# SOFTWARE CHECKLIST

**MAINTAINER:** SOFTWARE DISTRIBUTION CENTER  
**MAYNARD, MASSACHUSETTS 01754**

**CHECKLIST TITLE:** CM11-F DIAGNOSTIC  
**PAGE:** 1 OF 1  
**DATE:** 3/26/76

## HARDWARE DESIGNATIONS:

<table>
<thead>
<tr>
<th>CENTRAL PROCESSOR UNIT(S)</th>
<th>OPTION(S)</th>
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## SOFTWARE ASSEMBLY POINT:

- [ ] ML  
- [ ] GA  
- [ ] MR  
- [ ] WM

## CHECKLIST DISTRIBUTION:

- [x] ML  
- [ ] GA  
- [ ] MR  
- [ ] WM

## PROGRAM TITLE | PROGRAM CODE

| CM11F DIAGNOSTIC TEST | MAINDEC-11-DZCMB-B-D  
|                       | MAINDEC-11-DZCMB-B-PB |
| MARK SENSE ALPHA CARD DECK  
  (100 CARDS, 80 COL.) | MAINDEC-00-DZCMA-A-CA |
| MARK SENSE BINARY CARD DECK  
  (100 CARDS, 80 COL.) | MAINDEC-00-DZCMA-A-CB |
| MARK SENSE OPTICAL CARD DECK  
  (100 CARDS, 80 COL.) | MAINDEC-00-DZCMB-A-CO |
| M.C. 1347 | MAINDEC-11-DZCMB-00002 |

The following should be included if this kit is shipping with "ADD ON" hardware:

- DEC/X11 GENERAL PRODUCTS MODULE LIBRARY #2

## NOTES:

- **KIT CONTENTS:**  
  - 1 MCO  
  - 1 MANUAL  
  - 1 PAPER TAPES  
  - 3 CARD DECKS
The SXT at location 1196 wipes out the vector address held by R5.

**CORRECTION**

Do the SXT on a scratch register, R5.

**FAILURE/EFFECTIVITY**

**ITEM NO.** | **DOCUMENT/PART NO.** | **REV.** | **NEW REV.** | **DESCRIPTION OF CHANGE**
---|---|---|---|---
1. | //DECMB | B 31 83 | LOC WAS CHANGE TO
| | | | 1196 3587ps 38847ps
| | | | Change from:
| | | | SXT R6
| | | | To:
| | | | SXT R5

**APPROVAL SIGNATURES**

**ENGINEER**

**TECH**

[Signatures]

**PRODUCT**

[Signatures]
IDENTIFICATION

PRODUCT CODE: MAINDEC-11+DZCB-8=0
PRODUCT NAME: CM11F CARD READER DIAGNOSTIC TEST
DATE CREATED: DECEMBER 21, 1974
MAINTAINER: DIAGNOSTIC ENGINEERING
AUTHORS: RICK FADDEN
RAYMOND SHOOP

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1. ABSTRACT

This test is to be used as a card reader diagnostic for the PDP-11 with the CM11F card reader. It tests all logic functions of the card reader, and includes an exerciser for punch alphanumeric, punch binary, and marksense binary test decks. A separate starting address allows the error sensing functions of the reader to be checked. Another starting address tests special decks which have all columns and cards punched or marked identically, to aid in diagnosing special problems.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-11 standard computer
CM-11F card controller
CM-11FA and CB card reader documentation model CM-290 (80 columns)

2.2 TEST DECKS

MAINDEC-90=DECMA=A5CA Punched alphanumeric test deck
MAINDEC-90=DECM=ACB Punched binary test deck
MAINDEC-90=DECM=ACD Marksense binary test deck
Spare cards for the error function test

2.3 STORAGE

The routine uses memory 0 to 16000;

3. LOADING PROCEDURE

Procedure for normal absolute tapes should be followed.
4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

BASIC SWITCH REGISTER SETTINGS ARE:

SW15#1 OR JP==HALT ON ERROR
SW14#1 OR JP==SCOPE LOOP
SW13#1 OR JP==INHIBIT PRINT OUT
SW12#1 OR JP==INHIBIT TRACE TRAPPING
SW11#1 OR JP==INHIBIT SUB-PROGRAM ITERATION
   (NOTE THAT IF SW11 IS SET, THE CARD COUNT WILL BE ALTERED, CAUSING FAILURES IN THE DATA TEST SECTION.)

SW07#1 OR JP==LOOP THRU THE INSTRUCTION TEST PORTION
   (NOTE THAT THE PROGRAM MAY HANG LEGITIMATELY WHEN THE INPUT HOPPER GES EMPTY IF SW7 IS SET)

SW06#1 OR JP==RETURN TO THE BEGINNING OF THE INSTRUCTION TEST WHEN CONTINUING FROM ONE DECK TO ANOTHER

SW05#1 OR JP==HALT BETWEEN TEST DECKS
   (SEE 5.2.1 FOR EXPLANATION OF SW5#0)

LSR : 20  ->  SW04#1 OR JP==RUN THE PUNCHED BINARY TEST DECK (UNLESS SW0 IS SET)
LSR : 10  ->  SW03#1 OR JP==RUN THE MARKSENSE BINARY TEST DECK

4.2 STARTING ADDRESSES

200 = INSTRUCTION AND DATA TEST
210 = PICK SUB-TEST LOOP
220 = ERROR FUNCTION TEST
240 = SINGLE SUB-TEST LOOP
250 = READ SINGLE DATA PATTERN TEST
4,3 PROGRAM AND/OR OPERATOR ACTION

4,3,1 INSTRUCTION AND DATA RELIABILITY TEST (SA 200)

LOAD PROGRAM INTO MEMORY,
LOAD ONE TEST DECK IN THE CARD READER INPUT HOPPER,
PRESS RESET ON THE CARD READER, WAIT FOR RESET LIGHT,
SET SWITCH REGISTER TO STARTING ADDRESS,
LOAD ADDRESS,
SET SWITCHES (SEE 4.1) ALL DOWN FOR WORST CASE, ALPHA TEST DECK,
PRESS START,
WHEN THE INPUT HOPPER IS EMPTY THE PROGRAM WILL HANG WAITING
FOR AN INTERRUPT FROM THE CARD READER, LOAD ONE OR MORE
TEST DECKS INTO THE INPUT HOPPER, PRESSING "RESET"
ON THE CARD READER SHOULD CAUSE PROGRAM EXECUTION
TO RESUME;
THIS ENTIRE SEQUENCE IS NECESSARY TO RUN THE FULL TEST ON THE CARD
READER;

4,3,2 PICK SUBTEST LOOP (SA 210)

LOAD CARDS (SPARE CARDS OR A TEST DECK) INTO THE INPUT HOPPER,
PRESS "RESET" ON THE CARD READER, WAIT FOR THE RESET LIGHT;
LOAD THE STARTING ADDRESS,
PRESS START
AT THE HALT = LOAD SWITCH REGISTER WITH motion delay size;

4,3,3 ERROR FUNCTION TEST (SA 220)

LOAD A FEW SPARE CARDS INTO THE INPUT HOPPER
PRESS "RESET" ON THE CARD READER, WAIT FOR RESET LIGHT;
LOAD THE STARTING ADDRESS, THEN SET THE DESIRED SWITCH OPTIONS;
PRESS START,
FOLLOW THE INSTRUCTIONS AS THEY ARE PRINTED OUT;

4,3,4 SINGLE SUBTEST LOOP (SA 240)

LOAD CARDS (SPARE CARDS OR A TEST DECK) INTO THE INPUT HOPPER,
PRESS "RESET" ON THE CARD READER, WAIT FOR RESET LIGHT;
LOAD THE STARTING ADDRESS,
PRESS START,
AT THE 1ST HALT, LOAD THE STARTING ADDRESS OF THE DESIRED TEST
ADDRESS OF THE SCOPE INSTRUCTION AT THE BEGINNING
OF THE TEST,
PRESS CONTINUE;
AT THE 2ND HALT SET THE SWITCH REGISTER OPTIONS (BIT 11 MUST=0),
PRESS CONTINUE;
4, 3, 5 SINGLE DATA PATTERN TEST (SA 250)

A SPECIAL DECK (1 OR MORE CARDS) MUST BE PUNCHED OR MARKED TO RUN
THIS TEST. ANY DATA PATTERN MAY BE USED, BUT IT MUST
BE IDENTICAL IN ALL 80 COLUMNS OF ALL THE CARDS (11, E.,
ONLY ONE PIECE OF DATA).
LOAD THIS PREPARED DECK INTO THE XPJT HOPPER,
PRESS CARD READER "RESET", WAIT FOR RESER LIGHT,
LOAD SA 250,
PRESS START,
AT THE INITIAL HALT SET THE CARD IMAGE OF THE DATA PATTERN USED
IN SW11-SW30,
PRESS CONTINUE,
WHEN THE CARD READER RUNS OUT OF CARDS IT WILL RING THE BELL;
RELOADING THE DECK AND PRESSING "RESET" ON
THE CARD READER WILL CONTINUE THE TEST.

5. OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

5.1.1 AT SA 200 (INSTRUCTION AND DATA RELIABILITY TEST)

SEE 4, 1

5.1.2 AT SA 210 (PICK SUBTEST LOOP)

AT THE HALT = LOAD THE DELAY BETWEEN CARD
MOTION IN THE SWITCH REGISTER.

5.1.3 AT SA 220 (ERROR FUNCTION TEST FOR Q411F)

SW14 = 1 TO LOOP THRU THE CURRENT SUBTEST
SW15 = 1 TO HALT ON ERROR

5.1.4 AT SA 240 (SINGLE SUBTEST LOOP)

1ST HALT = LOAD STARTING ADDRESS OF DESIRED TEST
2ND HALT = SET SR OPTIONS (BIT 11 MUST=0)
SEE 4, 1 FOR SR OPTIONS
NOTE THAT T-BIT IS NOT SET WHEN USING THIS STARTING POINT,
5,5 AT SA 250 (SINGLE DATA PATTERN TEST)
AT THE HALT LOAD THE CARD IMAGE OF THE DATA PATTERN IN SW11-SW00.

5,2 SUBROUTINE ABSTRACTS

5,2,1 BEGIN SA 200

THE INSTRUCTION TESTS ARE RUN FIRST, FOLLOWED BY THE DATA
RELIABILITY TESTS ON THE REMAINING CARDS IN THE FIRST TEST DECK,
AT THE END OF THE DECK THE BELL WILL RING, AND IF SW5=1 THE
PROGRAM HALTS. IF SW5=0, PROGRAM ACTION DEPENDS ON THE NUMBER
OF TEST DECKS LOADED; IF THERE ARE STILL CARDS IN THE INPUT HOPPER,
THE PROGRAM WILL RUN THE DATA RELIABILITY TEST ON THE ENTIRE DECK;
IF THE INPUT HOPPER IS EMPTY AT THE END OF A DECK, THE PROGRAM
WILL RUN A SET OF TESTS OF OFF-LINE OPERATIONS. AT THE END OF
THESE TESTS, IT WAITS FOR THE CARD READER TO BE PUT BACK ON-LINE,
FURTHER CHECKS ARE MADE OF THE OFF-LINE TO ON-LINE OPERATIONS,
AND THEN THE DATA RELIABILITY TEST IS RUN ON THE ENTIRE DECK;
IF SW5=1,:aloading continue will resume program operation after
the Halt; if all other switches were down, FOR EXAMPLE, THE
DATA RELIABILITY TEST WOULD THEN BE RUN ON THE NEXT DECK, THE
OTHER SWITCHES AFFECT PROGRAM FLOW AS NOTED IN 4,1;

5,2,2 SCOPE

THIS SUBROUTINE CALL IS PLACED BETWEEN EACH SUBTEST IN THE
INSTRUCTION SECTION. IT RECORDS THE STARTING ADDRESS OF EACH
SUB-TEST AS IT IS BEING ENTERED. IF A SCOPE LOOP IS REQUESTED,
IT WILL JUMP TO THE START OF THE SUBTEST THAT THE SCOPE LOOP
IS REQUESTED FOR. IF SCOPE LOOP IS NOT REQUESTED, THERE WILL
BE 1 ITERATION ON THAT SUBTEST BEFORE THE NEXT SUBTEST
IS ENTERED, SWITCH 11 ON A 1 INHIBITS ITERATION OF SUBTESTS;

5,2,3 HLT

THIS SUBROUTINE PRINTS OUT THE LOCATION COUNTER AT THE TIME
OF FAILURE, AND THE CONTENTS OF THE PROCESSOR STATUS REGISTER,
NOTE THAT THE LOCATION COUNTER WILL BE THE ADDRESS OF THE
HLT PLUS TWO;
5,2.4 TTRAP

This routine allows the trace bit to be set after the first loop of the program. The trace bit will be set on alternate loops of the instruction and data test unless SW12 is set. The first instruction executed upon trapping is an "RTI" (or "RTT") which returns to the interrupted sequence. This continues until the end of the program loop is reached.

5,2.5 TRAPCATCHER

This is a series of instructions starting at location 0 designed to detect and isolate unexpected traps and interrupts to the trap and interrupt vector area of memory.

Each vector entrance address is loaded with the address of the next location. The next location is loaded with a halt (00000000). Thus an illegal trap or interrupt will cause a halt at the trap location plus two.

If a halt occurs in the trap or interrupt area, examine register six. It will contain the current stack address, the contents of the current stack address is the value of the location counter when the trap or interrupt occurred.

5,2.6 ERGM11 (ERROR FUNCTION TEST)

This test checks operation of the various error sensing features of the documentation or-200 card reader, card reader off-line, input hopper empty, output stacker full, feed error and motion error are checked.

5,2.7 TESTX (SINGLE TEST LOOP)

This routine allows a single subtest to be run continuously for scope loop purposes. While a scope loop switch option exists, it requires that you are within the test in which you wish to loop. In some cases (such as with intermittent failures) that is not easy to do. This subroutine allows you to load the address of any test from TEST0 thru TEST24 and TESTA thru TESTG at the halt and then go directly to that test.

5,2.8 CKSAME (SINGLE DATA PATTERN TEST)

This test is designed to aid in the diagnosis of difficult data error problems and facilitate some card reader adjustments. It continuously reads cards which have all columns punched or marked identically (and all cards must be identical), checking the data against a pattern set up on the switches initially. Any errors are printed out, along with a count of the total number of cards read and the total number of data errors which have occurred since the test was started,
5.2.9 Delay (Pick Subtest Loop)

This test is designed to aid in the diagnosis of difficult card problems and facilitate repair. It continuously moves cards thru the card reader at a rate determined by the switch register value, neither data or status register are checked for errors; the program will continually loop until stopped by the operator.

5.3 Program And/Or Operator Action

5.3.1 Loading and Starting at 208 with all switches down is worst case testing, a single alphanumeric deck should be run, this executes an instruction test followed by a data reliability test. At the end of the deck checks are made of the flag settings which should be affected, and the program waits for an interrupt from the reader coming back on-line; at the end of the first deck the operator should load one or more decks in the input hopper and press "reset" on the card reader; if the card reader is working properly, the bell will ring once when "reset" is pressed and the entire deck will be run thru the data reliability portion of the test; if, after reading 80 cards, the input hopper is not empty, the program will continue to the next deck; switch options may be used to alter this flow as noted in section 4.1.

5.3.2 To go directly to a single subtest and run it continuously, use Sa 240. At the first halt, set the switch register to the starting address of the desired subtest (i.e., the address of the scope instruction at the start of the test), and continue. At the second halt, set the desired switch register options and continue (Sw11 must be = 0), the program will continuously loop thru the desired subtest until Sw11 is set or the processor is halted.
6. ERRORS

6.1.1 STANDARD PRINTOUT

PRINTOUTS ARE IN A TWO-WORD FORMAT; THE FIRST IS THE PC#2 OF
THE DETECTED ERROR; THE SECOND IS THE CONTENTS OF THE PROCESSOR
STATUS REGISTER WHEN THE ERROR WAS DETECTED.

6.1.2 DATA ERROR PRINTOUT

THE HEADING IS PRINTED OUT ONCE PER TEST DECK, THE COLUMNS HAVE
THE FOLLOWING SIGNIFICANCE:

DECK *EITHER PUNCHED ALPHANUMERIC, PUNCHED BINARY, OR
MARKSSENSE BINARY DECK, DEPENDING ON SWITCHES 3 AND 4
CARD *THE CARD NUMBER WHERE THE FAILURE OCCURRED <DEC,>
COLUMN *THE COLUMN NUMBER WHERE THE FAILURE OCCURRED <DEC,>
PATTERN *THE CORRECT CARD IMAGE DATA THAT SHOULD HAVE BEEN READ
READ1 *THE CARD IMAGE DATA IS READ TWICE, THIS IS WHAT WAS
READ THE FIRST TIME FROM CRB1
READ2 *THIS IS WHAT WAS IN CRB1 AFTER A BRIEF TIMING LOOP, IT
SHOULD BE THE SAME AS THE PREVIOUS READING,
CODED *THIS IS WHAT THE DATA SHOULD BE IN ENCODED FORM
READ *THIS IS WHAT WAS READ BY ADDRESSING THE ENCODED BUFFER

DATA ERRORS NOT TRACED TO CARD READER HARDWARE INCLUDE:
A. SN03 AND SW04 NOT SET TO TYPE OF DECK USED
B. CARD MISSING
C. DAMAGED CARD

6.1.3 SINGLE DATA PATTERN PRINTOUT

THE SINGLE DATA PATTERN TEST PRINTS OUT A HEADING WITH EACH
ERROR PRINTOUT; THE COLUMNS HAVE THE FOLLOWING SIGNIFICANCE:

COLUMN *THE COLUMN NUMBER WHERE THE FAILURE OCCURRED;
READ1 *DATA IS READ TWICE, THIS IS THE FIRST READING,
READ2 *THIS IS WHAT WAS READ THE SECOND TIME,
CARDS *THE TOTAL NUMBER OF CARDS (IN OCTAL) THAT HAVE BEEN RUN
SINCE THE TEST WAS STARTED,
ERRORS *THE TOTAL NUMBER OF ERRORS DETECTED (IN OCTAL) SINCE
THE TEST WAS STARTED.

6.2 ERROR RECOVERY

IN GENERAL, TEST FAILURES WILL PRINTOUT AN ERROR MESSAGE AND
CONTINUE, IF THE "HALT ON ERROR" SWITCH IS SET, HITTING
CONTINUE WILL RECOVER; IF THE PROGRAM HANGS UP IN A LOOP, THE
ERROR IS LIKELY TO BE A SIGNAL WHICH WAS NEVER RECEIVED, IF
A HALT OCCURS IN THE TRAP AND VECTOR AREA THE PROGRAM MUST BE
RESTARTED; IF THE PROGRAM HALTS IN THE MAIN FLOW, CONSULT THE
LISTING IF NO MESSAGE IS TYPED OUT.
6.3 ERRORS INVOLVING BIT 8 OF THE CSR

THE CM11 HAS A DELAY WHICH OCCASIONALLY WILL CAUSE AN ERROR PRINTOUT REFERING TO BIT 8 TO OCCUR, SOMETIMES ON-LINE TRANSITION WILL SET BEFORE OFF-LINE CLEARS; ALSO, THE OFF-LINE BIT WILL NOT SET IMMEDIATELY WHEN AN ERROR OCCURS WHICH PUTS THE READER OFF-LINE.

7. RESTRICTIONS

7.1 STARTING PROCEDURE

NONE

7.2 OPERATIONAL RESTRICTIONS

7.2.1 COMBINED INSTRUCTION AND DATA RELIABILITY TEST (SA 200)

IF A STANDARD TEST DECK IS NOT BEING USED, SW7 MUST BE SET TO INHIBIT RUNNING THE DATA RELIABILITY PORTION OF THE TEST; THE PROCESSOR MAY HANG WHEN THE INPUT HOPPER GOES EMPTY, AND THIS IS NOT TO BE REGARDED AS A FAILURE.

WHEN USING THE STANDARD TEST DECKS, THEY MUST BE IN GOOD CONDITION. IT IS A GOOD IDEA TO LABEL THE CARDS DECKS AS SOON AS THE DECK IS RECEIVED.

7.2.2 PICK SUBTEST LOOP (SA 210)

THE PICK SUBTEST LOOP REQUIRES SPARE CARDS OR TEST DECKS; THE TEST WILL INITIIZE CARD MOTION AT A RATE DETERMINE BY THE SWITCH REGISTER.

7.2.3 ERROR FUNCTION TEST (SA 220)

THE ERROR FUNCTION TEST REQUIRES SPARE CARDS, THE TEST WILL TYPE OUT A REQUEST FOR THE CARDS WHEN THEY ARE NEEDED.

7.2.4 SINGLE DATA PATTERN TEST (SA 250)

A SPECIAL DECK (ONE OR MORE CARDS) MUST BE PREPARED, ALL COLUMNS OF ALL CARDS ARE PUNCHED OR MARKED IDENTICALLY, USING A DATA PATTERN WHICH WILL TEST THE PROBLEM BEING DIAGNOSED,
8.1 EXECUTION TIME
NOT APPLICABLE

8.2 CARD DECK DESCRIPTION

8.2.1 PUNCHED ALPHANUMERIC

REFERENCE THE ALPHANUMERIC TABLE BEGINNING AT THE TAG ALPCD IN THE LISTING FOR THE CODES PUNCHED FOR EACH OF 80 COLUMNS ON THE CARD. THE FIRST VALUE GIVEN FOR A COLUMN IS THE CARD IMAGE OF THAT COLUMN, WHILE THE SECOND VALUE IS THE ENCODED FORM OF THE SAME PATTERN. EACH SUCCESSIVE CARD IN THE DECK USES THE SAME SEQUENCE OF CODES.

8.2.2 PUNCHED BINARY

REFERENCE THE BINARY DATA TABLE BEGINNING AT THE TAG BINCO IN THE LISTING FOR THE CODES PUNCHED FOR EACH OF THE 80 COLUMNS OF THE CARD, AS WITH THE ALPHANUMERIC DECK EACH SUCCESSIVE CARD HAS THE SAME SEQUENCE OF CODES.

8.2.3 MARKSENSE BINARY DECK

REFERENCE THE MARKSENSE DATA TABLE BEGINNING AT THE TAG MKSCD IN THE LISTING FOR THE CODES PRINTED FOR EACH OF THE 80 COLUMNS ON THE CARD, THEY ARE PRINTED RATHER THAN PUNCHED, AS WITH THE ALPHA AND BINARY DECKS EACH SUCCESSIVE CARD HAS THE SAME SEQUENCE OF CODES.

8.3 SPECIAL NOTES

IF THE CARD READER GOES OFF-LINE BEFORE THE END OF A CARD, BUSY REMAINS SET UNTIL THE CARD ACTUALLY CLEARS THE READER;

"CARD DONE" FROM THE LAST CARD IN THE INPUT HOPPER WILL OCCUR BEFORE THE CARD READER GOES OFF-LINE DUE TO "INPUT HOPPER EMPTY."

CLEARING BIT 0 OF THE CRS AFTER SETTING IT CAN CAUSE THE READER TO NOT READ A CARD IF IT IS DONE RAPIDLY ENOUGH.

8.4 TESTING CH11F'S WITH NON-STANDARD ADDRESSES

BY SUBSTITUTING INTO THE LOCATIONS KCRS, KCRB1, AND CRB2 THE ADDRESSES OF THE CRS, CRB1, AND CRB2 OF A CARD READER ASSIGNED A NON-STANDARD ADDRESS, AND SUBSTITUTING ITS INTERRUPT VECTOR ADDRESS INTO INTVC, A CH11 MAY BE TESTED AT ANY ADDRESS ASSIGNED TO IT.
9. PROGRAM DESCRIPTION

This set of tests is designed to check all operations of the CM11 card reader, with the necessary exception that timing in most cases is only partially tested; a special test is included to check out the error functions of the documentation CM-200 reader, which prints out directions as it goes along. A test is also included to isolate difficult data errors using a special test deck made up by the user. A test is also included to isolate difficult pick errors using any test deck, in this test the switch register is used as a delay constant for initializing card motion, no data is checked in the this test.

10. LISTING

See following pages.

11. FLOWCHART

Not applicable.
706  14470  14480  TEST31  SCOPE

707  14480  14490  \*BUSY (BIT 9) SHOULD BE SET BY READING A CARD

708  14490  14500  \*IT SHOULD REMAIN SET UNTIL CARD DONE RETS, WHICH SHOULD CLEAR IT

709  14500  14510  JNR  N7,CH#78  \*CHECK FOR OFFLINE SET

710  14510  14520  CLR  CH#5  \*INITIALIZE STATUS REGISTER

711  14520  14530  INC  CH#6  \*READ A CARD

712  14530  14540  \*CHECK BUSY

713  14540  14550  BNE  \#0000,CH#9

714  14550  14560  LOOP31  \*CHECK CARD DONE

715  14560  14570  BNE  \#0000,CH#6

716  14570  14580  LOOP2  \*CHECK BUSY

717  14580  14590  BNE  \#0000,CH#9

718  14590  14600  DEC  CH#5  \*CHECK CARD DONE

719  14600  14610  BR  TEST4  \*IT SHOULD CLEAR BEFORE CARD DONE SET

720  14610  14620  TEST41  SCOPE

721  14620  14630  \*A TIMING ERROR SHOULD OCCUR IF DATA IS NOT READY AND NEW DATA COMES IN

722  14630  14640  \*A TIMING ERROR SHOULD SET THE SPECIAL CONDITION BIT WHEN CARD DONE OCCURS

723  14640  14650  \*COLUMN READY SHOULD BE CLEARED BY THE TIMING ERROR AND PREVENTED FROM SETTING

724  14650  14660  \*IT'S 11.15 AND IS SHOULD BE CLEARED BY A DATA TO THE STATUS REGISTER

725  14660  14670  JBR  N7,INIT  \*INIT STATUS REGISTER

726  14670  14680  CLR  COUNT  \*INITIALIZE COUNTER

727  14680  14690  INC  COUNT  \*WAIT FOR SPECIAL CONDITION, CARD DONE.

728  14690  14700  LOOP41  \*COPYifix

729  14700  14710  \*COPYifix

730  14710  14720  \*COPYifix

731  14720  14730  \*COPYifix

732  14730  14740  \*COPYifix

733  14740  14750  \*COPYifix

734  14750  14760  \*COPYifix

735  14760  14770  \*COPYifix

736  14770  14780  \*COPYifix

737  14780  14790  \*COPYifix

738  14790  14800  \*COPYifix
HALT

BIT #468, #482
JBR  #7, CRLF

I/O CHECK BITS
BRANCH IF SET

OFF-LINE BIT 8 WASN'T SET

I/O CHECK SPECIAL CONDITION BIT
BRANCH IF SET

SPECIAL CONDITION NOT SET
YES, TEST BIT 13
CONTINUE IF SET

I/O CARD SUPPLY ERROR WASN'T SET
RESTORE CARDS IN INPUT HOPPER

I/O MOVE MESSAGE UP ON TTY

RESETI MOV #860, R2
JBR  #7, CRLF

I/O PRESS CARD READER "RESETI"
I/O THEN HIT "CONTINUE" ON THE CONSOLE
I/O MOVE MESSAGE UP ON TTY

TESTI  ROPE

I/O INITIALIZE STATUS REGISTER
I/O "OVERRIDE THE OUTPUT STACKER PRESSURE ARM"
I/O THEN HIT "CONTINUE" ON THE CONSOLE
I/O MOVE MESSAGE UP ON TTY

INPUT STACKER FULL SHOULD SET BIT 19, AND IN AN HS READER SHOULD ALSO SET BIT 13

BIT #468, #482
BRANCH IF SET

OFF-LINE BIT 8 WASN'T SET

I/O CHECK SPECIAL CONDITION BIT
BRANCH IF SET

SPECIAL CONDITION NOT SET
YES, TEST BIT 13
CONTINUE IF SET

I/O CARD SUPPLY ERROR WASN'T SET
RESTORE CARDS IN INPUT HOPPER

I/O MOVE MESSAGE UP ON TTY

I/O FEED ERROR SHOULD SET BIT 19, AND IN THE HS READER IT SHOULD ALSO SET BIT 13

BIT #468, #482
WAIT FOR CARD READER TO COME ON-LINE

I/O INITIALIZE STATUS REGISTER
I/O "OVERRIDE THE OUTPUT STACKER PRESSURE ARM"
I/O THEN HIT "CONTINUE" ON THE CONSOLE
I/O MOVE MESSAGE UP ON TTY

BIT #468, #482
I/O TEST OFF-LINE BIT

BIT 8 WAS NOT SET

I/O CHECK BIT 13
BRANCH IF SET

BIT 13 WAS NOT SET
I/O MOVE MESSAGE UP ON TTY

I/O MOVE MESSAGE UP ON TTY

I/O MOVE MESSAGE UP ON TTY

I/O MOVE MESSAGE UP ON TTY

I/O MOVE MESSAGE UP ON TTY
SUBROUTINE TO ISSUE SPACE

IN A ONE PLUS VALUE CONTAINED IN SPACE

SPACE IS CLEARED WITHIN THE SUBROUTINE, SO THAT A CALL ON

SPACE WITHOUT LOADING SPACE ISSUES ONLY IN SPACE

SPACE: R

SPACE:

RETURN FOR TTY READY

SPACEX 0

ENTERED WITH SYSTEM TRAP CALL (HLT)

SPLINT THE ERROR PC AND STATUS REGISTER

PRINT: BIT SM, #4, #2282 TEST FOR INHIBIT PRINT OUT

BEQ $4, brANCH TO PRINT

BR $2, brANCH, INHIBIT, CHECK FOR HALT

MOV $164, SAVPR, IPC OF FAILING ROUTINE

MOV $164, SAVPR, IP IN ERROR CONDITION

CHR $16, #161, TO RESTORE STACK

OUT: OUTPUT CARRIER RETURN, LINEFEED

MOV $25, SAVPR, $2, TO SAVE R2

MOV SAVR, $2, TO SAVE R3

PROCT PRINT POS IN OCTAL

SPACEX 0

RETURN FOR TTY READY

SPACEX 0

RETURN MAIN LINE

SAVE R2

SAVE R3

SAVE R4

CLEAR R4 TO USE AS COUNTER
2632 019248 008296 236
2633 019249 002239
2634 019244 008127 129
2635 019244 002914 3292
2636 019256 008296 236
2637 019252 002239
2638 019294 008127 129
2639 019296 000000 0 MKEND 8
2640 019260 000000 1EWD MARK SENSE DIAG TABLE

2642
2643
2644 019261 012737 177777 000000 DEC0IM MOV #80,DISCNT
2645 019275 012737 012444 000000 MOV #DEC0IM42,DEC0IM7
2646 019277 012737 000020 000000 MOV #40,ERO
2647 019304 012737 177777 000000 TYPT3 MOV #81,DISCNT
2648 019312 002607 000000 TYPT31 INC DIGIT
2649 019316 167777 000000 SUB #DEC0IMX2
2650 019332 108273 BPL TYPT2
2651 019335 012737 008012 ADD #DEC0IMX2
2652 019335 014767 000000 UBE #T,DECOUT
2653 019334 002947 000000 INC DISCNT
2654 019334 001600 BNE TYPT3
2655 019340 008007 RTB #7
2656 019344 008767 00082 000878 TYPT3 ADD #8,DEC0IM
2657 019393 008754 BR TYPT1
2658 019394 008767 000894 DECOUTI TSP DIGIT
2659 019361 008104 BNE DEB
2660 019362 022757 177777 000046 CHP #4,DISCNT
2661 019376 011604 RDB DEB
2662 019372 016777 000842 000000 MOV BEO,DIGIT
2663 019342 008446 BR DE8
2664 019402 012737 000020 DEC11 MOV #99,ERO
2665 019411 005267 000020 000016 BIE #99,DI0BIT
2666 019416 100377 100377 DEC21 TSPB PODBR
2667 019422 108379 BPL #4
2668 019424 016777 000044 163866 MOV DISINT,PDDBR
2669 019430 002927 RTB #7
2670 019434 008000 DIGIT1 0
2671 019436 002000 DIGIT1 1
2672 019440 000440 100,48
2673 019442 015444 DEC0IM42 100BP
2674 019444 024269 100BP, LDBR
2675 019456 008144 100BP
2676 019452 000012 100BP
2677 019456 000012 100BP
2678 019469 008001 .END
2680 000001 .END