PROGRAM TITLE: RELOCATABLE TAPE PUNCH

PROGRAM CLASSIFICATION: Service

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PURPOSE   Automatically punches relocatable tape contain-
           ing desired program and all necessary control
           codes and coding for Address Modification Routines
           (SM/I 127-R, RUG #1082)

DATE: 18 April 1961

Published by

RECOMP Users' Library

at

AUTONETICS INDUSTRIAL PRODUCTS
A DIVISION OF NORTH AMERICAN AVIATION, INC.
3400 E. 70th Street, Long Beach 5, Calif.

RESEARCH DIVISION - SERVOMECHANISMS, INC.

RELOCATABLE TAPE PUNCH

PURPOSE:

Automatically punches relocatable tape containing desired program and all necessary control codes and coding for Address Modification Routine (SM/I 127-R, RUG #1082).

USE:

(A)

Fill a modification matrix, starting with first word after program (FA + 1). Each word in the matrix gives information about 19 program words (38 "instructions"); the first refers to words 00 through 18, the second to words 19 through 37, and so on. (See attached table of octal locations versus modifier word number.)

The last (39th) bit of each modifier word is used as a marker and must be a "1"; the sign may be either + or -; each of the remaining bits is a binary one if the address to which it refers should be modified, or zero if the address is fixed (loop addresses, data, routine calling sequences, etc.).

The bits in each word are read from left to right; so that for the first modifier word, for example, the left-most bit (#1) refers to loc'n 00, the next (#2) to 00.1, and so on through bit #38, which refers to loc'n 22.1.

The last modifier word probably will not be entirely used; its "spare" bits should be filled out with zeros (but for the marker) to bring the bits into the proper position for reading.

The series of binary bits of the modifier words may be entered directly in command fill mode by pushing "+" for a binary one and "-" for a binary zero.

(B)

(1) Fill this routine somewhere; it uses 50 (octal) sectors plus locations 7700 through 7737. Locations 7700-7737 must not be disturbed after this routine is filled as they contain the address modifier routine (127R) which is to be punched on tape.

(2) TRA to the start of this routine and enter the code word +00 IA +00 FA in command fill, where IA is the initial address and FA is the final address of the program to be punched out. It is assumed that the correct number of modifier words is filled starting in (FA + 1). This number will be one greater than the integral part of (FA - IA)/19.

During the punching operation this code word is displayed. When the
punching is almost finished, the last location punched (the location of the
last modifier word) is displayed.

(3) Feed out some blank tape for a leader, and push start. Punching is all
done automatically and the routine returns to its start location when
punching is through.

(4) Feed about one fold of blank tape before removing the tape from the
punch. No final halt need be punched; this is done automatically.

(5) To obtain further duplicates, repeat steps (3) and (4). It is not
necessary to re-enter the code word.

FILE UNITERMS:

Relocatable, punch, output, input

RESTRICTIONS:

Only positive words will be modified correctly. Negative (trapping
mode) instructions should be located in the right half word if they
have relative addresses.

TAPE FORMAT:

L 77000 CR
    16 blanks
    (Address Modification Routine #127R)

    8 blanks

L 77000 CR
    16 blanks
    S
    24 blanks
    (Program and Modification Matrix)

    8 blanks

L 77050 CR
    16 blanks
    C
    +00 1A +00 FA
    40 blanks
    S
    16 blanks

M	LOCATIONS
1, 01	000 - 022
2, 02	023 - 045
3, 03	046 - 070
4, 04	071 - 113
5, 05	114 - 136
6, 06	137 - 161
7, 07	162 - 204
8, 10	205 - 227
9, 11	230 - 252
10, 12	253 - 275
11, 13	276 - 320
12, 14	321 - 343
13, 15	344 - 366
14, 16	367 - 411
15, 17	412 - 434
16, 20	435 - 457
17, 21	460 - 502
18, 22	503 - 525
19, 23	526 - 550
20, 24	551 - 573
21, 25	574 - 616
22, 26	617 - 641
23, 27	642 - 664
24, 30	665 - 707
25, 31	710 - 732
26, 32	733 - 755
27, 33	756 - 1000
28, 34	1001 - 1023 ....

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Programmed by: W HW   Date   4-18-61

Loc'n	Cm'd	Addr.	Contents	Accumulator	b	Remarks
..00	✕	✕	1A		..	
			FA		..	
...1	C·T·V	·.1·0·0			..	
...	C·L·A	·.0·6·0	L 77000	baudot	..	
..2	P·N·C	7·7·6·0·0			..	punch " L 77000 cr"
...	A·R·S	00·5·0·0		zero	..	
..3	P·N·C	7·7·6·0·0			..	
...	C·T·L	·.2·0·0			..	punch 16 blanks
?..4	P·N·C	7·7·6·0·0			..	
...	P·N·C	0·0·1·5·0			..	punch "F"
..5	D·I·S	·.0·0·0		DISPLAY +00 1A +00 FA	..	
...	T·R·A	7·7·7·0·1	→ 10.1		..	
..6	+·1·3	3·1·6·3·1	L,fig,77,0,0,0,cr		..	
	+·3·2	6·5·4·4·0			..	
..7	+·1·3	3·1·6·3·1	L,fig,77,0,5,0,cr		..	
	+·3·2	0·5·4·4·0			..	
..1·0	+·0·0	0·0·3·7·0	(FA - 1A)		..	
...	C·L·A	7·7·0·0·0	(1A)		..	
...1	P·N·C	7·7·6·0·0		word in baudot	..	punch baudot word
...	C·L·A	7·7·7·7·0			..	
...2	A·D·D	7·7·7·0·0		bump loc'n	..	
...	T·M·I	7·7·7·4·1	→ through		..	
...3	S·T·O	7·7·7·0·0			..	
...	P·N·C	0·0·1·0·0			..	punch "cr"
...4	T·R·A	7·7·7·0·1		go around again	..	
...	P·N·C	0·0·1·6·0			..	punch "_"
...5	P·N·C	0·0·1·0·0			..	punch "cr"
...	A·R·S	0·0·3·0·0		zero	..	
...6	P·N·C	7·7·6·0·0			..	punch 8 blanks
...	T·R·A	7·7·6·0·0	→ loc - 40		..	
...7	-·0·0	0·0·0·0·1	-1 @18 +1 @58		..	
	+·7·7	7·7·7·7·0			..	
..2·0	C·L·A	·.0·6·0			..	
...	P·N·C	7·7·6·0·0			..	punch "L 77000 cr"
...1	A·R·S	0·0·5·0·0		zero	..	
...	P·N·C	7·7·6·0·0			..	punch 16 blanks
...2	P·N·C	7·7·6·0·0			..	
...	P·N·C	0·0·0·5·0			..	punch ">"
...3	P·N·C	7·7·6·0·0			..	
...	P·N·C	7·7·6·0·0			..	punch 24 blanks
...4	P·N·C	7·7·6·0·0			..	
...	C·L·S	·.0·0·0			..	
...5	A·R·S	0·0·2·4·0		-1A @3?	..	
...	S·T·A	7·7·7·0·1	1A		..	
...6	A·D·D	·.0·0·0		(FA-1A) left	..	
...	A·L·S	0·0·2·4·0			..	
...7	C·T·L	·.4·0·0			..	
	T·R·A	7·7·6·4·3			..	

V₁ (marked at row 1·0)
L₁ (marked at row 2·0)

Program No. 126-R Title PUNCH RELOCATABLE TAPE

Programmed by: _____ Date 4-18-61

Loc'n		Cm'd Addr.	Contents	Accumulator	b	Remarks
30		A.R.S 0.0.50.0		zero	. .	
. . .		P.N.C 7.7.6.0.0			. .	punch 16 blanks
. . . 1		P.N.C 7.7.6.0.0			. .	
. . .		P.N.C 0.0.1.6.0			. .	punch "C"
. . . 2		P.N.W . .0.0.0			. .	punch "+00 1A +00 FA"
. . .		P.N.C 0.0.1.0.0			. .	punch "CR"
. . . 3		P.N.C 7.7.6.0.0			. .	
. . .		P.N.C 7.7.6.0.0			. .	
. . . 4		P.N.C 7.7.6.0.0			. .	
. . .		P.N.C 7.7.6.0.0			. .	punch 48 blanks
. . . 5		P.N.C 7.7.6.0.0			. .	
. . .		P.N.C 7.7.6.0.0			. .	
. . . 6		P.N.C 0.0.0.5.0			. .	punch "s"
. . .		P.N.C 7.7.6.0.0			. .	punch 16 blanks
. . . 7		P.N.C 7.7.6.0.0			. .	
. . .		H.T.R . .0.0.0			. .	
. . 4.0		C.L.A . .0.7.0			. .	
. . .		D.I.S 7.7.7.0.0		display last loc'n	. .	
. . . 1		C.T.V . .3.0.0		punched	. .	
. . .		P.N.C 7.7.6.0.0			. .	punch "L 77050 CR"
. . . 2		T.R.A 7.7.7.0.0	→ V₂ ~ 30		. .	
. . .		-.0.0 0.0.0.0.1	1 @ 39		. .	
. . . 3		+.4.6 0.0.0.0.0	19 @ 5		. .	
. . .		-.0.0 0.0.0.0.0			. .	
. . . 4		S.T.A 7.7.7.0.0		FA - FA	. .	
. . .		D.S.L 7.7.6.3.0	19 @ 5	(FA - 1A)/19	. .	
. . . 5		A.R.S 0.0.3.2.0		" @ 39	. .	
. . .		A.D.D 7.7.6.2.0	1 @ 39	m = no. of mod. wds	. .	
. . . 6		P.N.C 0.0.1.5.0			. .	punch "F"
. . .		A.L.S 0.0.2.5.0		m @ 18	. .	
. . . 7		A.D.D 7.7.7.0.0		FA - 1A + m	. .	
. . .		S.T.O 7.7.7.0.0			. .	