

UNIVERSITY OF ILLINOIS
DIGITAL COMPUTER

LIBRARY ROUTINE N 8 - 181

TITLE Read One Number from Tape as an Integer or Fraction
TYPE Closed (DOI or SADOI)
NUMBER OF WORDS 22
TEMPORARY STORAGE 0, 1, 2
ACCURACY $\pm 2^{-40}$ for fraction, exact for integer
DURATION 3 ms computation time per digit. Time is determined by input speed.
DESCRIPTION This program uses standard subroutine entry. No program parameters or preset parameters are required. The number will appear as a signed integer in A and as a signed fraction in Q. A space or carriage return (or other character having the fifth hole punched) must follow the last digit of the number and will act as a terminating symbol. Hence spaces, decimal points, etc. may not be used to separate the digits of a single number to be read. Such characters may, however, follow the sign. If a sign is omitted the number is assumed positive.
NOTES 1. No fewer than one and no more than 12 digits may be read.
2. Integers which exceed capacity are interpreted mod 2^{40} .
REMARKS This routine has the following advantages over N 1.
1. Has no program parameter.
2. Has maximum accuracy.
3. Will read 12 digit integers without division hangup.
It has the following disadvantages.
1. It is 3 words longer.
2. You need a terminating symbol.
3. You cannot separate digits of a single number by a space.

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LOCATION	ORDER	NOTES	PAGE 1
0	K (MS) K5 F 42 18L	Link	
1	41 2F 81 4F	+ or - test	
2	L0 21L 36 19L	- Read sign and first digit	
3	L4 20L 40 F	First digit in 0	
4	L5 20L 22 8L		
5	50 F 74 21L		
6	00 39F 40 F		
7	50 1F 75 21L	- Form $N - \frac{1}{2} 10^n$ and $\frac{1}{2} 10^n$	
8	S5 F 40 1F		
9	91 4F 36 5L		
10	50 1F L5 F		
11	66 1F 10 1F		
12	L5 F L4 1F	- Form $(\frac{N - \frac{1}{2} 10^n}{\frac{1}{2} 10^n }) \times 2 + \frac{1}{2}$	
13	40 F SJ F		
14	40 1F L1 2F		
15	32 17L L1 F		
16	40 F L1 1F	- Reverse sign	
17	40 1F L5 F		

LOCATION	ORDER	NOTES	PAGE 2
18	50 1F 22 ()F		
19	40 2F 22 1L	+ or - test	
20	00 F 00 5F		
21	00 F 00 10F	- Constants	