

DIAGNOSTIC PROGRAM MANUAL
SIGMA 5 AND 7
CPU FORMAT CONVERTER/
CPU LOADER DOCUMENTATION
PROGRAM NO. 704029A

November 1968

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1      ****
2      ****
3      * PROGRAM OBJECTIVES: (1) CONVERT SIGMA 5/7 METASYMBOL BINARY OUTPUT
4      * DECKS INTO FORMATTED BINARY DECKS WHICH
5      * INCLUDE A LOAD ROUTINE.
6      *
7      *
8      *
9      *
10     *
11     *
12     *
13     *
14     *
15     * (2) PROVIDE DOCUMENTATION FOR THE LOAD ROUTINE.
16     *
17     *
18     *
19     *
20     ****

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21     ****
22     ****
23     * THE FORMAT OF A DATA CARD IS AS FOLLOWS:
24     *
25     * WORD (0-29)  HEX CHAR (0-7)  CONTENT  FUNCTION
26     * 0            0                C        INDICATES DATA CARD
27     * 0            1-5              VARIABLE  BYTE ADDRESS OF DATA
28     * 0            6-7              SC        BYTE COUNT (ALWAYS=5C)
29     * 1-23        0-7              VARIABLE  DATA TO BE LOADED
30     * 24          0-7              17       WORD COUNT
31     * 25          0-7              VARIABLE  WORD ADDRESS
32     * 26          0-7              VARIABLE  CHECKSUM
33     * 27          0-7              VARIABLE  PROGRAM REVISION-
34     * 28          0-3              VARIABLE  LEVEL
35     * 29          4-7              VARIABLE  SEQUENCE NUMBER
36     * 29          0-7              VARIABLE  SEQUENCE NUMBER
37     * END CARD FORMAT :
38     * WORD 0  HEX CHAR 0 = 4  END CARD INDICATOR
39     * WORD 0  HEX CHAR 1-5 = 4  BYTE ADDR
40     * WORD 0  HEX CHAR 6-7 = 4  BYTE COUNT
41     * WORD 1  HEX CHAR 0-7 = 6B0NNNNN = NNNNN IS THE ADDRESS FOR STARTING
42     *                               EXECUTION OF THE PROGRAM.
43     * WORD 26  DECK CHECKSUM
44     * WORD 24-25  UNCHANGED FROM LAST DATA CARD
45     * WORD 27-29  SAME MEANING AS A DATA CARD.
46     *
47     *
48     *
49     *

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CONVERSION ROUTINE

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* THE CONVERSION ROUTINE LOADS THE OBJECT PROGRAM, PRODUCES A LOADER,
* SEQUENCED DATA CARDS AND AN END CARD.

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50
51 *****
52 *****
53 * OPERATING REQUIREMENTS AND SPECIFICATIONS
54 * LOAD ROUTINE CONVERSION ROUTINE
55 *
56 * REQUIRED EQUIPMENT- SIGMA 5-7 CPU SIGMA 5-7 CPU, CARD
57 * CARD OR PAPER TAPE RDR READER AND PUNCH
58 * OPTIONAL EQUIPMENT- NONE NONE
59 * PROGRAM PREREQUISITES- NONE SUCCESSFUL DIAGNOSTICS
60 * CORE STORAGE- 8K MINIMUM 16K MINIMUM
61 * RUN TIME- DEPENDS ON PROGRAM SIZE DEPENDS ON PROG SIZE
62 * PROGRAM MEDIA- CARD OR PAPER TAPE CARDS ONLY
63 * SOURCE LANGUAGE- METASYMBOL METASYMBOL
64 *****
65 *****
66 *****
67 * OPERATING PROCEDURES: LOAD ROUTINE
68 *
69 * THE FOLLOWING DETAILS OPERATOR ACTION AND PROGRAM FLOW FOR EACH MODE.
70 *
71 * NORMAL LOAD:
72 * 1. CPU RESET
73 * 2. SET THE UNIT ADDRESS SWITCHES TO SELECT THE INPUT
74 * DEVICE ADDRESS.
75 * 3. DEPRESS LOAD.
76 * 4. PLACE THE COMPUTE SWITCH TO RUN.
77 *
78 *
79 * FLOWCHART OF NORMAL LOAD

80
81 *
82 *
83 *
84 *
85 * |-----|
86 * | THE FIRST CARD READS INTO L8C3 |
87 * | 2A THRU 3F |
88 * |-----|
89 * |
90 * |<<-----|
91 * |
92 * |-----|
93 * | LOAD RC WITH THE CRA FOR DBLWR1 |
94 * | BRANCH TO THE SIE IN L8C 27 |
95 * |-----|
96 * | CDA= COMMAND DOUBLEWORD ADDRESS |
97 * | DBLWD1= DOUBLEWORD 1 |
98 * |
99 * |
100 * |-----|
101 * | READ THE FIRST THREE BYTES FROM |
102 * | THE NEXT CARD INTO THE BYTE ADDR |
103 * | POSITION OF DBLWD3 |
104 * |-----|
105 * |
106 * |
107 * |-----|
108 * | DATA CHAIN TO READ THE NEXT |
109 * | BYTE INTO THE BYTE COUNT AREA |
110 * | OF DBLWD3 |
111 * |-----|
112 * |

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113                                     PAGE
114                                     I
115                                     V
116                                     I-----I
117                                     I DATA CHAIN TO DBLWD3 WHICH WILL I
118                                     I READ ALL BUT X'18' BYTES I
119                                     I-----I
120                                     I
121                                     I
122                                     V
123                                     I-----I
124                                     I DATA CHAIN TO DBLWD4 WHICH WILL I
125                                     I IGNORE THE REMAINING X'18' BYTES I
126                                     I BY LOADING THEM INTO L8CS 0-5. I
127                                     I (THIS ACTION IS NECESSARY FOR I
128                                     I PROPER POSITIONING OF PAPER TAPE I
129                                     I LOADING) I
130                                     I-----I
131                                     I
132                                     I
133                                     V
134                                     AAAAAAAAAAAAAAAAA
135                                     A DID THE CARD A (NB)
136                                     A MODIFY L8C 2A A-----I
137                                     A A
138                                     AAAAAAAAAAAAAAAAA
139                                     I
140                                     I (YES)
141                                     I
142                                     V
143                                     I-----I
144                                     I THE BRANCH INSTRUCTION LOADED I
145                                     I INTO 2A TRANSFERS CONTROL TO I
146                                     I THE DIAGNOSTIC PROGRAM I
147                                     I-----I

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148                                     PAGE
149                                     ****
150                                     I
151                                     I
152                                     I * CHECKSUM I BAD:
153                                     I
154                                     I 1. CPU RESET
155                                     I 2. SET UNIT ADDRESS SWITCHES
156                                     I 3. DEPRESS LOAD
157                                     I 4. SINGLE STEP THREE TIMES CAUSING THE FIRST CARD
158                                     I TO BE READ.
159                                     I 5. CPU RESET
160                                     I 6. COMPUTE SWITCH TO RUN.
161                                     I
162                                     I
163                                     I-----I
164                                     I THE SECOND LOADER CARD WAS READ I
165                                     I INTO L8CS 2A-3F. IT IN TURN I
166                                     I LOADS THE OTHER LOADER CARDS I
167                                     I INTO THE LAST PART OF THE FIRST I
168                                     I 8K OF MEMORY. I
169                                     I USE THE COMMENTS ON THE LISTING I
170                                     I TO DETERMINE THE DETAILED FLW. I
171                                     I-----I

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170                                     PAGE
171                                     ** OPERATING PROCEDURE: CONVERSION ROUTINE
172                                     *
173                                     * CONTROL OPTIONS:  SENSE SWITCH      ACTION
174                                     *                   2 SET          READ AND COMPARE CONVERTED DECK
175                                     *                   2 RESET         PUNCH A CONVERTED DECK
176                                     *
177                                     * CONTROL CARD: SPECIFY FIRST (F), LAST (L) AND STARTING ADDRESS (S)
178                                     *                   IN HEXADECIMAL.
179                                     *                   EXAMPLE: PROGRAM ORIGIN OF X'40', STARTING AT X'200'
180                                     *                   AND ENDING AT X'1E20'
181                                     *
182                                     *                   F,40,L,1E20,S,200
183                                     * DECK STRUCTURE:
184                                     * (1) FORMAT CONVERTER (USES 5/7 RELOCATABLE LOADER).
185                                     * (2) OBJECT (OB) DECK OF PROGRAM TO CONVERT. (NO LOADER)
186                                     * (3) CONTROL CARD
187                                     *
188                                     * LOAD PROCEDURE: STANDARD FILL
189                                     *
190                                     * RFRUN: CLEAR THE WAIT FOR MULTIPLE COPIES OF THE CONVERTED DECK.

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191                                     PAGE
192                                     SYSTEM  SIG7P
193                                     *
194                                     * ** NBRML LADDER **
195 01 03000                                ORG  X'3000'          STARTING ADDR OF FORMAT CONVERTER
196 01 03000                                LDR4IMG RES  0          LOADER IMAGE LABEL
197 01 0002A                                LDC  X'2A'          STARTING ADDR FOR EXECUTION OF CARD
198 01 0002A                                *
199 01 0002B                                *
200 01 0002C                                *
201 01 0002D                                *
202 01 0002E                                *
203 01 0002F                                *
204 01 00030                                *
205 01 00031                                *
206 01 00032                                *
207 01 00033                                *
208 01 00034                                *
209 01 00035                                *
210 01 00036                                *

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3F00002C	BEGIN	LW,0	ADDR		
68000027 A	B		X'27'		BRANCH TO SIG
00000017	ADDR	GEN,32	DA(DBLWD1)		
00000000 A		DATA	0		
02000009	DBLWD1	GEN,8,24	X'02',DA(DBLWD3)+1	COMMAND DOUBLEWORD	
88000003 A		DATA	X'88000003'	DATA CHAIN	
0200000F	DBLWD2	GEN,8,24	X'02',HA(DBLWD3)+7	COMMAND DOUBLEWORD	
88000001 A		DATA	X'88000001'	DATA CHAIN	
02000000 A	DBLWD3	DATA	X'02000000'	COMMAND DOUBLEWORD	
88000000 A		DATA	X'88000000'	DATA CHAIN	
02000000 A	DBLWD4	DATA	X'02000000'	COMMAND DOUBLEWORD	
02000018 A		DATA	X'08000018'	THROW AWAY LAST 6 WORDS	
	RES		18	PROVIDE 30 WORD IMAGE FOR CARD 1	

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211                                     PAGE
212                                     **** CARD 1 ****
213                                     ** CHECKSUM LOADER **
214 01 0002A                               L8C      X'12A'
    01 0301E
215 01 0002A   2001005C A                 A1,0    X'1005C'   DUMMY INSTRUCTION ALLOWS THJ CARD
216                                     *                               TO START LOADING INTO L8C 40 WHEN
217                                     *                               USING N8RML L8AD.
218 01 0002B   2200001C                     LI,0     DA(CDW1)
219 01 0002C   CC000025 A                   SI8,0    *37           L8AD CARD 2
220 01 0002D   CC000025 A                   TI8,0    *37
221 01 0002E   69C0002D                     RCS,12   $-1
222 01 0002F   2200001D                     LI,0     DA(CDW2)
223 01 00030   CC000025 A                   SI8,0    *37           L8AD CARD 3
224 01 00031   CC000025 A                   TI8,0    *37
225 01 00032   69C00031                     RCS,12   $-1
226 01 00033   2200001E                     LI,0     DA(CDW3)
227 01 00034   CC000025 A                   SI8,0    *37           L8AD CARD 4
228 01 00035   CC000025 A                   TI8,0    *37
229 01 00036   69C00035                     RCS,12   $-1
230 01 00037   6R001FA1                     B        CARD
231 01 0003E   02007F80 N CDW1           GEN,8,24,8,24 2,BA(CARD-1),12,120
    0C000078
232 01 0003A   02007F88 N CDW2           GEN,8,24,8,24 2,BA(NEXT1),12,120
    0C000078
233 01 0003C   02007F7C N CDW3           GEN,8,24,8,24 2,BA(NEXT2),12,120
    0C000078
234 01 0003E                               RFS      10

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235                                     PAGE
236 01 01FA0                               L8C      X'1FA0'   **** CARD 2 ****
    01 0303C
237 01 01FA0   8C01004C A                 DATA    X'8001005C'   ALLBWS THIS CARD TO BE SKIPPED BY
238                                     *                               THE N8RML L8ADER.
239 01 01FA1   2200000C A   CARD         LI,0     0
240 01 01FA2   35001FE3                     STW,0    T8TALSUM
241 01 01FA3   32000025 A                   LW,0     X'25'           INITIALIZE DECK CHECK SUM
242 01 01FA4   3500000F A                   STW,0    11
243 01 01FA5   220000F4 A   READ        LI,0     DA(READ8RD)
244 01 01FA6   CC000008 A                   SI8,0    *11           MOVE DEVICE ADDR TO SCRATHPAD
245 01 01FA7   C0000008 A                   TI8,0    *11           READ CARD INTO X'22' THRU X'3F'
246 01 01FA8   67C01FA7                     RCS,12   $-1
247 01 01FA9   32100022 A                   LW,1     X'22'
248 01 01FAA   4R101FF4 A                   AND,1    W00T03
249 01 01FAB   31101FFE                     CW,1     CBDE1
250 01 01FAC   69301FCC                     BNE      ENDTEST   L8BK AT C8DE IN 1ST HEX CHAR 8F CARD
251 01 01FAD   221FFFFF6 A                   LI,1     -26           N8T C8DE F8R DATA CARD
252 01 01FAE   222FFFFF A                   LI,2     -1
253 01 01FAF   3120003C A                   CW,2     X'3C'           I8N8RE IF CARD CHECKSUM = -1
254 01 01FB0   6R301FB9 A                   BF       M8VETEST      I8N8RE CHECKSUM IF ALL 8NES 8N CARD
255 01 01FB1   2220000C A                   LI,2     0
256 01 01FB2   3022003C A                   AW,2     60,1         C8MPUTE CHECKSUM
257 01 01FB3   65101FB2 A                   BIR,1    $-1
258 01 01FB4   3120003C A                   CW,2     X'3C'
259 01 01FB5   69301FB5 A                   BNE      $
260 01 01FB6   32301FE3 A                   LW,2     T8TALSUM
261 01 01FB7   30300002 A                   AW,3     2
262 01 01FB8   35301FE3 A                   STW,3    T8TALSUM
263 01 01FB9   3210003B A   M8VETEST  LW,1     X'3B'           PICK UP L8AD ADDR
264 01 01FBA   6R001FBF A                   B        NEXT1+1
265 01 01FBB                               RES      3

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SIGMA 5/7 CPU FORMAT CNVRTR/LDR DRC 704029-51A00/11A00 N8V 1,1968

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266				PAGE		
267	01	01FB E	8001005C A	NEXT1	DATA	X'8001005C'
268	01	01FB F	3A20003A A		LCW,2	X'13A'
269	01	01FC 0	21100040 A		CI,1	X'140'
270	01	01FC 1	69101FDD		BL	BUFBL
271	01	01FC 2	68001FC3		B	CARD3
272	01	01FC 3	3010003A A	CARD3	AW,1	X'13A'
273	01	01FC 4	21101FAC A		CI,1	X'1FA0'
274	01	01FC 5	68101FC5		RGE	\$
275	01	01FC 6	22300023 A		LI,3	X'123'
276	01	01FC 7	3030003A A		AW,3	X'13A'
277	01	01FC 8	B2440003 A		LW,4	*3,2
278	01	01FC 9	B5440001 A		STW,4	*1,2
279	01	01FCA	65201FC8		BIR,2	\$-2
280	01	01FCB	68001FA5		B	READ
281	01	01FCC	31101FE6	ENDTEST	CW,1	CODE2
282	01	01FCD	69301FCC		BNE	\$
283	01	01FCE	32100022 A		LW,1	X'122'
284	01	01FCF	30100023 A		AW,1	X'123'
285	01	01FD0	30101FE3		AW,1	TOTALSUM
286	01	01FD1	3110003C A		CW,1	X'13C'
287	01	01FD2	69301FD2		BNE	\$
288	01	01FD3	68000023 A		B	X'123'
289	01	01FD4			RES	8

CARD 3 - ALLBW BYPASS

POSSIBLE OVERFLOW INTO BUFFER AREA

HANG UP IF LOADING OVER LOADER

RELOCATE
DATA

TEST FOR FND CARD CODE
HANG UP IF INVALID CODE

VERIFY CHECKSUM FOR ENTIRE DECK
HANG UP IF CHECKSUM ERROR
ENTER PROGRAM

SIGMA 5/7 CPU FORMAT CNVRTR/LDR DRC 704029-51A00/11A00 N8V 1,1968

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290				PAGE		
291	01	01FDC	8001005C A	NEXT?	DATA	X'8001005C'
292	01	01FDD	3010003A A	BUFBL	AW,1	X'13A'
293	01	01FDE	21100020 A		CI,1	X'120'
294	01	01FDF	68101FE1		BGE	*2
295	01	01FE0	68001FC4		B	CARD3+1
296	01	01FE1	68001FE1		B	\$
297	01	01FE2	68001FA5		B	READ
298	01	01FE3	00000000 A	TOTALSUM	PZE	
299	01	01FE4	F0000000 A	W00T03	DATA	X'F0000000'
300	01	01FE5	C0000000 A	CODE1	DATA	X'C0000000'
301	01	01FE6	40000000 A	CODE2	DATA	X'40000000'
302	01	01FE7	00000000 A		DATA	0
303	01	01FE8	02000088 A	READBRD	DATA	X'02000088'
304	01	01FE9	00000078 A		DATA	X'00000078'
305	01	01FEA			RES	16
306					SPACE	6

CARD 4
TOP OF LOAD ADDR

CARD WILL OVERLAY THE LOADER AREA

TRYING TO LOAD INTO X'120' THRU X'13F'
BYPASS CURRENT CARD

THIS CAUSES A DOUBLE WORD BOUNDARY

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307                                     PAGE
308                                     ****
309                                     ****  CONVERSION ROUTINE
310                                     *
311                                     *
312 01 03300                               BRG      X'3300'
01 03300
313 01 03300   22000000 A  CALL  LI,0    0          RELLOCATION BIAS
314 01 03301   6AB20004 A  BAL,11  4,1        CALL THE LOADER
315           * SAVE REVISION LEVEL. PUT INTO OUTPUT BUFFER AREA
316 01 03302   22600003 A  LI,6    3
317 01 03303   32CC003C A  LW,12  X'3C',6     FROM X'3D' THRU X'3F'
318 01 03304   35CC346A          STW,12  0UTBUF+26,6  TO 00UTBUF 27 THRU 29
319 01 03305   64603303          BDR,6    3-2
320           * GET END CARD
321 01 03306   22001A47          RERFAD  LI,0    DA(PARAM)   CDW FOR READING LAST CARD
322 01 03307   CC0033FC          SI,0    *CR
323 01 03308   CC0033FC          TI,0    *CR
324 01 03309   69C03308          BCS,12  3-1
325 01 0330A   6AB034AE          BAL,11  CONVER      FORM FIRST, LAST AND STARTING ADDR
326 01 0330B   6800330D          B       CYCLE+1
327 01 0330C   2F000000 A  CYCLE  WAIT    0          WAIT FOR R1, R2, AND R3 TO BE LOADED
328 01 0330D   31300001 A  CW,3   1          TEST R1
329 01 0330E   6910330C          BL      CYCLE      R2
330 01 0330F   31300002 A  CW,3   2          AND
331 01 03310   6920330C          BG      CYCLE      R3
332 01 03311   22000000 A  LI,0    0
333 01 03312   3500342C          STW,0   LCARD      INITIALIZE LAST CARD INDICATOR
334 01 03313   3500342D          STW,0   ECARD      INITIALIZE END CARD INDICATOR
335 01 03314   3500342A          STW,0   SW1      INITIALIZE SW1
336 01 03315   3500342B          STW,0   SW2      AND SW2
337 01 03316   35003431          STW,0   CHECKSUM
338 01 03317   3510000A A  STW,1   10       FIRST LOCATION TO PUNCH IN R10

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339                                     PAGE
340 01 03318   22000001 A  LI,0    1
341 01 03319   35003380          STW,0   CPF      INITIALIZE FIRST CARD INDICATOR
342 01 0331A   22000009 A  LI,0    9
343 01 0331B   3500341C          STW,0   UNIT     SET SEQUENCE NUMBER TO 9999
344 01 0331C   3500341D          STW,0   TEN      IT WILL INCREMENT TO 0000 FOR
345 01 0331D   3500341E          STW,0   HUN      THE FIRST CARD
346 01 0331E   3500341F          STW,0   TH8U
347                                     *
348                                     *
349 01 0331F   22000003 A  LI,0    3
350 01 03320   6C000000 A  RD,0    0
351 01 03321   3500342A          STW,0   SW1
352 01 03322   68403324          BCR,4   3+2
353 01 03323   3500342B          STW,0   SW2      SAVE SS2
354 01 03324   22403000          LDR4    LI,4   LDR4IMG
355 01 03325   32F0342B          LW,15   SW2
356 01 03326   6930332D          BNEZ   LDR4TEST
357 01 03327   225FFFFB A  LI,5   -5      NUMBER OF CARDS IN LOADER
358 01 03328   354033AE          STW,4   CPBUF
359 01 03329   6AF033DC          BAL,15  PCHCARD
360 01 0332A   2040001E A  AI,4   30
361 01 0332B   65503328          BIR,5   3-3
362 01 0332C   68003337          B       SETUP
363 01 0332D   22603432          LDR4TEST LI,6   INBUF
364 01 0332E   3560340A          STW,6   CMLIST2
365 01 0332F   356033FB          STW,6   CRBUF
366 01 03330   225FFFFB A  LI,5   -5      NUMBER OF CARDS IN LOADER
367 01 03331   35403409          LDR4T1  STW,4   CMLIST1
368 01 03332   6AF033FE          BAL,15  READCARD
369 01 03333   6AF0340F          BAL,15  CMLIST
370 01 03334   69303334          BNE     $
371 01 03335   2040001E A  AI,4   30
372 01 03336   65503331          RIR,5   LDR4T1

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373                                     PAGE
374                                     *
375                                     * SET UP THE CARD IMAGE TO PUNCH A DATA CARD OR END CARD
376                                     *
377 01 03337 2250345C          SETUP  LI,5  BUTBUF
378 01 03338 355033AE          STW,5  CPHUF
379 01 03339 35503409          STW,5  CMPLIST1
380 01 0333A 2270000A A      LI,7  10
381 01 0333B 225FFFFC A      LI,5  -4
382 01 0333C 331A342C          RVR   MTW,1  THRU+1,5  INCR SEQ
383 01 0333D 317A342C          CW,7  THRU+1,5
384 01 0333E 69303342          BNE   SEQ 9 OR LESS
385 01 0333F 22600000 A      LI,6  0
386 01 03340 356A342C          STW,6  THRU+1,5  10 BECOMES 0
387 01 03341 6550333C          BVR   BVR  CARRY TO NEXT DIGIT
388 01 03342 65503348          SFD   BIR,5  CHUN  GO IF THOUSANDS DOESN'T CHANGE
389 01 03343 3270341F          LW,7  THOU
390 01 03344 2290FFFF A      LI,9  X'FFFF01  MASK
391 01 03345 328E3420          LW,8  TABLE,7  GET CONSTANT
392 01 03346 25800004 A      SLS,8  4  POSITION OVER MASK
393 01 03347 4780346C          STS,8  BUTBUF+28
394 01 03348 65503350          CHUN  BIR,5  CTEN  GO IF HUNDREDS DOESN'T CHANGE
395 01 03349 3270341E          LW,7  HUN
396 01 0334A 328E3420          LW,8  TABLE,7  OUTPUT CONSTANT
397 01 0334B 2290000F A      LI,9  15  MASK FOR 4 BITS
398 01 0334C 25800278 A      SCS,8  -8  POSITION BITS AT EACH END
399 01 0334D 4780346C          STS,8  BUTBUF+28
400 01 0334E 3290350D          LW,9  X'FFFFFF000001  MASK FOR 8 BITS
401 01 0334F 4780346D          STS,8  BUTBUF+29
    
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402                                     PAGE
403 01 03350 65503356          CTEN  BIR,5  CUNIT  GO IF TENS DOESN'T CHANGE
404 01 03351 3270341D          LW,7  TEN
405 01 03352 328F342C          LW,8  TABLE,7
406 01 03353 3290350E          LI,9  X'FFFFFF0001  MASK
407 01 03354 2580000C A      SLS,8  12  MOVE OVER MASK
408 01 03355 4780346D          STS,8  BUTBUF+29
409 01 03356 3270341C          CUNIT LW,7  UNIT
410 01 03357 328E3420          LW,8  TABLE,7
411 01 03358 2290FFFF A      LI,9  X'FFFF1  MASK
412 01 03359 4780346D          STS,8  BUTBUF+29
413 01 0335A 225FFFFCA A      LI,5  +54
414 01 0335B 2240000C A      LI,4  0
415 01 0335C 354A3468          STW,4  INBUF+54,5  CLEAR INPUT AND OUTPUT BUFFER EXCEPT
416                                     *  FOR ID AND SEQUENCE
417 01 0335D 6550335C          RIR,5  $=1
418 01 0335E 3250342C          LW,5  LCARD
419 01 0335F 69303391          RNEZ  ENDCARD
420 01 03360 22C00017 A      LI,12  23  LAST DATA CARD HAS BEEN PROCESSED
421 01 03361 32000002 A      LW,13  2  WORD COUNT
422 01 03362 3800000A A      SW,13  10  GET LAST ADDRESS
423 01 03363 20000001 A      AI,13  1  CALCULATE NUMBER OF
424 01 03364 3100000C A      CW,13  12  WORDS LEFT
425 01 03365 69203367          BG   ZBACK  COMPARE WORDS LEFT TO COUNT
426 01 03366 3310342C          MTW,1  LCARD  MORE THAN ONE CARD LEFT
427 01 03367 32F0000C A      ZBACK LW,15  12  SET LAST-DATA-CARD INDICATOR
428 01 03368 25F00018 A      SLS,15  24
429 01 03369 49F0000A A      BR,15  10
430 01 0336A 25F0020A A      SCS,15  10  ADDRESS INTO 15
431 01 0336B 49F0342E          BR,15  CONT1  SHIFT AND POSITION AS BYTE CNT/ADR
432 01 0336C 35F03450          STW,15  BUTBUF
    
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433				PAGE		
434			*			
435	01	03360	3A50000C A	LW,5	12	USE WORD COUNT FOR INDEX
436	01	0336E	22003451	LI,13	0UTBUF+1	
437	01	0336F	3300342A	MTW,0	SW1	TEST SW1
438	01	03370	68303373	BEZ	*+3	
439	01	03371	35C03468	STW,12	0UTBUF+24	WORD COUNT
440	01	03372	35A03469	STW,10	0UTBUF+25	WORD ADDR
441	01	03373	30D0000C A	AW,13	12	
442	01	03374	30A0000C A	AW,10	12	
443	01	03375	B2FA000A A	LW,15	*10,5	PICK UP DATA
444	01	03376	B5FA000D A	STW,15	*13,5	STORE DATA
445	01	03377	65503375	BIR,5	*-2	
446	01	03378	32F0342A	LW,15	SW1	TEST SW1
447	01	03379	68303382	BEZ	TESTSW?	RESET - NO CHECK SUM NEEDED
448	01	0337A	226FFFFE6 A	LI,6	-26	INDEX FOR CHECKSUM
449	01	0337B	22F00000 A	LI,15	0	
450	01	0337C	30FC346A	AW,15	0UTBUF+26,6	GENERATE CHECKSUM
451	01	0337D	6560337C	BIR,6	*-1	
452	01	0337E	35F0346A	STW,15	0UTBUF+26	CHECKSUM TO IMAGE
453	01	0337F	31F0346E	W,15	W00T31	
454	01	03380	68303382	RE	TESTSW2	DO NOT ADD ALL-ONES CHECKSUM TO TOTL
455	01	03381	66F03431	AWM,15	CHECKSUM	CHECK SUM FOR LAST CARD
456	01	03382	32F0342B	LW,15	SW2	
457	01	03383	69303386	BNEZ	*+3	
458	01	03384	6AF033D0	BAL,15	PCHCARD	PUNCH
459	01	03385	68003389	B	*+4	OR
460	01	03386	6AF033FE	BAL,15	READCARD	READ AND
461	01	03387	6AF0340F	BAL,15	CMPLIST	TEST
462	01	03388	69303388	BNE	*	NO COMPARE
463	01	03389	32F0342D	LW,15	ECARD	TEST THE
464	01	0338A	68303337	BEZ	SETUP	END CARD INDICATOR

465				PAGE		
466			*			
467			*	ISSUE BLANK CARD IF PUNCHING OR RETURN TO CYCLE IF TESTING		
468			*			
469	01	0338B	32F0342B	LW,15	SW2	
470	01	0338C	6930330C	RNLZ	CYCLE	
471	01	0338D	22F0346F	LI,15	BLANKING	
472	01	0338E	35F033AE	STW,15	CPBUF	
473	01	0338F	6AF03370	BAL,15	PCHCARD	
474	01	03390	6800330C	B	CYCLE	
475	01	03391	32F0342F	ENDCARD LW,15	CONT2	
476	01	03392	35F03450	STW,15	0UTBUF	
477	01	03393	32F00003 A	LW,15	3	PICK UP STARTING ADDRESS
478	01	03394	49F0343C	BR,15	BR0PC0DE	
479	01	03395	35F03451	STW,15	0UTBUF+1	PUT BRANCH INSTRUCTION ON END CARD
480	01	03396	22F00001 A	LI,15	1	
481	01	03397	35F0342D	STW,15	ECARD	
482	01	03398	32F0342A	LW,15	SW1	
483	01	03399	68303382	BEZ	TESTSW2	
484	01	0339A	32F03431	LW,15	CHECKSUM	MAKE TOTAL
485	01	0339B	30F0345C	AW,15	0UTBUF	CHECK SUM
486	01	0339C	30F03451	AW,15	0UTBUF+1	FOR END
487	01	0339D	35F0346A	STW,15	0UTBUF+26	CARD
488	01	0339E	68003382	B	TESTSW?	

```

489                                     PAGE
490                                     *
491                                     * *** CARD PUNCH SUBROUTINE ***
492                                     *
493                                     * ONE CARD OF THIRTY WORDS IS PUNCHED IN THE BINARY MODE. PRIOR TO
494                                     * ENTERING THE SUBROUTINE, THE PROGRAM MUST SET UP A BUFFER AREA WITH
495                                     * THE IMAGE TO BE PUNCHED AND STORE THE BEGINNING ADDRESS OF THE
496                                     * BUFFER IN CPBUF. THE SUBROUTINE SAVES THE DATA IN AN INTERNAL
497                                     * BUFFER IN ORDER TO RECOVER FROM A READ CHECK ERROR. A FIRST CARD
498                                     * INDICATOR IS MAINTAINED WHICH SHOULD BE INITIALIZED TO 1 BY THE
499                                     * MAIN PROGRAM WHENEVER IT RESTARTS (THE INDICATOR CAUSES THE
500                                     * READ CHECK TO BE IGNORED AND SETS STACKER SELECTION UNCON-
501                                     * DITIONALLY TO THE ALTERNATE STACKER FOR ONE CARD). THE
502                                     * SUBROUTINE CLEARS THE INDICATOR AFTER PUNCHING A CARD.
503                                     * ENTRY IS MADE BY EXECUTING THE INSTRUCTION: BAL,15 PCHCARD
504                                     *
505
506 01 033A0 00000000 A CPDW BOUND 8 DATA 0 PUNCH COMMAND DOUBLEWORD
507 01 033A1 28000078 A DATA X'28000078' (COMMAND CHAIN)
508 01 033A2 080019D0 GEN,8,24 8,DA(CPDW) TRANSFER IN CHANNEL
509 01 033A3 00000000 A DATA 0
510 01 033A4 00000000 A DATA 0 STOP
511 01 033A5 00000000 A DATA 0
512 01 033A6 09000000 A CPBRD1 DATA X'09000000' ORDER FOR ALT STACKER ON ERROR
513 01 033A7 11000000 A CPBRD2 DATA X'11000000' ORDER FOR ALT STKR UNCONDITIONALLY
514 01 033A8 1100CEC8 CPDWC GEN,8,24 X'11',BA(CPERRBUF) COMMAND DOUBLEWORD FOR READ CHK ERR
515 01 033A9 28000078 A DATA X'28000078' (COMMAND CHAIN)
516 01 033AA 080019D4 GEN,8,24 8,DA(CPDWC) TRANSFER IN CHANNEL
517 01 033AB 00000000 A DATA 0
518 01 033AC 00000000 A DATA 0 STOP
519 01 033AD 00000000 A DATA 0
520 01 033AE 00000000 A CPBUF PZE 0 BUFFER ADDRESS
521 01 033AF 00000004 A CP PZE 4 DEVICE ADDRESS
522 01 033B0 00000001 A CPF DATA 1 FIRST CARD INDICATOR
523 01 033B1 00000000 A CPLINK PZE 0 RETURN LINK
524 01 033B2 CPERRBUF RES 30 RECOVERY BUFFER
    
```

```

525                                     PAGE
526 01 033D0 CF0033AF PCHCARD HI0,0 *CP
527 01 033D1 35F033P1 STW,15 CPLINK SAVE RETURN LINK
528 01 033D2 32F033AF LW,15 CPRUF PICK UP BUFFER ADDRESS
529 01 033D3 25F00002 A SLS,15 2 CONVERT TO BYTE ADDRESS
530 01 033D4 330033RC MTW,0 CPF
531 01 033D5 693033D8 RNE7 **3 FIRST CARD
532 01 033D6 49F033A6 BR,15 CPBRD1 SET ORDER FOR ALT STACKER ON ERROR
533 01 033D7 680033D9 B **2
534 01 033D8 49F033A7 BR,15 CPBRD2 SET ORDER FOR ALT STACKER UNCOND.
535 01 033D9 35F033AC STW,15 CPDW INSERT IN COMMAND DOUBLEWORD
536 01 033DA 220019D0 LI,0 DA(CPDW)
537 01 033DB CC0033AF CPSIR SI0,0 *CP PUNCH A CARD
538 01 033DC 69C033DB RCS,12 **1
539 01 033DD CDF033AF CPTIP TI0,15 *CP
540 01 033DE 688033F1 HCR,8 **3
541 01 033DF 674033DD BCR,4 **2 STOP BUSY
542 01 033E0 2E000000 A WAIT 0 PUNCH WENT AWAY
543 01 033E1 25F00070 A SLS,15 -16
544 01 033E2 330033RC MTW,0 CPF
545 01 033E3 693033E6 RNE2 **3
546 01 033E4 21F0C840 A CI,15 X'0840'
547 01 033E5 694033F1 BCS,4 CPERRBR READ CHECK ERROR
548 01 033E6 21F06000 A CI,15 X'6000'
549 01 033E7 694033DD HCS,4 CPTIP BUSY
550 01 033E8 22F00000 A LI,15 0
551 01 033E9 35F033RC STW,15 CPF CLEAR FIRST CARD INDICATOR
552 01 033EA 22600000 A LI,4 0 INDEX
    
```

553				PAGE		
554	01 033EB	B2FC33AE	CPMBVE	LW,15	*CPBUF,6	MOVE
555	01 033EC	35FC33B2		STW,15	CPERRBUF,6	DATA
556	01 033ED	20600001 A		AI,6	1	BUFFER
557	01 033EE	2160001E A		CI,6	30	F0R ERR0R
558	01 033EF	691033EB		BL	CPMBVE	RECOVERY
559	01 033F0	E80033B1		B	*CPLINK	EXIT
560	01 033F1	CF0033AF	CPERR0R	HI0,0	*CP	
561	01 033F2	220019D4		LI,0	DA(CPDWC)	ATTEMPT
562	01 033F3	CC0033AF		SI0,0	*CP	ERR0R
563	01 033F4	69C033F3		BCS,12	*-1	RECOVERY
564	01 033F5	CD0033AF		TI0,0	*CP	
565	01 033F6	69C033F5		BCS,12	*-1	
566	01 033F7	680033DA		B	CPSI0-1	

567				PAGE		
568						
569						
570						
571						
572						
573						
574						
575						
576						
577				BBUND 8		
578	01 033F8	00000000 A	CRDW	DATA	0	READ COMMAND DOUBLEWORD
579	01 033F9	09000078 A		DATA	X'08000078'	
580	01 033FA	02000000 A	CR0RD	DATA	X'02000000'	ORDER CODE
581	01 033FB	00000000 A	CRBUF	PZE	0	BUFFER ADDRESS
582	01 033FC	00000003 A	CR	PZE	3	DEVICE ADDRESS
583	01 033FD	00000000 A	CRLINK	PZE	0	RETURN LINK
584						
585						
586	01 033FE	35F033FD	READCARD	STW,15	CRLINK	SAVE RETURN LINK
587	01 033FF	32F033FB		LW,15	CRBUF	
588	01 03400	25F00002 A		SLS,15	2	CONVERT TO BYTE ADDRESS
589	01 03401	49F033FA		0R,15	CR0RD	INSERT READ ORDER
590	01 03402	35F033FB		STW,15	CRDW	MOVE TO COMMAND DOUBLEWORD
591	01 03403	220019FC		LI,0	DA(CRDW)	
592	01 03404	CC0033FC		SI0,0	*CR	READ A CARD
593	01 03405	69C03404		HCS,12	*-1	
594	01 03406	CC0033FC		TI0,0	*CR	
595	01 03407	69C03406		BCS,12	*-1	
596	01 03408	E80033FD		R	*CRLINK	EXIT

*
* *** CARD READER SUBROUTINE ***
*
* ONE CARD IS READ IN THE BINARY MODE. THIRTY WORDS ARE INPUT TO THE
* BUFFER AREA DESIGNATED BY THE ADDRESS IN CRBUF. THE PROGRAM
* ENTERS THE SUBROUTINE BY LOADING AN ADDRESS IN CRBUF AND THEN
* EXECUTING THE INSTRUCTION: BAL,15 READCARD. REGISTERS R0, AND
* R15 ARE VOLATILE.
*

```

597                                     PAGE
598                                     *
599                                     * *** COMPARE WORD LISTS ***
600                                     *
601                                     * THIS SUBROUTINE COMPARES TWO LISTS OF CONSECUTIVE WORDS IN MEMORY.
602                                     * THE LISTS BEGIN AT THE ADDRESSES IN CMPLIST1 AND CMPLIST2. THE
603                                     * LENGTH OF EACH LIST IS SPECIFIED BY THE POSITIVE INTEGER IN CMPCNT.
604                                     * THE PROGRAM MUST STORE THE REQUIRED INFORMATION IN CMPLIST1,
605                                     * CMPLIST2 AND CMPCNT PRIOR TO ENTERING THE SUBROUTINE. ENTRY IS
606                                     * MADE BY EXECUTING THE INSTRUCTION: BAL,15 CMPLIST.
607                                     * REGISTERS R0, R6, AND R15 ARE VOLATILE. UPON EXITING, CC3
608                                     * AND CC4 ARE RESET IF ALL WORDS COMPARED.
609                                     *
610 01 03409 00000000 A CMPLIST1 PZE
611 01 0340A 00000000 A CMPLIST2 PZE
612 01 0340B 0000001E A CMPCNT DATA 30 THIRTY IF NOT SET OTHERWISE
613 01 0340C 00000000 A CMPL1 PZE
614 01 0340D 00000000 A CMPL2 PZE
615 01 0340E 00000000 A CMPLINK PZE
616
617
618 01 0340F 35F0340E CMPLIST STW,15 CMPLINK SAVE RETURN LINK
619 01 03410 32F03409 LW,15 CMPLIST1
620 01 03411 30F0340B AW,15 CMPCNT
621 01 03412 35F0340C STW,15 CMPL1 SET UP INDIRECT ADDRESS FOR 1ST LIST
622 01 03413 32F0340A LW,15 CMPLIST2
623 01 03414 30F0340B AW,15 CMPCNT
624 01 03415 35F0340D STW,15 CMPL2 SET UP INDIRECT ADDRESS FOR 2ND LIST
625 01 03416 3A60340B LCW,6 CMPCNT INDEX
626 01 03417 B2FC340C LW,15 *CMPL1,6
627 01 03418 B1FC340D CW,15 *CMPL2,6 COMPARE TWO WORDS
628 01 03419 E930340E BNE *CMPLINK NONCOMPARE EXIT
629 01 0341A 65603417 BIR,6 $=3
630 01 0341B EK00340F B *CMPLINK SUCCESSFUL COMPARE EXIT

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```

631                                     PAGE
632                                     *
633                                     * *** CONSTANTS AND WORKING STORAGE ***
634                                     *
635 01 0341C 00000009 A UNIT DATA 9
636 01 0341D 00000009 A TEN DATA 9
637 01 0341E 00000009 A HUN DATA 9
638 01 0341F 00000009 A THBU DATA 9
639 01 03420 00000200 A TABLE DATA 512,256,128,64,32,16,8,4,2,1
640 01 03421 00000100 A
641 01 03422 00000080 A
642 01 03423 00000040 A
643 01 03424 00000020 A
644 01 03425 00000010 A
645 01 03426 00000008 A
646 01 03427 00000004 A
647 01 03428 00000002 A
648 01 03429 00000001 A
649 01 0342A 00000000 A SW1 DATA 0
650 01 0342B 00000000 A SW2 DATA 0
651 01 0342C 00000000 A LCARD DATA 0 LAST DATA CARD INDICATOR
652 01 0342D 00000000 A ECARD DATA 0 END CARD INDICATOR
653 01 0342E C0000000 A CNT1 DATA X'00000000'
654 01 0342F 4000A804 A CNT2 DATA X'4000A804'
655 01 03430 68000000 A BR0PCODE R 0
656 01 03431 00000000 A CHECKSUM DATA 0
657 01 03432 INBUF RES 30
658 01 03433 OUTBUF RES 30
659 01 03434 FFFFFFFF A WOOT31 DATA -1

```

651				PAGE	
652	01	0346F	00000000	BLANKING DATA	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
	01	03470	00000000		
	01	03471	00000000		
	01	03472	00000000		
	01	03473	00000000		
	01	03474	00000000		
	01	03475	00000000		
	01	03476	00000000		
	01	03477	00000000		
	01	03478	00000000		
	01	03479	00000000		
	01	0347A	00000000		
	01	0347B	00000000		
	01	0347C	00000000		
	01	0347D	00000000		
653	01	0347E	00000000	DATA	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
	01	0347F	00000000		
	01	03480	00000000		
	01	03481	00000000		
	01	03482	00000000		
	01	03483	00000000		
	01	03484	00000000		
	01	03485	00000000		
	01	03486	00000000		
	01	03487	00000000		
	01	03488	00000000		
	01	03489	00000000		
	01	0348A	00000000		
	01	0348B	00000000		
	01	0348C	00000000		

654				PAGE	
655					
656				BOUND	8
657	01	0348E	0400D240 N	PARAM	GEN,8,24,32 6,BA(PARCARD),78
			0000004E		
658	01	03490		PARCARD	RFS 30
659	01	034AE	35B034C8	CONVFR	STW,11 SAFE RETURN ADDR
660	01	034AF	222FFF88 A		LI,2 -120 INDEX
661	01	034B0	721434AE	NEWBY	LB,1 PARCARD+30,2 GET FIRST CHAR - MUST BE F,S,OR L
662	01	034B1	211000D3 A		CI,1 X'03'
663	01	034B2	683C34C2		BE LFIELD
664	01	034B3	211000F2 A		CI,1 X'12'
665	01	034B4	683034B8		BE SFIELD CHECK FOR CONTROL CHAR = S
666	01	034B5	211000C6 A		CI,1 X'6'
667	01	034B6	683034C5		BE FFIELD
668	01	034B7	680034E6		B P88F8RM
669	01	034B8	6ABC34CD	SFIELD	BAL,11 HEX CONVERT ADDR
670	01	034B9	35C034CB		STW,12 AFIELD+2 STARTING ADDR TO STORAGE
671	01	034BA	65203448	RF	BIR,2 \$+1 NEXT BYTE
672	01	034BB	33F034CC		"TW,15 PRECESS UPDATE NO. OF FIELDS PROCESSED
673	01	034BC	693034B0		RNEZ NEWBY OR IF < 3 HAVE BEEN PROCESSED
674	01	034BD	32B034C8		LW,11 SAFE RETURN ADDR
675	01	034BE	321C34C9		LW,1 AFIELD FIRST LBC IN HEX
676	01	034BF	322C34CA		LW,2 AFIELD+1 LAST LBC IN HEX
677	01	034C0	3P3034CB		LW,3 AFIELD+2 STARTING LBC IN HEX
678	01	034C1	E800000B A		B *11 RETURN
679	01	034C2	6AB034CD	LFIELD	BAL,11 HEX CONVERT ADDR
680	01	034C3	35C034CA		STW,12 AFIELD+1 LAST ADDR TO STORAGE
681	01	034C4	680034BA		B RF NEXT FIELD
682	01	034C5	6AB034CD	FFIELD	BAL,11 HEX CONVERT ADDR
683	01	034C6	35C034C9		STW,12 AFIELD FIRST ADDR TO STORAGE
684	01	034C7	680034BA		B RF NEXT FIELD

685				PAGE		
686	01	034C8	00000000 A	SAFE	DATA	0
687	01	034C9		AFIELD	RES	3
688	01	034CC	00000003 A	PROCESS	DATA	3
689	01	034CD		HEX	RES	0
690	01	034CD	22C00000 A		LI,12	0
691	01	034CE	652034CF		BIR,2	*+1
692	01	034CE	2290000F A		LI,9	15
693	01	034D0	72E434AE		LB,14	PARCARD+30,2
694	01	034D1	21E0006B A		CI,14	X'6B'
695	01	034D2	693034E6		BNE	P00RF0RM
696	01	034D3	652034D4		BIR,2	*+1
697	01	034D4	72E434AE	NHX	LB,14	PARCARD+30,2
698	01	034D5	21E0006B A		CI,14	X'6B'
699	01	034D6	E830000B A		BE	*11
700	01	034D7	21E00040 A		CI,14	X'40'
701	01	034D8	683034EC		BE	MAYERR
702	01	034D9	25C00004 A		SLS,12	4
703	01	034DA	22F000F0 A		LI,15	X'F0'
704	01	034DB	45E0000F A		CS,14	15
705	01	034DC	693034E1		BNE	ALPHA
706	01	034DD	35E00008 A	NUM	STW,14	8
707	01	034DE	4780000C A		STS,8	12
708	01	034DF	652034D4		BIR,2	NHX
709	01	034E0	680034F6		B	P00RF0RM
710	01	034E1	22F000C0 A	ALPHA	LI,15	X'CO'
711	01	034E2	45E0000F A		CS,14	15
712	01	034E3	693034E6		BNE	P00RF0RM
713	01	034E4	20E00009 A		AI,14	9
714	01	034E5	680034DD		B	NUM

NEXT BYTE ADDR
MASK

SHOULD BE A COMMA
COMMA LEFT OUT OF F0RMAT
NEXT BYTE

FIELD IS COMPLETE - RETURN
IS IT A SPACE

MOVE BY ONE HEX
MASK FOR 0-9

00 IF NOT 0-9

F0RM ADDR
NEXT BYTE
RAN OUT OF BYTES
MASK FOR A-F

NOT C-9 OR A-F
CONVERT TO HEX NUM

715				PAGE		
716	01	034E6		P00RF0RM	RES	0
717	01	034E6	22700003 A		LI,7	3
718	01	034E7	357034CC		STW,7	PROCESS
719	01	034E8	22001A79		LI,0	DA(ERRMSG)
720	01	034E9	4C000001 A		SIB,0	1
721	01	034EA	2E000000 A		WAIT	TO KSR
722				* F0RMAT	ERR0R	PUT NEW CARD IN READER AND CLEAR THE WAIT
723	01	034EB	68003306	B	REREAD	READ NEW CARD
724	01	034EC	32E034CC	MAYERR	LW,14	PROCESS
725	01	034ED	21E00001 A		CI,14	1
726	01	034EE	693034E6		BNE	P00RF0RM
727	01	034EF	32C0000C A		LW,12	12
728	01	034F0	683034E6		BEZ	P00RF0RM
729	01	034F1	E800000B A		B	*11
730				R0UND		8

FORMAT ERR0R

FORMAT ERR0R
DRES R12 HAVF AN ADDR
FORMAT ERR0R
RETURN

731				PAGE	
732	01 034F2	0500D3D0 N	ERRMSG	GEN. 8, 24, 32 5, BA(ERM), (BA(ERMEND)-BA(ERM))	
		00000064			
733			ERM	TEXT	'N FBRMAT CARD IN ERROR, SHOULD BE AS FOLLOWS:','
734					'NF,XXX,L,XXX,S,XXX,','
735	01 034F4	1540C6D6 A			'N XXX MAY BE FROM 1 TO 5 CHARACTERS'
	01 034F5	D9D4C1E3 A			
	01 034F6	40C3C1D9 A			
	01 034F7	C440C9D5 A			
	01 034F8	40C5D9D9 A			
	01 034F9	D6D96B40 A			
	01 034FA	E2C8D6E4 A			
	01 034FB	D3C440C2 A			
	01 034FC	C540C1E2 A			
	01 034FD	40C6D6D3 A			
	01 034FE	D3D6E6F2 A			
	01 034FF	7A15C66B A			
	01 03500	E7E7E76B A			
	01 03501	D368E7F7 A			
	01 03502	E768E26B A			
	01 03503	E7E7E76B A			
	01 03504	154040F7 A			
	01 03505	E7E740D4 A			
	01 03506	C1E840C2 A			
	01 03507	C540C6D9 A			
	01 03508	D6D440F1 A			
	01 03509	40E3D640 A			
	01 0350A	F540C3C8 A			
	01 0350B	C1D9C1C3 A			
	01 0350C	E3C5D9F2 A			
736	01 0350D		ERMEND	RES	C
737	01 0350E	01 03300	END	END	CALL
		FF000000 A			
		00FF0000 A			



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