



# DECUS

## PROGRAM LIBRARY

DECUS NO.	8-259
TITLE	SYMBOLIC FROM PASS 3
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DATE	Submitted May 28, 1970
SOURCE LANGUAGE	PAL III

DEPT. OF AGRICULTURE

WASHINGTON, D. C.



*[The main body of the document contains extremely faint and illegible text, likely bleed-through from the reverse side. The text is arranged in several paragraphs and possibly includes a table or list structure.]*

## SYMBOLIC FROM PASS 3

DECUS Program Library Write-up

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Program to produce a modified PAL III symbolic program tape from a previous pass 3 tape using the high-speed I/P, O/P facilities of the computer.

A list of changes, deletions and insertions are read into core store, then the pass 3 tape of the symbolic program to be modified is read on the photo-electric reader and a new symbolic tape is produced at the high-speed punch.

### Operation

Place modification data tape in the photo-electric reader. Load address 200 and press START. At the end of this tape the computer will halt, place pass 3 tape in photo-electric reader, switch punch ON, press CONTINUE.

### Data Tape

All addresses and line numbers are octal.

''

Signifies the beginning of the data and is followed by a single CR LF

XXXXC  
AA.....CR LF  
AA.....CR LF  
AA..... ]

Commencing with the line numbered XXXX, change the following line or lines. The last character is a "]" which signifies the end of that list of text.

XXXXDXX

Commencing with the line numbered XXXX, delete XX lines.

XXXXI  
AA.....CR LF  
AA.....CR LF  
AA.....CR LF  
AA..... ]

At line XXXX insert the following new lines. Unless modified by the next instruction line XXXX will be copied after the insertions have been made.

Where unnumbered lines such as comments, definitions, starting addresses, etc., are to be modified, or new routines to be added in place of unnumbered lines, the following notation is used. For the purpose of numbering, blank lines are ignored.

XXXX+XXC  
AA.....CR LF  
AA..... ]

Commencing at unnumbered line XXXX plus XX, change the following line or lines.

XXXX+XXD

Delete unnumbered line XXXX plus XX. (One line only).

XXXX+XXI

AA.....CR LF

AA..... J

At unnumbered line XXXX plus XX insert the following line or lines.

\$

End of data tape.

In the case of unnumbered lines, XXXX is the last numbered line. If unnumbered lines are to be changed before a numbered line is seen, then XXXX is 0000.

The data tape must be made such that all modifications are in the same sequence as they will be read from the pass 3 tape.

XXXX is a four digit address  
C, D, I, + are the only legal instructions  
XX is an octal number commencing 01.

A seven character space tabulation can be generated by the single character " ← ". (Tabulation may be varied by changing KMT.)

Thus the two characters " J " and " ← " may not be used as characters to be inserted on a new symbolic tape.

A reference to a mixture of numbered and unnumbered lines may not be included in a single operation.

Store

There are 3093 (10) locations available for data. They are 1552 (8) - 7577 (8).

Store Organization

Each command consists of an address and an instruction word. The 'change' and 'insert' instruction word is followed by individual ASCII codes corresponding to the relevant text. To represent a CR LF only the CR code is held. The last stored character of a list of text is " J ."

The instruction word is made up as follows:

Bit	0	1	2	3	6 - 11
Command	C	D	I	+	Two digit number XX

Store Limitation

The number of store locations required by a set of data can be calculated as follows:

3 x No. of instructions, +No. of lines of text, +No. of text characters (including spaces but excluding CR and LF).

Thus a data tape containing 70 instructions, 150 lines of text and 18 characters per text line would require 3060 of the 3093 storage locations available.

Store capacity may be increased by changing location 0023 from 7577 to 7754 or 7776.

### Errors

The following errors will be indicated at the teleprinter if the circumstances arise. Errors are only notified at the 'read data tape' stage. The error message consists of a two character code followed by the address of the line being referenced, and the instruction word at the instant of error.

e.g.	C	40XX	+C	44XX
	D	20XX	+D	24XX
	I	10XX	+I	14XX

XX in the cases +C, +D and +I will be the two digit line number.

**ERR AD** The form of the address XXXX is illegal. Press CONTINUE and read correct address. In this case the address and instruction printed will be that of the previous instruction.

**ERR 2D** The form of the 2 digit number XX is illegal. Press CONTINUE and reread correct two digit number. In this case the instruction word printed will be incomplete.

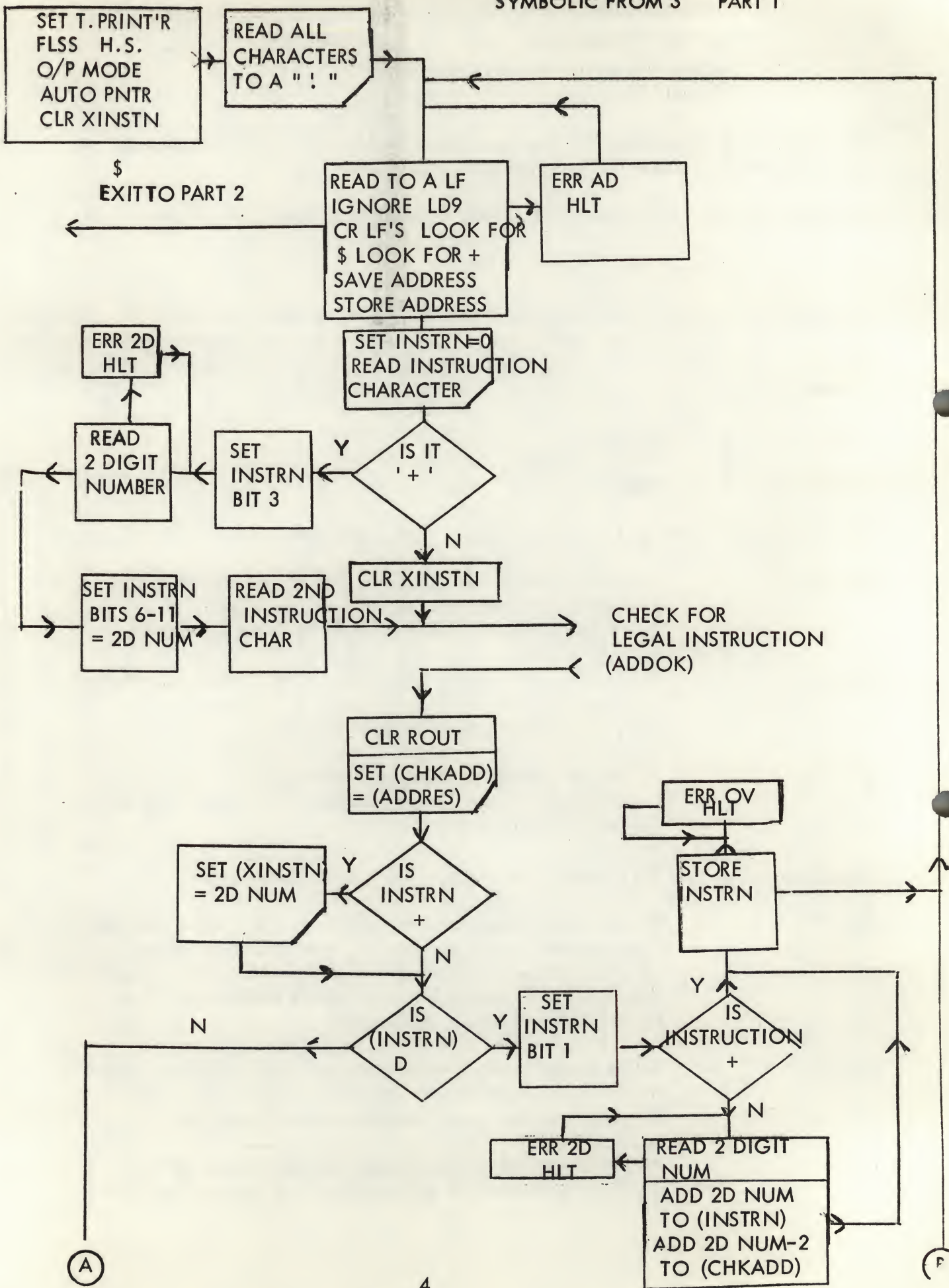
**ERR IN** An illegal instruction character other than C, D, or I or + has been seen. No recovery possible. The instruction word printed will be incomplete.

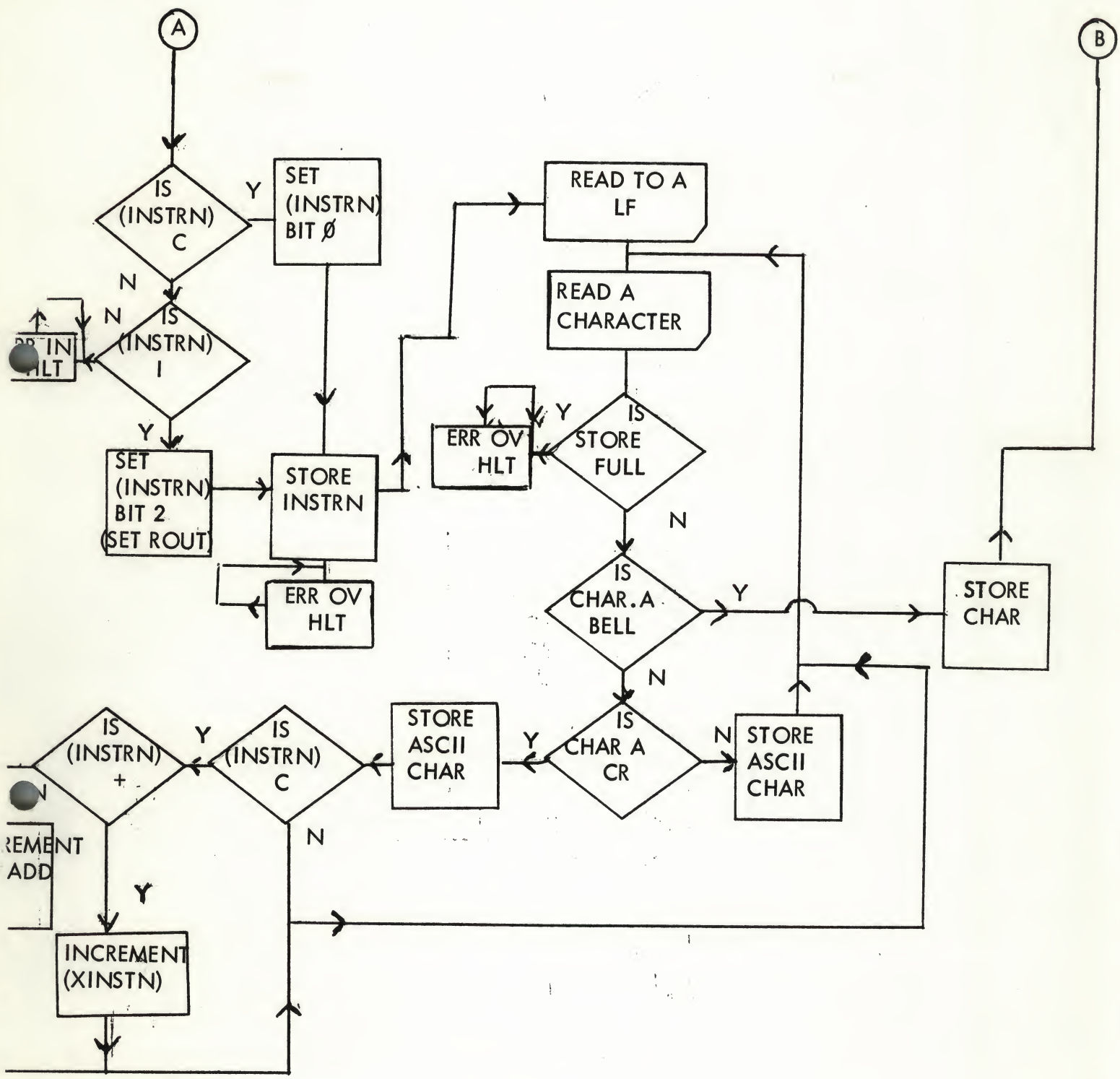
**ERR OV** Store capacity exceeded. No recovery possible.

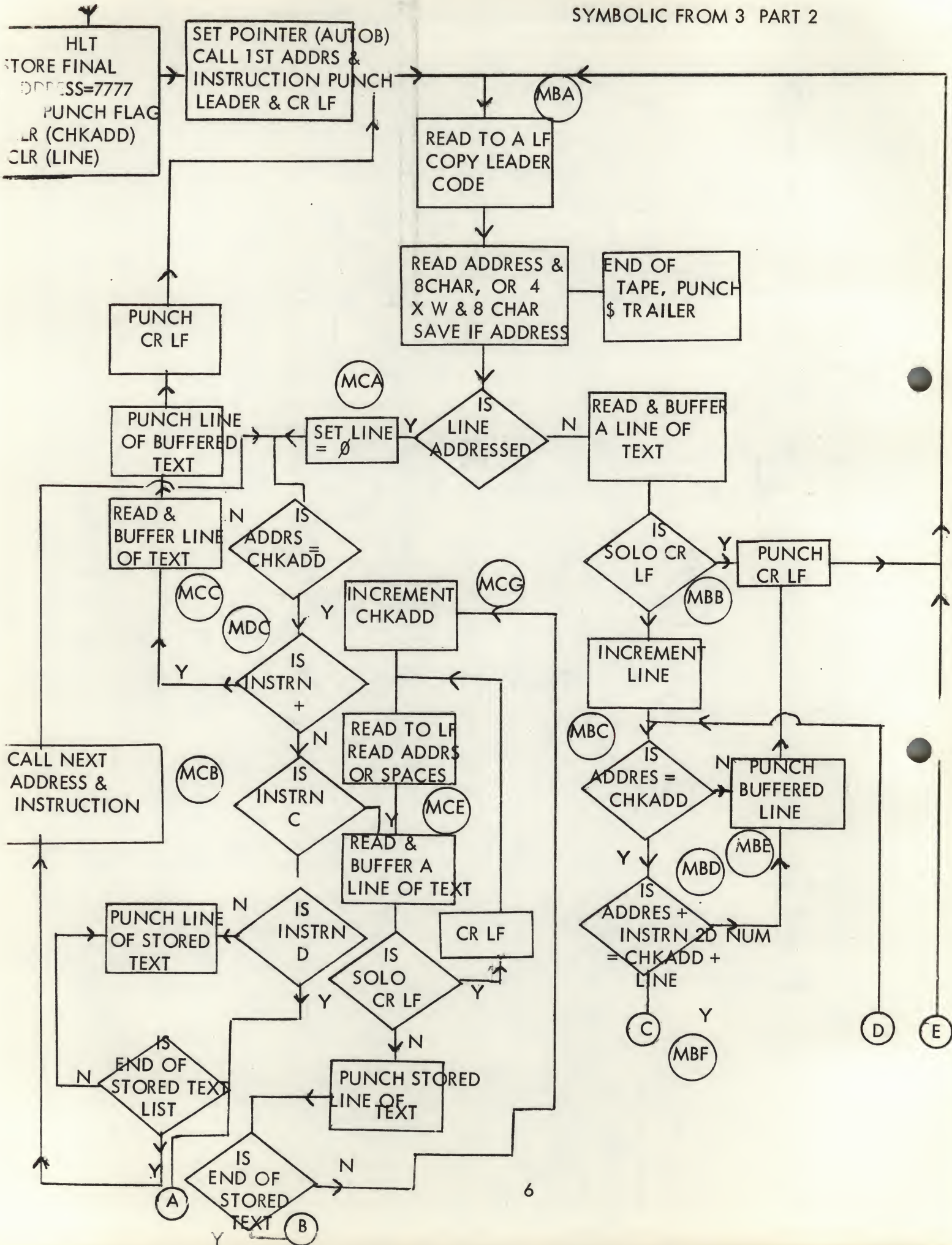
**ERR A<** A line number is less than the next line, that may be modified. This diagnostic will also occur if a modification is called for where the pass 3 listing is not consecutive. If the diagnostic is caused by the pass 3 listing being out of sequence, press CONTINUE and ignore the diagnostic.

**ERR N+** A line number is equal to the last line number modified, where the last instruction was not an insertion and this instruction does not reference an unnumbered line. No recovery.

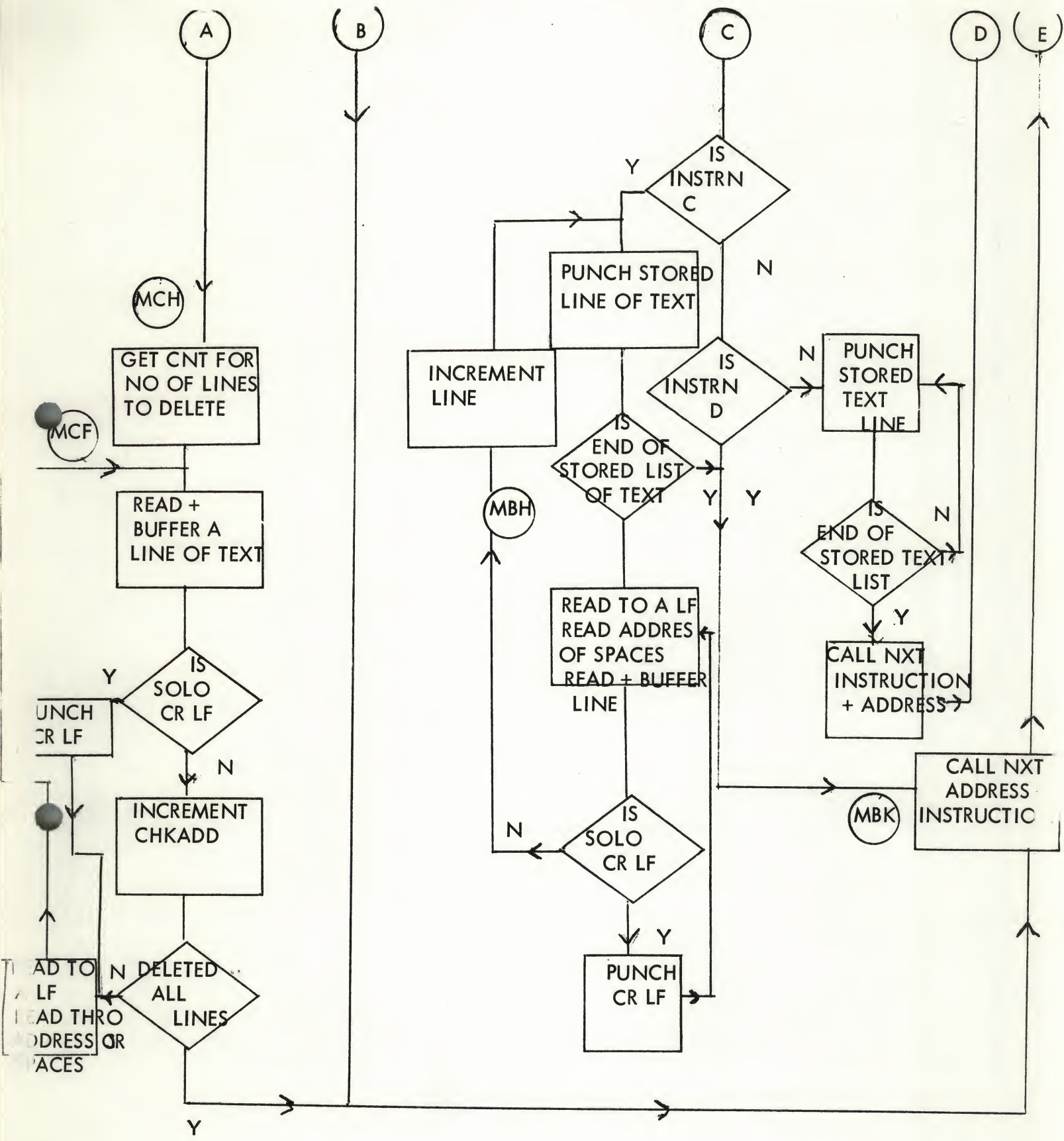
**ERR >L** An instruction for an unnumbered line calls for a line that is modified by the preceding instruction. No recovery possible.

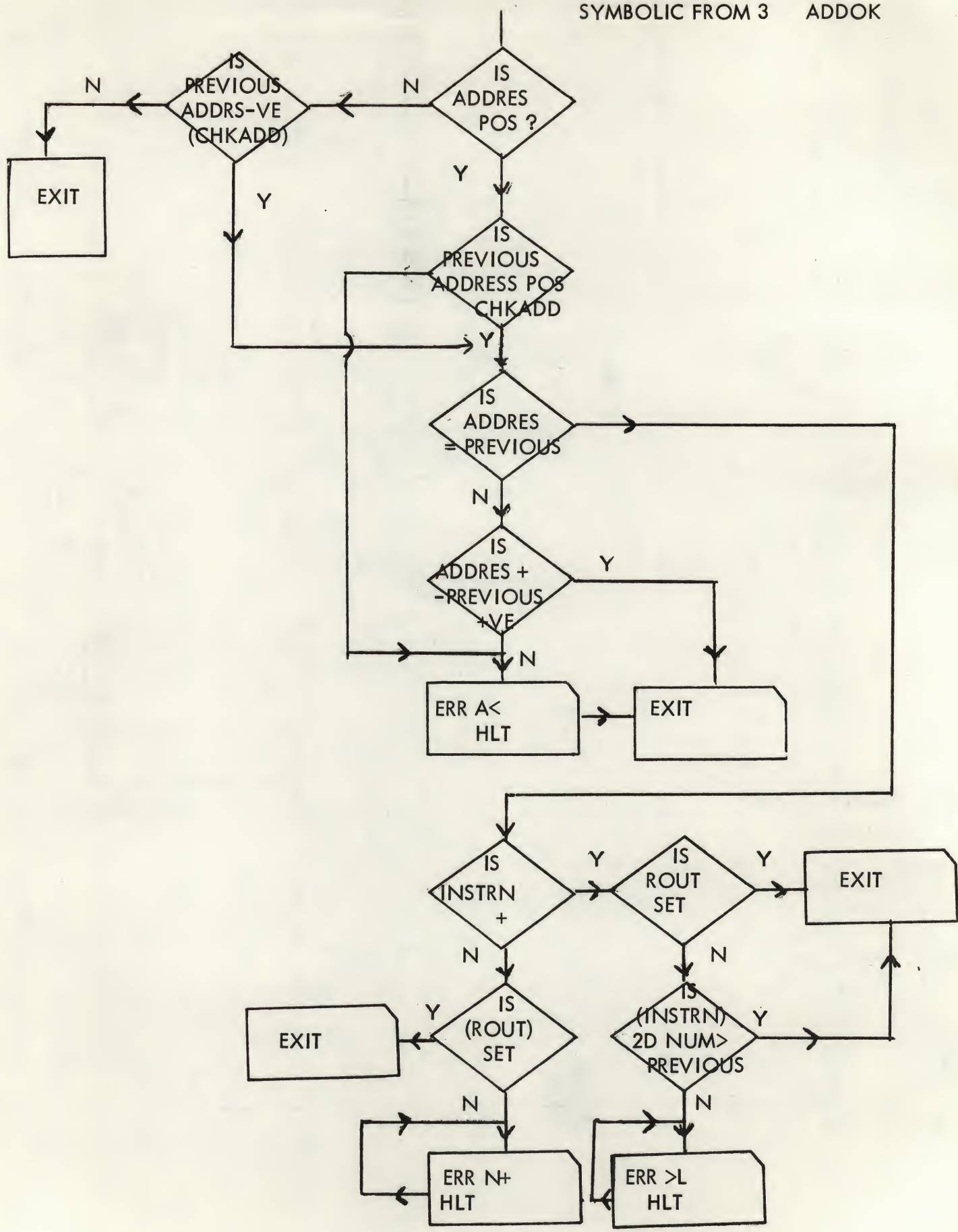












/SYMBOLIC TAPE EDITOR FROM PASS 3 TAPE

\*0001

0001	7402		HLT
0002	0000	ADDRES,	0
0003	0000	CHKADD,	0
0004	0000	INSTRN,	0
0005	0000	LINE,	0
0006	0000	OUTMKR,	0
0007	0000	XINSTN,	0
0010	0000	AUTOA,	0
0011	0000	AUTOB,	0

\*0021

0021	1400	MESAGI,	MESSAGE
0022	1552	STOREI,	STORE
0023	7577	STRENI,	STREND
0024	0400	ADDGEI,	ADDGET
0025	0600	MAINBI,	MAINB
0026	1234	NUMGEI,	NUMGET
0027	1270	NUMMKI,	NUMMKR
0030	1267	NUMSTI,	NUMSTR
0031	1356	CHRCKI,	CHRCHK
0032	0513	ADDOKI,	ADDOK
0033	1310	ERMSGI,	ERMSGE
0034	0327	RDTXTI,	RDTXT
0035	0471	RD2DTI,	RD2DT
0036	0507	RD2STI,	RD2STR
0037	1166	STRISI,	STRISN
0040	1274	LEADEI,	LEADER
0041	1000	READ4I,	READ4
0042	1147	PUNLII,	PUNLIN
0043	1200	PUNTXI,	PUNTXT
0044	1100	REDLII,	REDLIN
0045	1441	STRFUI,	STRFUL
0046	1266	DIGSTI,	DIGSTR
0047	0000	ROUT,	0

/TYPE CR LF

0050	0000	TYCR,	00
0051	7200		CLA
0052	1057		TAD TP215
0053	4070		JMS OUT
0054	1060		TAD TP212
0055	4070		JMS OUT
0056	5450		JMP I TYCR
0057	0215	TP215,	0215
0060	0212	TP212,	0212

```

/READ A CHARACTER
0061 0000 GET, 00
0062 6014 RFC
0063 6011 RSF
0064 5063 JMP .-1
0065 7200 CLA
0066 6012 RRB
0067 5461 JMP I GET

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/O/P A CHARACTER ON HS OR LS PUNCH
0070 0000 OUT, 00
0071 3110 DCA OUTSTR
0072 1006 TAD OUTMKR
0073 7640 SZA CLA
0074 5103 JMP OUTHIH
0075 1110 TAD OUTSTR
0076 6041 TSF
0077 5076 JMP .-1
0100 6046 TLS
0101 7200 CLA
0102 5470 JMP I OUT
0103 1110 OUTHIH, TAD OUTSTR
0104 6021 PSF
0105 5104 JMP .-1
0106 6026 PLS
0107 5101 JMP OUTHIH-2
0110 0000 OUTSTR, 0

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```

/READ ALL CHARS. TO A LF
0111 0000 GETLF, 00
0112 4426 JMS I NUMGEI
0113 4431 JMS I CHRCKI
0114 0200 0200
0115 4070 JMS OUT
0116 4431 JMS I CHRCKI
0117 0212 0212
0120 7610 SKP CLA
0121 5112 JMP GETLF+1
0122 5511 JMP I GETLF

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/CALL NEXT ADDRESS & INSTRUCTION
0123 0000 CALINS, 00
0124 7200 CLA
0125 1411 TAD I AUTOB
0126 3002 DCA ADDRES
0127 1411 TAD I AUTOB
0130 3004 DCA INSTRN
0131 5523 JMP I CALINS

```

/READ ALL CHARACTERS UNTIL " ! " IS SEEN

0132	0000	SPLASH,	00	
0133	4426		JMS I NUMGEI	
0134	4431		JMS I CHRCKI	
0135	0241		0241	
0136	7610		SKP CLA	
0137	5133		JMP .-4	
0140	5532		JMP I SPLASH	
0141	0000	TYDIG,	00	
0142	0146		AND T0007	
0143	1147		TAD T260	
0144	4070		JMS OUT	
0145	5541		JMP I TYDIG	
0146	0007	T0007,	0007	
0147	0260	T260,	260	
		*0200		
		/MAIN FLOW A		
0200	6046		TLS	
0201	6036		KRB	
0202	7240		CLA CMA	
0203	3006		DCA OUTMKR	/SET HS PUNCH O/P
0204	7240		CLA CMA	
0205	1022		TAD STOREI	
0206	3010		DCA AUTOA	/SET AUTO PNTR
0207	3003		DCA CHKADD	
0210	3007		DCA XINSTN	
0211	4132		JMS SPLASH	/READ TO A " ! "
0212	4424	B,	JMS I ADDGEI	/READ ADDRESS
0213	5425		JMP I MAINBI	/ \$ GO TO 2ND STAGE
0214	1002		TAD ADDRES	
0215	3410		DCA I AUTOA	/STORE ADDRESS
0216	3004		DCA INSTRN	
0217	4426		JMS I NUMGEI	/READ INSTRUCTION CHAR
0220	4431		JMS I CHRCKI	
0221	0253		0253	/ +
0222	5313		JMP G	
0223	7200		CLA	
0224	3007		DCA XINSTN	
0225	4432	H,	JMS I ADDOKI	/CHECK FOR LEGAL ADDRESS
0226	3047		DCA ROUT	
0227	1002		TAD ADDRES	
0230	3003		DCA CHKADD	
0231	1004		TAD INSTRN	
0232	7006		RTL	
0233	7006		RTL	
0234	7620		SNA CLA	/IS INSTRN+
0235	5240		JMP .+3	
0236	1436		TAD I RD2STI	
0237	3007		DCA XINSTN	

0240	1430		TAD I NUMSTI	/CALL INSTRUCTION CHAR
0241	4431		JMS I CHRCKI	
0242	0304		0304	/D
0243	5270		JMP E	
0244	4431		JMS I CHRCKI	
0245	0303		0303	/C
0246	5266		JMP C	
0247	4431		JMS I CHRCKI	
0250	0311		0311	/I
0251	5256		JMP A	
0252	7200		CLA	
0253	1326		TAD ERRIN	
0254	4433		JMS I ERMSGI	
0255	5253		JMP .-2	/ERR IN
0256	3047	A,	DCA ROUT	
0257	7320		STL CLA	
0260	7012		RTR	/SET BIT 2
0261	7010	D,	RAR	
0262	1004		TAD INSTRN	
0263	3004		DCA INSTRN	
0264	4434		JMS I RDTXTI	/READ TEXT
0265	5212		JMP B	
0266	7320	C,	STL CLA	/SET BIT 0
0267	5261		JMP D	
0270	7320	E,	STL CLA	
0271	7012		RTR	/SET BIT 1
0272	1004		TAD INSTRN	
0273	3004		DCA INSTRN	
0274	1004		TAD INSTRN	
0275	7006		RTL	
0276	7006		RTL	
0277	7630		SZL CLA	
0300	5311		JMP F	
0301	4435		JMS I RD2DTI	/READ 2 DIGIT NUM
0302	1436		TAD I RD2STI	
0303	1004		TAD INSTRN	
0304	3004		DCA INSTRN	
0305	7240		CLA CMA	
0306	1436		TAD I RD2STI	
0307	1003		TAD CHKADD	
0310	3003		DCA CHKADD	
0311	4437	F,	JMS I STRISI	/STORE INSTRUCTION & ADDRESS
0312	5212		JMP B	
0313	7320	G,	STL CLA	
0314	7012		RTR	
0315	7012		RTR	
0316	1004		TAD INSTRN	/SET INSTRN BIT 3
0317	3004		DCA INSTRN	

0320	4435		JMS I RD2DTI	/READ 2 DIGIT NUM
0321	1436		TAD I RD2STI	
0322	1004		TAD INSTRN	
0323	3004		DCA INSTRN	/SET INSTRN BITS 5-11
0324	4426		JMS I NUMGEI	/GET 2ND INSTRUCTION CHAR
0325	5225		JMP H	
0326	1116	ERRIN,	1116	
			/READ & STORE TEXT	
0327	0000	RDTXT,	00	
0330	4437		JMS I STRISI	/STORE INSTRN
0331	4111	RDB,	JMS GETLF	/READ TO LF
0332	4426	RDCHR,	JMS I NUMGEI	/READ A CHAR
0333	4445		JMS I STRFUI	/CHECK FOR FULL STORE
0334	1430		TAD I NUMSTI	
0335	4431		JMS I CHRCKI	
0336	0335		0335	/IS RT SQ BRACKET
0337	5362		JMP RDBEL	
0340	4431		JMS I CHRCKI	/NO IS IT CR
0341	0215		0215	
0342	5345		JMP RDA	
0343	3410		DCA I AUTOA	/STORE CHAR
0344	5332		JMP RDCHR	
0345	3410	RDA,	DCA I AUTOA	/STORE CR
0346	1004		TAD INSTRN	
0347	7004		RAL	
0350	7420		SNL	/IS INSTRN C
0351	5331		JMP RDB	
0352	7004		RAL	/YES
0353	7006		RTL	
0354	7620		SNL CLA	/IS INSTRN BIT 3 SET (+)
0355	5360		JMP .+3	
0356	2007		ISZ XINSTN	
0357	5331		JMP RDB	
0360	2003		ISZ CHKADD	
0361	5331		JMP RDB	
0362	3410	RDBEL,	DCA I AUTOA	/STORE <span style="border: 1px solid black; padding: 0 2px;">BELL</span> " ] "
0363	5727		JMP I RDTXT	

\*0400

/SYM FROM 3

/READ OCTAL 4 DIGIT ADDRESS, IGNORE LEADING CR/LF'S.

/EXT JMS+1 IF \$. JMS+2 IF LEGAL ADDRESS ERR AD IF ILLEGAL

0400	0000	ADDGET,	00	
0401	4111		JMS GETLF	
0402	1270		TAD ERRAD	
0403	3312		DCA ERROR	
0404	4426		JMS I NUMGEI	/GET CHAR
0405	4431		JMS I CHRCKI	
0406	0215		0215	/CR
0407	5201		JMP ADDGET+1	

0410	4431	JMS I CHRCKI	
0411	0212	0212	/LF
0412	5201	JMP ADDGET+I	
0413	4431	JMS I CHRCKI	
0414	0244	0244	/\$
0415	5245	JMP ADDEND	
0416	4247	JMS ADDTST	
0417	7112	CLL RTR	
0420	7012	RTR	
0421	3002	DCA ADDRES	/SAVE 1ST OCTAL DIGIT
0422	4426	JMS I NUMGEI	
0423	4247	JMS ADDTST	
0424	7106	CLL RTL	
0425	7006	RTL	
0426	7006	RTL	
0427	1002	TAD ADDRES	
0430	3002	DCA ADDRES	/SAVE 2ND OCTAL DIGIT
0431	4426	JMS I NUMGEI	
0432	4247	JMS ADDTST	
0433	7104	CLL RAL	
0434	7006	RTL	
0435	1002	TAD ADDRES	
0436	3002	DCA ADDRES	/SAVE 3RD OCTAL DIGIT
0437	4426	JMS I NUMGEI	
0440	4247	JMS ADDTST	
0441	1002	TAD ADDRES	
0442	3002	DCA ADDRES	/SAVE 4H OCTAL DIGIT
0443	2200	ISZ ADDGET	
0444	5600	JMP I ADDGET	/EXT JMS+2
0445	7200	ADDEND, CLA	
0446	5600	JMP I ADDGET	/EXT JMS+1
0447	0000	ADDTST, 00	
0450	2427	ISZ I NUMMKI	/IS NUMBER
0451	7000	NOP	
0452	1267	TAD ADM7	/YES
0453	7740	SMA SZA CLA	/IS CHAR OR NUM>7
0454	5257	JMP ADDERR	
0455	1446	TAD I DIGSTI	
0456	5647	JMP I ADDTST	/NO EXT WITH OCTAL DIGIT
0457	1312	ADDERR, TAD ERROR	
0460	4433	JMS I ERMSGI	/ERR AD
0461	1247	TAD ADDTST	
0462	7041	CIA	
0463	1311	TAD RDAD	
0464	7700	SMA CLA	/IS 2ND ERR
0465	5201	JMP ADDGET+I	
0466	5272	JMP RD2DT+I	/YES



0467	7771	ADM7,	-7
0470	0104	ERRAD,	0104
0471	0000	RD2DT,	00
0472	7200		CLA
0473	1310		TAD ERR2D
0474	3312		DCA ERROR
0475	4426		JMS I NUMGEI
0476	4247		JMS ADDTST
0477	7104		CLL RAL
0500	7006		RTL
0501	3307		DCA RD2STR
0502	4426		JMS I NUMGEI
0503	4247		JMS ADDTST
0504	1307		TAD RD2STR
0505	3307		DCA RD2STR
0506	5671		JMP I RD2DT
0507	0000	RD2STR,	0
0510	6204	ERR2D,	6204
0511	0471	RDAD,	RD2DT
0512	0000	ERROR,	0

/CHECK THAT ADDRSESS OF ALTERATION IS GREATER  
 /THAN PREVIOUS ALTERATIONS, OR IF= THE FIRST  
 /INSTRUCTION WAS + AND THAT THE LINE NUMBER  
 /TO BE ALTERED IS GREATER THAN THE PREVIOUS LINE NUMBER  
 /ERR A< IF ADDRESS LESS THAN PREVIOUS  
 /N+I INSTRUCTION WAS NOT + AND >L  
 / IF LINT NO.>PREVIOUS

0513	0000	ADDOK,	00	
0514	7200		CLA	
0515	1002		TAD ADDRES	
0516	7710		SPA CLA	/IS A +VE
0517	5335		JMP ADDB	
0520	1003		TAD CHKADD	
0521	7510		SPA	/YES IS B +VE?
0522	5331		JMP ADDA	/NO.
0523	7041	ADDE,	CIA	/NEGATE B
0524	1002		TAD ADDRES	/ADD A
0525	7450		SNA	/IS A =B
0526	5342		JMP ADDEQ	
0527	7700		SMA CLA	
0530	5713		JMP I ADDOK	
0531	7200	ADDA,	CLA	
0532	1371		TAD ERRAL	
0533	4433		JMS I ERMSGI	/ERR A< B>A
0534	5713		JMP I ADDOK	

0535	1003	ADDB,	TAD CHKADD	
0536	7500		SMA	/IS B+VE
0537	7610		SKP CLA	
0540	5323		JMP ADDE	/NO
0541	5713		JMP I ADDOK	
0542	1004	ADDEQ,	TAD INSTRN	
0543	7006		RTL	
0544	7006		RTL	
0545	7630		SZL CLA	/IS INSTRN BIT 3 SET (+)
0546	5355		JMP DDC	
0547	1047		TAD ROUT	/NO IS ROUT SET
0550	7640		SZA CLA	
0551	5713		JMP I ADDOK	/YES
0552	1372		TAD ERRNP	
0553	4433		JMS I ERMSGI	/NO ERR N+
0554	5352		JMP .-2	
0555	1047	ADDC,	TAD ROUT	
0556	7640		SZA CLA	
0557	5713		JMP I ADDOK	
0560	1004		TAD INSTRN	
0561	0374		AND ADP77	
0562	7041		CIA	
0563	1007		TAD XINSTN	
0564	7710		SPA CLA	/IS 2ND NUM>PREVIOUS 2D NUM
0565	5713		JMP I ADDOK	
0566	1373		TAD ERRGL	
0567	4433		JMS I ERMSGI	/ERR>L
0570	5366		JMP .-2	
0571	0174	ERRAL,	0174	
0572	1653	ERRNP,	1653	
0573	7614	ERRGL,	7614	
0574	0077	ADP77,	0077	
		/MAIN FLOW B		
		*0600		
0600	7402	MAINB,	HLT	
0601	7240		CLA CMA	
0602	3410		DCA I AUTOA	/SET LAST ADDRESS=7777
0603	6026		PLS	
0604	3003		DCA CHKADD	
0605	3005		DCA LINE	
0606	7040		CMA	
0607	1022		TAD STOREI	
0610	3011		DCA AUTOB	
0611	4123		JMS CALINS	/CALL 1ST INSTRUCTION
0612	4440		JMS I LEADEI	
0613	4050		JMS TYCR	

0614	4111	MBA,	JMS GETLF	/READ TO A LF
0615	4441		JMS I READ4I	/READ ADDRESS OR SPACES
0616	5273		JMP MCA	
0617	4444		JMS I REDLII	/SPACES READ A LINE
0620	5353		JMP MDA	
0621	4050	MBB,	JMS TYCR	/SOLO CRLF
0622	5214		JMP MBA	
0623	1002	MBC,	TAD ADDRES	
0624	7041		CIA	
0625	1003		TAD CHKADD	
0626	7650		SNA CLA	/IS THIS =INSTRN ADDRS
0627	5232		JMP MBD	
0630	4442	MBE,	JMS I PUNLII	/NO PUNCH LINE
0631	5221		JMP MBB	
0632	1004	MBD,	TAD INSTRN	
0633	0351		AND MBP77	
0634	1002		TAD ADDRES	
0635	7041		CIA	
0636	1003		TAD CHKADD	
0637	1005		TAD LINE	
0640	7650		SNA CLA	
0641	5243		JMP MBF	
0642	5230	MBG,	JMP MBE	
0643	1004	MBF,	TAD INSTRN	
0644	7004		RAL	
0645	7430		SZL	
0646	5257		JMP MBH+I	
0647	7004		RAL	
0650	7630		SZL CLA	
0651	5271		JMP MBK	
0652	4443		JMS I PUNTXI	/INSTRUCTION I. PUNCH LINE
0653	5252		JMP .-I	
0654	4123		JMS CALINS	/CALL NXT INSTR'N
0655	5223		JMP MBC	
0656	2005	MBH,	ISZ LINE	
0657	4443		JMS I PUNTXI	
0660	7410		SKP	
0661	5271		JMP MBK	
0662	4111	MDB,	JMS GETLF	
0663	4441		JMS I READ4I	
0664	7000		NOP	
0665	4444		JMS I REDLII	
0666	5256		JMP MBH	
0667	4050		JMS TYCR	
0670	5262		JMP MDB	
0671	4123	MBK,	JMS CALINS	/CALL NXT INSTR'N
0672	5214		JMP MBA	

0673	3005	MCA,	DCA LINE	/SET LINE =0
0674	1002		TAD ADDRES	
0675	7041		CIA	
0676	1003		TAD CHKADD	
0677	7650		SNA CLA	/IS THS LINE = INSTRUCTION
0700	5355		JMP MDC	
0701	4444	MCC,	JMS I REDLII	/NO.READ LINE
0702	4442		JMS I PUNLII	/PUNCH LINE
0703	4050		JMS TYCR	
0704	5214		JMP MBA	
0705	1004	MCB,	TAD INSTRN	
0706	7104		CLL RAL	
0707	7430		SZL	/IS INSTRN 'C' CHANGE
0710	5342		JMP MCE	
0711	7104		CLL RAL	
0712	7630		SZL CLA	/NO. IS INSTRN 'D' DELETE
0713	5363		JMP MCH	
0714	4443		JMS I PUNTXI	/NO. MUST BE INSERTION
0715	5314		JMP .-1	
0716	4123		JMS CALINS	
0717	5274		JMP MCA+1	
0720	0351	MCJ,	AND MBP77	
0721	7041		CIA	
0722	3352		DCA MBCNT	
0723	4444	MCF,	JMS I REDLII	
0724	5327		JMP .+3	
0725	4050		JMS TYCR	
0726	5332		JMP MDD	
0727	2352		ISZ MBCNT	
0730	7610		SKP CLA	
0731	5271		JMP MBK	
0732	4111	MDD,	JMS GETLF	
0733	4441		JMS I READ4I	
0734	7000		NOP	
0735	5323		JMP MCF	
0736	2003	MCG,	ISZ CHKADD	
0737	4111		JMS GETLF	
0740	4441		JMS I READ4I	
0741	7000		NOP	
0742	4444	MCE,	JMS I REDLII	
0743	5346		JMP .+3	
0744	4050		JMS TYCR	
0745	5337		JMP MCG+1	
0746	4443		JMS I PUNTXI	
0747	5336		JMP MCG	
0750	5271		JMP MBK	
0751	0077	MBP77,	0077	
0752	0000	MBCNT,	0	
0753	2005	MDA,	ISZ LINE	
0754	5223		JMP MBC	

0755	1004	MDC,	TAD INSTRN	
0756	7006		RTL	
0757	7006		RTL	
0760	7630		SZL CLA	
0761	5301		JMP MCC	/YES
0762	5305		JMP MCB	
0763	1004	MCH,	TAD INSTRN	
0764	5320		JMP MCJ	
/READ SPACES OR ADDRESS & INSTRUCTION. IF INSTRUCTION EXT				
/JMS+1, SPACES JMS+2 SYMBOL TABLE PUNCH \$				
*1000				
1000	0000	READ4,	00	
1001	7200		CLA	
1002	1273		TAD REAM4	
1003	3275		DCA RDCNT	
1004	4426		JMS I NUMGEI	/GET 1ST CHAR
1005	2427		ISZ I NUMMKI	
1006	5240		JMP READA	
1007	7112		CLL RTR	
1010	7012		RTR	
1011	3003		DCA CHKADD	/SAVE 1ST DIGIT
1012	4263		JMS REAGET	/GET 2ND DIGIT
1013	7106		CLL RTL	
1014	7006		RTL	
1015	7006		RTL	
1016	1003		TAD CHKADD	
1017	3003		DCA CHKADD	
1020	4263		JMS REAGET	/GET 3RD DIGIT
1021	7104		CLL RAL	
1022	7006		RTL	
1023	1003		TAD CHKADD	
1024	3003		DCA CHKADD	
1025	4263		JMS REAGET	/GET 4TH DIGIT
1026	1003		TAD CHKADD	
1027	3003		DCA CHKADD	
1030	7200	READC,	CLA	
1031	1274		TAD REM10	
1032	3275		DCA RDCNT	
1033	4426		JMS I NUMGEI	/READ 8 CHARACTERS
1034	2275		ISZ RDCNT	
1035	5233		JMP .-2	
1036	7200		CLA	
1037	5600		JMP I READ4	
1040	4431	READA,	JMS I CHRCKI	
1041	0240		0240	/SPACE
1042	5255		JMP READB	
1043	4431		JMS I CHRCKI	
1044	0200		0200	
1045	5201		JMP READ4+1	

1046	4050		JMS TYCR	
1047	1276		TAD REP244	
1050	4070		JMS OUT	/PUNCH \$
1051	4050		JMS TYCR	
1052	4440		JMS I LEADEI	
1053	7402		HLT	
1054	5252		JMP .-2	
1055	2275	READB,	ISZ RDCNT	/SEEN 4 SPACES
1056	5261		JMP READD	
1057	2200		ISZ READ4	/SET EXT=JMS+2
1060	5230		JMP READC	
1061	4426	READD,	JMS I NUMGEI	
1062	5240		JMP READA	
1063	0000	REAGET,	00	
1064	4426		JMS I NUMGEI	
1065	2427		ISZ I NUMMKI	
1066	7610		SKP CLA	
1067	5663		JMP I REAGET	
1070	1277		TAD RERRAD	
1071	4433		JMS I ERMSGI	/ERR AD
1072	5201		JMP READ4+1	
1073	7774	REAM4,	-4	
1074	7770	REM10,	-10	
1075	0000	RDCNT,	0	
1076	0244	REP244,	0244	
1077	0104	RERRAD,	0104	
			/READ & BUFFER A LINE. IGNORE LEADER CODE 0200	
			/PUNCH BUFFERED LINE	
1100	0000	REDLIN,	00	
1101	7200		CLA	
1102	1342		TAD BUFFAD	/SET PNTR & CNTR
1103	3343		DCA BUFFIN	
1104	3344		DCA RLCNT	
1105	4426		JMS I NUMGEI	/GET CHAR
1106	7200		CLA	
1107	1430		TAD I NUMSTI	
1110	4431		JMS I CHRCKI	
1111	0200		0200	
1112	5305		JMP .-5	
1113	4431		JMS I CHRCKI	
1114	0215		0215	
1115	5340		JMP RLB	
1116	3743	RLA,	DCA I BUFFIN	/SAVE CHARR
1117	2343		ISZ BUFFIN	
1120	2344		ISZ RLCNT	
1121	4426		JMS I NUMGEI	/GET CHAR
1122	7200		CLA	
1123	1430		TAD I NUMSTI	
1124	4431		JMS I CHRCKI	
1125	0215		0215	/IS END OF LINE
1126	5336		JMP RLC	

1127	3346		DCA BUFSTR	
1130	1344		TAD RLCNT	
1131	1345		TAD M74	
1132	7700		SMA CLA	
1133	5700		JMP I REDLIN	
1134	1346		TAD BUFSTR	
1135	5316		JMP RLA	
1136	7200	RLC,	CLA	
1137	5700		JMP I REDLIN	
1140	2300	RLB,	ISZ REDLIN	/SOLO CR. EXT JMS+2
1141	5336		JMP RLC	
1142	1456	BUFFAD,	BUFFER	
1143	0000	BUFFIN,	0	
1144	0000	RLCNT,	0	
1145	7704	M74,	-74	
1146	0000	BUFSTR,	0	
1147	0000	PUNLIN,	00	
1150	7200		CLA	
1151	1344		TAD RLCNT	
1152	7450		SNA	
1153	5747		JMP I PUNLIN	/NOTHING TO PUNCH
1154	7041		CIA	
1155	3344		DCA RLCNT	/SET CHAR CNTR
1156	1342		TAD BUFFAD	
1157	3343		DCA BUFFIN	/SET BUFFER PNTR
1160	1743		TAD I BUFFIN	
1161	4070		JMS OUT	/PUNCH CHAR
1162	2343		ISZ BUFFIN	
1163	2344		ISZ RLCNT	
1164	5360		JMP .-4	
1165	5747		JMP I PUNLIN	/EXT LINE DONE
			/STORE INSTRUCTION	
1166	0000	STRISN,	00	
1167	4445		JMS I STRFUI	/CHECK FOR STORE FULL
1170	1004		TAD INSTRN	
1171	3410		DCA I AUTOA	/STORE IT
1172	5766		JMP I STRISN	
1173	0077	SPP77,	0077	
		*1200		
			/EXIT JMS+1 AFTER CRLF. JMS+2 AFTER "RT SQ	
			/BRACKET"	
1200	0000	PUNTXT,	00	
1201	7200		CLA	
1202	1411		TAD I AUTOB	
1203	4431		JMS I CHRCKI	
1204	0335		0335	/RT SQ BRACKET
1205	5226		JMP PUA	
1206	4431		JMS I CHRCKI	
1207	0215		0215	
1210	5227		JMP PUB	

1211	4431		JMS I CHRCKI	
1212	0337		0337	/"BACK ARROW"
1213	5216		JMP .+3	
1214	4070		JMS OUT	/PUNCH CHAR.
1215	5201		JMP PUNTXT+1	
1216	7200		CLA	
1217	1232		TAD KM7	
1220	3231		DCA PUNCNT	/SET CNT FOR 7 SPACES
1221	1233		TAD KP240	
1222	4070		JMS OUT	
1223	2231		ISZ PUNCNT	
1224	5221		JMP .-3	
1225	5201		JMP PUNTXT+1	
1226	2200	PUA,	ISZ PUNTXT	
1227	4050	PUB,	JMS TYCR	
1230	5600		JMP I PUNTXT	
1231	0000	PUNCNT,	0	
1232	7771	KM7,	-7	
1233	0240	KP240,	0240	
			/NUMGET	
			/IGNORES SUBOUT ONLY	
1234	0000	NUMGET,	00	
1235	4061		JMS GET	
1236	3267		DCA NUMSTR	
1237	1267		TAD NUMSTR	
1240	4431		JMS I CHRCKI	
1241	0377		0377	
1242	5235		JMP NUMGET+1	
1243	4431		JMS I CHRCKI	
1244	0000		0000	
1245	5235		JMP NUMGET+1	
1246	1271		TAD NM260	
1247	7510		SPA	
1250	5262		JMP NUMJA	
1251	1272		TAD NM11	
1252	7540		SMA SZA	
1253	5262		JMP NUMJA	
1254	1273		TAD NP11	
1255	3266		DCA DIGSTR	
1256	7040		CMA	
1257	3270		DCA NUMMKR	
1260	1266		TAD DIGSTR	
1261	5634		JMP I NUMGET	
1262	7200	NUMJA,	CLA	
1263	3270		DCA NUMMKR	
1264	1267		TAD NUMSTR	
1265	5634		JMP I NUMGET	



1266	0000	DIGSTR,	0	
1267	0000	NUMSTR,	0	
1270	0000	NUMMKR,	0	
1271	7520	NM260,	-260	
1272	7767	NM11,	-11	
1273	0011	NP11,	0011	
		/LEADER CODE		
1274	0000	LEADER,	00	
1275	7200		CLA	
1276	1305		TAD LDM100	
1277	3306		DCA LEACNT	
1300	1307		TAD LEP200	
1301	4070		JMS OUT	
1302	2306		ISZ LEACNT	
1303	5300		JMP .-3	
1304	5674		JMP I LEADER	
1305	7700	LDM100,	-100	
1306	0000	LEACNT,	0	
1307	0200	LEP200,	0200	
		/ERMSGE		
1310	0000	ERMSGE,	00	
1311	3317		DCA CODE	
1312	3006		DCA OUTMKR	
1313	4050		JMS TYCR	
1314	4421		JMS I MESAGI	
1315	0522		0522	
1316	2240		2240	
1317	0000	CODE,	0	
1320	0000		0000	
1321	4050		JMS TYCR	
1322	1002		TAD ADDRES	
1323	4332		JMS ERWORD	
1324	1004		TAD INSTRN	
1325	4332		JMS ERWORD	
1326	7040		CMA	
1327	3006		DCA OUTMKR	
1330	7402		HLT	
1331	5710		JMP I ERMSGE	
1332	0000	ERWORD,	00	
1333	3355		DCA ERSTR	
1334	1355		TAD ERSTR	
1335	7006		RTL	
1336	7006		RTL	
1337	4141		JMS TYDIG	/1ST DIGIT
1340	1355		TAD ERSTR	
1341	7012		RTR	
1342	7012		RTR	
1343	7012		RTR	

1344	4141	JMS TYDIG	/2ND DIGIT
1345	1355	TAD ERSTR	
1346	7010	RAR	
1347	7012	RTR	
1350	4141	JMS TYDIG	/3RD DIGIT
1351	1355	TAD ERSTR	
1352	4141	JMS TYDIG	/4TH DIGIT
1353	4050	JMS TYCR	
1354	5732	JMP I ERWORD	
1355	0000	ERSTR, /CHRCHK	0
1356	0000	CHRCHK,	00
1357	3370	DCA CHRSTR	
1360	1370	TAD CHRSTR	
1361	7041	CIA	
1362	1756	TAD I CHRCHK	
1363	7640	SZA CLA	
1364	2356	ISZ CHRCHK	
1365	2356	ISZ CHRCHK	
1366	1370	TAD CHRSTR	
1367	5756	JMP I CHRCHK	
1370	0000	CHRSTR, *1400	0
		/TYPES TEXT FROM STRIPPED ASCII CODE .	
		/CODES 301 - 337 & 240 - 277 LEGAL	
1400	0000	MESSAGE,	00
1401	7200	CLA	
1402	1600	TAD I MESSAGE	
1403	2200	ISZ MESSAGE	/SET RETURN ADDR.
1404	3233	DCA MESSTR	
1405	1233	TAD MESSTR	
1406	7012	RTR	
1407	7012	RTR	
1410	7012	RTR	
1411	0234	AND P77	
1412	4217	JMS OPRTN	
1413	1233	TAD MESSTR	/OP 1ST DIGITS
1414	0234	AND P77	
1415	4217	JMS OPRTN	/OP 2ND DIGITS
1416	5201	JMP MESSAGE+1	
1417	0000	OPRTN,	00
1420	7450	SNA	
1421	5600	JMP I MESSAGE	
1422	1235	TAD M40	
1423	7510	SPA	/IS CODE 300
1424	5230	JMP CD300	/YES
1425	1236	TAD P240	
1426	4070	JMS OUT	
1427	5617	JMP I OPRTN	

1430	1240	CD300,	TAD P340
1431	4070		JMS OUT
1432	5617		JMP I OPRTN
1433	0000	MESSTR,	0
1434	0077	P77,	0077
1435	7740	M40,	-40
1436	0240	P240,	0240
1437	0360	P360,	0360
1440	0340	P340,	0340

/CHECKS FOR STORE

1441	0000	STRFUL,	00	
1442	7200		CLA	
1443	1010		TAD AUTOA	
1444	7500		SMA	
1445	5250		JMP .+3	
1446	7041		CIA	
1447	1023		TAD STRENI	
1450	7700		SMA CLA	/IS STORE FULL ?
1451	5641		JMP I STRFUL	
1452	1255		TAD ERROV	
1453	4433		JMS I ERMSGI/YES. ERR OV	
1454	5252		JMP .-2	
1455	1726	ERROV,	1726	
1456	0000	BUFFER,	0	
		*BUFFER+74		
1552	0000	STORE,	0	
		*7577		
7577	0000	STREND,	0	

