

UNIVERSITY OF ILLINOIS
DIGITAL COMPUTER

AUXILIARY LIBRARY ROUTINE M 29 - 295

TITLE: Drum Routine for Linear Programming by the Simplex Method (SADOI or DOI)
TYPE: Complete Floating Point Program
DESCRIPTION: This is a modification of the M 15 - 183 Williams Memory Routine of the same name. It is somewhat slower but has a larger capacity. The use of the drum approximately doubles the time over that required if the problem could be handled in the Williams Memory.

The problems are handled in the same way as for the M 15 - 183 Williams Memory Routine except that the parameter tape is as follows:

005+
00F 00jF
00F 00iF
00F 00tF
00F 00bF

where j , i , t , and b are defined as in M 15 - 183. The size of the problem must meet the two restrictions below:

$$\text{Drum Storage } (j + 1)(i + 1) \leq 10,240$$

$$\text{Williams Memory Storage } 4_i + 2(j + 1) \leq 662$$

If the problem converges, it will stop on an OF order.

If there is a drum error, it will stop on an FF order at $15J_{16}$.

If the problem diverges, it will stop on an FF at 123_{16} .

EXAMPLE: The example given in the write-up for the M 15 - 183 Routine would be handled by replacing that parameter

tape by

005+

00F 003F

00F 003F

00F 001F

00F 001F

24999N

DATE	<u>May 19, 1960</u>
CODED BY	<u>L. Isaacson</u>
WRITTEN BY	<u>R. W. Haeker</u>
APPROVED BY	<u>J. M. [Signature]</u>

nj

LOCATION	ORDER	NOTES	PAGE 1	M 29
	DOI(Routine X 1)			
	003K			
0	00 F			
	00 3F			
1	00 F			
	00 21F			
	00 10K			
0	00 F			
	00 365F			
	00 14K			
0	00 F			
	00 189F			
1	00 F			
	00 2560F			
2	00 F			
	00 325F			
	00 21K			
0	00 59F			
	L0 166L			
1	L0 124L			
	40 2L			
2	50 F			
	S5 20F			
3	40 2F			
	32 150L			
4	46 6L			
	10 12F			
5	L4 125L			
	L4 69L			
6	L5 F			
	10 1F			
7	40 F			
	10 6F			
8	01 7F			
	40 1F			

LOCATION	ORDER	NOTES PAGE 2 M 29
9	26 F 40 F	
10	L5 1S3 L0 1F	
11	50 F 32 15L	
12	40 2F S5 F	
13	50 S3 40 S3	
14	L5 1F 40 1S3	
15	L1 2F L4 125L	
16	42 17L L0 126L	
17	36 29L 7J F	
18	L4 S3 40 S3	
19	LL S3 36 27L	
20	50 S3 7J 32L	
21	40 S3 L5 43L	
22	L4 1S3 40 1S3	
23	26 27L 50 S3	
24	75 127L 00 4F	
25	40 S3 L1 43L	

LOCATION	ORDER	NOTES PAGE 3 M 29
26	L4 1S3 40 1S3	
27	L3 S3 36 68L	
28	L4 42L 32 23L	
29	L5 2L 36 1L	
30	L4 128L 22 1L	
31	7L 4095F LL 4095F	
32	00 F 00 1000 0000 0000 J	
33	00 F 00 1000 0000 000 J	
34	00 F 00 1000 0000 00 J	
35	00 F 00 1000 0000 0 J	
36	00 F 00 1000 0000 J	
37	00 F 00 1000 000 J	
38	00 F 00 1000 00 J	
39	00 F 00 1000 0 J	
40	00 F 00 1000 J	
41	00 F 00 64F	
42	00 F 00 4999 9999 998 J	
43	00 F 00 1F	

LOCATION	ORDER	NOTES	PAGE 4	M 29
44	L1 F 22 9L			
45	L1 F 26 67L			
46	L5 131L 26 133L			
47	L5 131L 22 133L			
48	J0 1021F 26 10L			
49	L5 F 26 67L			
50	L1 1F 26 63L			
51	L0 41L 26 60L			
52	49 1F 22 77L			
53	L5 6L 22 97L			
54	41 1F 26 138L			
55	L5 6L 26 69L			
56	L7 S3 26 76L			
57	L5 2F 22 5L			
58	92 131F 26 95L			
59	L5 6L 22 149L			
60	L4 1S3 40 1S3			
61	50 F 7J S3			

LOCATION	ORDER	NOTES
62	00 1F 22 18L	
63	L4 130L L4 1S3	
64	40 1S3 50 42L	
65	75 S3 66 F	
66	S5 31L 22 18L	
67	40 S3 L5 1F	
68	40 1S3 26 29L	
69	46 75L L5 1S3	
70	32 71L 41 S3	
71	41 1S3 L0 167L	
72	34 72L L5 S3	
73	10 6F 50 1F	
74	00 7F L4 1S3	
75	40 F 26 29L	
76	40 S3 L3 F	
77	22 9L 81 4F	
78	00 39F 36 80L	

LOCATION	ORDER	NOTES PAGE 6 M 29
79	L1 1F	
	40 1F	
80	27 84L	
	50 1F	
81	7J 32L	
	40 1F	
82	50 1F	
	75 2F	
83	00 39F	
	14 S3	
84	40 S3	
	81 4F	
85	40 2F	
	L0 129L	
86	36 87L	
	22 80L	
87	81 4F	
	40 F	
88	81 4F	
	50 F	
89	74 129L	
	L1 2F	
90	14 129L	
	36 92L	
91	S1 31L	
	22 92L	
92	S5 F	
	14 41L	
93	40 1S3	
	26 19L	
94	L1 F	
	50 4F	
95	L5 2F	
	10 20F	
96	42 94L	
	47 94L	

LOCATION	ORDER	NOTES PAGE 7 M 29
97	26 29L L4 91L	
98	46 105L L5 94L	
99	L0 79L 36 101L	
100	92 963F 22 122L	
101	46 94L L5 S3	
102	40 F 36 104L	
103	92 708F 22 104L	
104	92 644F 50 101L	
105	7J F L6 F	
106	L6 F 32 110L	
107	L5 43L L4 1S3	
108	40 1S3 L5 42L	
109	40 S3 40 F	
110	22 104L 10 39F	
111	75 129L 00 36F	
112	82 4F 10 40F	
113	L5 6L L0 49L	

LOCATION	ORDER	NOTES	PAGE 8	M 29
114	46 6L			
	L0 62L			
115	36 111L			
	92 961F			
116	L1 48L			
	40 48L			
117	32 118L			
	92 961F			
118	26 29L			
	46 6L			
119	L5 1S3			
	L0 41L			
120	40 F			
	50 F			
121	75 33L			
	00 38F			
122	26 102L			
	92 513F			
123	00 24F			
	26 101L			
124	5S F			
	S5 F			
125	00 172L			
	00 31L			
126	00 172L			
	00 42L			
127	50 F			
	00 F			
128	5S 1F			
	S5 F			
129	00 F			
	00 10F			
130	00 F			
	00 65F			

LOCATION	ORDER	NOTES
131	50 F S5 20F	
132	00 1F 00 1F	
133	L0 124L 40 1F	
134	L5 2F 46 1F	
135	32 143L L5 S3	
136	36 137L 26 29L	
137	L5 1F 22 1L	
138	L5 2F 36 146L	
139	46 1F 50 1F	
140	75 33L 00 18F	
141	40 S3 L5 130L	
142	L4 43L 40 1S3	
143	26 19L L5 157L	
144	L4 132L 40 157L	
145	00 28F 26 136L	
146	10 20F 42 1F	
147	L1 1F 50 158L	

LOCATION	ORDER	NOTES
148	L4 157L	
	40 157L	
149	26 29L	
	46 157L	
150	26 29L	
	50 2F	
151	01 3F	
	L4 147L	
152	42 143L	
	42 155L	
153	42 148L	
	42 149L	
154	42 144L	
	J0 166L	
155	11 3F	
	L5 157L	
156	S4 F	
	26 4L	
157	80 F	
	00 2048F	
158	80 F	
	00 F	
159	80 F	
	00 F	
160	80 F	
	00 F	
161	80 F	
	00 F	
162	80 F	
	00 F	
163	80 F	
	00 F	
164	80 F	
	00 F	
165	80 F	
	00 F	

LOCATION	ORDER	NOTES PAGE 11 M 29
166	LL 4094F	
	4K 4076F	
167	00 F	
	00 128F	
	24 999N	
	00 1000K	
0	81 8F	
	26 1005F	
	00 189K	
0	F5 5F	
	L4 6F	
1	40 9F	
	L5 10F	
2	L4 6F	
	40 13F	
3	L4 6F	
	40 19F	
4	F4 5F	
	40 20F	
5	L4 6F	
	40 11F	
6	F4 5F	
	40 12F	
7	L4 6F	
	40 17F	
8	L5 15F	
	F4 6F	
9	40 18F	
	50 11L	
10	26 999F	
	00 F	
11	00 F	
	00 E	

LOCATION	ORDER	NOTES
12	00 F 26 L 26 1N	
13	L1 6F L0 5F	
14	40 8L 41 S13	
15	F5 S13 40 1S13	
16	F5 8L 40 8L	
17	36 9L L5 2L	
18	L4 7L 40 2L	
19	26 2L 00 F	
20	00 1F 00 1F	
21	00 F 00 F	
22	50 10L 26 999F	
23	00 F 00 L	
24	00 F 26 L 26 1N	
25	41 9F 50 L	
26	26 S040 K1 S05	

LOCATION	ORDER	NOTES
27	1K S0 68 8F	
28	1S S0 K1 22L	
29	8J 56L 03 2L	
30	2K S0 98 8F	
31	2S S0 S2 25L	
32	8K F 8S 11F	
33	0K S05 8J 61L	
34	1K S06 8K F	
35	8S 10F 15 SOK	
36	17 S0 N8 410F	
37	8S 10F 12 10L	
38	81 10F 04 1SOS	
39	0S S11 80 11F	
40	83 17L 05 S11	
41	8S 11F 8J 66L	
42	8J 68L 02 8L	
43	85 11F 82 60L	
44	8J 92L 8J 70L	

LOCATION	ORDER	NOTES PAGE 14 M 29
45	3K S06 85 129L	
46	3N SOJ 83 28L	
47	31 SOJ 83 28L	
48	31 SOK 36 SOJ	
49	8S 10F 84 127L	
50	82 26L 81 10F	
51	83 28L 81 10F	
52	8S 127L 8J 80L	
53	8J 68L 32 20L	
54	85 127L 80 126L	
55	82 67L 8J 82L	
56	4K S06 8K F	
57	4S SOK 43 32L	
58	8K 1F 8S F	
59	8J 87L 5K 1S05	
60	8J 61L 6K S06	
61	85 F 86 F	

LOCATION	ORDER	NOTES
62	8S 17F	
	61 SOJ	
63	87 17F	
	64 SOK	
64	6S SOK	
	62 37L	
65	85 17F	
	8S F	
66	8J 56L	
	53 35L	
67	8J 106L	
	2K S06	
68	8F 1F	
	8J 70L	
69	8J 52L	
	25 SOK	
70	89 9F	
	23 44L	
71	2K S06	
	8K F	
72	8S 11F	
	25 SOK	
73	27 SON	
	84 11F	
74	8S 11F	
	22 47L	
75	8F 1F	
	85 11F	
76	89 9F	
	8J 130L	
77	92 131F	
	L5 S14	
78	00 28F	
	82 12F	

LOCATION	ORDER	NOTES PAGE 16 M 29
79	92 963F	
	F5 52L	
80	42 52L	
	26 29S04	
81	J0 SOK	
	50 56L	
82	26 S10	
	00 SOL	
83	00 S06	
	L5 57L	
84	F4 6F	
	40 57L	
85	26 29S04	
	8J 99L	
86	50 SOK	
	50 61L	
87	26 S10	
	00 S12	
88	00 S06	
	L5 62L	
89	F4 6F	
	40 62L	
90	26 29S0	
	40 098L	
91	F5 9F	
	40 18F	
92	26 29S04	
	8J 102L	
93	F5 9F	
	40 9F	
94	26 29S04	
	00 SOK	
95	50 SOK	
	50 70L	
96	26 S10	
	00 SOL	

LOCATION	ORDER	NOTES PAGE 17 M 29
97	00 S06 50 128L	
98	75 18F L5 15F	
99	S4 F L4 125L	
100	40 77L 40 90L	
101	50 S0J 50 76L	
102	26 S10 00 F	
103	00 S06 41 9F	
104	26 29S04 00 F	
105	L5 9F 40 16F	
106	26 29S04 00 S0S	
107	L5 69L L4 16F	
108	42 33L 42 40L	
109	00 20F 46 36L	
110	L5 13F L4 16F	
112	42 36L 26 29S04	
113	L5 71L 40 57L	
114	40 62L 26 89L	
115	J0 S0K 50 89L	

LOCATION	ORDER	NOTES
116	26 S10 00 F	
117	00 S06 26 29S04	
118	26 29S04 00 F	
119	36 94L 26 29S04	
120	L1 7F 40 8F	
121	L5 124L 40 72L	
122	41 S03 50 96L	
123	26 S04 82 42L	
124	08 F 00 F	
125	L5 65L 42 135L	
126	26 95L 00 1S13	
127	26 S10 00 S12	
128	FF F 00 S14	
129	L5 123L 40 72L	
130	41 S03 50 104L	
131	26 S04 82 19L	
132	L5 101L 40 62L	

LOCATION	ORDER	NOTES
133	L5 126L	
	40 127L	
134	L5 81L	
	L4 18F	
135	42 112L	
	42 113L	
136	L5 12F	
	41 6F	
137	42 114L	
	00 20F	
138	46 113L	
	50 F	
139	L5 F	
	40 F	
140	S5 F	
	40 F	
141	L1 1L	
	40 1L	
142	32 119L	
	L5 19F	
143	L4 18F	
	42 112L	
144	42 113L	
	L5 20F	
145	22 110L	
	41 9F	
146	L5 102L	
	42 52L	
147	41 S03	
	50 121L	
148	26 S04	
	83 7L	
149	00 S06	
	50 128L	
150	00 S06	
	26 29S04	

LOCATION	ORDER	NOTES PAGE 20 M 29
151	26 S10 00 F	
152	40 F 00 127F	
153	40 F 00 127F	
154	00 F 00 1S06	
155	ON 3276F NN 3255+	
156	L5 100L 42 52L	
157	92 131F 50 131L	
158	26 S04 2K S05	
159	8F 1F 8J 52L	
160	21 S11 89 9F	
161	22 133L 8J 103L	
0	00 325K L1 8F 36 3L	
1	L5 7L 40 13SOF	
2	L5 9L 40 134SOF	
3	L1 7F 36 6L	
4	40 8F L5 8L	
5	40 92SOF 26 6L	

LOCATION	ORDER	NOTES	PAGE 21	M 29
6	50 10L 26 999F			
7	85 10F 00 1S0S			
8	F5 8F 40 8F			
9	25 S11 89 9F			
10	00 F 00 L			
11	00 F 26 L 26 1N			
12	K5 F 42 9L			
13	42 33L F4 21L			
14	42 3L 42 31L			
15	41 F L5 F			
16	10 20F F0 21L			
17	S4 F 42 35L			
18	42 36L 42 37L			
19	S5 F 32 32L			
20	42 10L 42 16L			
21	L1 38L L4 F			

LOCATION	ORDER	NOTES PAGE 22 M 29
22	40 11L	
	L5 F	
23	86 11F	
	00 F	
24	F5 11L	
	40 11L	
25	F5 10L	
	42 10L	
26	F0 35L	
	32 10L	
27	L5 11L	
	40 20L	
28	L7 F	
	L4 F	
29	40 F	
	F5 16L	
30	42 16L	
	F0 36L	
31	36 16L	
	F1 F	
32	86 11F	
	00 F	
33	23 31L	
	00 F	
34	85 11F	
	00 F	
35	32 23L	
	40 F	
36	L6 F	
	40 F	
37	F5 22L	
	40 22L	
38	F5 23L	
	42 23L	

LOCATION	ORDER	NOTES
39	FO 37L	
	36 22L	
40	L5 22L	
	40 29L	
41	85 11F	
	00 F	
42	F4 F	
	40 F	
43	L3 F	
	32 F	
44	FF 16F	
	42 23L	
45	L1 39L	
	L4 F	
46	40 22L	
	26 22L	
47	NO 11L	
	L5 F	
48	77 F	
	L4 F	
49	S2 23L	
	40 F	
50	9L 4085L	
	00 F	
51	KO 4085L	
	00 F	
	24 189N	