/	5 5	U	0 4 0 0	/		
	/	5 6	X B	6,3 2 1	/		} Exit from routine
	/	5 7	H	0 0 0 1	/		
	/	5 8	X B	6,3 2 2	/		} Here single word fill
	/	5 9	C	0 0 0 0	/		
	/	6 0	U	[, ,]	/		} 6-Bit test
	/	6 1	R	0 3 6 3	/		
	/	6 2	U	0 3 5 9	/		} to continue
	/	6 3	U	0 4 5 3	/		

CARRIAGE RETURN

/ = CONDITIONAL STOP CODE