UNIVERSITY OF ILLINOIS

DIGITAL COMPUTER

AUXILIARY
LIBRARY ROUTINE X 15 - 269

TITLE: Maximum Speed Sexadecimal Input Preparation for Magnetic Drum and/or Williams Memory.

TYPE: Complete Program

NUMBER OF WORDS: 105

PURPOSE: This routine will permit loading of the drum and/or WM from the reader at maximum speed. It causes any information previously assembled on the drum (except for the locked out section and all empty locations) to be punched out in sexadecimal form. The output tape has its own bootstrap, read-in, and sum-check programs on the front and can be read immediately into the machine at the maximum speed of the reader in a minimum of time. Therefore, if it is necessary to load the drum several times with the same information--program or data--, this routine can effect a considerable saving of time.

METHOD OF USE: There are three options in using this program.

Case I. It is desired to punch out program or data stored on the drum except for the locked out section (0 through 2,559) and the SADOI storage section (11,058 through 12,799). This information is intended for fast input only at a later time, and the state of the WM is unimportant after the input of such data. After loading the drum with the desired information, the routine is placed into the machine with a clear start and stops on $24\ 066_{16}$. At this point, black switch. When the output tape is read in, the computer stops on OF 000. The WM will be essentially empty at this time.

Case II. It is desired to punch out programs or data stored on the drum (from 2,560 through 11,057) and the program in the WM. Read in the routine with a hold start stopping on $24\ 066_{16}$. Place an order

of the form TV nF in the reader. Skip start (white switch up and down). The order in the reader will be obeyed from location 1 when the output tape is read in. This order will normally be a 2V order. When the sexadecimal output tape has been read in, the original program is in the WM, the symbolic address information has been restored, and the SADOI instructions from 999 on are also restored. Thus transfers to 999 may be performed for additional input.

Case III. It is desired to punch out program stored on the drum from 2,560 through 12,769. The last 30 words are destroyed by the drum bootstrap operation. This is the same as case II except the routine should be started with a hold start skipping the first few words on the tape. The starting point is indicated by a string of spaces. The order OF should be used in the reader.

STOPS: FF in ONS_{16} immediately after read in is a program input sum check failure. Move the routine to the string of spaces on the tape and re-read with a hold start. FF stop in $3LS_{16}$ when the sexadecimal tape is read in is a sum check failure. Repeated failures to read in indicate a punching error in the translation process.

SPEED: The punching time may be calculated approximately as 0.0031 n + 0.25 minutes where n is the number of non-zero words to be punched.

The reading time is given approximately by 0.04 n + 10 seconds where n is the number of words read.

DATE September 9, 1959
SUBMITTED BY W.W. Lichtenberger
APPROVED BY J. Snyder

ns

LOCATION	ORDER	NOTES PAGE 1 X 15
	00 K	
0	85 11F	
	40 F	interlude to switch to punch and
1	26 F	record current state of W. M. on drum.
	00 F	
	26 1469N	
	↑	
	DOI	
	↓	
	00 100K	
0	24 2L	black sw.-play out drum only (ignoring SADOI portion)
	L5 41L	white sw.-read in specification order and play out entire drum
1	40 1018F	modify DOI to read 1/2 order pair
	26 1021F	
2	41 1L	open "end" switch
	19 3F	
3	92 61F	punch leader
	00 62F	
4	36 3L	
	92 770F	punch drum clear
5	92 63F	more leader
	L5 47L	
6	82 40F	
	F5 5L	punch tape bootstrap
7	42 5L	& input pgm.
	L0 95L	
8	32 5L	
	41 F	clear for sum check
9	85 11F	play out 1 word
	00 2560F	
10	40 1F	
	L3 1F	
11	36 23L	if zero
	L3 4L	
12	36 18L	if no directive is to be printed
	L5 9L	

LOCATION	ORDER	NOTES	PAGE 2 X 15
13	10 12F		
	50 15L		
14	00 6F		
	42 15L	punch directive	
15	06 1F		
	92 F		
16	L5 9L		
	00 28F		
17	82 12F		
	41 4L	open directive sw.	
18	L5 1F		
	L6 F	sum check	
19	40 F		
	L5 1F	punch word	
20	82 40F		
	L3 L		main punching loop
21	32 23L	if not counting symbolic addresses	
	F5 42L	count symb. addr.	
22	42 42L		
	22 23L		
23	49 4L	close directive sw.	
	F5 9L		
24	40 9L	advance and end test	
	L0 43L		
25	36 9L		
	L3 1L		
26	32 35L	if done	
	L3 2L		
27	32 29L		
	41 2L		
28	L5 44L		
	40 43L		
29	26 9L		
	L3 3L	modification ladder	
30	36 33L		
	41 3L		

LOCATION	ORDER	NOTES PAGE 3 X 15
31	L5 45L	
	40 43L	
32	49 L	
	26 9L	
33	41 L	
	41 1L	
34	L5 46L	
	40 43L	
35	26 9L	
	92 259F	punch terminating directive
36	L3 F	
	82 40F	punch sum check
37	L5 42L	
	00 28F	punch number of symbolic addresses
38	82 12F	
	L5 96L	
39	00 20F	punch specification order
	82 20F	
40	0F F	stop
	00 F	
41	41 L	modification order for DOI
	22 2L	
42	00 F	number of symbolic addresses
	00 F	
43	05 11F	
	00 11058F	
44	05 11F	
	00 11431F	end tests
45	05 11F	
	00 11755F	
46	05 11F	
	00 12800F	
47	80 40F	
	40 1F	
48	80 40F	
	40 2F	

LOCATION	ORDER		NOTES PAGE 4 X 15
49	26 F		
	00 F		
50	80 40F		
	40 F		
51	F5 1F		
	40 1F		
52	80 40F		
	40 982F		
53	85 11F	983	
	00 1614F		
54	50 F	984	
	40 999F		
55	F5 983F	985	
	40 983F		
56	F5 984F	986	
	42 984F		
57	L0 992F	987	
	36 983F		
58	81 12F	988	
	40 F		
59	L5 999F	989	
	L0 F		
60	40 999F	990	
	81 20F		
61	40 1F	991	
	26 1002F		
62	J0 F	992	
	40 1024F		
63	00 F	993	
	41 2F		
64	L5 1013F	994	
	42 1021F		
65	L5 1012F	995	
	42 997F		
66	42 1001F	996	
	42 1013F		

LOCATION	ORDER		NOTES PAGE 5 X 15
67	50 F	997	
	L5 3F		
68	L6 F	998	
	40 F		
69	F5 997F	999	
	42 997F		
70	L0 1021F	1000	
	32 997F		
71	50 F	1001	
	L5 3F		
72	86 11F	1002	
	00 2560F		
73	F5 1002F	1003	
	40 1002F		
74	F5 1001F	1004	
	42 1001F		
75	L0 1021F	1005	
	32 1001F		
76	L3 2F	1006	
	32 1011F		
77	L5 1F	1007	
	L0 1022F		
78	36 1018F	1008	input pgm.
	L5 1002F		
79	10 14F	1009	
	80 2F		
80	L4 1F	1010	
	80 12F		
81	40 1002F	1011	
	49 2F		
82	26 1016F	1012	
	00 3F		
83	80 36F	1013	
	40 3F		
84	F5 1013F	1014	
	42 101 F		

LOCATION	ORDER		NOTES	PAGE 6	X 15
85	L0 1023F	1015			
	32 993F				
86	91 4F	1016			
	36 1013F				
87	40 1F	1017			
	26 994F				
88	80 40F	1018			
	L6 F				
89	36 983F	1019			
	FF F				
90	26 983F	1020			
	00 F				
91	J0 F	1021			
	L5 F				
92	80 F	1022			
	00 4F				
93	80 36F	1023			
	40 983F				
94	41 F	0			
	26 1016F				
95	12 63F		end test const.		
	L5 195F				
96	00 F		specification order		
	0F F				
97	84 2981F		Sum check		
	S0 1947F				
98	L7 F				
	L4 99F				
99	40 F				
	F5 98L		Sum check		
100	42 98L		Routine		
	L0 104L				
101	36 98L				
	L3 F				
102	36 L				
	FF F				

LOCATION	ORDER		NOTES PAGE 7 X 15
103	22 102L		Nope!
	00 F		
104	77 F		End test
	L4 99L		constant
	00 196K		set DOI
	27 199N		