Program No. K2-71

REPOSITIONAL DECIMAL MEMORY PUNCH (RDMP)

Western Electric

PURPOSE:

To punch out a decimal tape of any area of memory. This tape may then be read in by PIR and repositioned in memory.

INPUT:

(1) L_o L_f = The boundary addresses of the area to be punched. Area may contain instructions and hex words inter-mixed.

(2) M = The modifier or the amount to be subtracted from each absolute address that is to be de-modified.

(3) Loh Lfh = The boundary addresses of any special area within the punch area to be punched in hex regardless of contents of words. This does not control the normal punching of Hex words.

OUTPUT:

A repositional decimal tape of the punch area including Hex load code words and Hex words. The operand address of instructions is "demodified" if the operand address, Aw, of the word w in location, Lw is:

$$M \leq Aw \leq Lf$$

By "de-modification" we mean that if the above condition is true, the modifier, M, is subtracted from the operand address; Aw - M = relative address.

If $M \leq Aw \leq Lf$ the punched command will be preceded by an X.

P and I instructions are not de-modified, and are always preceded by an X.

Hex words are printed out in groups of a maximum of 9. The Hex load code for the PIR ,000000H' is punched preceding each Hex word load, The H may vary from 1 to 9.

For example, 11 sequential Hex words will be punched as follows:

---, 0000009' Hex 1' Hex 2'-----Hex 9'
,0000002' Hex 10' Hex 11' ------

THIS PROGRAM IS [illegible] TO
MEMBERS OF POOL ONLY. DISTRIBUTION
TO NON MEMBERS OF POOL IS PROHIBITED

SUMMARY

ENTRANCE:

At first location of this program.

INPUT:

(1) Lo Lf = Area to be punched

REPOSITIONAL DECIMAL MEMORY PUNCH (RDMP)

Summary (continued)

LO Lf = XXXXYYYY
Press start compute

(2) M = modifier
M = XXXX
Press start compute

(3) Loh Lfh = Area to be punched in Hex
LOh Lfh = XXXXYYYY
(Note: If Lo Lf = 0000 0800, 0000 would be punched in hex unless 0000 < Loh Lfh)
Press start compute

Carriage will now return and computer will stop. Turn on punch, enter whatever heading is necessary, run a few inches of blank tape,* and press start compute. Punch out will now proceed.

OUTPUT:

A decimal tape which may be entered and repositioned by the PIR.

STOP:

No programmed stops except as noted above.

T-C:

T-C up, 8 words/line; T-C down, 10 words/line

NOTES:

The modifier, M, will be subtracted from any address Aw when $M \leq Aw \leq Lf$ and the de-modified or relative address punched.
If Lw is not as above, the instruction is preceded by an X and the absolute address will be punched. No P or I instructions are demodified.

In case there are several constants within the area to be punched, the Aw's which are $M \leq Aw \leq Lf$, these constants may be placed in a group and the area of this group given as Loh Lfh. Then that area will be punched as Hex.

*If High-Speed tape punch is used, refer to page 5.

Any word resembling a (-TXXXX) instruction will be punched as such, unless given the proper Loh Lfh. No other (-) instructions will be punched in decimal

EXAMPLES:

Suppose we wish to punch this R.D.M.P. which we have developed in the area 4000 to 4563.

To punch this entire area in relative form, we give:

Lo Lf = 4000 4563'
M = 4000'
Loh Lfh = 0000' or just'

REPOSITIONAL DECIMAL MEMORY PUNCH
Western Electric Company

EXAMPLES:

Here is a sample of the punch:

```
xp1650'xz0007'r0517'u0463'a0540'c0225'r0517'u0548'
c0310'r0517'u0463'y0204'y0309'r0517'u0463'a0029'
c0135'40517'u0548'xp1605'a0540'c0147'b0225's0204'
xz0001'y0206'b0135's0147'c0135'xz0002'u0104'b0411'
```

and so on until Lf is reached.

Notice that XZ0000' is punched for zero words.

Note also that the P orders are not de-modified. P and I orders are never de-modified and are always preceded by an X.

Now let us punch from the same area:

```
Lo Lf = 4000 4009
Lm = 4000'
Loh Lfh = 0'
```

```
xp1650'xz0007'xr4517'xu4463'xa4540'xc4225'xr4517'xu4548'
xc4310'xr4517'.0000000'
```

Notice that no instructions are de-modified because no

$$M \leq Aw \leq Lf$$

Notice also that the stop and transfer code .0000000' is punched after the last word to be punched.

Again, from the same area:

```
Lo Lf = 4000 4009'
M = 4000' (not really needed)
Loh Lfh = 4005 4007'
```

This means that the words 4005, 4006 and 4007 will be punched in hex.

```
                                        Hex load word
xp1650'xz0007'xr4517'xu4463'xa4540', 0000003'k2f64'32k44'
f2kj0'xc4310'xr4517' .0000000'
```

Notice the hex load word, 0000003' is not counted in the words/line count

Now, we punch from the same area a group containing hex words.

```
LoLf = 4532 4537'
M = 0'
Loh Lfh = 0
```

```
xt4340'xu4529', 0000002'3wwwj'3j3j0'xz6000'xp0254' .0000000'
```

Program No. K2-71

REPOSITIONAL DECIMAL MEMORY PUNCH
Western Electric Company

With the T - C up 8 words/line are printed, and with the T - C down 16 words/line are printed. One must be careful in using the 16 word count because it is conceivable that the Flexowriter, while printing, would run into the automatic carriage return and stop if several Hex words were to be printed out. Therefore, it seems best to punch out an unknown area as 8 words/line, then if necessary, upon inspection of the print out, the area may be re-punched 16 words/line.

Now a word of caution about the placement of programs to be punched out by this routine, Let us suppose that we have this R.D.M.P. routine in 1500 to 2063, and we give:

Lo Lf = 1500 2063
M = 1500
Loh Lfh = 0

(We are punching the R.D.M.P. out by the R.D.M.P. but this condition could occur while punching out any program.)

All goes well until we punch the contents of Lo + 0563 or 2063

Loc	Contents	Notes
2063	Z2000	20 at 23

Now when 2063 is punched, we get Z0500:

Aw - M
(Z2000 - 1500 = Z0500)

This is okay if we load this punch back into 1500 2063 with a Set Modifier of 1500, but suppose we load this punch into 1000 by the PIR with a modifier of 1000.

Location Lo + 0563 or 1563 will now appear as

Loc	Contents	Notes
1563	Z1500	15 at 23 instead of 20 at 23

Therefore one must be sure that there are no constants within the punch out area that will be de-modified by the R.D.M.P.

We state again that any operand address Aw where $M \leq Aw \leq Lf$ will be de-modified by M

This routine will punch out about 50 to 60 w/m.

If the High Speed punch is used for punch-out, follow this write-up normally down to the halt to turn on the punch, then connect the high-speed punch and Push Down Break-point 32. Then give a "start compute" and punching will commence.

Program No. K2-71 ...

REPOSITIONAL DECIMAL MEMORY PUNCH
Western Electric Company

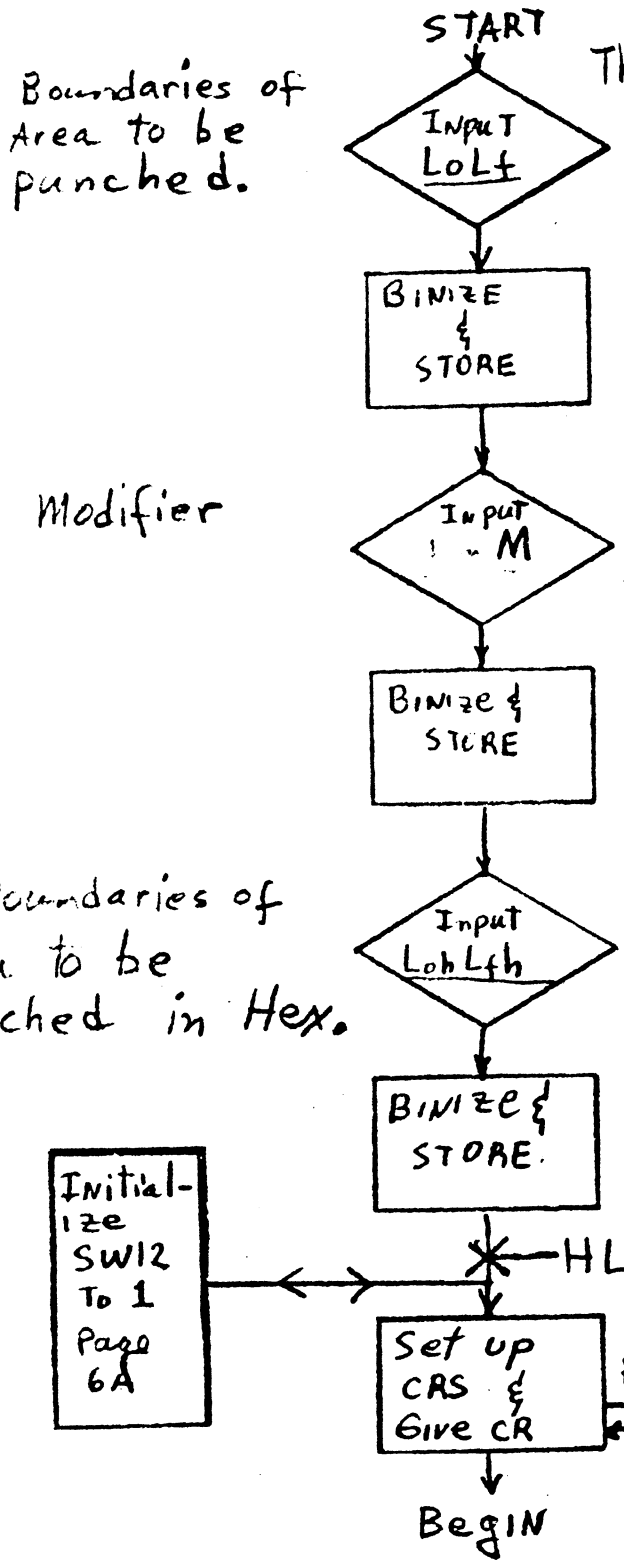
Comments by POOL Reviewer

1. Programs written for certain interpretive systems will be punched incorrectly since P and I instructions are never "demodified" by this routine. For example, P 3807 in memory will be punched as xp3807' in every case even when it is intended as a "Place" pseudo-instruction, referring to a location, rather than a "Print" order. Similarly, 800X pseudo-instructions in which X is an order letter other than T, will be treated as hex constants, and no modifier would be subtracted from their addresses.

2. Hex constants may happen to have the form of instructions, and as such they may happen to have an address part which falls between the modifier and Lf. In this case they will be "demodified" by the program. For this reason the routine can not be relied on absolutely. The L_{eh}-L_{fh} provision allows the user to protect a single group of locations as containing hex words. In non-optimized programs the hex constants may indeed be in one block; then there is no problem. In case of doubt, the user should check that all hex constants outside the protected hex block were indeed punched as hex words. (Unless the user knows and can indicate which locations contain hex constants, no punchout program could possibly produce a foolproof result.)

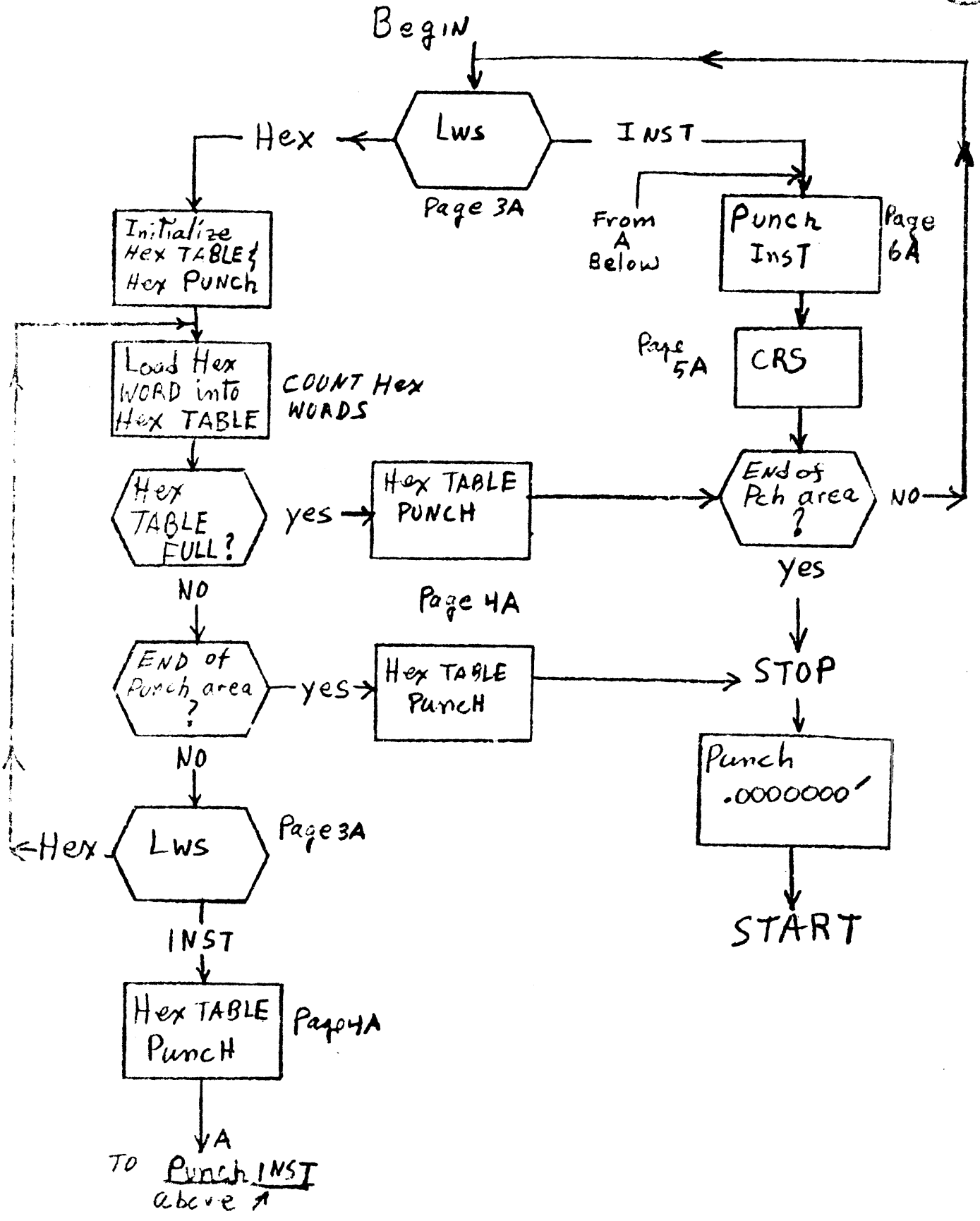
3. 16 word typeout lines will be longer than the width of the paper used at many installations. These users may prefer to have a choice of between, say, 6 and 8 words/line, rather than the 8 and 16 words/line alternatives provided. A 6 words/line printout could be compared line-for-line with a hex-print-or-punch printout.

Flow Chart for RDMP



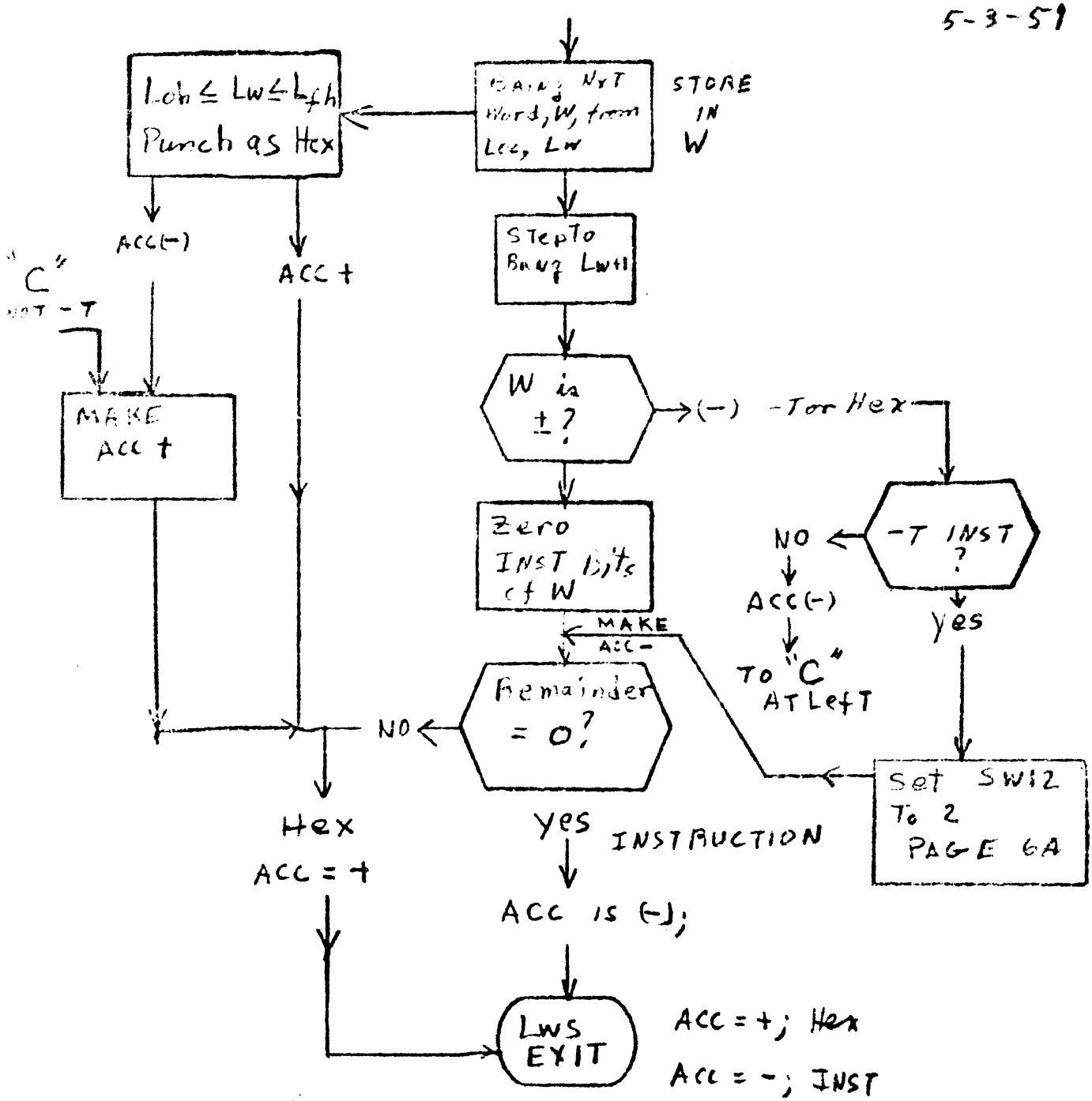
The Theory of the INST Punch, page 2A, was taken From the Decimal Memory Printout 21.0.

The Hex Word Punch, Page 4A, WAS TAKEN from the Hexidecimal Punch out 13.0.

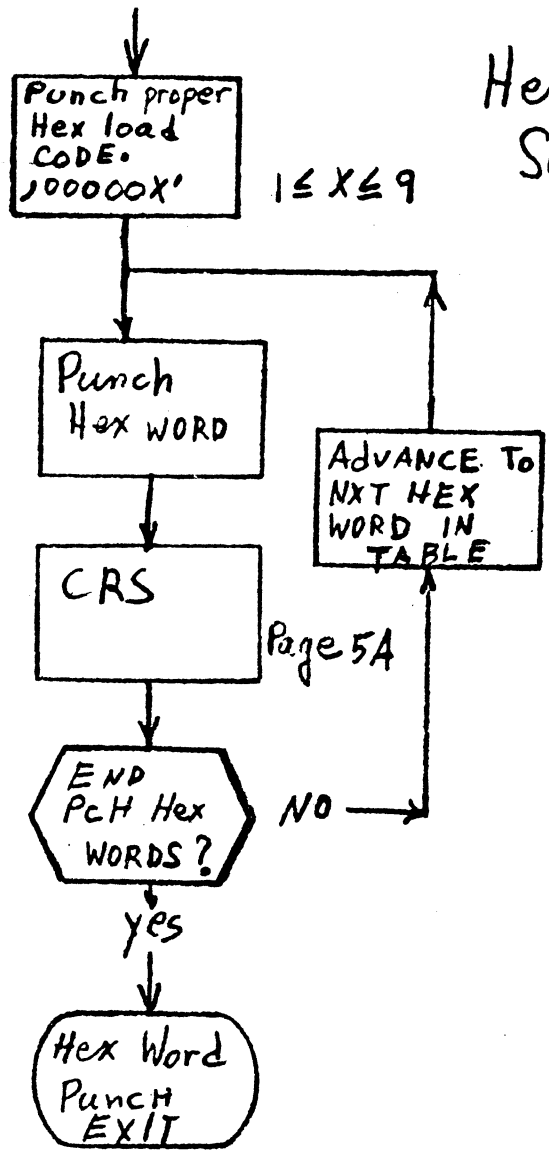

Begin
Lws
Hex
INST
Page 3A
Initialize Hex TABLE & Hex Punch
From A Below
Punch Inst
Page 6A
Page 5A
CRS
Load Hex WORD into Hex TABLE
COUNT Hex WORDS
Hex TABLE FULL?
yes
Hex TABLE PUNCH
End of Pch area ?
NO
yes
Page 4A
NO
END of Punch area ?
yes
Hex TABLE Punch
STOP
NO
Punch .0000000'
Hex
Lws
Page 3A
START
INST
Hex TABLE Punch
Page 4A
A
TO Punch INST above

Lws Sub

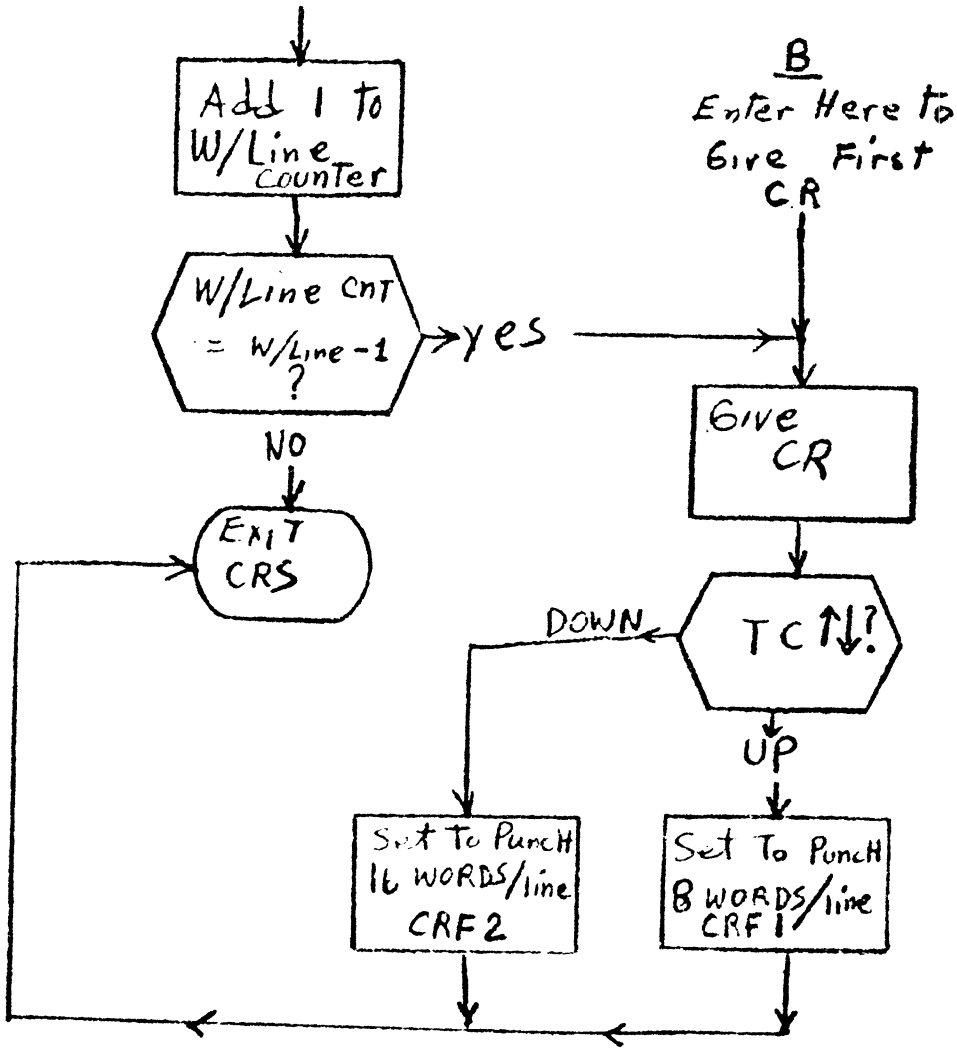
5-3-51


Lob ≤ Lw ≤ Lfh
Punch as Hex
GAIN NXT Word, W, from Loc, Lw
STORE IN W
ACC(-)
ACC +
"C" NOT -T
STep To Bmvf Lw11
MAKE ACC +
W in ±?
(-)
-T or Hex
Zero INST Bits of W
NO
-T INST ?
yes
ACC(-)
To "C" AT LefT
MAKE ACC -
Remainder = 0?
NO
Set SW12 To 2 PAGE 6A
Hex ACC = +
yes
INSTRUCTION
ACC is (-);
Lws EXIT
ACC = +; Hex
ACC = -; INST

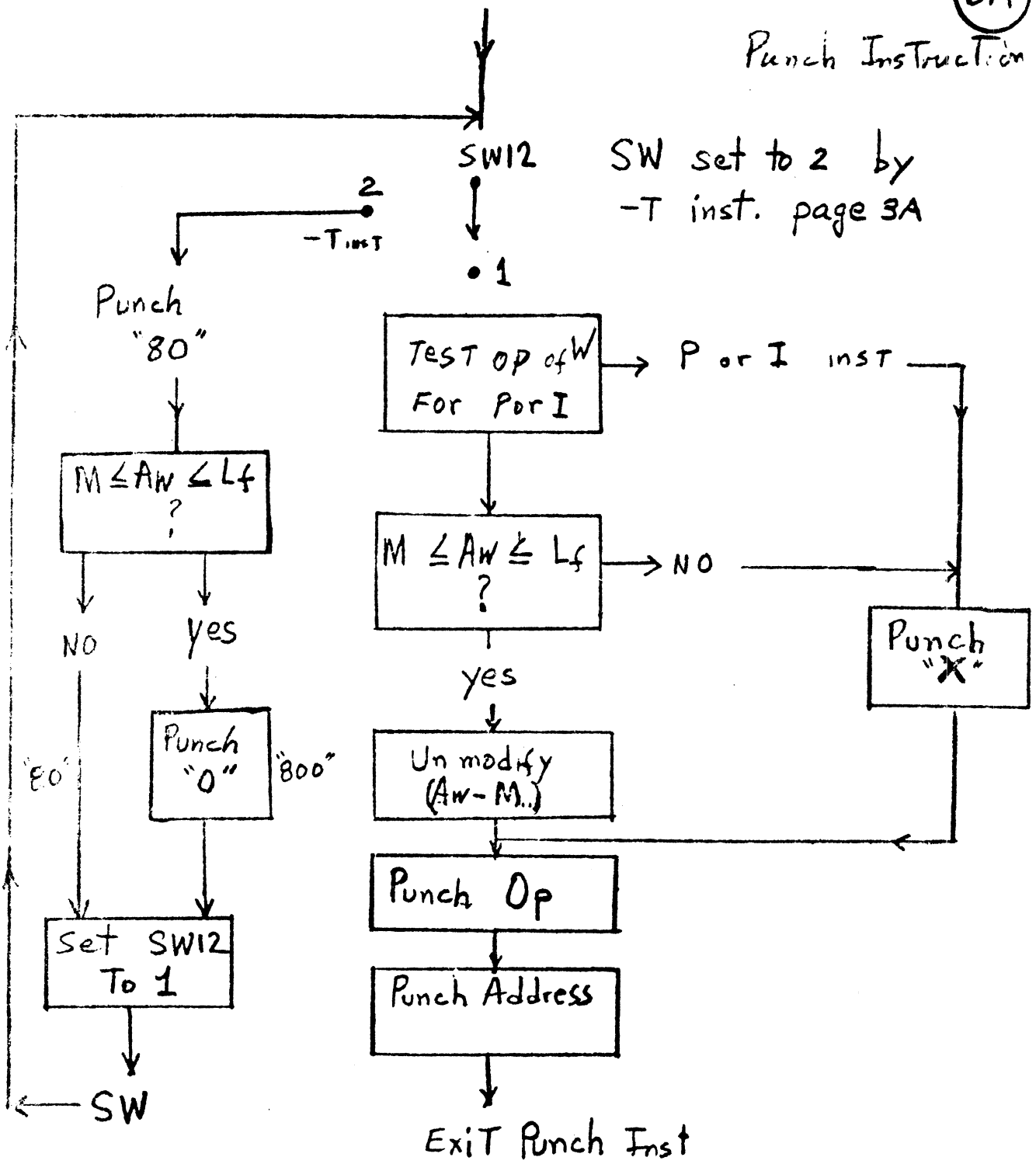
Hex Table Punch Subroutine



CRS Subroutine



Punch Instruction



LGP-30 CODING SHEET

PREPARED FOR:				PAGE / OF
LGP-30 USERS' ORGANIZATION - POOL Program No. K2-71				1 / 12
JOB NO.	PROGRAM NO	PROGRAM PREPARED BY:	PROGRAM CHECKED BY:	DATE
		J.H. Boatwright		4-29-59
PROBLEM: WESTERN ELECTRIC REPOSITIONAL DECIMAL MEMORY PUNCH				TRACK

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION OPERATION	INSTRUCTION ADDRESS	STOP	CONTENTS OF ADDRESS	NOTES
	/						
	/	☒					
		0 0	X	P 1 6 5 0	/	CR	START
		0 1	X	Z 0 1 0 0 7	/	Delay and CRFI (0142)(0457)	
		0 2	R	0 5 1 7	/	Read Lo Lf	
		0 3	U	0 4 6 3	/	☒ Bin Lf	
		0 4	A	0 5 4 1 0	/	1 (29)	Form Lf+1
		0 5	C	0 2 2 5	/	B(Lf +1)	
		0 6	R	0 5 1 7	/		
		0 7	U	0 5 4 8	/	☒ Bin Lb	
		0 8	C	0 3 1 1 0	/	B(LW)	
		0 9	R	0 5 1 7	/	Read and Bin	
		1 0	U	0 4 6 3	/	Lm	
		1 1	Y	0 2 0 4	/	☒ Z[M]	
		1 2	Y	0 3 0 9	/	Z[M]	
		1 3	R	0 5 1 7	/	Read Loh Lfh	
		1 4	U	0 4 6 3	/	Bin Lfh	
		1 5	A	0 0 2 9	/	☒ XZ0002	
		1 6	C	0 1 3 5	/	B(Lfh + 2)	
		1 7	R	0 5 1 7	/	Bin Loh	
		1 8	U	0 5 4 8	/		
		1 9	X	P 1 4 9 5	/	☒ CR	
		2 0	A	0 5 4 0	/	1 (29)	
		2 1	C	0 1 4 7	/	B(Loh+1)	
		2 2	B	0 2 2 5	/	B(Lf+1)	
		2 3	S	0 2 0 4	/	☒ Z(M)	
		2 4	X	Z 3 2 1 0 0	/	Delay for CR	
		2 5	Y	0 2 0 6	/	Z(Lf+1-M)	
		2 6	B	0 1 3 5	/	B(Lhf+2)	
		2 7	S	0 1 4 7	/	☒ B(Loh+1)	
		2 8	C	0 1 3 5	/	Z(Lfh+1-Loh)	
		2 9	X	Z 0 0 0 2	/	Halt to Turn on Pch 2 (29)	
		3 0	U	0 4 0 7	/	Initialize SWIZ = 1	
		0 0 3 1	B	0 4 1 1	/	☒ U0034	Here for Tinst

LGP-30 CODING SHEET

PREPARED FOR: LGP-30 USERS' ORGANIZATION - POOL Program K2-71

PAGE 2 / 12

JOB NO. | PROGRAM NO. | PROGRAM PREPARED BY: J. H. Boatwright | PROGRAM CHECKED BY: | DATE 4-29-59

PROBLEM: WESTERN ELECTRIC REPOSITIONAL DECIMAL MEMORY PUNCH | TRACK

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION OPERATION	INSTRUCTION ADDRESS	STOP	CONTENTS OF ADDRESS	NOTES
	/						
	/	X					
		0012	C	0414	/	Set SW to 2	
		13 13	U	0404	/	Make Acc (-), Then Lws Exit	
		13 14	B	0451	/	W	
		13 15	U	0255	/	X To Print 800 or 80X	
		13 16	H	0558	/	Add Word	
		13 17	E	0515 19	/	XZ6300	
		13 18	S	0515 10	/	30 (23)	
		13 19	XZ	3200	/	X Delay for CR Print op	
		14 10	T	0104 18	/		
		14 11	S	0515 13	/	20 (23)	
		14 12	T	0105 17	/		
		14 13	S	0131 15	/	X 10 (23)	
		14 14	T	9054	/		
		14 15	XP	2610	/	6	
		14 16	A	0312 15	/	XZ0032	
		14 17	U	0218	/	X	
		14 18	A	0515 13	/	20 (23)	
		14 19	T	0100	/		
		15 10	S	0131 15	/	10 (23)	
		15 11	T	0102	/	X	
		15 12	XP	1010	/	2	
		15 13	U	0046	/		
		15 14	XP	2226	/	5	
		15 15	A	0406	/	X XZ1032	
		15 16	U	0218	/		
		15 17	A	0315	/		
		15 18	T	0061	/		
		15 19	XP	1824	/	X 4	
		16 10	U	0046	/		
		16 11	XP	1440	/	3	
		16 12	U	0105 5	/		
		16 13	XR	0100 10	/	X Dummy (0420)	

FORM LP-12

PRINTED IN U.S.A.

Royal McBee Corporation
DATA PROCESSING DIV.
PORT CHESTER, NEW YORK

X = CARRIAGE RETURN

/ = CONDITIONAL STOP CODE

LGP-30 CODING SHEET

PREPARED FOR: LGP-30 USERS' ORGANIZATION - POOL Program No. K2-71				PAGE 3 OF 12
JOB NO.	PROGRAM NO.	PROGRAM PREPARED BY: J. H. Boatwright	PROGRAM CHECKED BY:	DATE 4-29-59
PROBLEM: WESTERN ELECTRIC REPOSITIONAL DECIMAL MEMORY PUNCH				TRACK

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION OPERATION	INSTRUCTION ADDRESS	STOP	CONTENTS OF ADDRESS	NOTES
	/						
	/	X					
		0 0 0 0	X	P 0 2 3 6	/	0	
		0 0 1 1	U	0 0 5 5	/		
		0 0 1 2	X	P 0 6 3 8	/	1	
		0 0 1 3	U	0 0 5 5	/	X	
		0 0 1 4	R	0 1 5 7	/	CR Test	for which CRF to
		0 0 1 5	U	0 4 5 6	/	use - 8	or 16 WPL
		0 0 1 6	R	0 4 0 5	/	LWS	
		0 0 1 7	U	0 3 1 0	/	X	
		0 0 1 8	T	0 4 1 4	/	Word to	be pchd is INST
		0 0 1 9	B	0 5 4 5	/	8 (21)	HTF Word is Hex
		0 1 1 0	C	0 2 4 5	/	HTC to	8; To load 9 Hex wor
		0 1 1 1	B	0 5 4 7	/	X Z0518	Low Add of Hex Tabl
		0 1 1 2	Y	0 2 0 9	/	B Hexer	Set Hexers to
		0 1 1 3	Y	0 1 1 5	/	C Hexer	Low Add of Table
		0 1 1 4	B	0 4 5 1	/	W	Begir to load
		0 1 1 5	X	C (0 H E X)	/	X	Table
		0 1 1 6	B	0 2 4 5	/	HTC	hex table count
		0 1 1 7	S	0 3 5 3	/	1 (21)	
		0 1 1 8	H	0 2 4 5	/	HTC	
		0 1 1 9	T	0 3 4 7	/	X TABLE	FULL;PCH TABLE
		0 2 1 0	B	0 5 4 2	/	1 (29)	Begin to advance
		0 2 1 1	U	0 3 2 9	/		0 115
		0 2 1 2	X	Z 0 0 1 6	/	1 (25)	Delay at end of Hex
		0 2 1 3	R	0 1 5 7	/	X CRS	check for (0350)
		0 2 1 4	U	0 1 5 1	/		end of line
		0 2 1 5	B	0 5 5 4	/	HWC	hex word count
		0 2 1 6	S	0 5 5 5	/	1 (21)	
		0 2 1 7	X	T (0 E T P)	/	X	END TABLE PCH (0237,0324, 0347)
		0 2 1 8	H	0 5 5 4	/	HWC	
		0 2 1 9	B	0 5 5 1	/	1 (29)	Advance
		0 3 1 0	A	0 2 0 9	/	B Hexer	B Hexer
		0 1 3 1 1	C	0 2 0 9	/	X B Hexer	

FORM LP-10

PRINTED IN U.S.A.

Royal McBee Corporation
DATA PROCESSING DIV.
PORT CHESTER, NEW YORK

X = CARRIAGE RETURN

/ = CONDITIONAL STOP CODE

LGP-30 CODING SHEET

PREPARED FOR: LGP-30 USERS' ORGANIZATION - POOL Program No. K2-71			PAGE 4 / 12
JOB NO.	PROGRAM NO.	PROGRAM PREPARED BY: J. H. Boatwright	PROGRAM CHECKED BY:	DATE 4-29-59
PROBLEM: WESTERN ELECTRIC REPOSITIONAL DECIMAL MEMORY PUNCH				TRACK

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION OPERATION	INSTRUCTION ADDRESS	STOP	CONTENTS OF ADDRESS	NOTES
	/						
	/	☒					
		0113 12	U	0207	/	To continue hex punch	
0101000103	'	1313		2	/	1 (30)	0211
		1314		0	/		
		1315	XZ	0hXa	/	☒ Lfh+1	Loh(0016,0027,0029, 0363)
		1316	B	0451	/	W here	to demodify
		1317	S	0309	/	XZ(Lm)	
		1318	U	0301	/		
0101000102	'	1319	WWW	0J002	/	☒ Zero	inst. bits 0403
		1410		2	/		0404
		1411	H	0513	/	No to punch	Here to pch 8 char.
		1412	B	0257	/	7 (29)	
		1413	U	0326	/	☒	
0100000001	'	1414	00100000		/	1 (11)	0215
		1415	N	0224	/	1 (19)	=XZ1600
		1416	U	0148	/		
		1417	XBL	0H1	/	☒ XB(Loh+1)(0021)(0028)(0361)	
		1418	H	0513	/	No. to pch	Here to pch 5 char.
		1419	B	0531	/	4 (29)	
		1510	U	0326	/		
		1511	XP	3209	/	☒ "1"	Begin CRS here
		1512	B	0324	/	CRC	CR count
		1513	S	0539	/	1 (29)	
		1514	T	0455	/		Do CR
		1515	C	0324	/	☒ CRC	
		1516	XZ	3200	/	Delay	for "1"and Sp and CR
		1517	XU	0CRS	/	EXIT CRS 0104,0439	
		1518	XP	2716	/	","	Begin HEX TABLE
		1519	B	0538	/	☒ 7 (21)	PUNCH
		1610	S	0245	/	HTC	
		1611	C	0554	/	HWC	No.of Hex words)-2
		1612	R	0532	/	To halt	for ","or"."and Prt
		0116 13	U	0527	/	☒ 6 zeros	

FORM LP-12

PRINTED IN U.S.A.

Royal McBee Corporation
DATA PROCESSING DIV.
PORT CHESTER, NEW YORK

☒ CARRIAGE RETURN

/ = CONDITIONAL STOP CODE

LGP-30 CODING SHEET

PREPARED FOR:				PAGE	OF
LGP-30 USERS' ORGANIZATION - POOL Program No. K2-71				5	12
JOB NO.	PROGRAM NO.	PROGRAM PREPARED BY: J. H. Boatwright	PROGRAM CHECKED BY:	DATE 4-29-59	
PROBLEM: WESTERN ELECTRIC REPOSITIONAL DECIMAL MEMORY PUNCH				TRACK	

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION OPERATION	INSTRUCTION ADDRESS	STOP	CONTENTS OF ADDRESS	NOTES
	/						
	/	X					
		0200	B	0554	/	HWC (21)	Prepare to
		01	A	0544	/	XP0625	Punch Hex Fill
		02	C	0203	/		Code
		03	XP	(0HXC)	/	X PUNCH	HEX FILL CODE
		04	XZ	(00M0)	/	XZ(M)	0011,0023
		05	XP	(3227	/	" 1"	
		06	XZ	0PHA	/	Z(Lf+1-Lo)	0026,0262,0427
		07	B	0443	/	X U0316	Begin HX pch
		08	C	0251	/	To inhibit Lead Zeros	
		09	XB	(0HEX)	/	B hexer	0112,0130,0131
		10	T	0141	/	-word to pch 8 hex char.	
		11	S	0133	/	X 1 (30)	
		12	T	0123	/	Zero word; punch	
		13	S	0449	/	1 at 11-1 at 30=WWWWQ	
		14	T	0145	/	To Pch 5 Hex Char.	
		15	A	0144	/	X 1 (11)	
		16	U	0141	/	To Pch 8 Hex Char.	
		17		0	/		
		18	N	0540	/	1 (29)	
		19	Y	0221	/	X	
		20	XZ	3200	/		
		21	XP	(0ADD)	/		0219
		22	B	0558	/	Add Word	
		23	XU	(0EPT)	/	X EXIT PCH TRACK	
		24	XZ	1600	/	1 (19)	0145
		25	B	(Lf+1)	/	B(Lf+1)	0005,0022,0332, 0446
		26	XT	0000	/	Dummy	0304
		27	U	0415	/	X SWIZ=1	0412
		28	XZ	0004	/	1 (27)	0242
		29	U	0415	/	SWIZ=1	0407
		30	B	0002	/	Make Acc=+	
		0231	U	0405	/	X to LWS	EXIT ;Hex

FORM LP-10

PRINTED IN U.S.A.

Royal McBee Corporation
DATA PROCESSING DIV.
PORT CHESTER, NEW YORK

X CARRIAGE RETURN

/ = CONDITIONAL STOP CODE

LGP-30 CODING SHEET

PREPARED FOR:				PAGE / OF
LGP-30 USERS' ORGANIZATION - POOL Program No. K2-71				6 / 12
JOB NO.	PROGRAM NO.	PROGRAM PREPARED BY:	PROGRAM CHECKED BY:	DATE
		J. H. Boatwright		4-29-59
PROBLEM:				TRACK
WESTERN ELECTRIC REPOSITIONAL DECIMAL MEMORY PUNCH				

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION OPERATION	INSTRUCTION ADDRESS	STOP	CONTENTS OF ADDRESS	NOTES
	/						
	/	☒					
		0 2 3 2	X	P 0 H E X	/	Print Hex Char. 0252,0253	
		3 3	B	0 4 5 5	/	Digit cntr.	
		3 4	S	0 3 4 1	/	1 (29)	
		3 5	T	0 1 2 2	/	☒ end of hex word	
		3 6	U	0 2 4 0	/	Not end of hex word	
		3 7	R	0 1 2 7	/	Next word after this hex	
		3 8	U	0 1 5 8	/	word is INST. Pch Hex Table	
		3 9	U	0 4 1 4	/	☒ Pch. Inst.	
		4 0	H	0 4 5 5	/	Digit Cntr.	
		4 1	B	0 5 1 3	/	No. to Punch	
		4 2	N	0 2 2 8	/	1 (27)	
		4 3	U	0 2 4 8	/	☒	
,0 0 0 0 0 0 1	'	4 4	K	0 0 0 0 0 0 0	/		(0508)
		4 5	X	Z 0 H T C	/	Hx Table Count 0110,0116,	
		4 6	B	0 5.6 1	/	N T.S.	0118,0160
		4 7	U	0 2 5 1	/	☒	
		4 8	H	0 1 5 1 3	/	No. to Punch	
		4 9	M	0 3 1 1 4	/	1 (18)	
		5 0	E	0 1 5 3 6	/	3J00	
		5 1	[U	0 3 1 1 6	/	☒ [A053? (XP0254) or U0316]	(0208,0322)
		5 2	U	0 2 5 3	/		
		5 3	C	0 2 3 2	/		
		5 4	U	0 2 3 2	/		
		5 5	X	P 3 4 1 3	/	☒ 8 Begin Pch "800" or	
		5 6	E	0 4 1 1 0	/	XZ6363; pull Add "80"	
		5 7	X	Z 0 0 0 7	/	Delay for "8" (0142)	
		5 8	S	0 3 0 9	/	Z(M1)	
		5 9	X	P 0 2 1 7	/	☒ 0	
,0 0 0 0 0 0 1	'	6 0	F	0 0 0 0 0 0 0	/	Delay for "0" (0514)	
		6 1	T	0 4 1 2	/	AW<M	
		6 2	S	0 2 0 6	/	(Lf+1)→M	
		0 2 6 3	T	0 2 5 9	/	☒ M≤ AW ≤ Lf	

LGP-30 CODING SHEET

PREPARED FOR:				PAGE / OF
LGP-30 USERS' ORGANIZATION - POOL Program No. K2-71				7 / 12
JOB NO.	PROGRAM NO.	PROGRAM PREPARED BY:	PROGRAM CHECKED BY:	DATE
		J. H. Boatwright		4-29-59
PROBLEM:				TRACK
WESTERN ELECTRIC REPOSITIONAL DECIMAL MEMORY PUNCH				

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION OPERATION	INSTRUCTION ADDRESS	STOP	CONTENTS OF ADDRESS	NOTES
	/						
	/ ☒						
		03 10	U	0412	/	AW >Lf	
		10 11	H	0451	/	W store demodified	
		10 12	U	0432	/		word
		10 13	E	0553	/ ☒	7wwwJ002;zero sign add	
		10 14	S	0226	/	XT0000	OPW-70000
		10 15	T	0230	/	Hex Word; Make Acc +	
		10 16	S	0442	/	1 (34)	OP-W T0000=0?
		10 17	T	0031	/ ☒	-TINST SET SW to 2	
		10 18	U	0405	/	Hex Word;Acct;Exit	
		10 19	XZ	00LM	/	XZ (LM); 0012,0137,0258	
		11 10	XBW	0RD	/	B(Lw);	LWS(0009)(0331)(0360)(0445)
		11 11	C	0451	/ ☒	W	
		11 12	B	0341	/	1 (29)	
		11 13	U	0359	/		
		11 14	XZ	3200	/	1 (18)	0249
		11 15	XZ	1000	/ ☒	10 (23)	0043,0050,0057
		11 16	S	0552	/	1 (30)	
		11 17	T	0233	/	Hex char is zero	
		11 18	H	0561	/	N T.S.	
		11 19	B	0562	/ ☒	A0537	=A(XP0254) END
		12 10	U	0322	/		ZERO CONTROL
,0 0 0 0 0 0 0 1 '		12 11	WWW	0J002	/	ZERO INST ADD Bits	
		12 12	C	0251	/		
		12 13	U	0246	/ ☒		
		12 14	XZ	0CRC	/	CRC	0152,0155
		12 15	XZ	0032	/		0046
		12 16	H	0455	/	Digit Cntr	
		12 17	B	0513	/ ☒	No. to Print	
		12 18	U	0249	/		
		12 19	A	0115	/	Advance	
		13 10	C	0115	/	C Hexer	
		03 13 11	B	0310	/ ☒	B(Lw)	

LGP-30 CODING SHEET

PREPARED FOR: LGP-30 USERS' ORGANIZATION - POOL Program No. K2-71				PAGE 8 OF 12
JOB NO.	PROGRAM NO.	PROGRAM PREPARED BY: J. H. Boatwright	PROGRAM CHECKED BY:	DATE 4-29-59
PROBLEM: WESTERN ELECTRIC REPOSITIONAL DECIMAL MEMORY PUNCH				TRACK

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION OPERATION	INSTRUCTION ADDRESS	STOP	CONTENTS OF ADDRESS	NOTES
	/						
	/	☒					
		0312	S	0225	/	B(Lf+1)	Test for STOP
		13	T	0355	/	Not end	of area; Test nxt
		14	R	0127	/	Punch	END word
		15	U	0158	/	☒ Hex Table	
		16	XP	2312	/	"."	STOP
		17	B	0343	/	6 (21)	
		18	R	0532	/	Zero Puncher	
		19	U	0528	/	☒ enter	at stop
		10	XP	3216	/	"1"	
		11	XZ	0001	/	1 (29)	0312 0120 0234
		12	U	0000	/	BEGIN	
		13	XZ	2400	/	☒ 6 (21)	0337
		14	R	0223	/	Punch	Start Punch
		15	U	0036	/	TRK	Address
		16	U	0350	/		
		17	R	0127	/	☒ Hex Table	TABLE FULL
		18	U	0158	/	Punch	
		19	U	0445	/	To area	test after Pch Inst.
		50	N	0122	/	1 (25)	
		51	R	0223	/	☒ Punch	
		52	U	0036	/	Sector	
		53	XZ	0400	/		0117
		54	XU	0EPA	/	Exit Pch Add	0437
		55	R	0405	/	☒ Test nxt	word
		56	U	0310	/	Lws	
		57	T	0237	/	Hex table Pch,	then INST
		58	U	0114	/	Load nxt Hex	Word
		59	A	0310	/	☒ B(Lw)	Step B(Lw)
		60	H	0310	/		
		61	S	0147	/	B(Loh+1)	Test forHx Pch Area
		62	T	0401	/	Not in	Hex Pch Area
		63	S	0135	/	☒ B(Lfh+2)	

LGP-30 CODING SHEET

PREPARED FOR: LGP-30 USERS' ORGANIZATION - POOL Program No. K2-71 | PAGE 9 OF 12

JOB NO. | PROGRAM NO. | PROGRAM PREPARED BY: J. H. Boatwright | PROGRAM CHECKED BY: | DATE 4-29-59

PROBLEM: WESTERN ELECTRIC REPOSITIONAL DECIMAL MEMORY PUNCH | TRACK

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION OPERATION	INSTRUCTION ADDRESS	STOP	CONTENTS OF ADDRESS	NOTES
	/						
	/	☒					
		04 00	T	0230	/	In hex	punch area
		00 01	B	0451	/	W	Not in hex area
		00 02	T	0303	/	Hex or	-T
		00 03	E	0139	/	☒ WWW0J002; Zero inst bits	
Here for -T →		00 04	S	0140	/	1 (30) CK Remaining bits=0?	
		00 05	X	U[E L W S]1		Lws exit; Acc=(-), Inst;	
		00 06	X	Z1032	/	(0055)	Acc=(+), Hex
		00 07	B	0229	/	☒ U0415	Set SW12 to 1
		00 08	C	0414	/	SW12	Initially
		00 09	V	U0104	/	Start	Punch out
		00 10	X	Z6363	/		(0256) (0424)
		00 11	U	0034	/	☒ SW2	0031 (for -T inst)
Here after "800", or "80",			B	0227	/	U 0415	Set SW to 1
		00 13	Y	0414	/		
Here for inst		00 14	U	0415	/	U0415=SW1 U0034=SW2	
		00 15	B	0451	/	☒ W	
		00 16	S	0452	/	XI0000	
		00 17	T	0424	/	Not I nor P inst	
		00 18	S	0454	/	XB0000	
		00 19	T	0429	/	☒ I inst, don't demodify	
		00 20	S	0063	/	XR0000=(XP0000-XI0000-XB0000)	
		00 21	T	0424	/	Not P inst	
		00 22	S	0444	/	XB0000	
		00 23	T	0429	/	☒ P inst; don't demodify	
		00 24	E	0410	/	XZ6363 Here for not I or P	
		00 25	S	0204	/	XZ[M]	
		00 26	T	0429	/	M >AW Don't demodify	
		00 27	S	0206	/	☒ Z(Lf+1-M)	
		00 28	T	0136	/	M ≤ AW ≤ Lf; demodify	
		00 29	B	0451	/	W Here for don't demodify	
		00 30	X	P3945	/	"X"	
		04 31	X	Z0400	/	☒ 1 (21) 0530	

FORM LP-10

PRINTED IN U.S.A.

Royal McBee Corporation
DATA PROCESSING DIV.
PORT CHESTER, NEW YORK

☒ CARRIAGE RETURN

/ = CONDITIONAL STOP CODE

LGP-30 CODING SHEET

PREPARED FOR:				PAGE OF
LGP-30 USERS' ORGANIZATION - POOL Program No. 2K-71				10 / 12
JOB NO.	PROGRAM NO.	PROGRAM PREPARED BY: J.H.Boatwright	PROGRAM CHECKED BY:	DATE 4/29/59
PROBLEM: WESTERN ELECTRIC REPOSITIONAL DECIMAL MEMORY PUNCH				TRACK

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION OPERATION	INSTRUCTION ADDRESS	STOP	CONTENTS OF ADDRESS	NOTES
	/						
	/	☒					
		04 3 2	M	04513	/	1 at 6	
		3 3	A	05517	/	XP0100	
		3 4	C	04345	/		
		3 5	XP	01000	/	☒	Punch OP (0434)
		3 6	B	04511	/	W	
		3 7	R	03514	/	Punch	
		3 8	U	03444	/		Add (AW)
		3 9	R	01517	/	☒ "."	
		4 0	U	01511	/	CRS	
		4 1	U	04445	/		
,0000001	'	4 2		2	/	1 at 30	(0306)
		4 3	U	03116	/	☒	(0207)
		4 4	XB	[0000]	/		(0422)
		4 5	B	03110	/	B[Lw]	
		4 6	S	02225	/	B[Lf+1]	
		4 7	T	01016	/	☒	Begin Lws No Stop
		4 8	U	03336	/		STOP
,0000007	'	4 9	WWWWQ		/		(0213)
		5 0		2	/	1 at 30	(0407)
		5 1	[	W]	/	☒ (0114,	0136,0301,0311,0401)
		5 2		40000	/		XI0000 (0416)
		5 3	2	00000	/	1 at 6	(0432)
		5 4		10000	/		XB0000 (0418,0516)
		5 5		DICT	/	☒	Digit Cntr.<--DOCR
		5 6	XP	16412	/	C.R.	(0233,0240,0326)
		5 7	B	00001	/	CBF1=7	at 29 8 w/line
		5 8	800T	04610	/		Do 16 w/line
		5 9	U	01555	/	☒	
		6 0	B	04612	/	CRF2=15	at 29 16 w/line
		6 1	U	01555	/		
		6 2	XZ	00155	/	CRF2	(0460)
		6 3	C	01541	/	☒	JUNK BEGIN BINARIZE

FORM LP-12

PRINTED IN U.S.A.

Royal McBee Corporation
DATA PROCESSING DIV.
PORT CHESTER, NEW YORK

☒ CARRIAGE RETURN

/ = CONDITIONAL STOP CODE

LGP-30 CODING SHEET

PREPARED FOR: LGP-30 USERS' ORGANIZATION - POOL Program No. K2-71 | PAGE 11 / 12

JOB NO. | PROGRAM NO. | PROGRAM PREPARED BY: J.H.Boatwright | PROGRAM CHECKED BY: | DATE 4/29/59

PROBLEM: WESTERN ELECTRIC REPOSITIONAL DECIMAL MEMORY PUNCH | TRACK

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION OPERATION	INSTRUCTION ADDRESS	STOP	CONTENTS OF ADDRESS	NOTES
	/						
	/	X					
		0510	X	P0510	/		Read either LoLf, Lm
		10 11	X	I0051	/		or Loh Lfh
		10 12	X	P0352	/		Space
		10 13	H	05561	/	X W1W2	
		10 14	N	05400	/	1 at (29)	
		10 15	E	C5314	/	3WWWJ	
		10 16	H	05411	/	N	
		10 17	E	05355	/	X 3J3J0	
		10 18	M	02444	/	K0000000	
		10 19	A	05411	/	N	
		11 10	H	05411	/	N	
		11 11	E	05446	/	X WWWW00	
		11 12	U	05114	/		
,0 0 0 0 0 0 1	'	11 13	N0	T0	P R	/	No.to Pr (0141,0148,02410248 0327)
		11 14	M	02600	/	F0000000	
		11 15	A	05411	/	X N	
		11 16	A	04514	/	XB0000	or 10000
		11 17	X	U0EBI	/		EXIT BINARIZE
,0 0 0 0 0 0 9	'	11 18			H	/	
		11 19			E	/ X	
		12 10			X	/	
		12 11				/	Hex table
		12 12			T	/	loaded by 0115
		12 13			A	/ X	brought by 0209
		12 14			B	/	
		12 15			L	/	
		12 16			E	/	
		12 17	B	05613	/	X 5 at (21)	START ZERO PRNTY
		12 18	X	Z3120	0	/ HLT for	"," or "a"
		12 19	X	P0251	/		"o"
		13 10	S	04311	/	1 at (21)	
		13 11	X	Z0004	/ X		

FORM LP-10

PRINTED IN U.S.A.

Royal McBee Corporation
DATA PROCESSING DIV.
PORT CHESTER, NEW YORK

X = CARRIAGE RETURN

/ = CONDITIONAL STOP CODE

LGP-30 CODING SHEET

PREPARED FOR: LGP-30 USERS' ORGANIZATION - POOL Program No. K2-71				PAGE 12 / 12
JOB NO.	PROGRAM NO.	PROGRAM PREPARED BY: J. H. Boatwright	PROGRAM CHECKED BY:	DATE 4-29-59
PROBLEM: WESTERN ELECTRIC REPOSITIONAL DECIMAL MEMORY PUNCH				TRACK

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION OPERATION	INSTRUCTION ADDRESS	STOP	CONTENTS OF ADDRESS	NOTES
	/						
	/	X					
		05 12	XT(OEZR)		/	Exit Pch Zero 0162,0338	
		13	U	0529	/	Pch another zero	
0000003	'	14	3	WWWJ	/		0505
		15	3	J3J0	/	X	0507
		16		3J00	/	XZ6000	0250
		17	X	P0254	/		0251
		18	X	Z2800	/	7 (21)	0159
		19	X	Z0001	/	X 1 (29)	0153
		10	X	Z0001	/	0004,0020,0218,0504	
		11	[	N	/	N 0506,0509,0510,0515	
		12	X	Z0001	/	0120	
		13	X	Y0000	/	X	
		14	X	P0627	/	To Form OP 0201	
		15	X	Z3200	/	8 (2)	HTF 0109
0000001	'	16	0	WWWW00	/		0511
		17		Z0518	/	X XZLOHT	
		18		B0543	/	1 14	Bin Lo or Loh
		19		M0556	/	W1W2	
		10		U0505	/		
		11	X	Z0001	/	X 1 (29)	0129
0000040	'	12			2	/ 1 (30)	0316
		13	7	WWWJ002	/	mask to test for zero address 0303 - T order	
		14	(	HWC	/	HWC 0125,0128,0161,0200,0201	
		15		0400	/	X XZ0400 1 (21)	0126
		16	[	W1W2	/		0503
		17		8010 0	/	XP0100	0433
		18	[ADD	WORD	/	ADD WORD	0036,0222
		19		3W00	/	X XZ6300	0037
		10		1Q00	/	XZ3000 30 (23)	0034
		11	[	NTS	/	N T.S.	0246,0318
		12		A0537	/	To cease leading "0"s	0319
		13	X	Z2000	/	X 20 (23) 5 (21)	

FORM LP-12

PRINTED IN U.S.A.

Royal McBee Corporation
DATA PROCESSING DIV.
PORT CHESTER, NEW YORK

X = CARRIAGE RETURN

/ = CONDITIONAL STOP CODE