UNIVERSITY OF ILLINOIS

DIGITAL COMPUTER

ILLINOIS CODE A 3 - 125

TITLE	Convert a Number from Floating Decimal Representation to Normal Machine Form (DOI or SADOI)
TYPE	Closed
NUMBER OF WORDS	27
TEMPORARY STORAGE	0
PARAMETERS	S3, location of Floating Decimal Accumulator S4, location of first word of Floating Decimal routine
DURATION	Less than 3 milliseconds -- depends upon number converted.
DESCRIPTION	This is entered in standard fashion for a closed subroutine and will in general be used by floating decimal auxiliaries. When Code 125 is left, one half the number in the floating accumulator will appear in the AQ register in standard machine form with the binary point assumed to be between 2^{-39} of A and 2^{-1} of Q. The extra digit 2^{0}Q will always be zero.
LIMITATIONS	(a) If the number being standardized is less than 10^{-10} in absolute value, the number zero will be placed in the AQ register. (b) If the number being standardized is greater than 10^{9} in absolute value, the fraction in the first register of the floating accumulator will be placed, unchanged, in the A register.

DATE 12/30/53 RT: 11/27/59

CODED BY D. E. Muller

APPROVED BY J. P. Nash

ns

LOCATION	ORDER	NOTES	PAGE 1 A 3
	0C K(A3)		
0	K5 F		
	42 5L		
1	L1 1S3		Select size of 1F1
	L4 16L		-p -10
2	32 8L		If +, $p \leq -10$
	L4 25L		-p
3	36 10L		If +, $p \leq 0$
	L4 26L		-p +9
4	36 6L		If +, $p \leq 9$
	L5 S3		$p > 9$
5	50 25L		$\|F\| > 10^9$, set A = S3
	22 F		Link
6	F4 1L		-p +9 +16L +1 =(26 -p)L
	42 7L		$10^9 > \|F\| > 1$
7	50 S3		
	75 F		$(10^p)(A/2)\ 2^{-39}$
8	22 5L		
	41 F		$\|F\| < 10^{-10}$, set A = 0
9	50 F		
	22 5L		
10	L4 15L		(-p + 31)S4
	42 11L		
11	50 S3		10^p
	7J F		$(10^p)(A/2)\ 2^{-39}$
12	40 F		$1 > \|F\| > 10^{-10}$
	50 F		
13	36 15L		
	J0 31S4		Correct if negative.
14	L1 43S4		
	22 5L		
15	23 5L		
	00 31S4		
16	00 F		

LOCATION	ORDER	NOTES PAGE 2 A 3
	00 54F	
17	00F 00 1000	
	0000 00F	
18	00F 00 100	
	0000 00F	
19	00 F 00 10	
	0000 00F	
20	00F 00	
	1000 000F	
21	00F 00	
	1000 00F	
22	00F 00	
	1000 0F	
23	00F 00	
	1000 F	
24	00 F	
	00 100F	
25	00 F	
	00 10F	
26	00 F	
	00 9F	