UNIVERSITY OF ILLINOIS

DIGITAL COMPUTER

LIBRARY ROUTINE N14-227

By D. B. Gillies

TITLE: Input a Sequence of Integers (DOI or SADOI)

TYPE: Closed with one program parameter

NUMBER OF WORDS: 18

ACCURACY: Exact

SPEED: Input time (4 ms. per digit). This routine has an inner loop of 667 μ sec, which makes it twice as fast, overall as inter-input routines with a multiplication in the inner loop.

USE: This routine should be used in problems requiring only integer input. If fractions also are required, use N 12.

To read a sequence of integers into location n, n+1, ... enter with Q:

50 n

50 q

Each integer is punched with a sign (+ or -) followed by up to 12 decimal digits. Zero may be punched as + alone. A sequence is terminated by one of N,J,F,L. When one of these characters is encountered, control is transferred to the right hand side of q+1, with A = 0, 2^{-39}, 2.2^{-39}, 3.2^{-39}, according as the termination was N,J,F,L. The left hand address of 13L relative to the subroutine at this time is n+k, if k words have been read in to locations n, n+1, ... , n+k-1.

RT: 3/4/59

DATE February 3, 1957

CODED BY D. B. Gillies

APPROVED BY D. E. Muller

lgr

LOCATION	ORDER		NOTES PAGE 1 N 14
	00K(N14)		
0	K5 F		
	42 3L		Plant link and n
1	46 13L		
	81 4F		read sign of first integer of sequence
2	L0 16L		$-1 + (s-10) \cdot 2^{-39}$
	42 12L		set 12' as 0 or 1 for + or -
3	L0 17L		if instead of sign an N, J, F, or L,
	32 (link)F	by 0'	A has 0, 1, 2, 3 so obey link
4	89 1F		
	22 7L		enter loop with A = -1 (so $n_0 = 0$)
5	10 3F		
	F4 F		
6	00 2F		$n_i = d_i - 10 + 10(1+n_{i-1})$
	F4 F		
7	00 1F		
	40 F		$-1 + 2^{-39}\, n_i$
8	81 4F		$-1 + 2^{-39}\, (d_i - 10)$
	L0 16L		
9	36 5L		loop if $d_i < 10$ (digit, not sign)
	40 2F		store sign of the next number
10	89 1F		
	L4 F		$2^{-39}\, n_i$
11	40 F		Store positively in 0
	L1 F		negatively in 1
12	40 1F		
	L5 (0 or 1)F	By 2'	Choose 0 or 1 depending on previous sign
13	40 (n)F	by 1,14'	
	L5 13L		Store in sequence and increase
14	L4 L		the address of the store instruction
	46 13L		by one
15	L5 2F		$-1 + (s-10) \cdot 2^{-39}$
	22 2L		loop
16	80 F		
	00 10F		$-1 + 10 \cdot 2^{-39}$
17	80 F		
	00 2F		$-1 + 2.2^{-39}$