

UNIVERSITY OF ILLINOIS
DIGITAL COMPUTER

LIBRARY ROUTINE X 3 - 222

TITLE Constant-Listing Auxiliary
PURPOSE To list constants as they are required in a program to avoid manual cross references.
TYPE Special - input. Used with Library Routine X-1 (D.O.I.)
NUMBER OF WORDS 21
TEMPORARY STORAGE None - except that of Routine X - 1.
ACCURACY - -
DURATION - -
READ AROUND 85 when the list has more than 28 entries
DESCRIPTION When a constant is wanted, as for example, "add 3/8 into the accumulator", the constant itself is used for the address of the L4 order. Library Routine X 3 stores it in the list and furnishes the L4 order with the correct address. If the list already has this constant, the constant is not stored again but the address of the order refers to the earlier constant.

To make X 3 more flexible, the constants are written just as with Routine X 1, that is, as order pairs. When a constant is being listed, the function digits of the order which refers to it are followed by N. In the above example, we can handle 3/8 in two ways:

L4N 30F00F

L4N 00F 003750 0000 0000J

This way of writing constants makes the handling of starting values and end conditions a simple matter. Consider the following example.

EXAMPLE: Divide by 10 each of the numbers $N(100 + i)$ for $i = 0$ to 99

0

L5N 7J100F 40100F

1 40 2L

50N 00F001000 0000 0000J

2 7J (100 + i)F

40 (100 + i)F

3 L5 2L

L4N 001F 001F

4 40 2L
 LON LJ200F 40200F
5 32 1L

NOTES

- (a) Zero cannot be listed as a constant
- (b) The list is started at 16. This may be changed by adjusting the last order of the subroutine appropriately. It is now 00 16F
- (c) The tape contains, 00 941K, spaces, Routine X-3. X-3 may be placed at any desired place in the store.
- (d) The computer room tape has the stop 24 999N at its end.
- (e) One word of the D.O.I. is changed and control detoured through Routine X-3. This will not affect any routine unless Routine X-3 is overwritten and the D.O.I. not read in again.
- (f) Post mortem C1 may not be used with this routine.
- (g) This routine requires that a sufficient amount of the memory be cleared initially to provide room for the stored constants.

DATE <u>June 9, 1953, Rev.10/15/56</u>
PROGRAMMED BY <u>D. J. Wheeler</u>
REVISED BY <u>G. Belford</u>
APPROVED BY <u>D.E. Muller</u>

LOCATION	ORDER	NOTES	PAGE 1
0	00 941K		
	L5 2L		
	40 1012F	After D.O.I.	
1	50 3L		
	26 999F		
2	26 3L		
	00 1F	New word for D.O.I.	
3	00 F		
	00 L		
4	00 F		
	26 L		
	26 1N		
0	00 F		
	00 F	Temporary Store	
1	40 1F		
	22 7L	Temporary alteration for D.O.I.	
2	40 1F	D.O.I. word 16 to replace 1L.	
	L1 1012F		
3	42 1F	Store address	
	L3 F		
4	36 5L	N follows function digits	
	22 1F	Obey order	
5	L5 1F		
	40 L	Store word	
6	L5 1L		
	40 1018F	— Make 1/2 word	
7	26 1021F		
	F5 1018F	— Make 1/2 word	
8	22 6L		
	50 1F	Constant to Q	
9	L5 2L		
	40 1018F	— Restore D.O.I.	
10	L5 L		
	40 1F	— Replace order	

LOCATION	ORDER	NOTES	PAGE 2
11	L5 20L 42 1F		
12	42 13L 42 19L	Preset list address.	
13	42 15L L3 ()F		
14	36 19L S1 F	If list location contains zero	
15	S1 F L4 ()F	or new entry	
16	40 F L3 F	is equal to previous entry	
17	36 19L F5 19L	Otherwise encrease list address and cycle.	
18	22 11L S5 F		
19	25 F 40 ()F	Store constant	
20	27 1017F 00 16F		