

IDENTIFICATION

PRODUCT CODE: MAINDEC-08-DHCRA-A-D
FORMERLY: MAINDEC-8E-D2EB
PRODUCT NAME: CR8E/CR8F CARD READER TEST
DATE REVISED: MAY 22, 1972
MAINTAINED: DIAGNOSTIC GROUP
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DIGITAL EQUIPMENT CORPORATION

1. ABSTRACT

THE PROGRAM TESTS THE CARD READER FOR CORRECT ALPHANUMERIC AND BINARY OPERATIONS. IT ALSO TESTS CONTROL INTERRUPT AND TIMING.

2. REQUIREMENTS

IF DF32 DISK IS PART OF THE SYSTEM, IT SHOULD BE IN THE OPERATE MODE. WHEN DF32 DISK IS IN MAINTENANCE MODE IT SHARES DEVICE CODES WITH THE CARD READER AND THEREFORE THE CARD READER DIAGNOSTIC CANNOT BE VALIDLY RUN. STATIC TESTS AND MANUAL INTERVENTION TESTS SHOULD OPERATE CORRECTLY BEFORE ATTEMPTING TO OPERATE ALL OTHER TESTS.

2.1 EQUIPMENT

PDP8-E WITH EITHER ONE OF THE FOLLOWING CARD READERS:
A. CR03 G.D.I 100 MS CARD READER (CR8E)
B. DOCUMENTATION M200 CARD READER (CR8F)
CR03 ALPHANUMERIC CARD DECK
CR03 BINARY CARD DECK

3. LOADING PROCEDURE

THE PROGRAM TAPE IS IN BINARY FORMAT. LOAD THE PROGRAM INTO CORE BY FOLLOWING THE INSTRUCTIONS PUBLISHED FOR THE PARTICULAR BINARY FORMAT BEING USED.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SW0=0 TEST ALPHANUMERIC DECK
SW0=1 TEST BINARY DECK
SW1=0 PRINT DATA ERROR
SW1=1 SUPPRESS PRINT DATA ERROR
SW2=0 HALT AFTER DATA ERROR
SW2=1 SUPPRESS HALT AFTER DATA ERROR
SW3=0 HALT AT END OF TEST DECK
SW3=1 CONTINUE TO NEXT TEST DECK WITHOUT HALT.

4.2 STARTING ADDRESSES OF CARD READER TESTS

0200 = ALPHA AND BINARY DATA RELIABILITY TESTS
0202 = STATIC IOT TESTS
0204 = MANUAL INTERVENTION TESTS
0206 = COMPRESSED CODE DATA RELIABILITY TESTS
0210 = VALIDITY BIT DATA RELIABILITY TESTS
2300 = SCOPE LOOP

4.3 PROGRAM AND/OR OPERATOR ACTION

THE TESTS PROVIDED IN THIS DIAGNOSTIC SHOULD BE RUN IN THE FOLLOWING SEQUENCE,

A, REFERENCE 4.4 FOR CR03 G,D,I CARD READER

B, REFERENCE 4.4A FOR DOCUMENTATION M200 CARD READER

4.4 CR03 G,D,I (CR8E) PROGRAM AND/OR OPERATOR ACTION

STATIC IOT TESTS FOR CR8E CARD READER

A, PLACE A CARD DECK INTO INPUT HOPPER

B, TURN ON CARD READER POWER AND THEN DEPRESS MOTOR START

C, AT THIS POINT THE ONLY RED LIGHT TO BE ON SHOULD BE READ STOP, REFERENCE G,D,I, MANUAL TO REMEDY OTHER RED LIGHT ERROR CONDITIONS,

D, LOAD ADDRESS 0202

E, DEPRESS CLEAR AND THEN DEPRESS CONTINUE

F, PROGRAM WILL PRINT "IOTS OK" IF TEST RUNS, PROGRAM WILL HALT IF TEST FAILS, REFERENCE SYMBOLIC LISTING AND COMMENTS FOR APPROPRIATE ERROR DESCRIPTION,

MANUAL INTERVENTION TESTS FOR CR8E CARD READER

A, PLACE ALPHANUMERIC OR BINARY TEST DECK IN LOWER HOPPER,

B, TURN ON CARD READER POWER

C, DEPRESS MOTOR START AND THEN DEPRESS READ START

AT THIS POINT ALL RED LIGHTS SHOULD BE OFF,

D, LOAD ADDRESS 0204

E, SELECT APPROPRIATE SWITCH CONTROL (REFERENCE 4.1),

F, DEPRESS CLEAR AND THEN DEPRESS CONTINUE

G, AT THIS POINT PROGRAM WILL ATTEMPT TO READ FOUR CARDS AND THEN ISSUE MESSAGE "OPERATOR MUST NOW PRESS READ STOP,"

H, AFTER READ STOP IS PRESSED PROGRAM WILL THEN ISSUE MESSAGE "OPERATOR MUST NOW PRESS READ START,"

I, PROGRAM WILL PRINT "MANUAL TESTS OK" IF TEST RUNS, PROGRAM WILL HALT IF TEST FAILS, REFERENCE SYMBOLIC LISTING AND COMMENTS FOR APPROPRIATE ERROR DESCRIPTION,

VALIDITY BIT DATA RELIABILITY TESTS FOR CR8E CARD READER

STATIC IOT TESTS MUST OPERATE CORRECTLY BEFORE ATTEMPTING THIS TEST.

- A, PLACE BINARY TEST DECK IN LOWER HOPPER
- B, TURN ON CARD READER POWER
- C, DEPRESS MOTOR START AND THEN DEPRESS READ START
AT THIS POINT ALL READ LIGHTS SHOULD BE OFF,
- D, LOAD ADDRESS 0210
- E, SELECT APPROPRIATE SWITCH CONTROL (REFERENCE 4,1)
- F, DEPRESS CLEAR AND THEN DEPRESS CONTINUE
- G, PROGRAM WILL RING BELL AND PRINT "*" WHEN FINISHED WITH AN 80 CARD TEST DECK,
- H, IF MORE THAN 1 TEST DECK HAS BEEN LOADED, REPEAT STEP E AND PRESS CONTINUE,

COMPRESSED CODE DATA RELIABILITY TESTS FOR CR8E CARD READER

STATIC IOT TEST MUST OPERATE CORRECTLY BEFORE ATTEMPTING THIS TEST.

- A, PLACE ALPHANUMERIC TEST DECK IN LOWER HOPPER,
- B, TURN ON CARD READER POWER,
- C, DEPRESS MOTOR START AND THEN DEPRESS READ START
AT THIS POINT ALL RED LIGHTS SHOULD BE OFF,
- D, LOAD ADDRESS 0206
- E, SELECT APPROPRIATE SWITCH CONTROL (REFERENCE 4,1)
- F, DEPRESS CLEAR THEN DEPRESS CONTINUE
- G, PROGRAM WILL RING BELL AND PRINT "*" WHEN FINISHED WITH AN 80 CARD TEST DECK,
- H, IF MORE THAN 1 TEST DECK HAS BEEN LOADED, REPEAT STEP E AND PRESS CONTINUE,

ALPHANUMERIC AND BINARY DATA RELIABILITY TESTS FOR CR8E CARD READER

STATIC TEST MUST OPERATE CORRECTLY BEFORE ATTEMPTING THIS TEST;

- A, PLACE ALPHANUMERIC OR BINARY TEST DECK IN LOWER HOPPER;
- B, TURN ON CARD READER POWER
- C, DEPRESS MOTOR START AND THEN DEPRESS READ START
AT THIS POINT ALL RED LIGHTS SHOULD BE OFF,
- D, LOAD ADDRESS 0200
- E, SELECT APPROPRIATE SWITCH CONTROL (REFERENCE 4,1),
- F, DEPRESS CLEAR AND THEN DEPRESS CONTINUE
- G, PROGRAM WILL RING BELL AND PRINT "*" WHEN FINISHED WITH AN
80 CARD DECK TEST,
- H, IF MORE THAN 1 TEST DECK HAS BEEN LOADED, REPEAT STEP E AND
PRESS CONTINUE.

SCOPE LOOP FOR CR8E CARD READER

- A, LOAD CARD DECK (ANY TYPE OF CARD FORMAT)
- B, TURN ON CARD READER POWER
- C, DEPRESS CARD READER START
- D, LOAD ADDRESS 2300
- E, DEPRESS CLEAR THEN DEPRESS CONTINUE
- F, NORMAL HALT WHEN INPUT HOPPER EMPTY

ERROR DESCRIPTION

REFERENCE 6,0

4, DOCUMENTATION M200 (CR8F) PROGRAM AND/OR OPERATOR ACTION

STATIC IOT TESTS FOR CR8F CARD READER

- A, PLACE A CARD DECK INTO UPPER HOPPER
- B, TURN ON CARD READER POWER AND ON REAR PANEL SET MODE TO REMOTE, SHUTDOWN TO AUTO,
- C, AT THIS POINT THE ONLY LIGHT TO BE ON SHOULD BE STOP, REFERENCE DOCUMENTATION MANUAL TO REMEDY OTHER LIGHT ERROR CONDITIONS,
- D, ON REAR PANEL OF READER PRESS LAMP TEST VERIFY THAT ALL LIGHTS DO LIGHT,
- E, LOAD ADDRESS 0202
- F, DEPRESS CLEAR AND THEN DEPRESS CONTINUE
- G, PROGRAM WILL PRINT "IOTS OK" IF TEST RUNS, PROGRAM WILL HALT IF TEST FAILS, REFERENCE SYMBOLIC LISTING AND COMMENTS FOR APPROPRIATE ERROR DESCRIPTION,

MANUAL INTERVENTION TESTS FOR CR8F CARD READER

- A, PLACE ALPHANUMERIC OR BINARY TEST DECK IN UPPER HOPPER,
- B, TURN ON CARD READER POWER
- C, DEPRESS RESET, AFTER 3 SEC, MAX, THE RESET LIGHT AND THE POWER LIGHT SHOULD BE THE ONLY LIGHTS ON,
- D, LOAD ADDRESS 0204
- E, SELECT APPROPRIATE SWITCH CONTROL (REFERENCE 4,1),
- F, DEPRESS CLEAR AND THEN DEPRESS CONTINUE
- G, AT THIS POINT PROGRAM WILL ATTEMPT TO READ FOUR CARDS AND THEN ISSUE MESSAGE "OPERATOR MUST NOW PRESS STOP,"
- H, AFTER STOP IS PRESSED PROGRAM WILL THEN ISSUE MESSAGE "OPERATOR MUST NOW PRESS RESET,"
- I, PROGRAM WILL PRINT "MANUAL TESTS OK" IF TEST RUNS, PROGRAM WILL HALT IF TEST FAILS, REFERENCE SYMBOLIC LISTING AND COMMENTS FOR APPROPRIATE ERROR DESCRIPTION,

VALIDITY BIT DATA RELIABILITY TESTS FOR CR8F CARD READER

STATIC IOT TESTS MUST OPERATE CORRECTLY BEFORE ATTEMPTING THIS TEST.

- A, PLACE BINARY TEST DECK IN UPPER HOPPER
- B, TURN ON CARD READER POWER
- C, DEPRESS RESET, AFTER 3 SEC MAX, THE RESET LIGHT AND THE POWER LIGHT SHOULD BE ONLY LIGHTS ON,
- D, LOAD ADDRESS 0210
- E, SELECT APPROPRIATE SWITCH CONTROL (REFERENCE 4,1)
- F, DEPRESS CLEAR AND THEN DEPRESS CONTINUE
- G, PROGRAM WILL RING BELL AND PRINT "*" WHEN FINISHED WITH AN 80 CARD TEST DECK,
- H, IF MORE THAN 1 TEST DECK HAS BEEN LOADED, REPEAT STEP E AND PRESS CONTINUE.

COMPRESSED CODE DATA RELIABILITY TESTS FOR CR8F CARD READER

STATIC IOT TEST MUST OPERATE CORRECTLY BEFORE ATTEMPTING THIS TEST.

- A, PLACE ALPHANUMERIC TEST DECK IN UPPER HOPPER,
- B, TURN ON CARD READER POWER,
- C, DEPRESS RESET, AFTER 3 SEC MAX THE RESET LIGHT AND THE POWER LIGHT SHOULD BE THE ONLY LIGHTS ON,
- D, LOAD ADDRESS 0206
- E, SELECT APPROPRIATE SWITCH CONTROL (REFERENCE 4,1)
- F, DEPRESS CLEAR THEN DEPRESS CONTINUE
- G, PROGRAM WILL RING BELL AND PRINT "*" WHEN FINISHED WITH AN 80 CARD TEST DECK,
- H, IF MORE THAN 1 TEST DECK HAS BEEN LOADED, REPEAT STEP E AND PRESS CONTINUE.

ALPHANUMERIC AND BINARY DATA RELIABILITY TESTS FOR CR8F CARD READER

STATIC TEST MUST OPERATE CORRECTLY BEFORE ATTEMPTING THIS TEST;

- A, PLACE ALPHANUMERIC OR BINARY TEST DECK IN UPPER HOPPER;
- B, TURN ON CARD READER POWER
- C, DEPRESS RESET, AFTER 3 SEC MAX, THE RESET LIGHT AND THE POWER LIGHT SHOULD BE ONLY LIGHTS ON,
- D, LOAD ADDRESS 0200
- E, SELECT APPROPRIATE SWITCH CONTROL (REFERENCE 4,1),
- F, DEPRESS CLEAR AND THEN DEPRESS CONTINUE
- G, PROGRAM WILL RING BELL AND PRINT "*" WHEN FINISHED WITH AN 80 CARD DECK TEST,
- H, IF MORE THAN 1 TEST DECK HAS BEEN LOADED, REPEAT STEP E AND PRESS CONTINUE,

SCOPE LOOP FOR CR8F CARD READER

- A, LOAD CARD DECK (ANY TYPE OF CARD FORMAT)
- B, TURN ON CARD READER POWER
- C, DEPRESS RESET
- D, LOAD ADDRESS 2300
- E, DEPRESS CLEAR THEN DEPRESS CONTINUE
- F, NORMAL HALT WHEN INPUT HOPPER EMPTY

ERROR DESCRIPTION

REFERENCE 6.0

5. OPERATING PROCEDURE -----

REFERENCE 4,3

6.0 ERRORS -----

ERROR HALTS AND DESCRIPTIONS

6.1 STATIC IOT TESTS -----

| TAG | ADDRESS | REASON |
|-----|---------|---|
| E1 | 0304 | RCSE SKIPPED WITH READER NOT READY |
| E2 | 0310 | RCSI SHOULDN'T HAVE SKIPPED |
| E3 | 0315 | DATA FLAG SHOULD NOT BE SET OR RCSE FAILED |
| E4 | 0321 | CARD DONE FLAG SHOULD NOT BE SET OR RCSD FAILED |
| E5 | 0335 | ILLEGAL PROGRAM INTERRUPT OCCURRED |

RCNI INSTRUCTION STATUS BIT ERRORS DURING STATIC IOT TEST

| | | |
|-----|------|--|
| E25 | 1007 | READY TRUE STATUS BIT (AC3) SHOULD BE ZERO |
| E26 | 1014 | TROUBLE TRANSITION STATUS BIT (AC2) SHOULD BE A ZERO |
| E27 | 1021 | CARD DONE STATUS BIT (AC1) SHOULD BE A ZERO |
| E28 | 1026 | DATA READY STATUS BIT (AC0) SHOULD BE A ZERO |

6.2 MANUAL INTERVENTION TESTS -----

| TAG | ADDRESS | REASON |
|-----|---------|---|
| E6 | 0412 | RCSE FAILED OR READER NOT READY |
| E7 | 0430 | RCSE FAILED OR READER NOT READY |
| E8 | 0447 | RCSD FAILED OR CARD DONE FLAG DIDN'T SET |
| E9 | 0454 | CAF DID NOT CLEAR CARD DONE FLAG |
| E10 | 0466 | CAF SHOULD HAVE CLEARED DATA FLAG |
| E11 | 0520 | RCNO DID NOT DISABLE DATA + CARD DONE INT, ENABLE |
| E12 | 0534 | CAF DID NOT ENABLE DATA + CARD DONE INT, ENABLE |
| E13 | 0627 | READ STOP (G,D,I) OR STOP (DOCUMENTATION) WAS NOT PRESSED, RESTART TEST |
| E14 | 0633 | READY/TROUBLE FLAG DIDN'T CAUSE PROGRAM INTERRUPT |
| E15 | 0640 | RCNI-TROUBLE TRANSITION STATUS BIT (AC2) SHOULD BE A ONE |
| E16 | 0642 | RCSI SHOULD HAVE SKIPPED WITH TROUBLE FLAG ENABLED |
| E17 | 0657 | RCTF DID NOT CLEAR TRANSITION FLOP |
| E18 | 0663 | RCNI-TROUBLE TRANSITION STATUS BIT (AC2) SHOULD BE A ZERO |
| E19 | 0713 | READY/TROUBLE FLAG DIDN'T CAUSE PROGRAM INTERRUPT |
| E20 | 0717 | READ START (G,D,I) OR RESET (DOCUMENTATION) WAS NOT PRESSED, RESTART TEST |
| E21 | 0723 | RCSI SHOULD HAVE SKIPPED ON READY TRUE TRANSITION INTERRUPT |
| E22 | 0727 | CAF DID NOT CLEAR TRANSITION FLOP |
| E23 | 0740 | CAF DID NOT DISABLE TRANSITION INTERRUPT |
| E24 | 0744 | RCNI-READY TRUE STATUS BIT (AC3) SHOULD BE A ZERO |

RCNI INSTRUCTION STATUS BIT ERRORS DURING MANUAL INTERVENTION TEST -----

RCNI ERRORS WITH CARD READER INITIALIZED -----

| | | |
|-----|------|--|
| E25 | 1007 | READY TRUE STATUS BIT (AC3) SHOULD BE A ZERO |
| E26 | 1014 | TROUBLE TRANSITION STATUS BIT (AC2) SHOULD BE A ZERO |
| E27 | 1021 | CARD DONE STATUS BIT (AC1) SHOULD BE A ZERO |
| E28 | 1026 | DATA READY STATUS BIT (AC0) SHOULD BE A ZERO |

RCNI ERRORS WITH DATA FLAG ENABLED -----

| | | |
|-----|------|--|
| E29 | 1037 | READY TRUE STATUS BIT (AC3) SHOULD BE A ZERO |
| E30 | 1044 | TROUBLE TRANSITION STATUS BIT (AC2) SHOULD BE A ZERO |
| E31 | 1051 | CARD DONE STATUS BIT (AC1) SHOULD BE A ZERO |
| E32 | 1056 | DATA READY STATUS BIT (AC0) SHOULD BE A ONE |

RCNI ERRORS WITH CARD DONE FLAG ENABLED -----

| | | |
|-----|------|--|
| E33 | 1070 | READY TRUE STATUS BIT (AC3) SHOULD BE A ZERO |
| E34 | 1075 | TROUBLE TRANSITION STATUS BIT (AC2) SHOULD BE A ZERO |
| E35 | 1102 | CARD DONE STATUS BIT (AC1) SHOULD BE A ONE |
| E36 | 1107 | DATA READY STATUS BIT (AC0) SHOULD BE A ZERO |

RCNI ERRORS WITH READY TRUE TRANSITION ENABLED -----

| | | |
|-----|------|--|
| E37 | 1121 | READY TRUE STATUS BIT (AC3) SHOULD BE A ONE |
| E38 | 1126 | TROUBLE TRANSITION STATUS BIT (AC2) SHOULD BE A ZERO |
| E39 | 1133 | CARD DONE STATUS BIT (AC1) SHOULD BE A ZERO |
| E40 | 1140 | DATA READY STATUS BIT (AC0) SHOULD BE A ZERO |

DATA RELIABILITY TESTS -----

| TAG | ADDRESS | REASON |
|------|---------|---|
| E41 | 1451 | RQSD FAILED OR CARD DONE FLAG PRESENT AT WRONG TIME |
| E42 | 1460 | RQSE FAILED OR READER NOT READY |
| E43 | 1476 | RQSF FAILED OR DATA READY FLAG DIDN'T SET |
| E43A | 1502 | RCNI-DATA READY STATUS BIT (AC0) SHOULD BE A ONE |
| E44 | 1513 | DATA FLAG DIDN'T CAUSE PROGRAM INTERRUPT |
| E45 | 1603 | RCSI DIDN'T SKIP ON DATA READY INTERRUPT |
| E46 | 1611 | RCNI-DATA READY STATUS BIT (AC0) DIDN'T CLEAR |
| E48 | 1655 | RQSD FAILED OR CARD DONE FLAG DIDN'T SET |
| E49 | 1661 | CARD DONE STATUS BIT (AC1) DID NOT SET |
| E50 | 1673 | CARD DONE FLAG DIDN'T CAUSE PROGRAM INTERRUPT |
| E51 | 1675 | RCSI DIDN'T SKIP ON CARD DONE INTERRUPT |
| E52 | 1704 | RQRD DIDN'T CLEAR CARD DONE FLAG |
| E53 | 2011 | NOT AN ERROR, END OF TEST DECK |
| E54 | 2032 | DATA ERROR |

6.4

A DATA READ ERROR OCCURS WHEN THE INCOMING DATA DOES NOT COMPARE FAVORABLY WITH THE STORED DATA PATTERN, THE FORMAT FOR A DATA ERROR TYPEOUT IS AS FOLLOWS:

| | | | | | |
|---------|-------|-------|--------|---------|---------|
| A,B,C,V | CD-XX | CL-XX | G-XXXX | R1-XXXX | R2-XXXX |
| A | B | C | D | E | F |

A, AN A,B,C,V TO SPECIFY WHAT DATA RELIABILITY TEST WAS SELECTED WHEN ERROR OCCURED,

A=ALPHA DATA RELIABILITY TEST
B=BINARY DATA RELIABILITY TEST
C=COMPRESSED DATA RELIABILITY TEST
V=VALIDITY BIT DATA RELIABILITY TEST

B, CARD NUMBER WHEN ERROR OCCURED

C, COLUMN NUMBER WHEN ERROR OCCURED

D, GOOD DATA PATTERN

E, DATA ACTUALLY READ (1ST READ)

F, DATA ACTUALLY READ (2ND READ)

EITHER OR BOTH OF THE DATA READS MAY BE BAD,

DATA ERRORS NOT TRACED TO CARD READER HARDWARE INCLUDE:

A, WRONG CARD DECK USED,

B, SWITCH 0 IN WRONG POSITION (REFERENCE 4,1)

C, CARD MISSING

D, CARD DECK OUT OF PROPER SEQUENCE,

E, DAMAGED CARD,

6 ERROR RECOVERY

- A, STATIC IOT TEST MUST BE RESTARTED AT ADDRESS 0202
- B, MANUAL INTERVENTION TESTS MUST BE RESTARTED AT ADDRESS 0204
- C, VALIDITY BIT TESTS MUST BE RESTARTED AT ADDRESS 0210
- D, COMPRESSED MODE DATA TESTS MUST BE RESTARTED AT ADDRESS 0206
- E, ALPHA AND BINARY MODE DATA TESTS MUST BE RESTARTED AT ADDRESS 0200
- F, DATA READ ERRORS; PRESS CONTINUE

7, RESTRICTIONS

7.1 CARD DECKS

- A, MUST BE IN PROPER SEQUENCE
- B, MUST BE IN GOOD CONDITION

NOTE: ALPHA-NUMERIC AND BINARY CARD DECKS CONSISTING OF 80 CARDS EACH ARE AVAILABLE FROM THE PROGRAM LIBRARY. SINCE THESE DECKS MUST BE KEPT IN PROPER SEQUENCE, IT IS SUGGESTED THAT EACH DECK BE NUMBERED FROM 1 TO 80 AS SOON AS IT IS RECEIVED.

8, MISCELLANEOUS

8.1 CARD DECK DATA TABLE DESCRIPTION

ALPHANUMERIC DATA TABLE

REFERENCE THE ALPHANUMERIC DATA TABLE BEGINNING AT LOCATION 3400 IN THE SYMBOLIC LISTING FOR THE CODES PUNCHED FOR EACH OF 80 COLUMNS OF THE 1ST CARD, EACH SUCCESSIVE CARD IN THE DECK USES THE SAME SEQUENCE OF CODES ROTATED 1 COLUMN TO THE LEFT.

BINARY DATA TABLE

REFERENCE THE BINARY DATA TABLE BEGINNING AT LOCATION 3200 IN THE SYMBOLIC LISTING FOR THE CODES PUNCHED FOR EACH OF THE 80 COLUMNS OF THE 1ST CARD, AS WITH THE ALPHANUMERIC DECK EACH SUCCESSIVE CARD HAS THE SAME SEQUENCE OF CODES ROTATED 1 COLUMN TO THE LEFT.

COMPRESSED DATA TABLE

REFERENCE THE COMPRESSED DATA TABLE BEGINNING AT LOCATION 3600 IN THE SYMBOLIC LISTING FOR THE CODES PUNCHED FOR EACH OF THE 80 COLUMNS OF THE 1ST CARD,

VALIDITY BIT DATA TABLE

REFERENCE THE VALIDITY BIT DATA TABLE BEGINNING AT LOCATION 4000 IN THE SYMBOLIC LISTING FOR THE CODES PUNCHED FOR EACH OF THE 80 COLUMNS OF THE 1ST CARD,

9, PROGRAM DESCRIPTION

9.1 STATIC IOT TEST

THIS TEST CHECKS TO SEE THAT SKIP ON READER READY, SKIP ON DATA FLAG, SKIP IF INTERRUPT IS GENERATED, AND SKIP ON CARD DONE FLAG DO NOT SKIP WITH THOSE FLAGS CLEARED,

9.2 MANUAL INTERVENTION TESTS

THIS TEST CHECKS CAF INSTRUCTION TO INITIALIZE FLAGS AND ALSO CHECK READY/TROUBLE INTERRUPTS THROUGH OPERATOR INTERVENTION, CHECKS ARE MADE TO DETERMINE IF THE SKIP ON READER READY, SKIP ON DATA FLAG, SKIP ON CARD DONE, SKIP IF INTERRUPT IS GENERATED, CLEAR CARD DONE, CLEAR TRANSITION FLAGS IOT'S ARE WORKING PROPERLY, TESTS ARE ALSO PERFORMED ON READ CONDITIONS IN FROM CARD READER AND READ CONDITIONS OUT FROM CARD READER,

9.7 VALIDITY BIT DATA RELIABILITY TEST

THIS TEST CHECKS VALIDITY LOGIC CIRCUITRY TO DETECT DOUBLE PUNCHES IN ROWS 1 THROUGH 7. THIS IS PERFORMED BY READING IN THE BINARY DECK IN THE COMPRESSED MODE. WHEN A DOUBLE PUNCH IS READ IN THE COMPRESSED MODE THE VALIDITY CIRCUITRY WILL ASSERT A ONE IN AC0. A DATA ERROR WILL BE FOUND IF EITHER DATA READ DOES NOT COMPARE WITH THE EXPECTED PATTERN.

9.4 DATA RELIABILITY TESTS

THE TESTS DESCRIBED PERTAIN TO THE COMPRESSED DATA MODE, ALPHANUMERIC DATA MODE AND THE BINARY DATA MODE.

A TEST DECK OF 80 ALPHANUMERIC OR BINARY CODED CARDS IS READ. CHECKS ARE MADE TO DETERMINE IF THE SKIP ON READER READY, SKIP ON DATA FLAG, SKIP ON CARD DONE, CLEAR CARD DONE, READ COMPRESSED, READ ALPHA, READ BINARY, SKIP IF INTERRUPT IS GENERATED, READ CONDITIONS IN FROM CARD READER IOT'S ARE WORKING PROPERLY.

EACH COLUMN OF DATA WILL BE PRESENT IN THE READ BUFFER FOR 1.2 .1 MILLISEC. THE DATA TEST READS EACH COLUMN TWICE. THE FIRST READ IS DONE AS SOON AS THE DATA FLAG INDICATES THAT DATA IS PRESENT. THE SECOND READ IS DONE 1.0 MILLISECOND LATER TO ASSURE THAT THE DATA BUFFER HAS NOT CHANGED. A DATA ERROR WILL BE FOUND IF EITHER DATA READ DOES NOT COMPARE WITH THE EXPECTED PATTERN.

THE PROGRAM INTERRUPT IS CHECKED TO MAKE SURE THAT THE DATA AND CARD DONE FLAGS WILL CAUSE INTERRUPTS. CARD DONE LOGIC IS TESTED TO MAKE SURE THAT THE CARD DONE FLAG ONLY OCCURS AFTER THE CARD HAS PASSED THE READ STATION.

9.5 SCOPE LOOP

THIS ROUTINE WILL CYCLE CARDS THROUGH THE READER WITHOUT MAKING DATA TESTS. IT'S ONLY PURPOSE IS TO AID IN MAINTENANCE PROCEDURES BY ALLOWING THE LOGIC TO OPERATE WHILE IT IS BEING CHECKED WITH A SCOPE. CARD DECKS TO BE USED MAY CONTAIN ANY NUMBER OF CARDS WITH ANY HOLE PATTERN THE USER WISHES.

9.6 LISTING

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/CR8E/CR8F CARD READER TEST
/MAINDEC-08-DHCRA-A
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/THIS PROGRAM TESTS FOR THE CORRECT OPERATION OF THE G.D.I. 100MS
/CARD READER(CR8E)OR THE DOCUMENTATION M200 CARD READER(CR8F)
/WHEN USED WITH POP8E,
/

/CONTROL SWITCH SETTINGS:
/
/SW2 = 0 TEST ALPHA NUMERIC DECK
/SW0 = 1 TEST BINARY DECK
/SW1 = 0 PRINT DATA ERROR
/SW1 = 1 SUPPRESS PRINT DATA ERROR
/SW2 = 0 HALT AFTER DATA ERROR
/SW2 = 1 SUPPRESS HALT AFTER DATA ERROR
/SW3 = 0 HALT AT THE END OF TEST DECK
/SW3 = 1 CONTINUE TO NEXT TEST DECK WITHOUT HALT
/

/NOT EQUALITIES
4420 RCSE=JMS I XXRCSE /SKIP ON DATA FLAG
4421 RCRA=JMS I XXRCRA /READ ALPHA
4422 RCRC=JMS I XXRCRC /READ BINARY
4423 RCRC=JMS I XXRCRC /READ COMPRESSED
4424 RCSD=JMS I XXRCSD /SKIP ON CARD DONE FLAG
4425 RCSE=JMS I XXRCSE /START CARD MOTION AND SKIP IF READER READY
4426 RCRD=JMS I XXRCRD /CLEAR CARD DONE FLAG
4427 RCNO=JMS I XXRCNO /READ CONDITIONS OUT TO CARD READER
4430 RCNI=JMS I XXRCNI /READ CONDITIONS IN FROM CARD READER
4431 RCSI=JMS I XXRCSI /SKIP IF INTERRUPT BEING GENERATED
4432 RCTF=JMS I XXRCTF /CLEAR TRANSITION FLAGS
6007 CAF=6007 /CLEAR ALL FLAGS
/

/PRIORITY INTERRUPT RETURN
*0
0000 0000 0
0001 5402 JMP I ,+1 /EXIT FROM INTERRUPT
0002 0000 0 /INTERRUPT RETURN POINTER
0003 7432 HLT /ERROR, SHOULD NEVER REACH HERE
/

*20
/PAGE REFERENCE POINTERS
0020 0212 XXRCSE, XXRCSE
0021 0217 XXRCRA, XXRCRA
0022 0224 XXRCRC, XXRCRC
0023 0231 XXRCRC, XXRCRC
0024 0236 XXRCSD, XXRCSD
0025 0243 XXRCSE, XXRCSE
0026 0250 XXRCRD, XXRCRD
0027 0254 XXRCNO, XXRCNO
0030 0260 XXRCNI, XXRCNI

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0031 0265 XXRCSE, XXRCSE
0032 0272 XXRCTF, XXRCTF
0033 0280 XDCPRT, XDCPRT
0034 0280 XDCPRT, XDCPRT
0035 0286 XTEXT, TSR
0036 0286 XOTY, OTY
0037 0286 XQRLF, CRLF
0040 0274 XIONB, IONB
0041 0280 XIONC, IONC
0042 0286 XIOND, IOND
0043 0286 XIONE, IONE
0044 0286 XIONF, IONF
0045 0286 XLOOP1, LOOP1
0046 0286 XLOOP2, LOOP2
0047 0286 ALPCOD, ALPCD
0050 0286 BINCOD, BINCD
0051 0286 VALCOD, VALCD
0052 0286 CMPCOD, CMPCD
0053 0286 ENDA, ENDA1+1
0054 0286 ENDB, ENDB1+1
0055 0286 ENC, ENDCM1+1
0056 0286 ENV, ENDDL1+1
0057 0286 XMES0, MES9+1
0060 0283 XDATER, DATERR
0061 0284 XRDAT1, RDAT1
0062 0284 XLOOPA, LOOPA
0063 0284 PRINTA, PRINT
0064 0276 XIOTST, IOTST
0065 0280 XDATST, DATST
0066 0280 XHNUAL, HANTST
0067 0280 XCMPE, CMPTST
0070 0224 XVALID, VALTST
0071 0274 UPDAT, UPDATA
/STORAGE AND WORK AREA
0072 0000 COLCNT, 0 /COLUMN COUNT
0073 0000 CRDCNT, 0 /CARD COUNT
0074 0000 MODE, 0 /ALPHA OR BINARY POINTER
0075 0000 MODE1, 0 /TABLE STARTING ADDRESS FOR EACH CARD
0076 0000 DATA, 0 /DATA TABLE POINTER
0077 0000 READ1, 0 /1ST DATA READ
0100 0000 READ2, 0 /2ND DATA READ
0101 0000 DFCNT, 0 /DATA DELAY COUNT
0102 0000 DFCNT1, 0
0103 0000 RDCNT, 0 /READ DELAY COUNT (PERMANENT)
0104 0000 RDCNT1, 0 /READ DELAY COUNT (MODIFIED)
0105 0000 DNFLG, 0 /DONE FLAG DELAY COUNT (PERMANENT)
0106 0000 DNFLG1, 0 /DONE FLAG DELAY COUNT (MODIFIED)
0107 0000 END, 0 /TABLE TERMINATOR
0110 0000 ACSTAT, 0
0111 0000 IOTCNT, 0
0112 0000 CMCHK, 0
0113 0000 VALCHK, 0
/
/CONSTANTS

```


2114 0001 K0001, 0001
 2115 0002 K0002, 0002
 0116 0003 K0003, 0003
 0117 0007 K0007, 0007
 0120 0051 K0051, 51
 0121 0077 K0077, 77
 0122 0121 K0121, 121
 0123 0207 K0207, 207
 0124 0212 K0212, 212
 0125 0215 K0215, 215
 0126 0240 K0240, 240
 0127 0252 K0252, 252
 0130 0260 K0260, 260
 0131 0340 K0340, 340
 0132 0400 K0400, 400
 0133 1000 K1000, 1000
 0134 2000 K2000, 2000
 0135 4000 K4000, 4000
 0136 5252 K5252, 5252
 0137 6632 K6632, 6632
 0140 6634 K6634, 6634
 0141 6636 K6636, 6636
 0142 7777 K7777, 7777
 0143 0377 K377, 377
 0144 7370 K7370, 7370
 0145 7660 K7660, 7660
 0146 7701 K7701, 7701
 0147 7702 K7702, 7702
 0150 7703 K7703, 7703
 0151 7715 K7715, 7715
 0152 7726 K7726, 7726
 0153 7730 K7730, 7730
 0154 7740 K7740, 7740
 0155 7771 K7771, 7771
 0156 7000 K7000, 7000

0200 *200

0220 5465 DATA, JMP I XDATST /DATA TEST
 0221 7402 HLT
 0222 5464 IOT8, JMP I XIOTST /STATIC IOT TESTS
 0223 7402 HLT
 0224 5466 MNVAL, JMP I XMNVAL /MANUAL INTERVENTION TESTS
 0225 7402 HLT
 0226 5467 CMP8E, JMP I XCMP8E /COMPRESSED CODE TEST
 0227 7402 HLT
 0212 5470 VALID, JMP I XVALID /VALIDITY BIT TEST
 0211 7402 HLT

/IOT MODIFICATION SECTION

0212 0000 XRCSE, 0
 0213 6631 6631 /SKIP ON DATA FLAG

0214 7410 SKP
 0215 2212 ISZ XRCSE
 0216 5612 JMP I XRCSE

0217 0000 XRCRA, 0
 0220 7200 CLA
 0221 6632 6632 /READ ALPHA
 0222 5617 JMP I XRCRA
 0223 7402 HLT

0224 0000 XRCRB, 0
 0225 7200 CLA
 0226 6634 6634 /READ BINARY
 0227 5624 JMP I XRCRB
 0230 7402 HLT

0231 0000 XRCRC, 0
 0232 7200 CLA
 0233 6636 6636 /READ COMPRESSED
 0234 5631 JMP I XRCRC
 0235 7402 HLT

0236 0000 XRCSD, 0
 0237 6671 6671 /SKIP ON CARD DONE FLAG
 0240 7410 SKP
 0241 2236 ISZ XRCSD
 0242 5636 JMP I XRCSD

0243 0000 XRCSE, 0
 0244 6672 6672 /START CARD MOTION AND SKIP IF READER READY
 0245 7410 SKP
 0246 2243 ISZ XRCSE
 0247 5643 JMP I XRCSE

0250 0000 XRCRD, 0
 0251 6674 6674 /CLEAR CARD DONE FLAG
 0252 5650 JMP I XRCRD
 0253 7402 HLT

0254 0000 XRCNO, 0
 0255 6635 6635 /READ CONDITIONS OUT TO CARD READER
 0256 5654 JMP I XRCNO
 0257 7402 HLT

0260 0000 XRCNI, 0
 0261 7300 CLA CLL
 0262 6637 6637 /READ CONDITIONS OUT TO CARD READER
 0263 5660 JMP I XRCNI
 0264 7402 HLT

0265 0000 XRCXI, 2
 0266 6675 6675 /SKIP IF INTERRUPT BEING GENERATED
 0267 7410 SKP
 0270 2265 ISZ XRCXI
 0271 5665 JMP I XRCXI

```

0272 0000 XRCTF, 0
0273 6677 /CLEAR TRANSITION FLAGS
0274 5672 JMP I XRCTF
0275 7402 HLT

/TEST CARD READER'S IOT'S WITH READER NOT READY
/THIS TEST MUST RUN SUCCESSFULLY BEFORE THE DATA TEST
/CAN BE ATTEMPTED

/TEST RCSE TO NOT SKIP AND READ CONDITIONS INTO AC
0276 7300 IOTST, CLA CLL
0277 1122 TAD K0121 /SET UP LOOP COUNT
0300 3111 DCA IOTCNT
0301 6007 CAF /CLEAR ALL FLAGS
0302 4425 IOT1, RCSE /SKIP ON READER READY (SHOULD NOT SKIP)
0303 7410 SKP /OK
0304 7402 E1, HLT /ERROR, READER SHOULD NOT BE READY OR RCSE FAILED
0305 4777 JMS CQSTA1 /CHECK CARD READER STATUS BITS

/TEST RCSI TO NOT SKIP
0306 4431 RCSI /SKIP IF INTERRUPT BEING GENERATED
0307 7410 SKP
0310 7402 E2, HLT /ERROR, RCSI SHOULDN'T HAVE SKIPPED
0311 4777 JMS CQSTA1

/TEST RCSE TO NOT SKIP
0312 6002 IOF
0313 4420 RCSE /SKIP ON DATA FLAG (SHOULD NOT SKIP)
0314 7410 SKP
0315 7402 E3, HLT /ERROR, DATA FLAG SHOULD NOT BE SET OR RCSE FAILED
0316 4777 JMS CQSTA1 /CHECK CARD READER STATUS BITS

/TEST RCSD TO NOT SKIP
0317 4424 RCSD /SKIP ON CARD DONE (SHOULD NOT SKIP)
0320 7410 SKP
0321 7402 E4, HLT /ERROR, CARD DONE FLAG SHOULD NOT BE SET OR RCSD FAILED
0322 4777 JMS CQSTA1 /CHECK CARD READER STATUS BITS

/TEST TO MAKE SURE THAT READER ISN'T CAUSING AN INTERRUPT
0323 7200 CLA
0324 1116 TAD K0003 /ENABLE READY/TROUBLE INTERRUPT ENABLE
0325 4427 RCNO
0326 7410 SKP
0327 0335 E5
0330 1327 TAD ,=1 /GET INTERRUPT RETURN
0331 3002 DCA 2 /INITIALIZE RETURN POINTER
0332 6001 ION /TURN ON INTERRUPT
0333 7000 NOP
0334 7410 SKP /SHOULD EXECUTE THIS INSTRUCTION
0335 7402 E5, HLT /ERROR, SOMETHING CAUSED AN ILLEGAL INTERRUPT
0336 6002 IOF
0337 2111 ISE IOTCNT /DO STATIC TEST 4000 TIMES
0340 5302 JMP IOT1

```

```

0341 7200 CLA
0342 1115 TAD K0002 /DISABLE READY/TROUBLE INTERRUPT ENABLE
0343 4435 JMS I XTEXT
0344 2654 MES14 /"IOTS OK"
0345 7402 HLT /END OF IOT TEST

```

/MANUAL TEST

/THIS TEST WILL CHECK CAF INSTRUCTION TO INITIALIZE FLAGS AND ALSO
 /CHECK READY/TROUBLE INTERRUPTION THROUGH OPERATOR INTERVENTION.
 /TEST SHOULD BEGIN WITH EITHER BINARY OR ALPHA CARD DECK IN READER
 /AND CARD READER START DEPRESSED. TEST WILL HALT UPON ERROR WITH
 /ERROR MESSAGE LOCATED IN LISTING. WHEN MANUAL TEST IS COMPLETED
 /SUCCESSFULLY "MANUAL TESTS OK" WILL PRINT OUT ON TELETYPE.

```

/INITIALIZE MANUAL TEST
0377 1000
0400 0400 *400

0400 7200 MANTST, CLA
0401 1144 TAD K7370 /1.0 MSEC DELAY
0402 3103 DCA RCNT
0403 6007 CAF /CLEAR ALL FLAGS
0404 4425 RCSE /SELECT CARD
0405 7410 SKP
0406 5213 JMP ,=5
0407 4435 JMS I XTEXT /"RCSE FAILED OR READER NOT READY"
0410 2425 MES2
0411 4430 RCNT
0412 7402 E0, HLT /ERROR HALT PROGRAM MUST BE REINITIALIZED
0413 1103 TAD RCNT
0414 3102 DCA DFCNT1
0415 3101 DCA DFCNT
0416 4420 RCSE /RCSE = SKIP ON DATA FLAG
0417 7410 SKP
0420 5231 JMP MANTS1
0421 2101 ISE DFCNT
0422 5216 JMP ,=4
0423 2102 ISE DFCNT1 /HAVE WE WAITED LONG ENOUGH FOR DATA FLAG
0424 5216 JMP ,=6 /NO
0425 4435 JMS I XTEXT /ERROR, DIDN'T GET DATA FLAG
0426 2447 MES3
0427 4430 RCNT /READ CONDITIONS INTO AC
0430 7402 E7, HLT /ERROR HALT, PROGRAM MUST BE RE-INITIALIZED

/CHECK CAF TO CLEAR CARD DONE FLAG
0431 4422 MANTS1, RCRB
0432 1103 TAD RCNT
0433 3105 DCA DNPLG
0434 3106 DCA DNPLG1
0435 4424 RCSD /SKIP ON CARD DONE FLAG
0436 7410 SKP

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0437 5256 JMP MANTS2 /HAVE CARD DONE FLAG
0440 2105 ISZ DNFLG
0441 5235 JMP ,=4
0442 2106 ISZ DNFLG1 /WAITED LONG ENOUGH FOR CARD DONE FLAG?
0443 5235 JMP ,=4 /NO
0444 4435 JMS I XTEXT /ERROR, CARD DONE FLAG FAILED TO OCCUR
0445 2525 MES5 /RCSO FAILED OR CARD DONE FLAG DIDN'T SET
0446 4430 RCNI /READ CONDITIONS INTO AC
0447 7402 E8, HLT /ERROR, PROGRAM MUST BE RE-INITIALIZED
0450 4777' MANTS2, JMS COSTA3 /CHECK CARD READER CONDITIONS INTO AC
0451 6007 CAF /CLEAR ALL FLAGS
0452 4424 RCSO /SKIP ON CARD DONE FLAG
0453 7410 SKP
0454 7402 E9, HLT /ERROR, CAF, DID NOT CLEAR CARD DONE FLAG
0455 4776' JMS COSTA1 /CHECK CARD READER CONDITIONS TO AC

/CHECK CAF TO CLEAR DATA FLAG
0456 4425 RCSE /SELECT CARD
0457 5256 JMP ,=1
0460 4420 RCSF
0461 5260 JMP ,=1
0462 4775' JMS COSTA2 /READ CONDITIONS INTO AC
0463 6007 CAF /CLEAR ALL FLAGS
0464 4420 RCSF /SKIP ON DATA FLAG
0465 7410 SKP
0466 7402 E10, HLT /ERROR HLT,CAF SHOULD HAVE CLEARED DATA FLAG
0467 4776' JMS COSTA1 /READ CONDITIONS INTO AC
0470 4422 RCRB
0471 4424 RCSO /SKIP ON CARD DONE FLAG
0472 5271 JMP ,=1
0473 6007 CAF /CLEAR ALL FLAGS

/CHECK "RCNO" TO DISABLE DATA + CARD DONE INTERRUPT ENABLE
0474 7200 CLA /DISABLE DATA + CARD DONE INTERRUPT ENABLE
0475 4427 RCNO /READ AC INTO CARD READER
0476 1301 TAD ,+3
0477 3002 DCA 2
0500 7410 SKP
0501 0520 E11
0502 4425 RCSE /SELECT CARD
0503 5302 JMP ,=1
0504 4420 RCSF /SKIP ON DATA FLAG
0505 5304 JMP ,=1
0506 6001 ION /TURN ON INTERRUPT
0507 7000 NOP
0510 6002 IOF /TURN OFF INTERRUPT
0511 4422 RCRB
0512 4424 RCSO /SKIP ON CARD DONE FLAG
0513 5312 JMP ,=1
0514 6001 ION /TURN ON INTERRUPT
0515 7000 NOP
0516 6002 IOF

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```

0517 7410 SKP
0520 7402 E11, HLT /ERROR, RCNO DID NOT DISABLE DATA+CARD DONE INTERRUPT ENABLE

/CHECK CAF TO ENABLE DATA + CARD DONE INTERRUPT ENABLE
0521 6007 CAF /CLEAR ALL FLAGS
0522 7200 CLA
0523 1042 TAD X10ND
0524 3002 DCA 2
0525 4425 RCSE /SELECT CARD
0526 5325 JMP ,=1
0527 4420 RCSF /SKIP ON DATA FLAG
0530 5327 JMP ,=1
0531 6001 ION /TURN ON INTERRUPT
0532 7000 NOP
0533 6002 IOF /SHOULD NOT GET TO THIS LOCATION
0534 7402 E12, HLT /ERROR, CAF DID NOT ENABLE DATA + CARD DONE INT ENABLE
0535 4422 I0ND, RCRB
0536 4424 RCSO
0537 5336 JMP ,=1
0540 5774' JMP MANTS3

/CHECK TROUBLE TRANSITION INTERRUPT ENABLE
0574 0600
0575 1030
0576 1000
0577 1061
0600 0600 *600

0600 6007 MANTS3, CAF /CLEAR ALL FLAGS
0601 7200 CLA
0602 1043 TAD X10NE
0603 3002 DCA 2
0604 1115 TAD K0002 /ENABLE READY/TROUBLE INTERRUPT
0605 4427 RCNO /READ AC INTO CARD READER
0606 4435 JMS I XTEXT
0607 2777 MES19 /"OPERATOR MUST PRESS READ STOP (G;D;I;)"
/ OR STOP (DOCUMENTATION);"
/TURN ON INTERRUPT

0610 6001 ION
0611 1103 TAD RCNT
0612 3102 DCA DFCNT1
0613 1135 TAD K4000 /DELAY BEFORE MESSAGE RETYPE
0614 3101 DCA DFCNT
0615 2102 ISZ DFCNT1
0616 5215 JMP ,=1
0617 2101 ISZ DFCNT
0620 5215 JMP ,=3
0621 6002 IOF /TURN INTERRUPT OFF
0622 4425 RCSE /ATTEMPT TO SELECT A CARD
0623 5230 JMP ,=5
0624 4435 JMS I XTEXT
0625 2733 MES21 /"READ STOP (G;D;I;) OR STOP (DOCUMENTATION)"
/ WAS NOT PRESSED,RESTART TEST;"

0626 4430 RCNI
0627 7422 E13, HLT /ERROR, TEST MUST BE RESTARTED

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0630 4435 JMS I XTEXT
0631 2666 MES17 /"READY/TROUBLE FLAG DIDN'T CAUSE PROGRAM INTERRUPT"
0632 4430 RCN1 /READ CARD READER FLAGS INTO AC
0633 7432 E14, HLT /ERROR, TEST MUST BE RE-INITIALIZED

/RETURN HERE AFTER PROGRAM INTERRUPT FROM TROUBLE TRANSITION
0634 7200 IONE, CLA
0635 4430 RCN1 /READ CARD READER FLAGS INTO AC
0636 3133 AND K1000 /IS TROUBLE TRANSITION STATUS BIT (AC2) A ONE?
0637 7650 SNA CLA
0640 7402 E15, HLT /ERROR, TROUBLE TRANSITION STATUS BIT (AC2) SHOULD BE A ONE

/CHECK RCN1 TO SKIP WITH TROUBLE TRANSITION FLAG ENABLED
0641 4431 RCN1 /SKIP IF INTERRUPT IS GENERATED
0642 7402 E16, HLT /ERROR, RCN1 SHOULD HAVE SKIPPED

/CLEAR TRANSITION FLOP AND CHECK FOR INTERRUPT
0643 4432 RCTF /CLEAR TRANSITION FLAGS
0644 4431 RCN1
0645 7410 SKP
0646 7402 HLT /ERROR, RCTF DID NOT CLEAR TRANSITION FLOP
0647 1252 TAD ,+3
0650 3002 DCA 2
0651 7410 SKP
0652 7657 E17
0653 6001 ION
0654 7000 NOP
0655 6002 IOF
0656 7410 SKP
0657 7402 E17, HLT /ERROR, RCTF DID NOT DISABLE TRANSITION INTERRUPT
0660 4430 RCN1 /READ CARD READER FLAGS INTO AC
0661 3133 AND K1000 /IS TROUBLE TRANSITION STATUS BIT (AC2) A ZERO?
0662 7440 SZA /YES, SKIP
0663 7402 E18, HLT /ERROR, TROUBLE TRANSITION STATUS BIT SHOULD BE A ZERO

/CHECK READY TRANSITION INTERRUPT ENABLE
0664 6007 MANTS4, CAF /CLEAR ALL FLAGS
0665 7200 CLA
0666 1044 TAD XIONF
0667 3002 DCA 2
0670 1115 TAD K0002 /ENABLE READY/TROUBLE INTERRUPT
0671 4427 RCNO /READ AC INTO CARD READER
0672 4435 JMS I XTEXT
0673 3041 MES18 /"OPERATOR MUST PRESS READ START(G,D,I)
/ OR RESET (DOCUMENTATION),"
/TURN ON INTERRUPT
0674 6001 ION
0675 1103 TAD RCNT
0676 3102 DCA DFCNT1
0677 1135 TAD K0000
0680 3101 DCA DFCNT
0681 2102 ISZ DFCNT1
0682 5301 JMP ,+1
0683 2101 ISZ DFCNT

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0704 5301 JMP ,+3
0705 6002 IOF
0706 4425 RCSE
0707 5314 JMP ,+5
0710 4435 JMS I XTEXT
0711 2666 MES17 /"READY/TROUBLE FLAG DIDN'T CAUSE PROGRAM INTERRUPT"
0712 4430 RCN1 /READ CARD READER FLAGS INTO AC
0713 7402 E19, HLT /ERROR, TEST MUST BE RE-INITIALIZED
0714 4435 JMS I XTEXT
0715 3103 MES22 /"READ START (G,D,I,) OR RESET (DOCUMENTATION)
/WAS NOT PRESSED, RESTART TEST,"
/READ CARD READER FLAGS INTO AC
0716 4430 RCN1
0717 7402 E20, HLT

/RETURN HERE AFTER PROGRAM INTERRUPT FROM READY/TRUE TRANSITION
0720 7200 IONF, CLA
0721 4777 JMS COSTA4 /CHECK READY TRANSITION FLAG
0722 4431 RCN1 /SKIP IF INTERRUPT IS GENERATED
0723 7402 E21, HLT /ERROR, RCN1 SHOULD HAVE SKIPPED

/CLEAR TRANSITION FLOP WITH CAF INSTRUCTION
0724 6007 CAF /CLEAR ALL FLAGS
0725 4431 RCN1 /SKIP IF INTERRUPT IS GENERATED
0726 7410 SKP
0727 7432 E22, HLT /ERROR, CAF DID NOT CLEAR TRANSITION FLOP
0730 1333 TAD ,+3
0731 3002 DCA 2
0732 7410 SKP
0733 0740 E23
0734 6001 ION /TURN ON INTERRUPT
0735 7000 NOP
0736 6002 IOF /TURN OFF INTERRUPT
0737 7410 SKP
0740 7402 E23, HLT /ERROR, CAF DID NOT DISABLE TRANSITION INTERRUPT
0741 4430 RCN1 /READ CARD READER FLAGS INTO AC
0742 3132 AND K0400 /IS READY TRUE STATUS BIT (AC3) A ZERO?
0743 7440 SZA
0744 7402 E24, HLT /ERROR, READY TRUE STATUS BIT (AC3) SHOULD BE A ZERO;
0745 4435 JMS I XTEXT
0746 2721 MES20 /"MANUAL TESTS OK"
0747 7402 HLT

0777 1112
1000 1000 *1000
1000 2000 /CHECK RCN1 WITH CARD READER INITIALIZED
1001 7300 COSTA1, 0
1002 4430 CLA CLL
1003 3110 RCN1
1004 1110 DCA ACSTAT
1005 3132 TAD ACSTAT /LOAD CARD READER STATUS BITS INTO AC
1006 7440 AND K0400 /IS READY TRUE TRANSITION STATUS BIT (AC3) A ZERO?
/YES, SKIP

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/CR8E/CR8F CARD READER TEST PAL10 V141 22-MAY-72 18104 PAGE 1-10

1027 7402 E25, HLT /ERROR, READY TRUE TRANSITION STATUS BIT (AC3) SHOULD BE ZERO
1010 7300 CLA CLL
1011 1110 TAD ACSTAT /LOAD CARD READER STATUS BITS INTO AC
1012 0133 AND K1000 /IS TROUBLE TRANSITION STATUS BIT (AC2) A ZERO
1013 7440 SEA /YES, SKIP
1014 7402 E26, HLT /ERROR, TROUBLE TRANSITION STATUS BIT (AC2) SHOULD BE ZERO
1015 7300 CLA CLL
1016 1110 TAD ACSTAT /LOAD CARD READER STATUS BITS INTO AC
1017 0134 AND K2000 /IS CARD DONE STATUS BIT (AC1) A ZERO?
1020 7440 SEA /YES, SKIP
1021 7402 E27, HLT /ERROR, CARD DONE STATUS BIT (AC1) SHOULD BE ZERO
1022 7300 CLA CLL
1023 1110 TAD ACSTAT /LOAD CARD READER STATUS BITS INTO AC
1024 0135 AND K4000 /IS DATA READY STATUS BIT (AC0) A ZERO?
1025 7440 SEA /YES, SKIP
1026 7402 E28, HLT /ERROR, DATA READY STATUS BIT (AC0) SHOULD BE A ZERO
1027 5600 JMP I COSTA1

/CHECK RCNI WITH DATA FLAG ENABLED
COSTA2, 0
1030 0000 CLA CLL
1031 7300 RCNI
1032 4430 DCA ACSTAT
1033 3110 TAD ACSTAT /LOAD CARD READER STATUS BITS INTO AC
1034 1110 AND K0400 /IS READY TRUE TRANSITION STATUS BIT (AC3) A ZERO?
1035 0132 SEA /YES, SKIP
1036 7440 E29, HLT /ERROR, READY TRUE TRANSITION STATUS BIT (AC3) SHOULD BE A ZERO
1037 7402 CLA CLL
1038 7300 TAD ACSTAT /LOAD CARD READER STATUS BITS INTO AC
1041 1110 AND K1000 /IS TROUBLE TRANSITION STATUS BIT (AC2) A ZERO
1042 0133 SEA /YES, SKIP
1043 7440

1044 7402 E30, HLT /ERROR, TROUBLE TRANSITION STATUS BIT (AC2) SHOULD BE A ZERO
1045 7300 CLA CLL
1046 1110 TAD ACSTAT /LOAD CARD READER STATUS BITS INTO AC
1047 0134 AND K2000 /IS CARD DONE STATUS BIT (AC1) A ZERO
1050 7440 SEA /YES, SKIP
1051 7402 E31, HLT /ERROR, CARD DONE STATUS BIT (AC1) SHOULD BE A ZERO
1052 7300 CLA CLL
1053 1110 TAD ACSTAT /LOAD CARD READER STATUS BITS INTO AC
1054 0135 AND K4000 /IS DATA READY STATUS BIT (AC0) A ONE
1055 7450 SNA /YES, SKIP
1056 7402 E32, HLT /ERROR, DATA READY STATUS BIT (AC0) SHOULD BE A ONE
1057 7200 CLA
1060 5630 JMP I COSTA2

/CHECK RCNI WITH CARD DONE FLAG ENABLED
COSTA3, 0
1061 0000 RCRB /CLEAR DATA READY
1062 4422 RCNI
1063 4430 DCA ACSTAT
1064 3110 TAD ACSTAT /LOAD CARD READER STATUS BITS INTO AC
1065 1110 AND K0400 /IS READY TRUE TRANSITION STATUS BIT (AC3) A ZERO?
1066 0132 SEA /YES, SKIP
1067 7440

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/CR8E/CR8F CARD READER TEST PAL10 V141 22-MAY-72 18104 PAGE 1-11

1070 7402 E33, HLT /ERROR, READY TRUE TRANSITION STATUS BIT (AC3) SHOULD BE A ZERO
1071 7300 CLA CLL
1072 1110 TAD ACSTAT /LOAD CARD READER STATUS BITS INTO AC
1073 0133 AND K1000 /IS TROUBLE TRANSITION STATUS BIT (AC2) A ZERO
1074 7440 SEA /YES, SKIP
1075 7402 E34, HLT /ERROR, TROUBLE TRANSITION STATUS BIT (AC2) SHOULD BE A ZERO
1076 7300 CLA CLL
1077 1110 TAD ACSTAT /LOAD CARD READER STATUS BITS INTO AC
1080 0134 AND K2000 /IS CARD DONE STATUS BIT (AC1) A ONE
1081 7450 SNA /YES, SKIP
1082 7402 E35, HLT /ERROR, CARD DONE STATUS BIT (AC1) SHOULD BE A ONE
1083 7300 CLA CLL
1084 1110 TAD ACSTAT /LOAD CARD READER STATUS BITS INTO AC
1085 0135 AND K4000 /IS DATA READY STATUS BIT (AC0) A ZERO
1086 7440 SEA /YES, SKIP
1087 7402 E36, HLT /ERROR, DATA READY STATUS BIT (AC0) SHOULD BE A ZERO
1088 7200 CLA
1089 5661 JMP I COSTA3

/CHECK RCNI WITH READY TRUE TRANSITION ENABLED
COSTA4, 0
1112 0000 CLA CLL
1113 7300 RCNI
1114 4430 DCA ACSTAT
1115 3110 TAD ACSTAT /LOAD CARD READER STATUS BITS INTO AC
1116 1110 AND K0400 /IS READY TRUE TRANSITION STATUS BIT (AC3) A ONE
1117 0132 SNA /YES, SKIP
1120 7450 E37, HLT /ERROR, READY TRUE TRANSITION STATUS BIT (AC3) SHOULD BE A ONE
1121 7402 CLA CLL
1122 7300 TAD ACSTAT /LOAD CARD READER STATUS BITS INTO AC
1123 1110 AND K1000 /IS TROUBLE TRANSITION STATUS BIT (AC2) A ZERO
1124 0133 SEA /YES, SKIP
1125 7440 E38, HLT /ERROR, TROUBLE TRANSITION STATUS BIT (AC2) SHOULD BE A ZERO
1126 7402 CLA CLL
1127 7300 TAD ACSTAT /LOAD CARD READER STATUS BITS INTO AC
1130 1110 AND K2000 /IS CARD DONE STATUS BIT (AC1) A ZERO
1131 0134 SEA /YES, SKIP
1132 7440 E39, HLT /ERROR, CARD DONE STATUS BIT (AC1) SHOULD BE A ZERO
1133 7402 CLA CLL
1134 7300 TAD ACSTAT /LOAD CARD READER STATUS BITS INTO AC
1135 1110 AND K4000 /IS DATA READY STATUS BIT (AC0) A ZERO
1136 0135 SNA /YES, SKIP
1137 7440 E40, HLT /ERROR, DATA READY STATUS BIT (AC0) SHOULD BE A ZERO
1140 7402 CLA
1141 7200 JMP I COSTA4
1142 5712

1200 *1200
/TEST COMPRESSED CODE OF ALPHA DECK WITH COMPRESSED
/COE TABLE AND VERIFY THAT VALIDITY BIT (ACF) DOES NOT SET

1200 7300 CMPTST, CLA CLL
1201 3113 DCA VALCHK
1202 1144 TAD K7370 /1.0 MSEC DELAY

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1203 3103 DCA RDCNT
1204 1052 TAD CMPCOD /SET MODE TO COMPRESSED
1205 3074 DCA MODE
1206 1074 TAD MODE
1207 3075 DCA MODE1
1210 1150 TAD K7703 /SET "C" IN TYP0UT
1211 3457 DCA I XMES9
1212 1141 TAD K6636 /STORE COMPRESSED CODE 10T
1213 3777' DCA RDATA1
1214 1777' TAD RDATA1
1215 3776' DCA RDATA2
1216 2112 ISZ CMCHK /COMPRESSED CODE INDICATOR
1217 1055 TAD ENC /SET UP COMPRESSED TABLE TERMINATOR
1220 3107 DCA END
1221 1145 TAD K7660
1222 3073 DCA CRDCNT /INITIALIZE 80 CARD COUNT
1223 5445 JMP I XLOOP1 /TEST ALPHA CARD DECK IN COMPRESSED MODE

```

/EXERCISE VALIDITY BIT (0) TO DETECT ERRORS BY READING BINARY
/DECK IN THE COMPRESSED MODE

```

1224 7300 VALTST, CLA CLL
1225 3112 DCA CMCHK
1226 2113 ISZ VALCHK
1227 1144 TAD K7370 /1.0 MSEC DELAY
1230 3103 DCA RDCNT
1231 1051 TAD VALCOD /SET MODE TO VALIDITY
1232 3074 DCA MODE
1233 1074 TAD MODE
1234 3075 DCA MODE1
1235 1152 TAD K7726 /SET "V" IN TYP0UT
1236 3457 DCA I XMES9
1237 1141 TAD K6636 /STORE COMPRESSED CODE 10T
1240 3777' DCA RDATA1
1241 1777' TAD RDATA1
1242 3776' DCA RDATA2
1243 1145 TAD K7660
1244 3073 DCA CRDCNT /INITIALIZE 80 CARD COUNT
1245 1056 TAD ENV /SET UP VALIDITY TABLE TERMINATOR
1246 3107 DCA END
1247 5445 JMP I XLOOP1 /EXERCISE VALIDITY BIT

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```

1376 1617
1377 1604
1400
*1400
/INITIALIZE DATA ROUTINE FOR POP-08
DATSY, CAF /CLEAR ALL FLAGS
1401 7200 CLA
1402 1144 TAD K7370 /1.0 MSEC DELAY
1403 3103 DCA RDCNT
1404 7200 CLA
1405 3112 DCA CMCHK /CLEAR COMPRESSED MODE INDICATOR
1406 3113 DCA VALCHK /CLEAR VALIDITY MODE INDICATOR

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```

1407 7604 /DATA TEST
1410 7710 BEGIN, LAS /TEST AC SW0 = 1 FOR BINARY = 0 FOR ALPHA
1411 5222 JMP SETBIN
1412 1047 TAD ALPCOD
1413 3074 DCA MODE /SET MODE TO ALPHA
1414 1146 TAD K7701
1415 3457 DCA I XMES9 /SET "A" IN TYPEOUT
1416 1053 TAD ENDA /SET UP ALPHA TABLE TERMINATOR
1417 3107 DCA END
1420 1137 TAD K6632
1421 5231 JMP ,*10
1422 1050 SETBIN, TAD BINCOD
1423 3074 DCA MODE /SET MODE TO BINARY
1424 1147 TAD K7702
1425 3457 DCA I XMES9 /SET "B" IN TYPEOUT
1426 1054 TAD ENDB /SET UP BINARY TABLE TERMINATOR
1427 3107 DCA END
1430 1140 TAD K6634
1431 3777' DCA RDATA1
1432 1777' TAD RDATA1
1433 3776' DCA RDATA2
1434 1145 TAD K7660
1435 3073 DCA CRDCNT /INITIALIZE 80 CARD COUNT
1436 1074 TAD MODE
1437 3075 DCA MODE1
1440 1075 LOOP1, TAD MODE1
1441 3076 DCA DATA
1442 1145 LOOPA, TAD K7660
1443 3072 DCA COLCNT
1444 4424 RCSD /INITIALIZE 80 COLUMN COUNT
1445 5252 JMP ,*5 /RCSD = SKIP ON CARD DONE FLAG
1446 4435 JMS I XTEXT /OK, DID NOT SKIP
1447 2371 MES1 /ERROR, RCSD SHOULDN'T HAVE SKIPPED
1450 4430 RCNI /"RCSD FAILED OR CARD DONE FLAG PRESENT AT WRONG TIME"
1451 7402 E41, HLT /ERROR HALT, PROGRAM MUST BE RE-INITIALIZED
1452 4425 RCSE /RCSE = SELECT CARD, SKIP ON READER READY
1453 7410 SKP /ERROR, RCSE DID NOT SKIP
1454 5261 JMP ,*5 /OK
1455 4435 JMS I XTEXT /
1456 2425 MES2 /"RCSE FAILED OR READER NOT READY"
1457 4430 RCNI
1460 7402 E42, HLT /ERROR HALT, PROGRAM MUST BE RE-INITIALIZED
1461 1103 LOOP2, TAD RDCNT
1462 3102 DCA OFCNT1
1463 3101 DCA OFCNT
1464 4420 RCSE /RCSE = SKIP ON DATA FLAG
1465 7410 SKP
1466 5277 JMP E43+1 /HAVE DATA FLAG, GO READ DATA
1467 2101 ISZ OFCNT
1470 5264 JMP ,*4
1471 2102 ISZ OFCNT1 /HAVE WE WAITED LONG ENOUGH FOR DATA FLAG
1472 5264 JMP ,*6 /NO
1473 4435 JMS I XTEXT /ERROR, DIDN'T GET DATA FLAG
1474 2447 MES3 /"RCSE FAILED OR DATA READY FLAG DIDN'T SET"

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/CR8E/CR8F CARD READER TEST    PAL10  V141  22-MAY-72    10104    PAGE 1-14

1475 4430      RCNI      /HEAD CARD READER FLAGS INTO AC
1476 7402      E43,      HLT      /ERROR HALT, PROGRAM MUST BE RE-INITIALIZED
1477 4430      RCNI      /READ FLAGS INTO AC
1500 2135      AND K4000  /IS DATA READY STATUS BIT (AC0) A ONE?
1501 7650      SNA CLA
1502 7402      E43A,     HLT      /ERROR, DATA READY STATUS BIT (AC0) SHOULD BE A ONE
1503 1041      TAD X10NC
1504 3002      DCA 2
1505 6001      ION      /TURN ON INTERRUPT
1506 7000      NOP      /DATA FLAG SHOULD CAUSE INTERRUPT NOW
1507 6002      IOF
1510 4435      JMS I XTEXT /ERROR NO INTERRUPT OCCURRED
1511 2476      MES4      /"DATA FLAG DIDNT CAUSE PROGRAM INTERRUPT"
1512 4430      RCNI
1513 7402      E44,      HLT      /ERROR HALT, PROGRAM MUST BE RE-INITIALIZED

1576 1617
1577 1604
1600 1600      *1600

/RETURN HERE AFTER PROGRAM INTERRUPT
10NC, RCSF
1601 4420      JMP .-1
1602 5200      RCSF
1603 4431      /SKIP IF DATA READY INTERRUPT IS GENERATED
1604 7402      E45,      HLT      /ERROR, RCSF DIDN'T SKIP ON DATA READY INTERRUPT
1605 7000      RDATA1, 0 /RCRA OR RCRB, READ ALPHA OR BINARY DATA
1606 3077      DCA READ1 /SAVE READ 1
1607 4430      RCNI      /READ FLAGS INTO THE AC
1608 0135      AND K4000  /DID DATA READY FLAG CLEAR
1609 7440      SZA      /YES SKIP
1610 7402      E46,      HLT      /ERROR, DATA READY STATUS BIT DIDN'T CLEAR
1611 7200      CLA
1612 1103      TAD RDCNT
1613 3104      DCA RDCNT1
1614 2104      ISZ RDCNT1
1615 5215      JMP .-1 /DELAY BEFORE RE-READ
1616 7000      RDATA2, 0 /DO 2ND READ
1617 3100      DCA READ2 /SAVE READ 2
1618 1077      RDCHCK, TAD READ1
1619 7041      CIA
1620 1100      TAD READ2
1621 7640      SZA CLA /DOES READ1 = READ2 ?
1622 5460      JMP I XDATER /NO, GO TO ERROR ROUTINE
1623 1077      TAD READ1 /YES
1624 7041      CIA
1625 1476      TAD I DATA
1626 7640      SZA CLA /DOES READ = EXPECTED DATA?
1627 5460      JMP I XDATER /NO, GO TO ERROR ROUTINE
1628 2076      ISZ DATA /+1 TO DATA TABLE
1629 4471      JMS I UPDAT
1630 2072      ISZ COLCNT /FINISHED 80 COLUMNS?
1631 5200      JMP IONC
1632 5240      JMP RDONE
1640 1103      RDONE, TAD RDCNT /TEST CARD DONE FLAG

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/CR8E/CR8F CARD READER TEST    PAL10  V141  22-MAY-72    10104    PAGE 1-15

1641 3105      DCA DNFLG
1642 3106      DCA DNFLG1
1643 4424      RCSD      /RCSD = SKIP ON CARD DONE FLAG
1644 7410      SKP
1645 5256      JMP E48+1 /HAVE CARD DONE FLAG
1646 2105      ISZ DNFLG
1647 5243      JMP .-4
1648 2106      ISZ DNFLG1
1649 5243      JMP .-6
1650 4435      JMS I XTEXT /ERROR, CARD DONE FAILED TO OCCUR
1651 2525      MES5      /"RCSD FAILED OR CARD DONE FLAG DIDN'T SET"
1652 4430      RCNI
1653 7402      E48,      HLT      /ERROR HALT, PROGRAM MUST BE RE-INITIALIZED
1654 4430      RCNI
1655 0134      AND K2000  /DID CARD DONE STATUS BIT (AC1) SET
1656 7650      SNA CLA
1657 7402      E49,      HLT      /ERROR, CARD DONE STATUS BIT (AC1) DID NOT SET
1658 7200      CLA
1659 1040      TAD X10NB
1660 3002      DCA 2 /CHECK FLAG STATUS BITS INTO THE AC
1661 6001      ION      /TURN ON INTERRUPT
1662 7000      NOP      /CARD DONE FLAG SHOULD CAUSE INTERRUPT NOW
1663 6002      IOF
1664 4435      JMS I XTEXT /ERROR, NO INTERRUPT OCCURRED
1665 2554      MES6      /"CARD DONE FLAG DIDN'T CAUSE PROGRAM INTERRUPT"
1666 4430      RCNI
1667 7402      E50,      HLT      /ERROR HALT, PROGRAM MUST BE RE-INITIALIZED
1668 4431      IONB,     RCSF /SKIP IF CARD DONE FLAG IS A ONE
1669 7402      E51,      HLT      /ERROR, RCSF DIDN'T SKIP ON CARD DONE INTERRUPT
1670 4426      RCRD      /RCRD = CLEAR CARD DONE FLAG
1671 4424      RCSD      /RCSD = SKIP ON CARD DONE FLAG
1672 5305      JMP .-5 /OK
1673 4435      JMS I XTEXT /ERROR, RCRD FAILED
1674 2605      MES7      /"RCRD DIDN'T CLEAR DONE FLAG"
1675 4430      RCNI      /READ FLAGS INTO THE AC
1676 7402      E52,      HLT      /ERROR HALT, PROGRAM MUST BE RE-INITIALIZED
1677 4426      /
1678 4422      RCRD      /CLEAR CARD DONE
1679 2073      RCRB      /CLEAR DATA READY
1680 7410      ISZ CRDCNT
1681 5777'      SKP
1682 7604      JMP FINIS
1683 7006      LAS
1684 7006      RTL
1685 7006      RTL
1686 3104      DCA RDCNT1
1687 2104      ISZ RDCNT1
1688 5316      JMP .-1
1689 2075      ISZ MODE1
1690 7200      CLA
1691 5445      JMP I XLOOP1
1692 2000
1693 2000      *2000
2020 7200      FINIS, CLA

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2001 1123 TAD K0207
2002 4436 JMS I XOTY
2003 1127 TAD K0252
2004 4436 JMS I XOTY /RING BELL AND PRINT "B" AT END OF TEST DECK
2005 7004 LAS
2006 7004 RAL
2007 7006 RTL
2008 7500 SMA
2009 7402 HLT /TEST SW 3=1 TO CONTINUE WITH NEXT TEST DECK,
2010 7300 /HALT AT END OF TEST DECK
2011 1112 CLA CLL
2012 7402 TAD CMCHK /COMPRESSED MODE?
2013 1112 SZA
2014 7440 JMP I XCMPS8
2015 5467 TAD VALCHK /VALIDITY CHECK MODE?
2016 1113 SZA
2017 7440 JMP I XVALID /RESTART DATA TEST
2020 5470 JMP I ,+1
2021 5622 BEGIN
2022 1407

/
/HAVE A DATA ERROR
/SW 1 = 0 PRINT ERROR
/SW 2 = 0 HALT ON ERROR
2023 7604 DATERR, LAS
2024 7004 RAL
2025 7500 SMA /DOES SW 1 = 0 TO PRINT ERROR?
2026 4234 JMS PRINT /YES
2027 7604 LAS
2028 7006 RTL
2031 7700 SMA CLA /DOES SW 2 = 0 TO HALT ON ERROR
2032 7402 HLT /YES
2033 5777 JMP RDONE

/
/PRINT ERROR MESSAGE
PRINT, 0
2034 1000 JMS I XTEXT
2035 4435 MES9 /A OR B = CD
2036 2627 TAD CRDCNT
2037 1073 TAD K0121
2040 1122 JMS I XDCPRT
2041 4433 JMS I XTEXT
2042 4435 MES10 /CL
2043 2634 TAD COLCNT
2044 1072 TAD K0121
2045 1122 JMS I XDCPRT
2046 4433 JMS I XTEXT
2047 4435 MES11 /G
2050 2640 TAD I DATA
2051 1476 JMS I XDCPRT
2052 4434 JMS I XTEXT
2053 4435 MES12 /R1
2054 2644 TAD READ1
2055 1077 JMS I XDCPRT /PRINT 1ST READ
2056 4434 JMS I XTEXT
2057 4435

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2060 2650 MES13 /R2
2061 1100 TAD READ2
2062 4434 JMS I XDCPRT /PRINT 2ND READ
2063 4437 JMS I XCRLF
2064 5634 JMP I PRINT
2065 0000 /TYPE CHARACTER IN AC
2066 6046 OTY, 0
2067 6041 TFS
2070 5267 TSF
2071 6042 JMP ,=1
2072 7200 TCF
2073 5665 CLA
JMP I OTY

/
2074 0000 UPDATA, 0
2075 1076 TAD DATA /TEST FOR END OF DATA TABLE
2076 7041 CIA
2077 1107 TAD END
2100 7640 SZA CLA
2101 5304 JMP ,+3
2102 1074 TAD MODE /YES, WE ARE AT END OF DATA TABLE
2103 3076 DCA DATA /RE-INITIALIZE DATA TABLE
2104 5674 JMP I UPDATA

/
2177 1640
2200 *2200
/
/PRINT OCTAL NUMBER IN AC
2200 0000 OCTPRT, 0
2201 3222 DCA OCT1
2202 1222 TAD OCT1
2203 7006 RTL
2204 7006 RTL
2205 4223 JMS OCT2 /PRINT 1ST DIGIT
2206 1222 TAD OCT1
2207 7012 RTR
2210 7012 RTR
2211 7012 JMS OCT2 /PRINT 2ND DIGIT
2212 4223 TAD OCT1
2213 1222 RTR
2214 7012 RAR
2215 7010 JMS OCT2 /PRINT 3RD DIGIT
2216 4223 TAD OCT1
2217 1222 JMS OCT2 /PRINT 4TH DIGIT
2220 4223 JMP I OCTPRT
2221 5600
2222 0000 OCT1, 0
2223 0000 OCT2, 0
2224 1117 AND K0007
2225 1130 TAD K0260
2226 4436 JMS I XOTY
2227 5623 JMP I OCT2

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                /TYPE DECIMAL DIGIT IN AC
2230 7070      DECPRT, 0
2231 7510      SPA
2232 7040      CMA
2233 3267      DCA VALUE      /SAVE INPUT
2234 1264      TAD CNTRZA
2235 3271      DCA CNTRZB      /SET COUNTER TO TWO
2236 1263      TAD ADDRZA
2237 3244      DCA ARROW
2240 7410      SKP
2241 3267      DCA VALUE
2242 7100      CLL
2243 1267      TAD VALUE
2244 1265      ARROW, TAD TENPWR      /SUBTRACT POWER OF TEN
2245 7430      SZL
2246 2270      ISZ DIGIT      /DEVELOP BCD DIGIT
2247 7430      SZL
2250 5241      JMP ARROW=3      /LOOP
2251 7200      CLA      /HAVE BCD DIGIT
2252 1270      TAD DIGIT      /GET DIGIT
2253 1130      TAD K0260      /MAKE ASCII
2254 4436      JMS I XOTY      /PRINT
2255 7200      CLA
2256 3270      DCA DIGIT      /CLEAR
2257 2244      ISZ ARROW      /UPDATE POINTER
2260 2271      ISZ CNTRZB      /DONE
2261 5243      JMP ARROW=1      /NO

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2262 5630      JMP I DECPRT      /YES
2263 1265      ADDRZA, TAD TENPWR
2264 7776      CNTRZA, -2
2265 7766      TENPWR, -12
2266 7777      -1
2267 0000      VALUE, 0
2270 0000      DIGIT, 0
2271 0000      CNTRZB, 0

2300          *2300
2300 4425      /SCOPE LOOP TEST
2301 7402      SCOPE, RCSE      /SKIP ON READY AND SELECT CARD
2302 7200      HLT      /ERROR OR NO CARDS IN READER
2303 1145      CLA
2304 3072      TAD K7660
2305 4420      DCA COLCNT
2306 5305      RGSF      /SKIP ON DATA READY
2307 4422      JMP ,=1
2310 2072      RCRB      /READ BINARY DATA
2311 5305      ISZ COLCNT
2312 4424      JMP ,=4
2313 5312      RCRD      /SKIP ON CARD DONE
2314 4426      JMP ,=1
2315 5300      RCRD      /CLEAR CARD DONE FLAG
2315 5300      JMP SCOPE      /GET NEXT CARD

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                /TAPE 2
                /TYPE TEXT
2316 0000      TSR, 0
2317 7200      CLA
2320 1716      TAD I TSR
2321 2316      ISZ TSR
2322 3010      DCA 10
2323 1410      TAD I 10      /GET CHARACTER
2324 3335      DCA TSR1
2325 1335      TAD TSR1
2326 7012      RTR
2327 7012      RTR
2330 7012      RTR
2331 4336      JMS TSR2      /PRINT LEFT CHARACTER
2332 1335      TAD TSR1
2333 4336      JMS TSR2      /PRINT RIGHT CHARACTER
2334 5323      JMP TSR=5
2335 0000      TSR1, 0
2336 0000      TSR2, 0
2337 0121      AND K0077
2340 7450      SNA      /IS CODE = 00
2341 5716      JMP I TSR      /YES EXIT
2342 7040      CMA
2343 0121      AND K0077
2344 7440      SZA      /IS CODE = 77
2345 5350      JMP ,=3      /NO
2346 4437      JMS I XCRLF      /YES CR-LF

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| | | | |
|------|------|------------|-------------------------------------|
| 2347 | 5736 | JMP I TSR2 | |
| 2350 | 7040 | CMA | |
| 2351 | 0121 | AND K0077 | |
| 2352 | 1154 | TAD K7740 | /RECOMBINE ASCII WITH STRIPPED CODE |
| 2353 | 7500 | SMA | |
| 2354 | 5357 | JMP ,+3 | |
| 2355 | 1131 | TAD K0340 | /CHARACTER WAS < 40, ADD 300 |
| 2356 | 7410 | SKP | |
| 2357 | 1126 | TAD K0240 | /CHARACTER WAS > 40, ADD 200 |
| 2360 | 4436 | JMS I XOTY | /PRINT CHARACTER |
| 2361 | 5736 | JMP I TSR2 | /EXIT |

/CARRIAGE RETURN = LINE FEED

| | | | |
|------|------|------------|---|
| 2362 | 0000 | CRLF, | 0 |
| 2363 | 7200 | CLA | |
| 2364 | 1125 | TAD K0215 | |
| 2365 | 4436 | JMS I XOTY | |
| 2366 | 1124 | TAD K0212 | |
| 2367 | 4436 | JMS I XOTY | |
| 2370 | 5762 | JMP I CRLF | |

/RCSO FAILED OR CARD DONE FLAG PRESENT AT WRONG TIME

| | | | |
|------|------|-------|------|
| 2371 | 2371 | MES1, | 1 |
| 2372 | 7722 | | 7722 |
| 2373 | 0323 | | 0323 |
| 2374 | 0440 | | 0440 |
| 2375 | 0601 | | 0601 |
| 2376 | 1114 | | 1114 |
| 2377 | 0504 | | 0504 |
| 2400 | 4017 | | 4017 |
| 2401 | 2240 | | 2240 |
| 2402 | 0301 | | 0301 |
| 2403 | 2204 | | 2204 |
| 2404 | 4004 | | 4004 |
| 2405 | 1716 | | 1716 |
| 2406 | 0540 | | 0540 |
| 2407 | 0614 | | 0614 |
| 2410 | 0107 | | 0107 |
| 2411 | 4020 | | 4020 |
| 2412 | 2205 | | 2205 |
| 2413 | 2305 | | 2305 |
| 2414 | 1624 | | 1624 |
| 2415 | 4001 | | 4001 |
| 2416 | 2440 | | 2440 |
| 2417 | 2722 | | 2722 |
| 2420 | 1716 | | 1716 |
| 2421 | 0740 | | 0740 |
| 2422 | 2411 | | 2411 |
| 2423 | 1505 | | 1505 |
| 2424 | 7700 | | 7700 |

/RCSE FAILED OR READER NOT READY

| | | | |
|------|------|-------|------|
| 2425 | 2425 | MES2, | 1 |
| 2426 | 7722 | | 7722 |
| 2427 | 0323 | | 0323 |
| 2430 | 0540 | | 0540 |
| 2431 | 0601 | | 0601 |

| | | | |
|------|------|--|------|
| 2432 | 1114 | | 1114 |
| 2433 | 0504 | | 0504 |
| 2434 | 4017 | | 4017 |
| 2435 | 2240 | | 2240 |
| 2436 | 2205 | | 2205 |
| 2437 | 0104 | | 0104 |
| 2440 | 0522 | | 0522 |
| 2441 | 4016 | | 4016 |
| 2442 | 1724 | | 1724 |
| 2443 | 4022 | | 4022 |
| 2444 | 0501 | | 0501 |
| 2445 | 0431 | | 0431 |
| 2446 | 7700 | | 7700 |

/RCSF FAILED OR DATA READY FLAG DIDN'T SET

| | | | |
|------|------|-------|------|
| 2447 | 2447 | MES3, | 1 |
| 2450 | 7722 | | 7722 |
| 2451 | 0323 | | 0323 |
| 2452 | 0640 | | 0640 |
| 2453 | 0601 | | 0601 |
| 2454 | 1114 | | 1114 |
| 2455 | 0504 | | 0504 |
| 2456 | 4017 | | 4017 |
| 2457 | 2240 | | 2240 |
| 2460 | 0401 | | 0401 |
| 2461 | 2401 | | 2401 |
| 2462 | 4022 | | 4022 |
| 2463 | 0501 | | 0501 |
| 2464 | 0431 | | 0431 |
| 2465 | 4006 | | 4006 |
| 2466 | 1401 | | 1401 |
| 2467 | 0740 | | 0740 |
| 2470 | 0411 | | 0411 |
| 2471 | 0416 | | 0416 |
| 2472 | 4724 | | 4724 |
| 2473 | 4023 | | 4023 |
| 2474 | 0524 | | 0524 |
| 2475 | 7700 | | 7700 |

/DATA FLAG DIDN'T CAUSE PROGRAM INTERRUPT

| | | | |
|------|------|-------|------|
| 2476 | 2476 | MES4, | 1 |
| 2477 | 7704 | | 7704 |
| 2500 | 0124 | | 0124 |
| 2501 | 0140 | | 0140 |
| 2502 | 0614 | | 0614 |
| 2503 | 0107 | | 0107 |
| 2504 | 4004 | | 4004 |
| 2505 | 1104 | | 1104 |
| 2506 | 1647 | | 1647 |
| 2507 | 2440 | | 2440 |
| 2510 | 0301 | | 0301 |
| 2511 | 2523 | | 2523 |
| 2512 | 0540 | | 0540 |
| 2513 | 2022 | | 2022 |
| 2514 | 1707 | | 1707 |
| 2515 | 2201 | | 2201 |

2516 1540 1540
2517 1116 1116
2520 2405 2405
2521 2222 2222
2522 2520 2520
2523 2477 2477
2524 0000 0000

/RCSD FAILED OR CARD DONE FLAG DIDN'T SET

2525 2525
2526 7722
2527 0323
2530 0440
2531 0601
2532 1114
2533 0504
2534 4017
2535 2240
2536 0301
2537 2204
2540 4004
2541 1716
2542 0540
2543 0614
2544 0107
2545 4004
2546 1104
2547 1647
2550 2440
2551 2305
2552 2477
2553 0000

/CARD DONE FLAGS DIDN'T CAUSE PROGRAM INTERRUPT

2554 2554
2555 7703
2556 0122
2557 0440
2560 0417
2561 1605
2562 4006
2563 1401
2564 0740
2565 0411
2566 0416
2567 4724
2570 4003
2571 0125
2572 2305
2573 4020
2574 2217
2575 0722
2576 0115
2577 4011
2600 1624
2601 0522

2602 2225 2225
2603 2024 2024
2604 7700 7700

/RCRD DIDN'T CLEAR CARD DONE FLAG

2605 2605
2606 2203
2607 2204

2610 4004
2611 1104
2612 1647
2613 2440
2614 0314
2615 0501
2616 2240
2617 0301
2620 2204
2621 4004
2622 1716
2623 0540
2624 0614
2625 0107
2626 7700

/ALPHA OR BINARY DECK

2627 2627
2630 7700
2631 4040
2632 0304
2633 5500
2634 2634
2635 4040
2636 0314
2637 5500
2640 2640

/MODIFIED (A OR B)

2641 4040
2642 0755
2643 0000
2644 2644
2645 4040
2646 2261
2647 5500
2650 2650
2651 4040
2652 2262
2653 5500
2654 2654
2655 7711
2656 1724
2657 2340
2660 1713
2661 7700

2662 2662

/GL

/E

/R1

/R2

/LOTS OK

/B

| | | |
|--|------|------|
| 2663 | 4040 | 4040 |
| 2664 | 0255 | 0255 |
| 2665 | 2000 | 0000 |
| /READY/TROUBLE FLAG DIDN'T CAUSE PROGRAM INTERRUPT | | |
| MES17, , | | |
| 2666 | 2666 | 7722 |
| 2667 | 7722 | 0501 |
| 2670 | 0501 | 0431 |
| 2671 | 0431 | 3424 |
| 2672 | 3424 | 2217 |
| 2673 | 2217 | 2502 |
| 2674 | 2502 | 1405 |
| 2675 | 1405 | 4006 |
| 2676 | 4006 | 1401 |
| 2677 | 1401 | 0740 |
| 2700 | 0740 | 0411 |
| 2701 | 0411 | 0416 |
| 2702 | 0416 | 4724 |
| 2703 | 4724 | 4003 |
| 2704 | 4003 | 0125 |
| 2705 | 0125 | 2305 |
| 2706 | 2305 | 4020 |
| 2707 | 4020 | 2217 |
| 2710 | 2217 | 0722 |
| 2711 | 0722 | 0115 |
| 2712 | 0115 | 4011 |
| 2713 | 4011 | 1624 |
| 2714 | 1624 | 0522 |
| 2715 | 0522 | 2225 |
| 2716 | 2225 | 2024 |
| 2717 | 2024 | 7700 |
| 2720 | 7700 | |

/MANUAL TESTS OK

| | | |
|------|------|----------|
| 2721 | 2721 | MES20, , |
| 2722 | 7715 | 0116 |
| 2723 | 0116 | 2501 |
| 2724 | 2501 | 1440 |
| 2725 | 1440 | 2405 |
| 2726 | 2405 | 2324 |
| 2727 | 2324 | 2340 |
| 2730 | 2340 | 1713 |
| 2731 | 1713 | 7700 |
| 2732 | 7700 | |

/READ STOP (G,D,I) OR STOP (DOCUMENTATION) WAS NOT PRESSED, RESTART TEST

| | | |
|------|------|----------|
| 2733 | 2733 | MES21, , |
| 2734 | 7722 | 0501 |
| 2735 | 0501 | 0440 |
| 2736 | 0440 | 2324 |
| 2737 | 2324 | 1720 |
| 2740 | 1720 | |

| | | |
|------|------|------|
| 2741 | 5007 | 5007 |
| 2742 | 5604 | 5604 |
| 2743 | 5611 | 5611 |
| 2744 | 5651 | 5651 |
| 2745 | 4017 | 4017 |
| 2746 | 2240 | 2240 |
| 2747 | 2324 | 2324 |
| 2750 | 1720 | 1720 |
| 2751 | 5004 | 5004 |
| 2752 | 1703 | 1703 |
| 2753 | 2515 | 2515 |
| 2754 | 0124 | 0124 |
| 2755 | 1117 | 1117 |
| 2756 | 1651 | 1651 |
| 2757 | 4027 | 4027 |
| 2760 | 0123 | 0123 |
| 2761 | 4016 | 4016 |
| 2762 | 1724 | 1724 |
| 2763 | 4020 | 4020 |
| 2764 | 2205 | 2205 |
| 2765 | 2323 | 2323 |
| 2766 | 0504 | 0504 |
| 2767 | 5422 | 5422 |
| 2770 | 0523 | 0523 |
| 2771 | 2401 | 2401 |
| 2772 | 2224 | 2224 |
| 2773 | 4024 | 4024 |
| 2774 | 0523 | 0523 |
| 2775 | 2456 | 2456 |
| 2776 | 7700 | 7700 |

/OPERATOR MUST NOW PRESS READ STOP (G,D,I) OR STOP (DOCUMENTATION)

| | | |
|------|------|----------|
| 2777 | 2777 | MES19, , |
| 3000 | 7717 | 2005 |
| 3001 | 2005 | 2201 |
| 3002 | 2201 | 2417 |
| 3003 | 2417 | 2240 |
| 3004 | 2240 | 1525 |
| 3005 | 1525 | 2324 |
| 3006 | 2324 | 4016 |
| 3007 | 4016 | 1727 |
| 3010 | 1727 | 4020 |
| 3011 | 4020 | 2205 |
| 3012 | 2205 | 2323 |
| 3013 | 2323 | 4022 |
| 3014 | 4022 | 0501 |
| 3015 | 0501 | 0440 |
| 3016 | 0440 | 2324 |
| 3017 | 2324 | 1720 |
| 3020 | 1720 | 5007 |
| 3021 | 5007 | 5604 |
| 3022 | 5604 | 5611 |
| 3023 | 5611 | 5651 |
| 3024 | 5651 | |

| | | |
|------|------|------|
| 3025 | 4017 | 4017 |
| 3026 | 2240 | 2240 |
| 3027 | 2324 | 2324 |
| 3030 | 1720 | 1720 |
| 3031 | 5004 | 5004 |
| 3032 | 1703 | 1703 |
| 3033 | 2515 | 2515 |
| 3034 | 0124 | 0124 |
| 3035 | 1117 | 1117 |
| 3036 | 1651 | 1651 |
| 3037 | 5677 | 5677 |
| 3040 | 0000 | 0000 |

/OPERATOR MUST NOW PRESS READ START (G,D,1) OR RESET (DOCUMENTATION),

| | | |
|------|------|----------|
| 3041 | 3041 | MES10, . |
| 3042 | 7717 | 7717 |
| 3043 | 2005 | 2005 |
| 3044 | 2201 | 2201 |
| 3045 | 2417 | 2417 |
| 3046 | 2240 | 2240 |
| 3047 | 1525 | 1525 |
| 3050 | 2324 | 2324 |
| 3051 | 4016 | 4016 |
| 3052 | 1727 | 1727 |
| 3053 | 4020 | 4020 |
| 3054 | 2205 | 2205 |
| 3055 | 2323 | 2323 |
| 3056 | 4022 | 4022 |
| 3057 | 0501 | 0501 |
| 3060 | 0440 | 0440 |
| 3061 | 2324 | 2324 |
| 3062 | 0122 | 0122 |
| 3063 | 2450 | 2450 |
| 3064 | 0756 | 0756 |
| 3065 | 0456 | 0456 |
| 3066 | 1151 | 1151 |
| 3067 | 4017 | 4017 |
| 3070 | 2240 | 2240 |
| 3071 | 2205 | 2205 |
| 3072 | 2305 | 2305 |
| 3073 | 2450 | 2450 |
| 3074 | 0417 | 0417 |
| 3075 | 0325 | 0325 |
| 3076 | 1501 | 1501 |
| 3077 | 2411 | 2411 |
| 3100 | 1716 | 1716 |
| 3101 | 5156 | 5156 |
| 3102 | 7700 | 7700 |

/READ START (G,D,1) OR RESET (DOCUMENTATION) WAS NOT PRESSED, RESTART TEST

| | | |
|------|------|----------|
| 3103 | 3103 | MES22, . |
| 3104 | 7722 | 7722 |
| 3105 | 0501 | 0501 |

| | | |
|------|------|------|
| 3106 | 0440 | 0440 |
| 3107 | 2324 | 2324 |
| 3110 | 0122 | 0122 |
| 3111 | 2450 | 2450 |
| 3112 | 0756 | 0756 |
| 3113 | 0456 | 0456 |
| 3114 | 1156 | 1156 |
| 3115 | 5140 | 5140 |
| 3116 | 1722 | 1722 |
| 3117 | 4022 | 4022 |
| 3120 | 0523 | 0523 |
| 3121 | 0524 | 0524 |
| 3122 | 5004 | 5004 |
| 3123 | 1703 | 1703 |
| 3124 | 2515 | 2515 |
| 3125 | 0124 | 0124 |
| 3126 | 1117 | 1117 |
| 3127 | 1651 | 1651 |
| 3130 | 4027 | 4027 |
| 3131 | 0123 | 0123 |
| 3132 | 4016 | 4016 |
| 3133 | 1724 | 1724 |
| 3134 | 4020 | 4020 |
| 3135 | 2205 | 2205 |
| 3136 | 2323 | 2323 |
| 3137 | 0504 | 0504 |
| 3140 | 5422 | 5422 |
| 3141 | 0523 | 0523 |
| 3142 | 2401 | 2401 |
| 3143 | 2224 | 2224 |
| 3144 | 4024 | 4024 |
| 3145 | 0523 | 0523 |
| 3146 | 2456 | 2456 |
| 3147 | 7700 | 7700 |

3200 *3200

| | | | |
|------|------|----------|--------------|
| 3200 | 0000 | BINCD, 0 | /CARD COLUMN |
| 3201 | 0001 | 1 | /1 |
| 3202 | 0002 | 2 | /2 |
| 3203 | 0004 | 4 | /3 |
| 3204 | 0010 | 10 | /4 |
| 3205 | 0020 | 20 | /5 |
| 3206 | 0040 | 40 | /6 |
| 3207 | 0100 | 100 | /7 |
| 3210 | 0200 | 200 | /8 |
| 3211 | 0400 | 400 | /9 |
| 3212 | 1000 | 1000 | /10 |
| 3213 | 2000 | 2000 | /11 |
| 3214 | 4000 | 4000 | /12 |
| 3215 | 1111 | 1111 | /13 |
| 3216 | 2222 | 2222 | /14 |
| 3217 | 3333 | 3333 | /15 |
| 3220 | 4444 | 4444 | /16 |

| | | | |
|------|------|------|-----|
| 3221 | 5555 | 5555 | /18 |
| 3222 | 6666 | 6666 | /19 |
| 3223 | 7777 | 7777 | /20 |
| 3224 | 1010 | 1010 | /21 |
| 3225 | 1212 | 1212 | /22 |
| 3226 | 1313 | 1313 | /23 |
| 3227 | 1414 | 1414 | /24 |
| 3230 | 1515 | 1515 | /25 |
| 3231 | 1616 | 1616 | /26 |
| 3232 | 1717 | 1717 | /27 |
| 3233 | 2020 | 2020 | /28 |
| 3234 | 2121 | 2121 | /29 |
| 3235 | 2323 | 2323 | /30 |
| 3236 | 2424 | 2424 | /31 |
| 3237 | 2525 | 2525 | /32 |
| 3240 | 2626 | 2626 | /33 |
| 3241 | 2727 | 2727 | /34 |
| 3242 | 3030 | 3030 | /35 |
| 3243 | 3131 | 3131 | /36 |
| 3244 | 3232 | 3232 | /37 |
| 3245 | 3434 | 3434 | /38 |
| 3246 | 3535 | 3535 | /39 |
| 3247 | 3636 | 3636 | /40 |
| 3250 | 3737 | 3737 | /41 |
| 3251 | 4040 | 4040 | /42 |
| 3252 | 4141 | 4141 | /43 |
| 3253 | 4242 | 4242 | /44 |
| 3254 | 4343 | 4343 | /45 |
| 3255 | 4545 | 4545 | /46 |
| 3256 | 4646 | 4646 | /47 |
| 3257 | 4747 | 4747 | /48 |
| 3260 | 5050 | 5050 | /49 |
| 3261 | 5151 | 5151 | /50 |
| 3262 | 5252 | 5252 | /51 |
| 3263 | 5353 | 5353 | /52 |
| 3264 | 5454 | 5454 | /53 |
| 3265 | 5656 | 5656 | /54 |
| 3266 | 5757 | 5757 | /55 |
| 3267 | 6060 | 6060 | /56 |
| 3270 | 6161 | 6161 | /57 |
| 3271 | 6262 | 6262 | /58 |
| 3272 | 6363 | 6363 | /59 |
| 3273 | 6464 | 6464 | /60 |
| 3274 | 6565 | 6565 | /61 |
| 3275 | 6767 | 6767 | /62 |
| 3276 | 7070 | 7070 | /63 |
| 3277 | 7171 | 7171 | /64 |
| 3300 | 7272 | 7272 | /65 |
| 3301 | 7373 | 7373 | /66 |
| 3302 | 7474 | 7474 | /67 |
| 3303 | 7575 | 7575 | /68 |
| 3304 | 7676 | 7676 | /69 |
| 3305 | 0101 | 0101 | /70 |
| 3306 | 0202 | 0202 | /71 |
| 3307 | 0303 | 0303 | /72 |

| | | | |
|------|--------|------|-----|
| 3310 | 0404 | 0404 | /73 |
| 3311 | 0505 | 0505 | /74 |
| 3312 | 0606 | 0606 | /75 |
| 3313 | 0707 | 0707 | /76 |
| 3314 | 3210 | 3210 | /77 |
| 3315 | 0123 | 0123 | /78 |
| 3316 | 7654 | 7654 | /79 |
| 3317 | 4567 | 4567 | /80 |
| | END81, | | |
| | / | | |
| 3400 | *3400 | | |

| | | | /COLUMN CHAR HOLLERITH | |
|------|------|----|------------------------|------|
| 3400 | 0000 | 60 | /1 | 4000 |
| 3401 | 0001 | 61 | /2 | 4001 |
| 3402 | 0002 | 62 | /3 | 4002 |
| 3403 | 0003 | 63 | /4 | 4003 |
| 3404 | 0004 | 64 | /5 | 4004 |
| 3405 | 0005 | 65 | /6 | 4005 |
| 3406 | 0006 | 66 | /7 | 4006 |
| 3407 | 0007 | 67 | /8 | 4007 |
| 3410 | 0070 | 70 | /9 | 4008 |

| | | | /COLUMN CHAR HOLLERITH | |
|------|------|----|------------------------|------|
| 3411 | 0071 | 71 | /10 | 4009 |
| 3412 | 0072 | 72 | /11 | 4010 |
| 3413 | 0073 | 73 | /12 | 4011 |
| 3414 | 0074 | 74 | /13 | 4012 |
| 3415 | 0075 | 75 | /14 | 4013 |
| 3416 | 0076 | 76 | /15 | 4014 |
| 3417 | 0077 | 77 | /16 | 4015 |
| 3420 | 0040 | 40 | /17 | 2000 |
| 3421 | 0041 | 41 | /18 | 2001 |
| 3422 | 0042 | 42 | /19 | 2002 |
| 3423 | 0043 | 43 | /20 | 2003 |
| 3424 | 0044 | 44 | /21 | 2004 |
| 3425 | 0045 | 45 | /22 | 2005 |
| 3426 | 0046 | 46 | /23 | 2006 |
| 3427 | 0047 | 47 | /24 | 2007 |
| 3430 | 0050 | 50 | /25 | 2008 |
| 3431 | 0051 | 51 | /26 | 2009 |
| 3432 | 0052 | 52 | /27 | 2010 |
| 3433 | 0053 | 53 | /28 | 2011 |
| 3434 | 0054 | 54 | /29 | 2012 |
| 3435 | 0055 | 55 | /30 | 2013 |
| 3436 | 0056 | 56 | /31 | 2014 |
| 3437 | 0057 | | /32 | 2015 |
| 3440 | 0020 | 20 | /33 | 1000 |
| 3441 | 0021 | 21 | /34 | 1001 |
| 3442 | 0022 | 22 | /35 | 1002 |
| 3443 | 0023 | 23 | /36 | 1003 |
| 3444 | 0024 | 24 | /37 | 1004 |
| 3445 | 0025 | 25 | /38 | 1005 |
| 3446 | 0026 | 26 | /39 | 1006 |
| 3447 | 0027 | 27 | /40 | 1007 |
| 3450 | 0030 | 30 | /41 | 1008 |
| 3451 | 0031 | 31 | /42 | 1009 |

| | | | | | |
|------|------|----|-----|-------|--------|
| 3452 | 0032 | 32 | /43 | 0 8 2 | 1202 |
| 3453 | 0033 | 33 | /44 | 0 8 3 | 1102 |
| 3454 | 0034 | 34 | /45 | 0 8 4 | 1042 |
| 3455 | 0035 | 35 | /46 | 0 8 5 | 1022 |
| 3456 | 0036 | 36 | /47 | 0 8 6 | 1012 |
| 3457 | 0037 | 37 | /48 | 0 8 7 | 1002 |
| 3460 | 0000 | 00 | /49 | BLANK | |
| 3461 | 0001 | 01 | /50 | 1 | 400 |
| 3462 | 0002 | 02 | /51 | 2 | 200 |
| 3463 | 0003 | 03 | /52 | 3 | 100 |
| 3464 | 0004 | 04 | /53 | 4 | 40 |
| 3465 | 0005 | 05 | /54 | 5 | 20 |
| 3466 | 0006 | 06 | /55 | 6 | 10 |
| 3467 | 0007 | 07 | /56 | 7 | 4 |
| 3470 | 0010 | 10 | /57 | 8 | 2 |
| 3471 | 0011 | 11 | /58 | 9 | 1 |
| 3472 | 0012 | 12 | /59 | 0 2 | 0202 |
| 3473 | 0013 | 13 | /60 | 0 3 | 0102 |
| 3474 | 0014 | 14 | /61 | 0 4 | 0042 |
| 3475 | 0015 | 15 | /62 | 0 5 | 22 |
| 3476 | 0016 | 16 | /63 | 0 6 | 12 |
| 3477 | 0017 | 17 | /64 | 0 7 | 6 |
| 3500 | 0060 | 00 | /65 | 12 | 4000 |
| 3501 | 0061 | 01 | /66 | 12 1 | 4000 |
| 3502 | 0062 | 02 | /67 | 12 2 | |
| 3503 | 0063 | 03 | /68 | 12 3 | |
| 3504 | 0064 | 04 | /69 | 12 4 | |
| 3505 | 0065 | 05 | /70 | 12 5 | |
| 3506 | 0066 | 06 | /71 | 12 6 | |
| 3507 | 0067 | 07 | /72 | 12 7 | |
| 3510 | 0070 | 70 | /73 | 12 8 | |
| 3511 | 0071 | 71 | /74 | 12 9 | |
| 3512 | 0072 | 72 | /75 | CENT | 12 8 2 |
| 3513 | 0073 | 73 | /76 | 1 | 12 8 3 |
| 3514 | 0074 | 74 | /77 | 1 | 12 8 4 |
| 3515 | 0075 | 75 | /78 | 1 | 12 8 5 |
| 3516 | 0076 | 76 | /79 | 1 | 12 8 6 |
| 3517 | 0077 | 77 | /80 | 1 | 12 8 7 |

/COMPRESSED CODE TABLE

| 3600 | *3600 | /COLUMN | /CHAR | /HOLLERITH |
|------|-------|---------|-------|------------|
| 3600 | 0100 | /1 | A | 12 1 |
| 3601 | 0101 | /2 | B | 12 2 |
| 3602 | 0102 | /3 | C | 12 3 |
| 3603 | 0103 | /4 | D | 12 4 |
| 3604 | 0104 | /5 | E | 12 5 |
| 3605 | 0105 | /6 | F | 12 6 |
| 3606 | 0106 | /7 | G | 12 7 |
| 3607 | 0107 | /8 | H | 12 8 |
| 3610 | 0110 | /9 | I | 12 9 |
| 3611 | 0300 | /10 | 1 | 12 8 2 |
| 3612 | 0112 | /11 | CENT | 12 8 2 |

| | | | | | |
|------|------|-----|-----|-------|--------|
| 3613 | 0113 | 113 | /12 | 1 | 12 8 3 |
| 3614 | 0114 | 114 | /13 | 1 | 12 8 4 |
| 3615 | 0115 | 115 | /14 | 1 | 12 8 5 |
| 3616 | 0116 | 116 | /15 | 1 | 12 8 6 |
| 3617 | 0117 | 117 | /16 | 1 | 12 8 7 |
| 3620 | 0040 | 40 | /17 | 11 | 11 |
| 3621 | 0041 | 41 | /18 | J | 11 1 |
| 3622 | 0042 | 42 | /19 | K | 11 2 |
| 3623 | 0043 | 43 | /20 | L | 11 3 |
| 3624 | 0044 | 44 | /21 | M | 11 4 |
| 3625 | 0045 | 45 | /22 | N | 11 5 |
| 3626 | 0046 | 46 | /23 | O | 11 6 |
| 3627 | 0047 | 47 | /24 | P | 11 7 |
| 3630 | 0050 | 50 | /25 | Q | 11 8 |
| 3631 | 0240 | 240 | /26 | R | 11 9 |
| 3632 | 0052 | 52 | /27 | I | 11 8 2 |
| 3633 | 0053 | 53 | /28 | S | 11 8 3 |
| 3634 | 0054 | 54 | /29 | * | 11 8 4 |
| 3635 | 0055 | 55 | /30 |) | 11 8 5 |
| 3636 | 0056 | 56 | /31 | 1 | 11 8 6 |
| 3637 | 0057 | 57 | /32 | 1 | 11 8 7 |
| 3640 | 0020 | 20 | /33 | 0 | 0 |
| 3641 | 0021 | 21 | /34 | / | 0 1 |
| 3642 | 0022 | 22 | /35 | 8 | 0 2 |
| 3643 | 0023 | 23 | /36 | T | 0 3 |
| 3644 | 0024 | 24 | /37 | U | 0 4 |
| 3645 | 0025 | 25 | /38 | V | 0 5 |
| 3646 | 0026 | 26 | /39 | W | 0 6 |
| 3647 | 0027 | 27 | /40 | X | 0 7 |
| 3650 | 0030 | 30 | /41 | Y | 0 8 |
| 3651 | 0220 | 220 | /42 | 8 | 0 9 |
| 3652 | 0032 | 32 | /43 | 0 | 0 8 2 |
| 3653 | 0033 | 33 | /44 | 0 | 0 8 3 |
| 3654 | 0034 | 34 | /45 | 0 | 0 8 4 |
| 3655 | 0035 | 35 | /46 | 0 | 0 8 5 |
| 3656 | 0036 | 36 | /47 | 0 | 0 8 6 |
| 3657 | 0037 | 37 | /48 | 0 | 0 8 7 |
| 3660 | 0000 | 00 | /49 | BLANK | |
| 3661 | 0001 | 01 | /50 | 1 | 1 |
| 3662 | 0002 | 02 | /51 | 2 | 2 |
| 3663 | 0003 | 03 | /52 | 3 | 3 |
| 3664 | 0004 | 04 | /53 | 4 | 4 |
| 3665 | 0005 | 05 | /54 | 5 | 5 |
| 3666 | 0006 | 06 | /55 | 6 | 6 |
| 3667 | 0007 | 07 | /56 | 7 | 7 |
| 3670 | 0010 | 10 | /57 | 8 | 8 |
| 3671 | 0200 | 200 | /58 | 9 | 9 |
| 3672 | 0012 | 12 | /59 | 0 2 | 02 |
| 3673 | 0013 | 13 | /60 | 0 3 | 03 |
| 3674 | 0014 | 14 | /61 | 0 4 | 04 |
| 3675 | 0015 | 15 | /62 | 0 5 | 05 |
| 3676 | 0016 | 16 | /63 | 0 6 | 06 |
| 3677 | 0017 | 17 | /64 | 0 7 | 07 |
| 3700 | 0100 | 100 | /65 | 0 | 12 |
| 3701 | 0101 | 101 | /66 | A | 12 1 |

| | | | | | |
|------|------|-----|-----|------|--------|
| 3702 | 0102 | 102 | /67 | B | 12 2 |
| 3703 | 0103 | 103 | /68 | C | 12 3 |
| 3704 | 0104 | 104 | /69 | D | 12 4 |
| 3705 | 0105 | 105 | /70 | E | 12 5 |
| 3706 | 0106 | 106 | /71 | F | 12 6 |
| 3707 | 0107 | 107 | /72 | G | 12 7 |
| 3710 | 0110 | 110 | /73 | H | 12 8 |
| 3711 | 0300 | 300 | /74 | I | 12 9 |
| 3712 | 0112 | 112 | /75 | CENT | 12 8 2 |
| 3713 | 0113 | 113 | /76 | J | 12 8 3 |
| 3714 | 0114 | 114 | /77 | K | 12 8 4 |
| 3715 | 0115 | 115 | /78 | L | 12 8 5 |
| 3716 | 0116 | 116 | /79 | M | 12 8 6 |
| 3717 | 0117 | 117 | /80 | N | 12 8 7 |

4000 *4000

/VALIDITY BIT TABLE
/TABLE OF BINARY CARD DECK IN COMPRESSED MODE TABLE USED
/TO VERIFY VALIDITY BIT

/COLUMN /BINARY /ZONES

| | | | | | |
|------|------|----------|-----|------|---|
| 4000 | 0000 | VALCD: 0 | /1 | 0 | 0 |
| 4001 | 0200 | 200 | /2 | 1 | 29 |
| 4002 | 0010 | 10 | /3 | 2 | 00 |
| 4003 | 0007 | 7 | /4 | 4 | 27 |
| 4004 | 0006 | 6 | /5 | 10 | 26 |
| 4005 | 0005 | 5 | /6 | 20 | 25 |
| 4006 | 0004 | 4 | /7 | 40 | 24 |
| 4007 | 0003 | 3 | /8 | 100 | 23 |
| 4010 | 0002 | 2 | /9 | 200 | 22 |
| 4011 | 0001 | 1 | /10 | 400 | 21 |
| 4012 | 0020 | 20 | /11 | 1000 | 210 |
| 4013 | 0040 | 40 | /12 | 2000 | 211 |
| 4014 | 0100 | 100 | /13 | 4000 | 212 |
| 4015 | 4227 | 4227 | /14 | 1111 | 210, 23, 24, 29 |
| 4016 | 4057 | 4057 | /15 | 2222 | 211, 22, 25, 28 |
| 4017 | 4277 | 4277 | /16 | 3333 | 211, 210, 22, 23, 25, 26, 28, 29 |
| 4020 | 4107 | 4107 | /17 | 4444 | 212, 21, 24, 27 |
| 4021 | 4327 | 4327 | /18 | 5555 | 212, 210, 21, 23, 24, 26, 27, 29 |
| 4022 | 4157 | 4157 | /19 | 6666 | 212, 211, 21, 22, 24, 25, 27, 28 |
| 4023 | 4377 | 4377 | /20 | 7777 | 212, 211, 210, 21, 22, 23, 24, 25, 26, 27, 28, 29 |
| 4024 | 0026 | 26 | /21 | 1010 | 210, 26 |
| 4025 | 4036 | 4036 | /22 | 1212 | 210, 22, 26, 28 |
| 4026 | 4237 | 4237 | /23 | 1313 | 210, 22, 23, 26, 28, 29 |
| 4027 | 4027 | 4027 | /25 | 1414 | 210, 21, 26, 27 |
| 4030 | 4227 | 4227 | /25 | 1515 | 210, 21, 23, 26, 27, 29 |
| 4031 | 4037 | 4037 | /26 | 1616 | 210, 21, 22, 26, 27, 28 |
| 4032 | 4237 | 4237 | /27 | 1717 | 210, 21, 22, 23, 24, 27, 28, 29 |
| 4033 | 0045 | 45 | /28 | 2020 | 211, 25 |

| | | | | | |
|------|------|------|-----|------|----------------------------------|
| 4034 | 4247 | 4247 | /29 | 2121 | 211, 23, 25, 29 |
| 4035 | 4257 | 4257 | /30 | 2323 | 211, 22, 23, 25, 28, 29 |
| 4036 | 4047 | 4047 | /31 | 2424 | 211, 21, 25, 27 |
| 4037 | 4247 | 4247 | /32 | 2525 | 211, 21, 23, 25, 27, 29 |
| 4040 | 4057 | 4057 | /33 | 2626 | 211, 21, 22, 25, 27, 28 |
| 4041 | 4257 | 4257 | /34 | 2727 | 211, 21, 22, 23, 25, 27, 28, 29 |
| 4042 | 4067 | 4067 | /35 | 3030 | 211, 210, 25, 26 |
| 4043 | 4267 | 4267 | /36 | 3131 | 211, 210, 23, 25, 26, 29 |
| 4044 | 4077 | 4077 | /37 | 3232 | 211, 210, 22, 25, 26, 28 |
| 4045 | 4067 | 4067 | /38 | 3434 | 211, 210, 21, 25, 26, 27 |
| 4046 | 4267 | 4267 | /39 | 3535 | 211, 210, 21, 23, 25, 26, 27, 29 |
| 4047 | 4077 | 4077 | /40 | 3636 | 211, 210, 21, 22, 25, 26, 27, 28 |

/COLUMN BINARY ZONES

| | | | | | |
|------|------|--------------|-----|------|---|
| 4050 | 4277 | 4277 | /41 | 3737 | 211, 210, 21, 22, 23, 25, 26, 27, 28, 29 |
| 4051 | 0104 | 104 | /42 | 4040 | 212, 24 |
| 4052 | 4307 | 4307 | /43 | 4141 | 212, 23, 24, 29 |
| 4053 | 4116 | 4116 | /44 | 4247 | 212, 22, 24, 28 |
| 4054 | 4317 | 4317 | /45 | 4343 | 212, 22, 23, 24, 28, 29 |
| 4055 | 4307 | 4307 | /46 | 4545 | 212, 21, 23, 24, 27, 29 |
| 4056 | 4117 | 4117 | /47 | 4646 | 212, 21, 22, 24, 27, 28 |
| 4057 | 4317 | 4317 | /48 | 4747 | 212, 21, 22, 23, 24, 27, 28, 29 |
| 4060 | 4126 | 4126 | /49 | 5050 | 212, 210, 24, 26 |
| 4061 | 4327 | 4327 | /50 | 5151 | 212, 210, 23, 24, 26, 29 |
| 4062 | 4136 | 4136 | /51 | 5252 | 212, 210, 22, 24, 26, 28 |
| 4063 | 4337 | 4337 | /52 | 5353 | 212, 210, 22, 23, 24, 26, 28, 29 |
| 4064 | 4127 | 4127 | /53 | 5454 | 212, 210, 21, 24, 26, 27 |
| 4065 | 4137 | 4137 | /54 | 5656 | 212, 210, 21, 22, 24, 26, 27, 28 |
| 4066 | 4337 | 4337 | /55 | 5757 | 212, 210, 21, 22, 23, 24, 26, 27, 28, 29 |
| 4067 | 4145 | 4145 | /56 | 6060 | 212, 211, 24, 25 |
| 4070 | 4347 | 4347 | /57 | 6161 | 212, 211, 23, 24, 25, 29 |
| 4071 | 4157 | 4157 | /58 | 6262 | 212, 211, 22, 24, 25, 28 |
| 4072 | 4357 | 4357 | /59 | 6363 | 212, 211, 22, 23, 24, 25, 28, 29 |
| 4073 | 4147 | 4147 | /60 | 6464 | 212, 211, 21, 24, 25, 27 |
| 4074 | 4347 | 4347 | /61 | 6565 | 212, 211, 21, 23, 24, 25, 27, 29 |
| 4075 | 4357 | 4357 | /62 | 6767 | 212, 211, 21, 22, 23, 24, 25, 27, 28, 29 |
| 4076 | 4167 | 4167 | /63 | 7070 | 212, 211, 210, 24, 25, 26 |
| 4077 | 4367 | 4367 | /64 | 7171 | 212, 211, 210, 23, 24, 25, 26, 29 |
| 4100 | 4177 | 4177 | /65 | 7272 | 212, 211, 210, 22, 24, 25, 26, 28 |
| 4101 | 4377 | 4377 | /66 | 7373 | 212, 211, 210, 22, 23, 24, 25, 26, 28, 29 |
| 4102 | 4167 | 4167 | /67 | 7474 | 212, 211, 210, 21, 24, 25, 26, 27 |
| 4103 | 4367 | 4367 | /68 | 7575 | 212, 211, 210, 21, 23, 24, 25, 26, 27, 29 |
| 4104 | 4177 | 4177 | /69 | 7676 | 212, 211, 210, 21, 22, 25, 26, 27, 28 |
| 4105 | 0203 | 203 | /70 | 8181 | 23, 29 |
| 4106 | 0012 | 12 | /71 | 8282 | 22, 28 |
| 4107 | 4213 | 4213 | /72 | 8383 | 22, 23, 28, 29 |
| 4110 | 4007 | 4007 | /73 | 8484 | 21, 27 |
| 4111 | 4207 | 4207 | /74 | 8585 | 21, 23, 27, 29 |
| 4112 | 4017 | 4017 | /75 | 8686 | 21, 22, 27, 28 |
| 4113 | 4217 | 4217 | /76 | 8787 | 21, 22, 23, 27, 28, 29 |
| 4114 | 4066 | 4066 | /77 | 9210 | 211, 210, 22, 26 |
| 4115 | 4217 | 4217 | /78 | 9213 | 23, 25, 27, 28, 29 |
| 4116 | 4167 | 4167 | /79 | 7654 | 212, 211, 210, 21, 22, 24, 26, 27 |
| 4117 | 4317 | ENDVL1, 4317 | /80 | 4567 | 212, 21, 23, 24, 25, 27, 28, 29 |

[illegible]

```

4000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4100 11111111 11111111 00000000 00000000 00000000 00000000 00000000 00000000

```

```

4200
4300
4400
4500
4600
4700

```

```

5000
5100
5200
5300
5400
5500
5600
5700

```

```

6000
6100
6200
6300
6400
6500
6600
6700

```

```

7000
7100
7200
7300
7400
7500
7600
7700

```

```

/CR8E/CR8F CARD READER TEST PAL10 V141 22-MAY-72 10104 PAGE 2-18
ACSTAT 0110 E27 1021 IOTCNT 0111 MES17 2666
ADDRZA 2263 E28 1026 IOTST 0276 MES18 3041
ALPCD 3400 E29 1037 K0001 0114 MES19 2777
ALPCOD 0047 E3 0315 K0002 0115 MES2 2425
ARROW 2244 E30 1044 K0003 0116 MES20 2721
BEGIN 1407 E31 1051 K0007 0117 MES21 2733
BINCD 3200 E32 1056 K0001 0120 MES22 3103
BINCOD 0050 E33 1070 K0077 0121 MES3 2447
CAF 6007 E34 1075 K0121 0122 MES4 2476
CDSTA1 1000 E35 1102 K0207 0123 MES5 2525
CDSTA2 1030 E36 1107 K0212 0124 MES6 2554
CDSTA3 1061 E37 1121 K0215 0125 MES7 2605
CDSTA4 1112 E38 1126 K0240 0126 MES9 2627
CMCHK 0112 E39 1133 K0292 0127 MNJAL 0204
CMPBE 0206 E4 0321 K0260 0130 MODE 0074
CMPCOD 0052 E40 1140 K0340 0131 MODE1 0075
CMPCRD 3600 E41 1451 K0400 0132 ODT1 2222
CMPTST 1200 E42 1460 K1000 0133 OCT2 2223
CYRZA 2264 E43 1476 K2000 0134 ODTPT 2200
CNRZB 2271 E43A 1502 K377 0143 OTY 2065
COLCNT 0072 E44 1513 K4000 0135 PRINT 2034
CRDCNT 0073 E45 1603 K5252 0136 PRINTA 0043
CRLF 2362 E46 1611 K6032 0137 RCNI 4430
DATA 0076 E48 1655 K6034 0140 RCNO 4427
DATA8 0200 E49 1661 K6036 0141 RCRA 4421
DATERR 2023 E5 0335 K7000 0156 RCRB 4422
DATST 1400 E50 1673 K7370 0144 RCRC 4423
DECPRT 2230 E51 1675 K7660 0145 RCRD 4426
DFCNT 0101 E52 1704 K7701 0146 RCSD 4424
DFCNT1 0102 E53 2011 K7702 0147 RCSE 4425
DIGIT 2270 E54 2032 K7703 0150 RCBF 4420
DNFLG 0105 E6 0412 K7715 0151 RCS1 4431
DNFLG1 0106 E7 0430 K7726 0152 RCTF 4432
E1 0304 E8 0447 K7730 0153 RDATA1 1604
E10 0466 E9 0454 K7740 0154 RDATA2 1617
E11 0520 ENC 0055 K7771 0155 RDCCK 1621
E12 0534 END 0107 K7777 0142 RDCNT 0103
E13 0627 ENDA 0053 LOOP1 1440 RDCNT1 0104
E14 0633 ENDA1 3517 LOOP2 1461 RDOE 1640
E15 0640 ENDB 0054 LOOPA 1442 READ1 0077
E16 0642 ENDB1 3317 MANTS1 0431 READ2 0100
E17 0657 ENDCM1 3717 MANTS2 0450 SCOPE 2300
E18 0663 ENDOVL1 4117 MANTS3 0600 SETBIN 1422
E19 0713 ENV 0056 MANTS4 0664 TENPWR 2265
E2 0310 FINIS 2000 MANTSY 0400 TSR 2316
E20 0717 IONB 1674 MES1 2371 TSR1 2335
E21 0723 IONC 1600 MES10 2634 TSR2 2336
E22 0727 IOND 0935 MES11 2640 UPDAT 0071
E23 0740 IONE 0634 MES12 2644 UPDATA 2074
E24 0744 IONF 0720 MES13 2650 VALCD 4000
E25 1007 IOT1 0302 MES14 2654 VALCHK 0113
E26 1014 IOT8 0202 MES16 2662 VALCOD 0051

```

VALID 2210
VALTST 1224
VALUE 2267
XCMPBE 2067
XCRLF 0037
XDATER 0060
XDATST 0065
XDCPRT 0033
XIONB 0040
XIONC 0041
XIOND 0042
XIONE 0043
XIONF 0044
XIOTST 0064
XLOOP1 0045
XLOOP2 0046
XLOOPA 0062
XMES9 0057
XNUAL 0066
XDCPRT 0034
XQTY 0036
XRCNI 0260
XRCNO 0254
XRCRA 0217
XRCRB 0224
XRCRC 0231
XRCRD 0250
XRCSD 0236
XRCSE 0243
XRCSE 0212
XRCSE 0265
XRCSE 0272
XRDAT1 0061
XTEXT 0035
XVALID 0070
XXRCNI 0030
XXRCNO 0027
XXRCRA 0021
XXRCRB 0022
XXRCRC 0023
XXRCRD 0026
XXRCSD 0024
XXRCSE 0025
XXRCSE 0020
XXRCSE 0031
XXRCTF 0032

ERRORS DETECTED: 0

LINKS GENERATED: 21

RUN-TIME: 13 SECONDS

