

CR11

DIAGNOSTIC TEST
MD-11-DZCRA-B

EP DZCRA B DL
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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZCRA-B-D

PRODUCT NAME: CR11 DIAGNOSTIC TEST

PROGRAM DATE: MAY 1976

MAINTAINER: DIAGNOSTIC GROUP

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1. ABSTRACT

THIS TEST IS TO BE USED AS A CARD READER DIAGNOSTIC FOR THE PDP-11 WITH THE CR11 CARD READER. IT TESTS ALL LOGIC FUNCTIONS OF THE CARD READER, AND INCLUDES AN EXERCISER FOR ALPHANUMERIC AND BINARY TEST DECKS. A SEPARATE STARTING ADDRESS ALLOWS THE ERROR SENSING FUNCTIONS OF THE G.D.I. OR DOCUMENTATION READER TO BE CHECKED. ANOTHER STARTING ADDRESS TESTS SPECIAL DECKS WHICH HAVE ALL COLUMNS AND CARDS PUNCHED IDENTICALLY, TO AID IN DIAGNOSING SPECIAL PROBLEMS.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-11 COMPUTER WITH 6K MEMORY
CR11 CARD READER

2.2 TEST DECKS

MAINDEC-89-D241-C ALPHANUMERIC TEST DECK
MAINDEC-89-D242-C BINARY TEST DECK
EXTRA CARDS (FOR ERROR FUNCTION TEST)

3. LOADING PROCEDURE

PROCEDURE FOR NORMAL ABSOLUTE TAPES SHOULD BE FOLLOWED.

4. STARTING PROCEDURE

THIS PROGRAM HAS BEEN MODIFIED TO RUN ON A PROCESSOR WITH OR WITHOUT A HARDWARE SWITCH REGISTER. WHEN FIRST EXECUTED THE PROGRAM TESTS THE EXISTENCE OF A HARDWARE SWITCH REGISTER. IF NOT FOUND A SOFTWARE SWITCH REGISTER LOCATION (SWREG=LOC. 176) IS DEFAULTED TO. IF THIS IS THE CASE, UPON EXECUTION THE CONTENTS OF THE SWREG ARE DUMPED IN OCTAL ON THE CONSOLE TTY AND ANY CHANGES ARE REQUESTED

(IE) SWR=XXXXXX NEW=

POSSIBLE RESPONSES ARE:

1. <CR> IF NO CHANGES ARE TO BE MADE
2. 6 DIGITS 0-7 TO REPRESENT IN OCTAL THE NEW SWITCH REGISTER VALUE (LAST DIGIT FOLLOWED BY <CR>.
3. ^U TO ALLOW REENTERING VALUE IF ERROR IS COMMITTED KEYING IN SWREG VALUE.

BUILT INTO THE PROGRAM IS THE ABILITY TO DYNAMICALLY CHANGE THE CONTENTS OF SWREG DURING PROGRAM EXECUTION. BY STRIKING ^G (CNTRL G) ON CONSOLE TTY THE OPERATOR SETS A REQUEST FLAG TO CHANGE THE CONTENTS OF SWREG, WHICH IS PROCESSED IN KEY AREAS OF THE PROGRAM CODE (IE) ERROR ROUTINES, AFTER HALTS END OF PASS, AND OTHER APPLICABLE AREAS.

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4.1 CONTROL SWITCH SETTINGS

BASIC SWITCH REGISTER SETTINGS ARE:

SW15=1 OR UP---HALT ON ERROR

SW14=1 OR UP---SCOPE LOOP

SW13=1 OR UP---INHIBIT PRINT OUT

SW12=1 OR UP---INHIBIT TRACE TRAPPING

SW11=1 OR UP---INHIBIT SUB-PROGRAM ITERATION

(NOTE THAT IF SW11 IS SET, THE CARD COUNT
WILL BE ALTERED, CAUSING FAILURES IN THE
DATA TEST SECTION.)

SW10=1 OR UP---CR11 CONTROLLER USES THE M829 MODULE

(IF DOWN, ASSUMES THE M8290 MODULE)

SW07=1 OR UP---LOOP THRU THE INSTRUCTION TEST PORTION

NOTE: DATA ERRORS MAY OCCUR IF SW7 IS SET, THEN CLEARED.

ALSO THE TEST MAY HANG WHEN THE INPUT HOPPER GOES EMPTY
IF SW7 WAS SET.

SW06=1 OR UP---RETURN TO THE BEGINNING OF THE INSTRUCTION TEST

WHEN CONTINUING FROM ONE DECK TO ANOTHER

SW05=1 OR UP---HALT BETWEEN TEST DECKS

(SEE 5.2.1 FOR EXPLANATION OF SW5=0)

SW04=1 OR UP---RUN THE BINARY TEST DECK

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4.2 STARTING ADDRESSES

200 = INSTRUCTION AND DATA TEST
210 = ERROR FUNCTION TEST (WITH G.D.I. READER)
220 = ERROR FUNCTION TEST (WITH DOCUMENTATION READER)
240 = SINGLE SUBTEST 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 MOTOR START AND READ START ("RESET" ON DOCUMENTATION READER).
SET SWITCH REGISTER TO STARTING ADDRESS.
LOAD ADDRESS.
IF HARDWARE SWITCH REGISTER IS AVAILABLE SET SWITCHES
SETTINGS BEFORE PRESSING START. IF SWITCH-LESS MACHINE SIMPLY
PRESS START.
WHEN THE INPUT HOPPER IS EMPTY THE PROGRAM WILL BE WAITING
FOR AN INTERRUPT FROM THE CARD READER. LOAD ONE OR MORE
TEST DECKS INTO THE INPUT HOPPER. PRESSING "MOTOR START" AND
"READ START" ("RESET" ON DOCUMENTATION READER) ON THE CARD
READER SHOULD CAUSE PROGRAM EXECUTION TO RESUME.
THIS ENTIRE SEQUENCE IS NECESSARY TO RUN THE FULL TEST ON THE CARD
READER.
ALL PRINTOUTS INDICATE FAILURE, INCLUDING THOSE SAYING
THAT BIT 8 OR BIT 15 WAS SET.

4.3.2 ERROR FUNCTION TEST (SA 210 OR 220)

LOAD A FEW SPARE CARDS INTO THE INPUT HOPPER (DO NOT LOAD A
TEST DECK-THIS TEST IS DESTRUCTIVE!)
PRESS "MOTOR START" AND "READ START" ("RESET" ON DOCUMENTATION READER)
ON THE CARD READER.
LOAD THE STARTING ADDRESS.
IF HARDWARE SWITCH REGISTER IS AVAILABLE SET SWITCHES
SETTINGS BEFORE PRESSING START. IF SWITCH-LESS MACHINE SIMPLY
PRESS START.
FOLLOW THE INSTRUCTIONS AS THEY ARE PRINTED OUT.

4.3.3 SINGLE SUBTEST LOOP (SA 240)

LOAD CARDS (SPARE CARDS OR A TEST DECK) INTO THE INPUT HOPPER.
PRESS "MOTOR START" AND "READ START" ("RESET" ON DOCUMENTATION READER)
ON THE CARD READER.
LOAD THE STARTING ADDRESS.
IF HARDWARE SWITCH REGISTER IS AVAILABLE SET SWITCHES
SETTINGS BEFORE PRESSING START. IF SWITCH-LESS MACHINE SIMPLY
PRESS START.
WHEN ASKED, ENTER THE STARTING ADDRESS OF DESIRED TEST
(ADDRESS OF THE TESTXX TAG, WHERE XX MAY BE 1 THRU 24
OR A THRU G).

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4.3.4 SINGLE DATA PATTERN TEST (SA 250)

A SPECIAL DECK (1 OR MORE CARDS) MUST BE PUNCHED TO RUN THIS TEST. ANY DATA PATTERN MAY BE USED, BUT IT MUST BE IDENTICAL IN ALL 80 COLUMNS OF ALL THE CARDS (I.E. ONLY ONE PIECE OF DATA). LOAD THIS PREPARED DECK INTO THE INPUT HOPPER. PRESS CARD READER "MOTOR START" AND "READ START" ("RESET" ON DOCUMENTATION READER).

LOAD SA 250.

IF HARDWARE SWITCH REGISTER IS AVAILABLE SET SWITCH SETTINGS BEFORE PRESSING START. IF SWITCH-LESS MACHINE SIMPLY PRESS START.

WHEN THE CARD READER RUNS OUT OF CARDS IT WILL RING THE BELL. RELOADING THE DECK AND PRESSING "READ START" ("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 OR 220 (ERROR FUNCTION TEST FOR CR11)

SW00=1 TO INHIBIT TESTING THE DARK-LIGHT ERROR.
SW14=1 TO LOOP THRU THE CURRENT SUBTEST
SW15=1 TO HALT ON ERROR

5.1.3 AT SA 240 (SINGLE SUBTEST LOOP)

SEE 4.1 FOR SR OPTIONS

5.1.4 AT SA 250 (SINGLE DATA PATTERN TEST)

SW15=1 TO HALT ON ERROR
SW13=1 TO INHIBIT PRINTOUTS

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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 SWS=1 THE PROGRAM HALTS. IF SWS=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 NEXT 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 SWS=1, HITTING 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.

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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 TEST, AND ON ALL LOOPS OF THE CHANNEL TEST UNLESS SW12 IS SET. THE FIRST INSTRUCTION EXECUTED UPON TRAPPING IS AN "RTI" 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 (00000). 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 ERCR11 (ERROR FUNCTION TEST)

THIS TEST CHECKS OPERATION OF THE VARIOUS ERROR SENSING FEATURES OF THE G.O.I. OR THE DOCUMENTATION CARD READER. CARD READER OFF-LINE, INPUT HOPPER EMPTY, OUTPUT STACKER FULL, FEED ERROR, MOTION ERROR, STACK FAIL, AND DARK-LIGHT ERROR ARE ALL 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'S 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 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.

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5.3 PROGRAM AND/OR OPERATOR ACTION

5.3.1 LOADING AND STARTING AT 2BR 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 MOTOR START AND READ START (RESET ON THE DOCUMENTATION READER). IF THE CARD READER IS WORKING PROPERLY, THE BELL WILL RING ONCE WHEN READ START 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. SEE 4.3.3 FOR DETAILS. THE PROGRAM WILL CONTINUOUSLY LOOP THRU THE DESIRED SUBTEST.

6. ERRORS

6.1 ERROR PRINTOUT

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.

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6.1.2 DATA ERROR PRINTOUT

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

DECK -EITHER ALPHANUMERIC OR BINARY , DEPENDING ON SW4
CARD -THE CARD NUMBER WHERE THE FAILURE OCCURRED
COLUMN -THE COLUMN NUMBER WHERE THE FAILURE OCCURRED
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 CR01
READ2 -THIS IS WHAT WAS IN CR01 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. SW04 NOT SET TO TYPE OF DECK USED
- B. CARD MISSING
- C. CARD DECK OUT OF PROPER SEQUENCE
- D. 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.

6.1.4 "BIT 0 WAS SET"

AT THE BEGINNING OF MOST SUBTESTS, BIT 0 (OFF-LINE) IS CHECKED TO MAKE SURE THAT THE READER IS NOT OFF-LINE. IT IS ALSO CHECKED IN THE DATA TEST WHEN AN INTERRUPT OCCURS DUE TO BIT 15 BEING SET. IF BIT 0 IS SET WHEN IT WAS NOT SUPPOSED TO BE, THE ERROR MESSAGE "BIT 0 WAS SET. REMEDY THE ERROR CONDITION AND PRESS 'CONTINUE'." IS PRINTED OUT. THE PROCESSOR THEN HALTS. SINCE THE CARD READER GOES OFF-LINE WHEN A CARD READER FUNCTION ERROR OCCURS (CARD JAM, PICK FAIL, ETC.), THE CARD READER ERROR MUST BE FIXED AND THE READER MUST BE PUT BACK ON-LINE BEFORE THE PROGRAM CAN BE CONTINUED.

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.

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7. RESTRICTIONS

7.1 STARTING PROCEDURE

NONE

7.2 OPERATIONAL RESTRICTIONS

7.2.1 COMBINED INSTRUCTION AND DATA RELIABILITY TEST (SA200)

IF A STANDARD TEST DECK IS NOT BEING USED, SW7 MUST BE SET TO INHIBIT RUNNING THE DATA RELIABILITY PORTION OF THE TEST.

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

IF THE CR11 USES AN M829 MODULE SW10 MUST BE SET IN THE SWITCH REGISTER.

7.2.2 ERROR FUNCTION TEST (SA 210 FOR G.O.I. READER - SA.220 FOR DOCUMENTION READER)

THE ERROR FUNCTION TEST REQUIRES SPARE CARDS, AS IT SENDS SEVERAL. ALSO, TO RUN THE DARK-LIGHT CHECK 2 CARDS MUST BE SPECIALLY PREPARED. THE TEST WILL TYPE OUT A REQUEST FOR THESE CARDS WHEN THEY ARE NEEDED. TO MAKE THEM:

1. TEAR A SMALL PIECE FROM THE LEADING EDGE OF ONE CARD.
2. TAPE 2 OTHER CARDS TOGETHER TO MAKE ONE "LONG" CARD - IT ONLY NEEDS TO BE ABOUT 1/2 INCH LONGER THAN A REGULAR CARD

7.2.3 SINGLE DATA PATTERN TEST (SA 250)

A SPECIAL DECK (ONE OR MORE CARDS) MUST BE PREPARED. ALL COLUMNS OF ALL CARDS ARE PUNCHED IDENTICALLY, USING A DATA PATTERN WHICH WILL TEST THE PROBLEM BEING DIAGNOSED.

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0. MISCELLANEOUS

0.1 EXECUTION TIME

NOT APPLICABLE

0.2 CARD DECK DESCRIPTION

0.2.1 ALPHANUMERIC

REFERENCE THE ALPHANUMERIC TABLE BEGINNING AT THE TAG ALPCD IN THE LISTING FOR THE CODES PUNCHED FOR EACH OF 80 COLUMNS OF THE FIRST 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 ROTATED ONE COLUMN TO THE LEFT.

0.2.2 BINARY

REFERENCE THE BINARY DATA TABLE BEGINNING AT THE TAG BINCD IN THE 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 ONE COLUMN TO THE LEFT.

0.3 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.

THE CARD READER GOES OFF-LINE DUE TO "INPUT HOPPER EMPTY" AFTER THE 80TH COLUMN OF THE LAST CARD IS READ, BUT BEFORE CARD DONE OCCURS. THUS, THE SPECIAL CONDITION BIT IN THE CSR WILL BE SET BEFORE CARD DONE ON THE LAST CARD.

IF THE CARD READER USES AN M829 MODULE, SW10 MUST BE SET IN THE SWITCH REGISTER. WITH THE M829 MODULE, CARD DONE NEVER OCCURS AFTER THE LAST CARD IN THE INPUT HOPPER IS READ. IF THE CARD READER USES AN M829P MODULE, SW10 MUST NOT BE SET. WITH THE M829P MODULE, CARD DONE IS ISSUED AFTER THE LAST CARD IN THE INPUT HOPPER IS READ.

IF BIT R OF THE CRS IS CLEARED IMMEDIATELY AFTER BEING SET, THE READING OF A CARD MAY NOT OCCUR. SINCE THIS BIT IS WRITE ONLY, A BIS OR BIC DONE AFTER SETTING BIT R MAY CLEAR THE BIT AND PREVENT THE READ FROM OCCURRING.

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8.4 TESTING CR11'S WITH NON-STANDARD ADDRESSES

BY SUBSTITUTING INTO THE LOCATIONS KCR8, KCR81, AND CR82 THE ADDRESSES OF THE CR8, CR81, AND CR82 OF A CARD READER ASSIGNED A NON-STANDARD ADDRESS, AND SUBSTITUTING ITS INTERRUPT VECTOR ADDRESS INTO ADINT, A CR11 MAY BE TESTED AT ANY ADDRESS ASSIGNED TO IT.

9. PROGRAM DESCRIPTION

THIS SET OF TESTS IS DESIGNED TO CHECK ALL OPERATIONS OF THE CR11 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 G.D.I. 100 READER, WHICH PRINTS OUT DIRECTIONS AS IT GOES ALONG. A TEST IS ALSO INCLUDED TO ISOLATE DIFFICULT DATA ERRORS USING A SPECIAL TEST DECK PUNCHED BY THE USER.

10. LISTINGS

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.ABS
.TITLE DZCRA-8      CR11 DIAGNOSTIC TEST
.NLIST MD,MC,CND
.LIST ME
;DIAGNOSTIC FOR CR11 CARD READER
;COPYRIGHT 1970,1971,1972, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
;BY RICK FADDEN
;(MODIFIED AUGUST-71 FOR DOCUMENTATION CARD READER (JOHN RODENHISER))
;(MODIFIED APRIL-72 FOR HARDWARE ECO)
;MODIFIED MARCH 1976 FOR SWITCH-LESS PROCESSORS BY RON PLATUKIS

;STARTING ADDRESSES ARE:
; 20R=INSTRUCTION AND DATA TEST FOR THE CR11
; 21R=ERROR FUNCTION TEST OF CR11 (GOI)
; 22R=ERROR FUNCTION TEST OF CR11 USING DOCUMENTATION READER.
; 24R=SINGLE TEST LOOP
; 25R=READ SINGLE DATA PATTERN TEST

;SWITCH REGISTER SETTINGS FOR THE INSTRUCTION AND DATA TEST ARE:
; SW84=1 FOR THE BINARY TEST DECK
; SW85=1 TO HALT AT THE END OF A STANDARD 80 CARD
; TEST DECK.
; 00 TO CONTINUE FROM ONE DECK TO THE NEXT.
; AFTER THE LAST DECK IN THE HOPPER IS
; RUN, THE PROGRAM WAITS FOR THE CARD READER
; TO COME BACK ON-LINE, AND RUNS THRU
; A SERIES OF CHECKS OF OFF-LINE AND
; COMING ON-LINE OPERATIONS OF THE READER.
; WHEN THE READER IS BACK ON-LINE AND THE
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542 /                               CHECKS ARE COMPLETE, THE DATA TEST IS RESUMED.
543 / SW06=1 TO RUN THE COMBINED INSTRUCTION AND DATA TEST
544 / WHEN CONTINUING FROM ONE DECK TO THE NEXT
545 /      =0 TO RUN ONLY THE DATA TEST ON EVERY DECK AFTER THE FIRST
546 / SW07=1 TO RUN ONLY THE INSTRUCTION TEST CONTINUALLY
547 /      SETTING SW06 AND SW07 AT THE END OF A DECK WILL
548 / CAUSE THE INSTRUCTION TEST TO BE RUN CONTINUOUSLY FROM THEN ON
549 / NOTE: IF SW7 IS SET, CHECKED BY PROGRAM, AND THEN
550 / CLEARED, THE DATA TEST WILL BE INCORRECT. THIS IS
551 / TRUE BECAUSE THE FIRST CARD IN THE DATA TEST WILL NOT
552 / BE THE ONE EXPECTED. WITH SW7 SET THE TEST MAY HANG
553 / WHEN THE INPUT HOPPER RUNS OUT OF CARDS.
554 / SW10=1 TO INDICATE THAT THE CR11 BEING TESTED USES THE
555 /      M029 MODULE
556 /      =0 TO INDICATE THAT THE CR11 BEING TESTED USES THE
557 /      M0200 MODULE
558 / SW11=1 TO INHIBIT SUBPROGRAM ITERATION
559 /      (NOTE THAT IF PROGRAM FLOW IS ALLOWED TO ENTER THE
560 / DATA SUBTEST, DATA ERRORS WILL OCCUR SINCE THE
561 / CARD COUNT WILL BE INCORRECT.)
562 / SW12=1 TO INHIBIT TRACE TRAPPING
563 / SW13=1 TO INHIBIT PRINTOUT
564 / SW14=1 FOR SCOPE LOOP
565 / SW15=1 TO HALT ON ERROR

566
567
568 /                               PSR=177776
569 /                               NOP=240
570 /                               HLT=EMT
571 /                               SCOPE=EMT+1
572 /                               CNTLU=EMT+2
573 /                               KBINTT=EMT+3
574 /                               READC=EMT+4
575 /                               SUSWR=EMT+5
576 /                               CR11=EMT+6
577 /                               TIT=EMT+7
578 /                               ADINT=X0
579 /                               COUNT=X1
580 /                               R2=X2
581 /                               CR3=X3
582 /                               CR1=X4
583 /                               R5=X5
584 /                               SP=X6
585 /                               PC=X7
586 /                               ICONTAINS ADDRESS OF INTERRUPT VECTOR
587 /                               IUSED FOR TIMING, ETC.
588 /                               ISCRATCH
589 /                               ICONTAINS ADDRESS OF CARD READ STATUS REGISTER
590 /                               ICONTAINS ADDRESS OF CARD READER BUFFER (12 BIT DATA)
591 /                               ISCRATCH
592 /                               ISTACK POINTER
593 /                               IPROGRAM COUNTER
594 /
595 / ILOAD TRAP CATCHER INTO LOCATIONS 0 THRU 377
596 / ILOAD TRAP VECTORS
597 /      .014
598 /      TRTRAP
599 /      340
600 /      .030
601 /      EMYSRV
602 /      340
603 /
604 /      .046
605 /      LOGIC

568 177776
569 000240
570 104000
571 104001
572 104002
573 104003
574 104004
575 104005
576 104006
577 104007
578 000000
579 000001
580 000002
581 000003
582 000004
583 000005
584 000006
585 000007
588 000014
589 000014 000642
590 000016 000340
591 000030 000030
592 000030 012752
593 000032 000340
594
595 000046
596 000046 006466
597
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598
599
600
601      000174
602 000174 000000
603 000176 000000
604
605
606      000200
607 000200 012706 000600
608 000204 000137 000726
609 000210 012706 000600
610 000214 000137 000720
611 000220 012706 000600
612 000224 000137 000720
613
614      000240
615 000240 012706 000600
616 000244 000137 010676
617
618 000250 012706 000600
619 000254 000137 011014
620
621
622      000600
623 000600 000000
624 000602 000000
625 000604 000230
626 000606 177560
627 000610 177562
628 000612 177564
629 000614 177566
630 000616 177570
631 000620 177570
632 000622 000000
633 000624 177777
634 000626 000000
635 000630 000000
636 000632 000000
637 000634 177160
638 000636 177162
639 000640 177164
640 000642 000002
641 000644 000000
642 000646 000000
643
644 000650 000000
645
646
647
648 000652 000737 012152
649 000656 104005
650 000660 104002
651 000662 104006
652 000664 012737 000001 012144
653 000672 013707 000634

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SOFTWARE SWITCH REGISTER LOCATIONS

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      .0174
DISPREG:0
SWREG: 0

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LOAD STARTING ADDRESS AREA

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      .0200
MOV     @STACK,SP
JMP     BEGIN           INORMAL STARTING ADDRESS FOR G.D.I. 100 READER
MOV     @STACK,SP
JMP     ERCR11         ISTARTING ADDRESS FOR CR11 ERROR FUNCTION TEST (G.D.I)
MOV     @STACK,SP
JMP     ERCH11         ISTARTING ADDRESS FOR CR11 ERROR FUNCTION TEST (DOCUMENTATI
      .0240
MOV     @STACK,SP
JMP     TESTX          ISTARTING ADDRESS FOR LOOP WHICH CONTINUALLY RUNS
                        IANY SINGLE SUBTEST
MOV     @STACK,SP
JMP     CKSAME         ISTARTING ADDRESS OF TEST TO READ A SINGLE DATA
                        IPATTERN CONTINUOUSLY

```

LOAD POINTERS AND GENERAL STORAGE

```

      .0400
STACK: 0               ISTACK POINTER INITIALIZED TO POINT HERE
INTFLG: 0              ICONTAINS LEVEL THAT INTERRUPT IS FOUND AT
INTVCI: 230           IADDRESS OF CARD READER INTERRUPT VECTOR
KBCSR: 177560
KADDR: 177562
TCSR: 177564          IADDRESS OF TELETYPE STATUS REGISTER
TDBR: 177566          IADDRESS OF TELETYPE DATA BUFFER
SWR: 177570
DISPLAY: 177570
TMP: 0
TIFLG: -1
TIB: 0
CSNT: 0
FLAG: 0
KCRS: 177160
KCRB1: 177162
CRB2: 177164
TRTRAP: RTI          IRETURN FROM TRACE LOOP
TRFLG: 0             ITOGGLED TO SWITCH BETWEEN TRACE TRAPPING AND NORMAL FLO
PROC: 0              ISTORES PROCESSOR STATUS WHEN TRACE TRAP MUST BE CLEARED
                        IIN A SUBTEST
ERFLG: 0             ISET TO ZERO TO OUTPUT DATA ERROR HEADING

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INITIALIZE CSR AND ORR POINTERS

```

SETUP: JSR     $7, TOUT
        SUSWR
        CNTLU
        CKU
MOV     @1, ITMAX     ISET ITERATION MAXIMUM TO 1 ITERATION
MOV     @KCRS, CRS    ISET UP REGISTER POINTERS

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654	000676	013704	000636		MOV	KCRB1,CRB1	
655	000702	013700	000604		MOV	INTVC,ADINT	ILOAD ADDRESS OF INTERRUPT VECTOR
656	000706	005037	000602		CLR	INTFLG	IINITIALIZE INTERRUPT FLAG
657	000712	005037	000644		CLR	TRPLG	IINITIALIZE TRACE FLAG
658	000716	012737	000340	177776	MOV	0340,PSR	ISETUP PROCESSOR STATUS
659	000724	000207			RTS	X7	IRETURN
660	000726	104007			BEGIN1	TIY	
661	000730	012702	016214		MOV	08UBT1,R2	
662	000734	004737	000652		JSR	X7,SETUP	IINITIALIZE POINTERS AND FLAGS
663	000740	000424			BR	TEST	I GO TO INSTRUCTION TESTS
664	000742	022737	000176	000616	RESTRY1	CMP	08SWR0,SWR
665	000750	001002			BNE	18	
666	000752	104002			CNTLU		
667	000754	104006			CKU		
668	000756	005737	000644		181	TSY	TRPLG
669	000762	001004			BNE	TRAPX	IIF SET, TRACE TRAP
670	000764	012737	000340	177776	NOTRP1	MOV	0340,PSR
671	000772	000407			BR	TEST	IIF ZERO, CLEAR TRACE BIT
672	000774	032777	010000	177614	TRAPX1	RTY	I GO TO INSTRUCTION TESTS
673	001002	001370			BNE	010000,0SWR	IIF SET, TRACE TRAP
674	001004	012737	000360	177776	MOV	0360,PSR	IIF ZERO, CLEAR TRACE BIT
675							
676							
677	001012	012737	001022	012150	ITEST FOR CORRECT INITIALIZATION OF STATUS REGISTER		
678	001020	104001			TEST1	MOV	0TEST1A,RETURN
679	001022	004737	011506		TEST11	SCOPE	ISETUP SCOPE LOOP RETURN ADDRESS
680	001026	013737	177776	000646	TEST1A1	JSR	X7,CKBITS
681	001034	005037	177776		MOV	PSR,PROC	IIF SET, TRACE TRAP
682	001040	005001			CLR	PSR	IIF ZERO, CLEAR TRACE BIT
683	001042	005201			CLR	COUNT	IINITIALIZE COUNTER
684	001044	001376			INC	COUNT	IWAIT TO BE CERTAIN
685	001046	005201			BNE	.-2	IWAIT TO BE CERTAIN
686	001050	001376			INC	COUNT	IWAIT TO BE CERTAIN
687	001052	013737	000646	177776	BNE	.-2	IWAIT TO BE CERTAIN
688	001060	000005			MOV	PROC,PSR	IWAIT TO BE CERTAIN
689	001062	005713			RESET		IWAIT TO BE CERTAIN
690	001064	001401			TSY	0CRS	IWAIT TO BE CERTAIN
691	001066	104000			REQ	.+6	IWAIT TO BE CERTAIN
692					HLT		IWAIT TO BE CERTAIN
693							IWAIT TO BE CERTAIN
694	001070	052713	177776		ONLY BITS 1 AND 6 OF THE STATUS REGISTER SHOULD BE ABLE TO BE SET TO ONE		
695	001074	022713	000102		IAND READ BACK AS ONE		
696	001100	001402			BIS	017776,0CRS	ISET ALL BITS BUT 0
697	001102	104000			CMP	0102,0CRS	IONLY BITS 1 AND 6 SHOULD BE SET
698	001104	000404			REQ	.+6	IIF SET, TRACE TRAP
699					HLT		IIF ZERO, CLEAR TRACE BIT
700	001106	005013			BR	TEST2	ISTATUS REGISTER DIDN'T CONTAIN 102
701	001110	005713			ICLEARING STATUS REGISTER SHOULD CLEAR BITS 1 AND 6		
702	001112	001401			CLR	0CRS	IIF SET, TRACE TRAP
703	001114	104000			TSY	0CRS	IIF ZERO, CLEAR TRACE BIT
704					REQ	.+6	IIF SET, TRACE TRAP
705	001116	104001			HLT		IIF ZERO, CLEAR TRACE BIT
706					TEST21	SCOPE	IIF SET, TRACE TRAP
707					ISTART SHOULD CAUSE CARD DONE WITHIN 1 SECOND		
708	001120	004737	011506		I BIT 0 SHOULD ALWAYS READ AS BEING EQUAL TO ZERO		
709	001124	013737	177776	000646	JSR	X7,CKBITS	IIF SET, TRACE TRAP
					MOV	PSR,PROC	IIF ZERO, CLEAR TRACE BIT

710	001132	005037	177776	CLR	PSR	ICLEAR TRACE BIT
711	001136	005213		INC	PCRS	ISTART READING A CARD
712	001140	032713	RRRR01	BIT	01,PCRS	ICHECK BIT 0
713	001144	001401		BEG	..+4	I BRANCH IF NOT SET
714	001146	104000		HLT		I BIT 0 READ AS A ONE
715	001150	005227	RRRR00	INC	00	I WAIT
716	001154	001375		BNE	..-4	
717	001156	005227	RRRR00	INC	00	
718	001162	001375		BNE	..-4	
719	001164	005227	RRRR00	INC	00	
720	001170	001375		BNE	..-4	
721	001172	005227	RRRR00	INC	00	
722	001176	001375		BNE	..-4	
723	001200	005227	RRRR00	INC	00	
724	001204	001375		BNE	..-4	
725	001206	013737	RR0646 177776	MOV	PRNC,PSR	I RESTORE PROCESSOR STATUS
726	001214	032713	RRRR00	BIT	040000,PCRS	ICHECK CARD DONE
727	001220	001002		BNE	CONT2	I CONTINUE IF SET
728	001222	104000		HLT		ICARD DONE DIDN'T SET WITHIN 400 MS
729	001224	000406		BR	TEST3	I NOTE THAT FAILURE COULD BE DUE TO READ
730						I NOT BEING RESET
731	001226	052713	RRRR00	CONT2: BIT	040000,PCRS	IDATO TO STATUS REGISTER SHOULD CLEAR
732	001232	032713	RRRR00	BIT	040000,PCRS	ICARD DONE
733	001236	001401		BEG	..+4	I BRANCH IF IT DID
734	001240	104000		HLT		IDATO DIDN'T CLEAR CARD DONE
735						
736	001242	104001		TEST3: SCOPE		
737						
738						
739	001244	004737	RR1506	JSR	27,CKRITA	ICHECK FOR OFF-LINE SET
740	001250	005013		CLR	PCRS	I INITIALIZE STATUS REGISTER
741	001252	005213		INC	PCRS	I READ A CARD
742	001254	032713	RR1000	BIT	01000,PCRS	ICHECK BUSY
743	001260	001002		BNE	LOOP3	I BRANCH IF SET
744	001262	104000		HLT		I READING A CARD DIDN'T SET BUSY
745	001264	000417		BR	TEST4	
746	001266	032713	RRRR00	LOOP3: BIT	040000,PCRS	ICHECK CARD DONE
747	001272	001010		BNE	DONE3	I BRANCH IF SET
748	001274	032713	RR1000	BIT	01000,PCRS	ICHECK BUSY
749	001300	001372		BNE	LOOP3	I BRANCH IF STILL SET
750	001302	032713	RRRR00	BIT	040000,PCRS	ICHECK CARD DONE
751	001306	001006		BNE	TEST4	I GO TO NEXT TEST IF SET
752	001310	104000		HLT		I BUSY CLEARED BEFORE CARD DONE SET
753	001312	000404		BR	TEST4	
754	001314	032713	RR1000	DONE3: BIT	01000,PCRS	ICHECK BUSY
755	001320	001401		BEG	TEST4	I GO ON TO NEXT TEST IF CLEAR
756	001322	104000		HLT		ICARD DONE DIDN'T CLEAR BUSY
757						
758	001324	104001		TEST4: SCOPE		
759						
760						
761						
762						
763	001326	004737	RR1434	JSR	27,INIT	I INITIALIZE STATUS REGISTER
764	001332	005001		CLR	COUNT	I INITIALIZE COUNTER
765	001334	005213		INC	PCRS	I INITIATE READ

766	001336	032713	140200	LOOP4:	BIT	0140200, 0CRS	IWAIT FOR SPECIAL CONDITION, CARD DONE, FOR COLUMN READY
767							ILOOP IF NONE OCCURRED
768	001342	001775			BEG	LOOP4	I SPECIAL CONDITION OR CARD DONE?
769	001344	032713	140000		BIT	0140000, 0CRS	IYES, BRANCH
770	001350	001007			BNE	CK4	I NO, COUNT COLUMN READYS
771	001352	005201			INC	COUNT	IWAIT FOR COLUMN READY TO CLEAR
772	001354	105713		LOOP4B:	TSTB	0CRS	IIF CLEAR, RETURN TO LOOP4
773	001356	100367			BPL	LOOP4	I CHECK FOR SPECIAL CONDITION OR CARD DONE
774	001360	032713	140000		BIT	0140000, 0CRS	I BRANCH IF EITHER SET
775	001364	001001			BNE	CK4	I OTHERWISE, CHECK AGAIN
776	001366	000772			BR	LOOP4B	I CHECK CARD DONE
777	001370	032713	040000	CK4:	BIT	040000, 0CRS	I BRANCH IF SET
778	001374	001002			BNE	.*6	I SPECIAL CONDITION SET BEFORE CARD DONE
779	001376	104000			HLT		
780	001400	000403			BR	CONTA	
781	001402	005713			TST	0CRS	I CHECK SPECIAL CONDITION
782	001404	100401			BMI	.*6	I BRANCH IF SET
783	001406	104000			HLT		I SPECIAL CONDITION WASN'T SET
784	001410	032713	004000	CONTA:	BIT	00000, 0CRS	I CHECK TIMING ERROR
785	001414	001001			BNE	.*6	I BRANCH IF SET
786	001416	104000			HLT		I TIMING ERROR WASN'T SET
787	001420	005301			DEC	COUNT	I CHECK NUMBER OF COLUMN READYS
788	001422	100002			BPL	.*6	I BRANCH IF ANY OCCURRED
789	001424	104000			HLT		I COLUMN READY NEVER OCCURRED
790	001426	000402			BR	.*6	
791	001430	001401			BEG	.*6	I BRANCH IF ONLY ONE OCCURRED
792	001432	104000			HLT		I COLUMN READY OCCURRED MORE THAN ONCE
793	001434	105713			TSTB	0CRS	I CHECK COLUMN READY
794	001436	100001			BPL	.*6	I BRANCH IF NOT SET
795	001440	104000			HLT		I COLUMN READY WASN'T CLEARED
796	001442	005013			CLR	0CRS	I CLEAR BITS 11, 14, AND 15 VIA DATO
797	001444	032713	144000		BIT	0144000, 0CRS	I CHECK
798	001450	001401			BEG	.*6	
799	001452	104000			HLT		I BITS 11, 14, AND 15 WEREN'T ALL CLEARED
800							
801							
802	001454	104001		TEST5:	SCOPE		
803							I SETTING READ SHOULD CAUSE COLUMN READY TO SET 00 TIMES BEFORE CARD DONE SETS
804							I READING THE DATA BUFFER SHOULD CLEAR COLUMN READY AND PREVENT A TIMING ERROR
805	001456	004737	011434		JSR	07, INIT	I INITIALIZE STATUS REGISTER
806	001462	005001			CLR	COUNT	I INITIALIZE COUNTER
807	001464	005213			INC	0CRS	I INITIATE READ
808	001466	032713	140200	LOOP5:	BIT	0140200, 0CRS	IWAIT FOR COLUMN READY, CARD DONE
809	001472	001775			BEG	.-4	I FOR SPECIAL CONDITION
810	001474	032713	040000		BIT	040000, 0CRS	I CARD DONE?
811	001500	001015			BNE	CK5	I YES, BRANCH
812	001502	005713			TST	0CRS	I CHECK BIT 15
813	001504	100002			BPL	.*6	I SKIP ERROR HALT IF NOT SET
814	001506	104000			HLT		I BIT 15 WAS SET
815	001510	000437			BR	TEST6	I GO TO NEXT TEST
816	001512	020127	000117		CHD	COUNT, 070.	I CHECK FOR 00
817	001516	100363			BPL	LOOP5	I BRANCH IF 00 OR MORE WITHOUT CLEARING READY
818	001520	005201			INC	COUNT	I INCREMENT COUNTER
819	001522	005714			TST	0CRB1	I CLEAR READY
820	001524	105713			TSTB	0CRS	I MAKE SURE IT CLEARED
821	001526	100001			BPL	.*6	I BRANCH IF IT DID

022	001530	104000		HLT		!READING DATA BUFFER DIDN'T CLEAR READY
023	001532	000755		BR	LOOPS	!LOOP
024	001534	032713	RR4000	CK51 BIT	04000, 0CRS	!CHECK TIMING ERROR BIT
025	001540	001401		BEQ	.*	!BRANCH IF NOT SET
026	001542	104000		HLT		!TIMING ERROR WAS SET
027						!NOTE THAT IF COLUMN READY SET MORE THAN 80 TIMES
028						!A TIMING ERROR WILL OCCUR AND THE COUNT WILL BE 79 (=117 OCTAL)
029	001544	000421		BR	TEST6	!BRANCH AFTER ERROR
030	001546	020127	RR117	CMP	COUNT, 079,	!CHECK COUNT
031	001552	001401		REQ	.*	!BRANCH IF 80 COLUMN READYS OCCURRED
032	001554	104000		HLT		!COLUMN READY DIDN'T OCCUR 80 TIMES
033						!BEFORE CARD DONE
034	001556	021327	040200	CMP	0CRS, 040200	!ONLY CARD DONE AND COLUMN READY SHOULD BE SET
035	001562	001401		BEQ	.*	
036	001564	104000		HLT		!STATUS REGISTER IN WRONG STATE
037	001566	005013		CLR	0CRS	!SHOULD CLEAR DONE BUT NOT READY
038	001570	021327	RR200	CMP	0CRS, 0200	!CHECK FOR ONLY READY SET
039	001574	001401		BEQ	.*	!BRANCH IF OK
040	001576	104000		HLT		!STATUS REGISTER IN WRONG STATE
041	001600	005714		TST	0CR01	!READING DATA BUFFER SHOULD CLEAR COLUMN READY
042	001602	005713		TST	0CRS	!CHECK STATUS REGISTER
043	001604	001401		REQ	.*	!BRANCH IF ALL BITS ZERO
044	001606	104000		HLT		!STATUS REGISTER NOT EQUAL TO ZERO
045						
046	001610	104001		TEST6: SCOPE		
047				!A TIMING ERROR SHOULD SET BIT 11 BEFORE CARD DONE OCCURS, EVEN IF IT OCCURS AT COLUMN 0		
048				!A DATOB TO THE LOW BYTE OF THE CRS SHOULD CLEAR BITS 15, 14, AND 11		
049	001612	004737	011434	JSR	17, INIT	!INITIALIZE
050	001616	012701	000115	MOV	077, COUNT	!SETUP COUNTER
051	001622	005213		INC	0CRS	!START READING A CARD
052	001624	105713		LOOP6: TSTR	0CRS	!WAIT FOR COLUMN READY
053	001626	100376		RPL	.-2	
054	001630	005714		TST	0CR01	!CLEAR COLUMN READY
055	001632	005301		DEC	COUNT	!GO THRU LOOP FOR 1ST 70 COLUMN READYS
056	001634	100373		RPL	LOOP6	
057	001636	032713	144000	BIT	0144000, 0CRS	!WAIT FOR CARD DONE OR TIMING ERROR
058	001642	001775		BEQ	.-4	!OR SPECIAL CONDITION
059	001644	032713	040000	BIT	040000, 0CRS	!CARD DONE SET?
060	001650	001026		BNE	ERR6	!YES, 2 POSSIBLE TEST FAILURES
061	001652	032713	RR4000	BIT	04000, 0CRS	!CHECK TIMING ERROR
062	001656	001416		REQ	OFF6	!IF NOT SET, READER IS PROBABLY OFF-LINE
063	001660	105713		TSTR	0CRS	!CHECK COLUMN READY
064	001662	100001		RPL	.*	!BRANCH IF CLEAR
065	001664	104000		HLT		!TIMING ERROR DIDN'T CLEAR READY
066	001666	005713		TST	0CRS	!WAIT FOR SPECIAL CONDITION
067	001670	100376		RPL	.-2	
068	001672	032713	040000	RIT	040000, 0CRS	!CHECK CARD DONE
069	001676	001406		BEQ	OFF6	!IF NOT SET, READER IS PROBABLY OFF-LINE
070	001700	105013		CLRR	0CRS	!DATOB TO LOW BYTE OF CRS
071	001702	032713	144000	RIT	0144000, 0CRS	!CHECK BITS 15, 14, 11
072	001706	001415		BEQ	TEST7	!BRANCH IF CLEAR TO NEXT TEST
073	001710	104000		HLT		!DATOB TO LOW BYTE OF CRS DIDN'T CLEAR
074						!BITS 15, 14 AND/OR 11
075	001712	000413		BR	TEST7	!GO TO NEXT TEST
076	001714	032713	RR0400	OFF6: RIT	0400, 0CRS	!CHECK BIT 8
077	001720	001010		BNE	TEST7	!BRANCH IF SET

878	001722	104000		HLT			
879	001724	000406		BR	TEST7		IBIT 15 WAS SET, 0 WASN'T
880	001726	032713	004000	ERR61	BIT	00000,0CRS	IGO TO NEXT TEST
881	001732	001402		BEQ	.*6		ITIMING ERROR SET?
882	001734	104000		HLT			INO, BRANCH
883	001736	000401		RR	TEST7		ITIMING ERROR DIDN'T SET BEFORE CARD DONE
884	001740	104000		HLT			IGO TO NEXT TEST AFTER ERROR
885							ITIMING ERROR WASN'T SET
886	001742	104001					
887							
888							
889							
890							
891							
892	001744	004737	011434	JSR	X7,INIT		IINITIALIZE
893	001750	005213		INC	0CRS		ISTART READ
894	001752	012701	000120	MOV	000,,COUNT		IINITIALIZE COUNTER
895	001756	032713	140200	LOOP71	BIT	0140200,0CRS	ITEST FOR ERROR, DONE OR READY
896	001762	001775		BEQ	LOOP7		ILOOP IF NONE SET
897	001764	005713		TST	0CRS		ICHECK ERROR
898	001766	100002		BPL	.*6		IBRANCH IF NOT SET
899	001770	104000		HLT			IBIT 15 WAS SET
900	001772	000455		RR	TEST8		IGO TO NEXT TEST AFTER ERROR
901	001774	032713	040000	BIT	040000,0CRS		ICHECK FOR CARD DONE
902	002000	001013		RNE	DONE7		IBRANCH IF SET
903	002002	005301		DEC	COUNT		ICOUNT
904	002004	001402		BEQ	.*6		IIF BOTH COLUMN READY, BRANCH
905	002006	005714		TST	0CR01		ICLEAR DONE
906	002010	000762		BR	LOOP7		ILOOP
907	002012	032713	140000	BIT	0140000,0CRS		IWAIT FOR DONE OR SPECIAL CONDITION
908	002016	001775		REQ	.-8		
909	002020	005713		TST	0CRS		ICHECK SPECIAL CONDITION
910	002022	100002		BPL	DONE7		IBRANCH IF NOT SET
911	002024	104000		HLT			ISPECIAL CONDITION WAS SET
912	002026	000437		BR	TEST8		IGO TO NEXT TEST AFTER ERROR
913	002030	005701		DONE71	TST	COUNT	ITEST FOR 00 COLUMN READY'S
914	002032	001402		BEQ	.*6		IBRANCH IF OK
915	002034	104000		HLT			ICOLUMN READY DID NOT OCCUR 00 TIMES
916	002036	000433		RR	TEST8		IGO TO NEXT TEST AFTER ERROR
917	002040	105213		INCR	0CRS		ISTART READ
918	002042	105713		TST0	0CRS		ICHECK COLUMN READY
919	002044	100401		RMI	.*6		IBRANCH IF STILL SET
920	002046	104000		HLT			IREADY DID NOT REMAIN SET
921	002050	032713	004000	BIT	04000,0CRS		ITEST FOR TIMING ERROR
922	002054	001775		BEQ	.-4		ILOOP IF NOT SET
923	002056	105713		TST0	0CRS		ICHECK COLUMN READY
924	002060	100002		BPL	.*6		IBRANCH IF NOT SET
925	002062	104000		HLT			ITIMING ERROR DIDN'T CLEAR READY
926	002064	000420		BR	TEST8		
927	002066	112713	000002	MOV0	02,0CRS		ISET EJECT
928	002072	032713	004000	BIT	04000,0CRS		ICHECK TIMING ERROR
929	002076	001402		BEQ	.*6		IBRANCH IF CLEARED
930	002100	104000		HLT			ITIMING ERROR NOT CLEARED BY DAT00
931	002102	000411		BR	TEST8		IGO TO NEXT TEST AFTER ERROR
932	002104	032713	140000	BIT	0140000,0CRS		IWAIT FOR DONE OR SPECIAL CONDITION
933	002110	001775		REQ	.-4		

934	002112	032713	000400		BIT	0400,0CRS	ICHECK BIT 0
935	002116	001003			RNE	TEST8	I BRANCH IF READER OFF-LINE
936	002120	005713			TST	0CRS	ISPECIAL CONDITION SHOULDN'T SET
937	002122	100001			BPL	.*4	ISINCE DATOB CLEARED TIMING ERROR
938	002124	104000			HLT		IRIT 15 WAS SET, 0 WASN'T
939							
940							
941	002126	104001			TEST8: SCOPE		
942					DATA SHOULD BE	AVAILABLE IN THE DATA BUFFER FOR AT LEAST 1.0 MILLISECOND	
943	002130	004737	011434		JSR	17,INIT	I INITIALIZE STATUS REGISTER
944	002134	013737	177776	000646	MOV	PSR,PROC	ISTORE CURRENT PROCESSOR STATUS
945	002142	005037	177776		CLR	PSR	ICLEAR TRACE BIT
946	002146	005213			INC	0CRS	ISTART READ
947	002150	032713	140200		LOOP8: BIT	0140200,0CRS	IWAIT FOR COLUMN READY OR CARD DONE
948	002154	001775			BEQ	.*4	FOR SPECIAL CONDITION
949	002156	032713	040000		BIT	040000,0CRS	ICARD DONE?
950	002162	001023			BNE	DBRCK8	IYES, GO TO CHECK STORING OF DR
951	002164	005713			TST	0CRS	INO, CHECK BIT 15
952	002166	100002			BPL	.*6	I BRANCH IF NOT SET
953	002170	104000			HLT		IBIT 15 WAS SET
954	002172	000441			BR	TEST9	IGO TO NEXT TEST AFTER ERROR
955	002174	005013			CLR	0CRS	IDATO TO CRS - SHOULDN'T CLEAR BUSY OR READY
956	002176	022713	001200		CHP	01200,0CRS	ICHECK FOR BUSY AND READY
957	002202	001402			REQ	.*6	I BRANCH IF STILL SET
958	002204	104000			HLT		ICRS IN WRONG STATE
959	002206	000433			BR	TEST9	IGO TO NEXT TEST AFTER ERROR
960	002210	011405			MOV	0CR01,R5	ISTORE DATA
961	002212	012701	000300		MOV	0300,COUNT	I INITIALIZE COUNTER
962	002216	005301			DEC	COUNT	IWAIT FOR 1 MILLISECOND (APPROX.)
963	002220	001376			BNE	.*2	
964	002222	021405			CHP	0CR01,R5	IDATA UNCHANGED?
965	002224	001751			BEQ	LOOP8	IOK, CONTINUE
966	002226	104000			HLT		IDATA NOT AVAILABLE FOR 1.0 MILLISECONDS
967	002230	000422			BR	TEST9	IGO TO NEXT TEST AFTER FAILURE
968	002232	017702	176402		DBRCK8: MOV	0CR02,R2	ISTORE ENCODED DATA IN REGISTER 2
969	002236	012701	000100		MOV	0100,COUNT	ISET UP COUNTER
970	002242	021405			CONT8: CHP	0CR01,R5	I READ CARD-IMAGE DATA BUFFER
971	002244	001402			BEQ	.*6	I BRANCH IF UNCHANGED
972	002246	104000			HLT		ICR01 READ INCORRECTLY
973	002250	000407			BR	REST8	I BRANCH TO RESTORE PROCESSOR STATUS AND EXIT
974	002252	027702	176362		CHP	0CR02,R2	I READ ENCODED DATA BUFFER
975	002256	001402			BEQ	.*6	I BRANCH IF UNCHANGED
976	002260	104000			HLT		ICR02 READ INCORRECTLY
977	002262	000402			BR	REST8	I BRANCH AFTER FAILURE
978	002264	005301			DEC	COUNT	ICOUNT DOWN
979	002266	001365			RNE	CONT8	I LOOP IF NOT DONE
980	002270	013737	000646	177776	REST8: MOV	PROC,PSR	IRESTORE PROCESSOR STATUS
981							
982							
983	002276	104001			TEST9: SCOPE		
984					REJECT SHOULD PREVENT FURTHER COLUMN READY'S		
985					ICARD DONE SHOULD STILL OCCUR, AND TIMING ERRORS SHOULD BE		
986					IPREVENTED IF THE CURRENT COLUMN READY IS CLEARED		
987	002300	004737	011434		JSR	17,INIT	I INITIALIZE STATUS REGISTER
988	002304	013737	177776	000646	MOV	PSR,PROC	ISAVE PROCESSOR STATUS
989	002312	005037	177776		CLR	PSR	ICLEAR TRACE BIT

990	002316	005213			INC	0CRS	I START READ
991	002320	105713			TST	0CRS	I WAIT FOR COLUMN READY
992	002322	001776			BEG	.-?	
993	002324	052713	000002		BIS	02,0CRS	I SET EJECT
994	002330	005714			TST	0CRS1	I CLEAR COLUMN READY
995	002332	005001			CLR	COUNT	I LOOP TAKES 11.4 MICROSECONDS ONCE THRU
996	002334	032713	044200	WAIT9:	RIT	044200,0CRS	I WAIT FOR CARD DONE, TIMING ERROR, OR
997	002340	001004			BNE	CK9	I COLUMN READY
998	002342	005201			INC	COUNT	I TIME FOR ABOUT 3/4 SECOND
999	002344	001373			BNE	WAIT9	I CONTINUE WAITING
1000	002346	104000			HLT		I NO CARD DONE OCCURRED WITHIN 3/4 SECOND
1001	002350	000411			BR	REST9	I CONTINUE AFTER FAILURE
1002	002352	032713	040000	CK9:	BIT	040000,0CRS	I CHECK FOR CARD DONE
1003	002356	001006			BNE	REST9	
1004	002360	032713	000200		RIT	0200,0CRS	I CHECK COLUMN READY
1005	002364	001402			BEG	.*6	I BRANCH IF NOT SET
1006	002366	104000			HLT		I COLUMN READY WAS SET
1007	002370	000401			BR	REST9	
1008	002372	104000			HLT		I EJECT DID NOT PREVENT A TIMING ERROR
1009	002374	013737	000646	177776	REST9:	PRC,PSR	I RESTORE PROCESSOR STATUS
1010							
1011							
1012	002402	104001			TEST10: SCOPE		
1013					I CARD DONE SHOULD CAUSE AN INTERRUPT		
1014	002404	004737	011434		JSR	07,INIT	I INITIALIZE
1015	002410	012710	002464		MOV	0TINT10,0ADINT	I LOAD RETURN POINTER
1016	002414	052737	000340	177776	BIS	0340,PSR	I SET PROCESSOR TO LEVEL 7
1017	002422	013760	177776	000002	MOV	PSR,2(ADINT)	I LOAD RETURN PROCESSOR STATUS
1018	002430	042737	000340	177776	BIC	0340,PSR	I SET PROCESSOR PRIORITY TO 0
1019	002436	012713	000103		MOV	0103,0CRS	I SET EJECT, INTERRUPT ENABLE, AND READ
1020	002442	032713	040000		BIT	040000,0CRS	I WAIT FOR CARD DONE
1021	002446	001775			BEG	.-4	
1022	002450	016037	000002	177776	MOV	2(ADINT),PSR	I RESTORE PROCESSOR TO HIGHEST PRIORITY
1023	002456	105013			CLRR	0CRS	I CLEAR INTERRUPT ENABLE
1024	002460	104000			HLT		I NO INTERRUPT OCCURRED
1025	002462	000414			BR	CONT10	
1026	002464	032713	040000	TINT10:	BIT	040000,0CRS	I CHECK CARD DONE
1027	002470	001001			BNE	.*4	I BRANCH IF SET
1028	002472	104000			HLT		I CARD DONE NOT SET
1029	002474	022626			CMR	(SP)+,(SP)+	I RESTORE STACK POINTER
1030	002476	005713			TST	0CRS	I MAKE SURE NO ERROR OCCURRED
1031	002500	100001			BPL	.*4	
1032	002502	104000			HLT		I BIT 15 WAS SET
1033	002504	105713			TST	0CRS	I CHECK COLUMN READY
1034	002506	100001			BPL	.*4	I BRANCH IF NOT SET
1035	002510	104000			HLT		I COLUMN READY WAS SET
1036	002512	005013			CLR	0CRS	I DISABLE INTERRUPTS
1037	002514	012710	000232	CONT10:	MOV	0232,0ADINT	I CHANGE INTERRUPT RETURN ADDRESS
1038	002520	005037	000232		CLR	00232	I TO CAUSE A HALT IF AN INTERRUPT OCCURS
1039							
1040	002524	104001			TEST11: SCOPE		
1041					I COLUMN READY SHOULD CAUSE AN INTERRUPT		
1042	002526	004737	011434		JSR	07,INIT	I INITIALIZE
1043	002532	012710	002604		MOV	0TINT11,0ADINT	I LOAD RETURN POINTER
1044	002536	052737	000340	177776	BIS	0340,PSR	I SET PROCESSOR STATUS TO LEVEL 7
1045	002544	013760	177776	000002	MOV	PSR,2(ADINT)	I LOAD RETURN PROCESSOR STATUS

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1046 002552 042737 000340 177776      BIC      0340,PSR      ISET PROCESSOR PRIORITY TO 0
1047 002560 012713 000101      MOV      0101,PCRS    ISET READ AND INTERRUPT ENABLE
1048 002564 105713      TSTB    PCRS          IWAIT FOR COLUMN READY
1049 002566 100376      BPL     .-2
1050 002570 016037 000002 177776      MOV      2(ADINT),PSR IRESTORE PROCESSOR TO HIGHEST PRIORITY
1051 002576 005013      CLR     PCRS          ICLEAR INTERRUPT ENABLE
1052 002600 104000      HLT     PCRS          ICOLUMN READY DID NOT INTERRUPT
1053 002602 000405      BR     CONT11
1054 002604 005013      TINT11: CLR     PCRS    ICLEAR INTERRUPT ENABLE
1055 002606 105713      TSTB    PCRS          IMAKE SURE COLUMN READY IS SET
1056 002610 100401      BMI     .+4           IBRANCH IF SET
1057 002612 104000      HLT     PCRS          ICOLUMN READY WASN'T SET
1058 002614 022626      CMP     (SP)+,(SP)+  IRESTORE STACK POINTER
1059 002616 012710 000232      CONT11: MOV     0232,0ADINT ICHANGE INTERRUPT RETURN ADDRESS
1060 002622 005037 000232      CLR     00232        ITO CAUSE A HALT IF ANOTHER INTERRUPT OCCURS
1061
1062 002626 104001      TEST12: SCOPE
1063      ICARD DONE SHOULDN'T CAUSE AN INTERRUPT IF THE PROCESSOR IS AT LEVEL 7 PRIORITY
1064 002630 004737 011434      JSR     X7,INIT      IINITIALIZE
1065 002634 012710 002670      MOV     0TINT12,0ADINT ISETUP RETURN
1066 002640 052737 000340 177776      BIS     0340,PSR    ISET PROCESSOR TO LEVEL 7 PRIORITY
1067 002646 013760 177776 000002      MOV     PSR,2(ADINT) ILOAD RETURN PROCESSOR STATUS
1068 002654 012713 000103      MOV     0103,PCRS   ISET EJECT, INTERRUPT ENABLE, AND READ
1069 002660 032713 040000      BIT     040000,PCRS IWAIT FOR CARD DONE
1070 002664 001775      BEQ     .-4
1071 002666 000402      BR     .+6           ICONTINUE IF NO INTERRUPT OCCURRED
1072 002670 104000      TINT12: HLT     PCRS    IAN INTERRUPT OCCURRED
1073 002672 022626      CMP     (SP)+,(SP)+  IRESTORE STACK POINTER
1074 002674 005013      CLR     PCRS          ICLEAR INTERRUPT ENABLE AND EJECT
1075 002676 012710 000232      MOV     0232,0ADINT ICHANGE INTERRUPT RETURN ADDRESS
1076 002702 005037 000232      CLR     00232        ITO CAUSE A HALT IF AN INTERRUPT OCCURS
1077
1078      IFIND THE LEVEL AT WHICH AN INTERRUPT OCCURS
1079      IPRINT OUT A MESSAGE STATING THIS LEVEL IF IT IS OTHER THAN THE STANDARD (LEVEL 6)
1080      IMAKE CERTAIN THAT IT ALWAYS OCCURS AT THIS LEVEL
1081      ITHE MESSAGE STATING THE LEVEL IS PRINTED ONLY ONCE, AND THE PROGRAM MUST
1082      IBE STARTED OVER AT LOCATION 200 FOR IT TO BE PRINTED AGAIN
1083
1084
1085      ITEST FOR AN INTERRUPT ON LEVEL 7
1086 002706 104001      TEST13: SCOPE
1087 002710 004737 011434      JSR     X7,INIT      IINITIALIZE
1088 002714 012710 003024      MOV     0TINT13,0ADINT ISETUP RETURN ADDRESS
1089 002720 052737 000340 177776      BIS     0340,PSR    ISET PROCESSOR PRIORITY TO 7
1090 002726 013760 177776 000002      MOV     PSR,2(ADINT) ISETUP RETURN PROCESSOR STATUS
1091 002734 042737 000340 177776      BIC     0340,PSR    ISET PROCESSOR PRIORITY TO 0
1092 002742 052737 000300 177776      BIS     0300,PSR    ISET PROCESSOR TO LEVEL 6 PRIORITY
1093 002750 012713 000103      MOV     0103,PCRS   ISET EJECT INTERRUPT ENABLE, AND READ
1094 002754 032713 040000      BIT     040000,PCRS IWAIT FOR CARD DONE
1095 002760 001775      BEQ     .-4
1096 002762 016037 000002 177776      MOV     2(ADINT),PSR IRESTORE PROCESSOR TO HIGHEST PRIORITY
1097 002770 005013      CLR     PCRS          IDISABLE INTERRUPTS
1098 002772 012710 000232      MOV     0232,0ADINT ICHANGE INTERRUPT RETURN ADDRESS
1099 002776 005037 000232      CLR     00232        ITO CAUSE A HALT IF AN INTERRUPT OCCURS
1100 003002 005737 000602      TST     INTFLG       ICHECK TO SEE IF LEVEL ALREADY RECORDED
1101 003006 100044      BPL     TEST14       IIF NO, GO TO NEXT TEST

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1102	003010	023727	000602	100007		CMP	INTFLG,0100007	IF 80, CHECK TO SEE
1103	003016	100440				BMI	TEST14	IF THAT THE INTERRUPT LEVEL RECORDED
1104								IS BELOW THE CURRENT LEVEL
1105	003020	104000				HLT		IF INTERRUPT DIDN'T OCCUR WITH STATUS
1106								AT LEVEL 7, BUT PREVIOUSLY OCCURRED
1107								AT OR ABOVE THIS LEVEL
1108	003022	000436				RR	TEST14	
1109	003024	032713	040000		TINT131	BIT	040000,0CR8	IF MAKE SURE CARD DONE IS SET
1110	003030	001001				BNE	.+4	IF BRANCH IF SET
1111	003032	104000				HLT		IF CARD DONE WASN'T SET
1112	003034	005013				CLR	0CR8	IF DISABLE FURTHER INTERRUPTS
1113	003036	012710	000232			MOV	0232,0ADINT	IF CHANGE INTERRUPT RETURN ADDRESS
1114	003042	005037	000232			CLR	00232	IF TO CAUSE A HALT IF AN INTERRUPT OCCURS
1115	003046	022626				CMP	(SP)+,(SP)+	IF RESTORE STACK POINTER
1116	003050	005737	000602			TST	INTFLG	IF CHECK FOR PREVIOUS FLAG
1117	003054	100414				BMI	SET7	IF BRANCH IF FLAG SET
1118	003056	012737	100007	000602		MOV	0100007,INTFLG	IF SET FLAG AND LEVEL
1119	003064	012702	014503			MOV	0MSG4,R2	IF SETUP FOR PRINTOUT
1120	003070	004737	012152			JSR	07,TOUT	IF PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1121	003074	012702	000007			MOV	07,R2	
1122	003100	004737	011734			JSR	07,PROCT	IF PRINT LEVEL NUMBER
1123	003104	000405				OR	TEST14	
1124	003106	023727	000602	100007	SET71	CMP	INTFLG,0100007	IF CHECK PREVIOUS LEVEL
1125	003114	100001				BPL	TEST14	
1126	003116	104000				HLT		IF INTERRUPT PREVIOUSLY OCCURRED ONLY AT A LOWER LEVEL
1127								
1128								IF TEST FOR AN INTERRUPT ON LEVEL 6
1129								IF SINCE THIS IS WHERE THE CARD READER NORMALLY IS, DON'T PRINT OUT A MESSAGE
1130								IF IF IT IS FOUND HERE
1131	003120	104001						TEST141 SCOPE
1132	003122	004737	011434			JSR	07,INIT	IF INITIALIZE
1133	003126	012710	003216			MOV	0TINT14,0ADINT	IF SETUP RETURN ADDRESS
1134	003132	052737	000340	177776		BIS	0340,PSR	IF SET PROCESSOR PRIORITY TO 7
1135	003140	013760	177776	000002		MOV	PSR,2(ADINT)	IF SETUP RETURN PROCESSOR STATUS
1136	003146	042737	000340	177776		BIC	0340,PSR	IF SET PROCESSOR PRIORITY TO 0
1137	003154	052737	000240	177776		RIS	0240,PSR	IF SET PROCESSOR TO LEVEL 5 PRIORITY
1138	003162	012713	000103			MOV	0103,0CR8	IF SET EJECT, INTERRUPT ENABLE, AND READ
1139	003166	032713	040000			BIT	040000,0CR8	IF WAIT FOR CARD DONE
1140	003172	001775				REQ	.-4	
1141	003174	016037	000002	177776		MOV	2(ADINT),PSR	IF RESTORE PROCESSOR TO HIGHEST PRIORITY
1142	003202	005013				CLR	0CR8	IF DISABLE INTERRUPTS
1143	003204	012710	000232			MOV	0232,0ADINT	IF CHANGE INTERRUPT RETURN ADDRESS
1144	003210	005037	000232			CLR	00232	IF TO CAUSE A HALT IF AN INTERRUPT OCCURS
1145	003214	000426				OR	TEST15	
1146	003216	032713	040000		TINT141	BIT	040000,0CR8	IF MAKE SURE CARD DONE IS SET
1147	003222	001001				BNE	.+4	IF BRANCH IF SET
1148	003224	104000				HLT		IF CARD DONE WASN'T SET
1149	003226	005013				CLR	0CR8	IF DISABLE FURTHER INTERRUPTS
1150	003230	012710	000232			MOV	0232,0ADINT	IF CHANGE INTERRUPT RETURN ADDRESS
1151	003234	005037	000232			CLR	00232	IF TO CAUSE A HALT IF AN INTERRUPT OCCURS
1152	003240	022626				CMP	(SP)+,(SP)+	IF RESTORE STACK POINTER
1153	003242	005737	000602			TST	INTFLG	IF CHECK FOR PREVIOUS FLAG
1154	003246	100404				BMI	SET14	IF BRANCH IF FLAG SET
1155	003250	012737	100006	000602		MOV	0100006,INTFLG	IF SET FLAG AND LEVEL
1156	003256	000405				OR	TEST15	
1157	003260	023727	000602	100006	SET141	CMP	INTFLG,0100006	IF CHECK PREVIOUS LEVEL


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1158 003266 100001          BPL      TEST15
1159 003270 104000          HLT
1160
1161
1162 003272 104001          ;TEST FOR AN INTERRUPT ON LEVEL 5
1163 003274 004737 011434    TEST15: SCOPE
1164 003300 012710 003410    JSR      X7,INIT          ;INITIALIZE
1165 003304 052737 000340 177776  MOV      @TINT15,@ADINT  ;SETUP RETURN ADDRESS
1166 003312 013760 177776 000002  RIS      @340,PSR        ;SET PROCESSOR PRIORITY TO 7
1167 003320 042737 000340 177776  MOV      PSR,2(ADINT)    ;SETUP RETURN PROCESSOR STATUS
1168 003326 052737 000200 177776  BIC      @340,PSR        ;SET PROCESSOR PRIORITY TO 0
1169 003334 012713 000103          BIS      @200,PSR        ;SET PROCESSOR TO LEVEL 4 PRIORITY
1170 003340 032713 040000          MOV      @103,PCRS      ;SET EJECT INTERRUPT ENABLE, AND READ
1171 003344 001775          BIT      @40000,PCRS    ;WAIT FOR CARD DONE
1172 003346 016037 000002 177776  BEQ      ,=4
1173 003354 005013          MOV      2(ADINT),PSR   ;RESTORE PROCESSOR TO HIGHEST PRIORITY
1174 003356 012710 000232    CLR      PCRS          ;DISABLE INTERRUPTS
1175 003362 005037 000232    MOV      @232,@ADINT    ;CHANGE INTERRUPT RETURN ADDRESS
1176 003366 005737 000602    CLR      @0232          ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1177 003372 100044          TST     INTFLG         ;CHECK TO SEE IF LEVEL ALREADY RECORDED
1178 003374 023727 000602 100005  BPL     TEST16         ;IF NO, GO TO NEXT TEST
1179 003402 100440          CMP     INTFLG,@100005 ;IF SO, CHECK TO SEE
1180
1181 003404 104000          BMT     TEST16         ;THAT THE INTERRUPT LEVEL RECORDED
1182
1183
1184
1185 003406 000436          ;IS BELOW THE CURRENT LEVEL
1186 003410 032713 040000    HLT     ;INTERRUPT DIDN'T OCCUR WITH STATUS
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1200
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1205 003404 000436          ;AT LEVEL 5, BUT PREVIOUSLY OCCURRED
1206 003410 032713 040000    HLT     ;AT OR ABOVE THIS LEVEL
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1214	003556	001775			BEG	.-4	
1215	003560	016037	000002	177776	MOV	2(ADINT),PSR	IRESTORE PROCESSOR TO HIGHEST PRIORITY
1216	003566	005013			CLR	PCRS	IDISABLE INTERRUPTS
1217	003570	012710	000232		MOV	0232,0ADINT	ICHANGE INTERRUPT RETURN ADDRESS
1218	003574	005037	000232		CLR	00232	ITO CAUSE A HALT IF AN INTERRUPT OCCURS
1219	003600	005737	000602		TST	INTFLG	ICHECK TO SEE IF LEVEL ALREADY RECORDED
1220	003604	100044			BPL	TEST17	IF NO, GO TO NEXT TEST
1221	003606	023727	000602	100004	CMP	INTFLG,#100004	IF SO, CHECK TO SEE
1222	003614	100440			BMI	TEST17	IF THAT THE INTERRUPT LEVEL RECORDED
1223							IS BELOW THE CURRENT LEVEL
1224	003616	104000			HLT		IF INTERRUPT DIDN'T OCCUR WITH STATUS
1225							AT LEVEL 4, BUT PREVIOUSLY OCCURRED
1226							AT OR ABOVE THIS LEVEL
1227	003620	000436			BR	TEST17	
1228	003622	032713	040000		TINT16: BIT	040000,PCRS	IMAKE SURE CARD DONE IS SET
1229	003626	001001			BNE	.-4	IBRANCH IF SET
1230	003630	104000			HLT		ICARD DONE WASN'T SET
1231	003632	005013			CLR	PCRS	IDISABLE FURTHER INTERRUPTS
1232	003634	012710	000232		MOV	0232,0ADINT	ICHANGE INTERRUPT RETURN ADDRESS
1233	003640	005037	000232		CLR	00232	ITO CAUSE A HALT IF AN INTERRUPT OCCURS
1234	003644	022626			CMP	(SP)+,(SP)+	IRESTORE STACK POINTER
1235	003646	005737	000602		TST	INTFLG	ICHECK FOR PREVIOUS FLAG
1236	003652	100414			BMI	SET4	IF FLAG SET
1237	003654	012737	100004	000602	MOV	0100004,INTFLG	IF SET FLAG AND LEVEL
1238	003662	012702	014503		MOV	0MSG0,R2	IF SETUP FOR PRINTOUT
1239	003666	004737	012152		JSR	07,TOUT	IF PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1240	003672	012702	000004		MOV	04,R2	
1241	003676	004737	011734		JSR	07,PROCT	IF PRINT LEVEL NUMBER
1242	003702	000405			BR	TEST17	
1243	003704	023727	000602	100004	SET4: CMP	INTFLG,#100004	ICHECK PREVIOUS LEVEL
1244	003712	100001			BPL	TEST17	
1245	003714	104000			HLT		IF INTERRUPT PREVIOUSLY OCCURRED ONLY AT A LOWER LEVEL
1246							
1247							
1248	003716	104001					
1249	003720	004737	011434		TINT17: JSR	07,INIT	IF INITIALIZE
1250	003724	012710	000434		MOV	0TINT17,0ADINT	IF SETUP RETURN ADDRESS
1251	003730	052737	000340	177776	BIS	0340,PSR	IF SET PROCESSOR PRIORITY TO 7
1252	003736	013760	177776	000002	MOV	PSR,2(ADINT)	IF SETUP RETURN PROCESSOR STATUS
1253	003744	042737	000340	177776	BIC	0340,PSR	IF SET PROCESSOR PRIORITY TO 0
1254	003752	052737	000100	177776	BIS	0100,PSR	IF SET PROCESSOR TO LEVEL 2 PRIORITY
1255	003760	012713	000103		MOV	0103,PCRS	IF SET EJECT INTERRUPT ENABLE, AND READ
1256	003764	032713	040000		BIT	040000,PCRS	IF WAIT FOR CARD DONE
1257	003770	001775			BEG	.-4	
1258	003772	016037	000002	177776	MOV	2(ADINT),PSR	IRESTORE PROCESSOR TO HIGHEST PRIORITY
1259	004000	005013			CLR	PCRS	IDISABLE INTERRUPTS
1260	004002	012710	000232		MOV	0232,0ADINT	ICHANGE INTERRUPT RETURN ADDRESS
1261	004006	005037	000232		CLR	00232	ITO CAUSE A HALT IF AN INTERRUPT OCCURS
1262	004012	005737	000602		TST	INTFLG	ICHECK TO SEE IF LEVEL ALREADY RECORDED
1263	004016	100044			BPL	TEST18	IF NO, GO TO NEXT TEST
1264	004020	023727	000602	100003	CMP	INTFLG,#100003	IF SO, CHECK TO SEE
1265	004026	100440			BMI	TEST18	IF THAT THE INTERRUPT LEVEL RECORDED
1266							IS BELOW THE CURRENT LEVEL
1267	004030	104000			HLT		IF INTERRUPT DIDN'T OCCUR WITH STATUS
1268							AT LEVEL 3, BUT PREVIOUSLY OCCURRED
1269							AT OR ABOVE THIS LEVEL

1270	004032	000436		RR	TEST10	
1271	004034	032713	A40000	TINT17: BIT	040000,0CRS	MAKE SURE CARD DONE IS SET
1272	004040	001001		BNE	.+4	BRANCH IF SET
1273	004042	104000		HLT		CARD DONE WASN'T SET
1274	004044	005013		CLR	0CRS	DISABLE FURTHER INTERRUPTS
1275	004046	012710	000232	MOV	0232,0ADINT	CHANGE INTERRUPT RETURN ADDRESS
1276	004052	005037	000232	CLR	00232	TO CAUSE A HALT IF AN INTERRUPT OCCURS
1277	004056	022626		CMP	(SP)+,(SP)+	RESTORE STACK POINTER
1278	004060	005737	000602	TST	INTFLG	CHECK FOR PREVIOUS FLAG
1279	004064	100414		BMI	SET3	BRANCH IF FLAG SET
1280	004066	012737	100003	MOV	0100003,INTFLG	SET FLAG AND LEVEL
1281	004074	012702	014503	MOV	0MSG4,R2	SETUP FOR PRINTOUT
1282	004100	004737	012152	JSR	X7,TOUT	PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1283	004104	012702	000003	MOV	03,R2	
1284	004110	004737	011734	JSR	X7,PROCT	PRINT LEVEL NUMBER
1285	004114	000405		BR	TEST10	
1286	004116	023727	000602	SET3: CMP	INTFLG,#100003	CHECK PREVIOUS LEVEL
1287	004124	100001		BPL	TEST10	
1288	004126	104000		HLT		INTERRUPT PREVIOUSLY OCCURRED ONLY AT A LOWER LEVEL
1289						
1290						
1291	004130	104001				
1292	004132	004737	011434	JSR	X7,INIT	INITIALIZE
1293	004136	012710	004246	MOV	0TINT10,0ADINT	SETUP RETURN ADDRESS
1294	004142	052737	000340	BIS	0340,PSR	SET PROCESSOR PRIORITY TO 7
1295	004150	013760	177776	MOV	PSR,2(ADINT)	SETUP RETURN PROCESSOR STATUS
1296	004156	042737	000340	BIC	0340,PSR	SET PROCESSOR PRIORITY TO 0
1297	004164	052737	000040	BIS	0040,PSR	SET PROCESSOR TO LEVEL 1 PRIORITY
1298	004172	012713	000103	MOV	0103,0CRS	SET EJECT INTERRUPT ENABLE, AND READ
1299	004176	032713	A40000	RTY	040000,0CRS	WAIT FOR CARD DONE
1300	004202	001775		BEQ	.+4	
1301	004204	016037	000002	MOV	2(ADINT),PSR	RESTORE PROCESSOR TO HIGHEST PRIORITY
1302	004212	005013		CLR	0CRS	DISABLE INTERRUPTS
1303	004214	012710	000232	MOV	0232,0ADINT	CHANGE INTERRUPT RETURN ADDRESS
1304	004220	005037	000232	CLR	00232	TO CAUSE A HALT IF AN INTERRUPT OCCURS
1305	004224	005737	000602	TST	INTFLG	CHECK TO SEE IF LEVEL ALREADY RECORDED
1306	004230	100044		BPL	TEST10	IF NO, GO TO NEXT TEST
1307	004232	023727	000602	CMP	INTFLG,#100002	IF SO, CHECK TO SEE
1308	004240	100440		BMI	TEST10	THAT THE INTERRUPT LEVEL RECORDED
1309						IS BELOW THE CURRENT LEVEL
1310	004242	104000		HLT		INTERRUPT DIDN'T OCCUR WITH STATUS
1311						AT LEVEL 2, BUT PREVIOUSLY OCCURRED
1312						AT OR ABOVE THIS LEVEL
1313	004244	000436		BR	TEST10	
1314	004246	032713	A40000	TINT10: BIT	040000,0CRS	MAKE SURE CARD DONE IS SET
1315	004252	001001		BNE	.+4	BRANCH IF SET
1316	004254	104000		HLT		CARD DONE WASN'T SET
1317	004256	005013		CLR	0CRS	DISABLE FURTHER INTERRUPTS
1318	004260	012710	000232	MOV	0232,0ADINT	CHANGE INTERRUPT RETURN ADDRESS
1319	004264	005037	000232	CLR	00232	TO CAUSE A HALT IF AN INTERRUPT OCCURS
1320	004270	022626		CMP	(SP)+,(SP)+	RESTORE STACK POINTER
1321	004272	005737	000602	TST	INTFLG	CHECK FOR PREVIOUS FLAG
1322	004276	100414		BMI	SET2	BRANCH IF FLAG SET
1323	004300	012737	100002	MOV	0100002,INTFLG	SET FLAG AND LEVEL
1324	004306	012702	014503	MOV	0MSG4,R2	SETUP FOR PRINTOUT
1325	004312	004737	012152	JSR	X7,TOUT	PRINT MESSAGE "THE INTERRUPT LEVEL WAS"

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1326 004316 012702 RPP002      MOV      02,R2
1327 004322 004737 R11734      JSR      27,PROCT      IPRINT LEVEL NUMBER
1328 004326 000405      BR
1329 004330 023727 RPP602 1RPP02 SET21 CMP      INTFLG,#1RPP02  ICHECK PREVIOUS LEVEL
1330 004336 100001      BPL      TEST19
1331 004340 104000      HLT
1332
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1334 004342 100001      ITEST FOR AN INTERRUPT ON LEVEL 1
1335 004344 004737 R11434 TEST19: SCOPE
1336 004350 012710 004460      JSR      27,INIT      IINITIALIZE
1337 004354 052737 R00340 177776      MOV      0TINT19,0ADINT ISETUP RETURN ADDRESS
1338 004362 013760 177776 R00340      BIS      0340,PSR      ISET PROCESSOR PRIORITY TO 7
1339 004370 042737 R00340 177776      MOV      PSR,2(ADINT)  ISETUP RETURN PROCESSOR STATUS
1340 004376 052737 RPP000 177776      BIC      0340,PSR      ISET PROCESSOR PRIORITY TO 0
1341 004404 012713 000103      BIS      0000,PSR      ISET PROCESSOR TO LEVEL 0 PRIORITY
1342 004410 032713 R40000      MOV      #103,0CRS    ISET EJECT INTERRUPT ENABLE, AND READ
1343 004414 001775      BIT      040000,0CRS  IWAIT FOR CARD DONE
1344 004416 016037 RPP002 177776      REG      #-4
1345 004424 005013      MOV      2(ADINT),PSR  IRESTORE PROCESSOR TO HIGHEST PRIORITY
1346 004426 012710 RPP232      CLR      0CRS        IDISABLE INTERRUPTS
1347 004432 005037 RPP232      MOV      0232,0ADINT  ICHANGE INTERRUPT RETURN ADDRESS
1348 004436 005737 RPP602      CLR      00232      ITO CAUSE A HALT IF AN INTERRUPT OCCURS
1349 004442 100044      TST      INTFLG      ICHECK TO SEE IF LEVEL ALREADY RECORDED
1350 004444 023727 RPP602 1RPP01  CMP      INTFLG,#1RPP01 IIF NO, GO TO NEXT TEST
1351 004452 100440      RMI      TEST20      IIF SO, CHECK TO SEE
1352
1353 004454 104000      HLT      ITHAT THE INTERRUPT LEVEL RECORDED
1354
1355
1356 004456 000436      IIS BELOW THE CURRENT LEVEL
1357 004460 032713 040000 TINT19: BIT      040000,0CRS  IINTERRUPT DIDN'T OCCUR WITH STATUS
1358 004464 001001      RNE      #-4        IAT LEVEL 1, BUT PREVIOUSLY OCCURRED
1359 004466 104000      HLT      IAT OR ABOVE THIS LEVEL
1360 004470 005013      CLR      0CRS
1361 004472 012710 RPP232      MOV      0232,0ADINT  IMAKE SURE CARD DONE IS SET
1362 004476 005037 RPP232      CLR      00232      IBRANCH IF SET
1363 004502 022626      CMP      (SP)+,(SP)+  ICARD DONE WASN'T SET
1364 004504 005737 RPP602      TST      INTFLG      IDISABLE FURTHER INTERRUPTS
1365 004510 100414      RMI      SET1 IBRANCH IF FLAG SET
1366 004512 012737 100001 000602  MOV      #100001,INTFLG ISET FLAG AND LEVEL
1367 004520 012702 R14503      MOV      0MSG0,R2    ISETUP FOR PRINTOUT
1368 004524 004737 012152      JSR      27,TOUT     IPRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1369 004530 012702 000001      MOV      01,R2
1370 004534 004737 R11734      JSR      27,PROCT    IPRINT LEVEL NUMBER
1371 004540 000405      BR
1372 004542 023727 RPP602 100001 SET11 CMP      INTFLG,#100001 ICHECK PREVIOUS LEVEL
1373 004550 100001      BPL      TEST20
1374 004552 104000      HLT      IINTERRUPT PREVIOUSLY OCCURRED ONLY AT A LOWER LEVEL
1375
1376
1377 004554 104001      I A TIMING ERROR SHOULDN'T CAUSE AN INTERRUPT
1378 004556 004737 011434 TEST20: SCOPE
1379 004562 012710 RPP4634      JSR      27,INIT     IINITIALIZE
1380 004566 052737 RPP340 177776      MOV      0TINT20,0ADINT ILOAD RETURN POINTER
1381 004574 013760 177776 000002      BIS      0340,PSR    ISET PROCESSOR TO HIGHEST PRIORITY
1381 004574 013760 177776 000002      MOV      PSR,2(ADINT) ILOAD RETURN PROCESSOR STATUS

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1382	004602	012713	000101		MOV	0101,0CRS	ISET INTERRUPT ENABLE AND READ
1383	004606	032713	004000		BIT	04000,0CRS	IWAIT FOR TIMING ERROR TO SET
1384	004612	001775			BEG	.-4	
1385	004614	042737	000340	177776	RIC	0340,PSR	I MOVE PROCESSOR TO LOWEST PRIORITY
1386	004622	000240			NOP		ICLOCK INTERRUPT IF IT OCCURRED
1387	004624	016037	000002	177776	MOV	2(ADINT),PSR	I MOVE PROCESSOR BACK TO HIGHEST PRIORITY
1388	004632	000402			RR	.*6	
1389	004634	104000			TINT201	HLT	ITIMING ERROR CAUSED AN INTERRUPT
1390	004636	022626			CMP	(SP)+,(SP)+	I RESTORE STACK POINTER
1391	004640	012710	000232		MOV	0232,0ADINT	ICCHANGE INTERRUPT ADDRESS TO CAUSE A
1392	004644	005037	000232		CLR	00232	IHALT IF AN INTERRUPT OCCURS
1393	004650	032713	040000		BIT	04000,0CRS	IWAIT FOR CARD DONE
1394	004654	001775			BEG	.-4	
1395	004656	005013			CLR	0CRS	ICLEAR INTERRUPT ENABLE
1396							
1397	004660	104001			TEST211	SCOPE	
1398							
1399	004662	004737	011434		JSR	07,INIT	I INITIALIZE CSR TO ZERO
1400	004666	012710	004736		MOV	0TINT,0ADINT	I SETUP RETURN ADDRESS
1401	004672	052737	000340	177776	RIS	0340,PSR	ISET PROCESSOR TO LEVEL 7
1402	004700	013760	177776	000002	MOV	PSR,2(ADINT)	I STORE PROCESSOR STATUS
1403	004706	005037	177776		CLR	PSR	ISET PROCESSOR TO LEVEL 0
1404	004712	012713	000100		MOV	0100,0CRS	IENABLE INTERRUPTS
1405	004716	005227	000000		INC	00	IWAIT ANMILE
1406	004722	001375			RNE	.-4	
1407	004724	016037	000002	177776	MOV	2(ADINT),PSR	I RESTORE PROCESSOR TO LEVEL 7
1408	004732	005013			CLR	0CRS	IDISABLE FURTHER INTERRUPTS
1409	004734	000403			BR	CONT21	
1410	004736	104000			TINT1	HLT	I AN INTERRUPT OCCURRED
1411	004740	022626			CMP	(SP)+,(SP)+	I RESTORE STACK
1412	004742	005013			CLR	0CRS	IDISABLE FURTHER INTERRUPTS
1413	004744	005037	000232		CONT211	CLR	ICCHANGE INTERRUPT RETURN ADDRESS TO
1414	004750	012710	000232		MOV	0232,0ADINT	ICAUSE A HALT IF AN INTERRUPT OCCURS
1415							
1416	004754	104001			TEST221	SCOPE	
1417							
1418	004756	004737	011434		JSR	07,INIT	I INITIALIZE CSR TO ZERO
1419	004762	012710	005020		MOV	0T2INT,0ADINT	I SETUP RETURN ADDRESS
1420	004766	052737	000340	177776	RIS	0340,PSR	ISET PROCESSOR TO LEVEL 7
1421	004774	013760	177776	000002	MOV	PSR,2(ADINT)	I STORE PROCESSOR STATUS
1422	005002	042737	000340	177776	RIC	0340,PSR	ISET PROCESSOR TO LEVEL 0
1423	005010	012713	000103		MOV	0103,0CRS	ISET INTERRUPT ENABLE AND EJECT A CARD
1424	005014	000001			WAIT		IWAIT FOR INTERRUPT
1425	005016	000776			BR	.-2	ISIT IF TRACE BIT IS SET
1426	005020	022626			T2INT1	CMP	(6)+,(6)+
1427	005022	012710	005044		MOV	0T2INTA,0ADINT	I RESTORE STACK POINTER
1428	005026	005037	177776		CLR	PSR	ICCHANGE RETURN ADDRESS
1429	005032	000240			NOP		ISET PROCESSOR TO LEVEL 0
1430	005034	016037	000002	177776	MOV	2(ADINT),PSR	IWAIT
1431	005042	000402			BR	CONT22	I RESTORE PROCESSOR TO LEVEL 7
1432	005044	022626			T2INTA1	CMP	(6)+,(6)+
1433	005006	104000			HLT		I RESTORE STACK
1434	005050	005013			CONT221	CLR	ITHE INTERRUPT OCCURRED AT 2 LEVELS
1435	005052	005037	000232		CLR	0CRS	IDISABLE INTERRUPTS
1436	005056	012710	000232		CLR	00232	ICCHANGE INTERRUPT RETURN ADDRESS TO
1437					MOV	0232,0ADINT	ICAUSE A HALT IF AN INTERRUPT OCCURS

1438	005062	104001		TEST23: SCOPE		
1439				FALL MODES OF ADDRESSING CR1 CR CR2 (DATA, DATOB, DATI) SHOULD CLEAR		
1440				ICOLUMN READY		
1441	005064	004737	011434	JSR	X7, INIT	JINITIALIZE
1442	005070	005213		INC	PCRS	JSTART READING A CARD
1443	005072	105713		TSTB	PCRS	JWAIT FOR COLUMN READY
1444	005074	100376		BPL	.-2	
1445	005076	005014		CLR	PCRB1	JDATA TO CRB1
1446	005100	105713		TSTB	PCRS	JCHECK COLUMN READY
1447	005102	100002		RPL	CNT23A	JBRANCH IF CLEARED
1448	005104	104000		HLT		JDATA TO CRB1 DIDN'T CLEAR READY
1449	005106	000467		BR	TEST24	JGO TO NEXT TEST
1450	005110	105713		CNT23A: TSTR	PCRS	JWAIT FOR COLUMN READY
1451	005112	100376		BPL	.-2	
1452	005114	105014		CLRR	PCRB1	JDATOB TO LOW BYTE OF CRB1
1453	005116	105713		TSTR	PCRS	JCHECK COLUMN READY
1454	005120	100002		BPL	CNT23B	JBRANCH IF CLEARED
1455	005122	104000		HLT		JDATOB TO CRB1 LOW BYTE DIDN'T CLEAR READY
1456	005124	000460		BR	TEST24	JGO TO NEXT TEST
1457	005126	105713		CNT23B: TSTB	PCRS	JWAIT FOR COLUMN READY
1458	005130	100376		BPL	.-2	
1459	005132	105064	000001	CLRB	1(CRB1)	JDATOB TO HIGH BYTE OF CRB1
1460	005136	105713		TSTR	PCRS	JCHECK COLUMN READY
1461	005140	100002		BPL	CNT23C	JBRANCH IF CLEARED
1462	005142	104000		HLT		JDATOB TO CRB1 HIGH BYTE DIDN'T CLEAR READY
1463	005144	000450		RR	TEST24	JGO TO NEXT TEST
1464	005146	105713		CNT23C: TSTR	PCRS	JWAIT FOR COLUMN READY
1465	005150	100376		RPL	.-2	
1466	005152	005714		TST	PCRB1	JDATI TO CRB1
1467	005154	105713		TSTR	PCRS	JCHECK COLUMN READY
1468	005156	100002		BPL	CNT23D	JBRANCH IF CLEARED
1469	005160	104000		HLT		JDATI TO CRB1 DIDN'T CLEAR READY
1470	005162	000441		RR	TEST24	JGO TO NEXT TEST
1471	005164	105713		CNT23D: TSTR	PCRS	JWAIT FOR COLUMN READY
1472	005166	100376		BPL	.-2	
1473	005170	005077	173444	CLR	PCRB2	JDATA TO CRB2
1474	005174	105713		TSTR	PCRS	JCHECK COLUMN READY
1475	005176	100002		RPL	CNT23E	JBRANCH IF CLEARED
1476	005200	104000		HLT		JDATA TO CRB2 DIDN'T CLEAR READY
1477	005202	000431		RR	TEST24	JGO TO NEXT TEST
1478	005204	105713		CNT23E: TSTR	PCRS	JWAIT FOR COLUMN READY
1479	005206	100376		BPL	.-2	
1480	005210	105077	173424	CLRR	PCRB2	JDATOB TO LOW BYTE OF CRB2
1481	005214	105713		TSTR	PCRS	JCHECK COLUMN READY
1482	005216	100002		BPL	CNT23F	JBRANCH IF CLEARED
1483	005220	104000		HLT		JDATOB TO CRB2 LOW BYTE DIDN'T CLEAR READY
1484	005222	000421		BR	TEST24	JGO TO NEXT TEST
1485	005224	105713		CNT23F: TSTR	PCRS	JWAIT FOR COLUMN READY
1486	005226	100376		BPL	.-2	
1487	005230	013702	000600	MOV	CRB2, R2	JLOAD POINTER
1488	005234	105062	000001	CLRR	1(R2)	JDATOB TO HIGH BYTE OF CRB2
1489	005240	105713		TSTB	PCRS	JCHECK COLUMN READY
1490	005242	100002		RPL	CNT23G	JBRANCH IF CLEARED
1491	005244	104000		HLT		JDATOB TO CRB2 HIGH BYTE DIDN'T CLEAR READY
1492	005246	000407		RR	TEST24	JGO TO NEXT TEST
1493						

1494	005250	105713		CNT23G1	TSTB	0CR8	WAIT FOR COLUMN READY
1495	005252	100376			BPL	.-2	
1496	005254	005777	173360		TST	0CR82	IDATI TO CRB2
1497	005260	105713			TSTR	0CR8	ICHECK COLUMN READY
1498	005262	100001			BPL	TEST24	IBRANCH IF CLEARED
1499	005264	104000			HLT		IDATI TO CRB2 DIDN'T CLEAR READY
1500							
1501	005266	104001		TEST24:	SCOPE		
1502							ISETTING EJECT AFTER A COLUMN READY WITHOUT CLEARING THE COLUMN READY
1503							ISHOULD SET TIMING ERROR (WHICH IN TURN SHOULD CLEAR COLUMN READY)
1504	005270	004737	011434		JSR	X7,INIT	IINITIALIZE
1505	005274	005213			INC	0CR8	ISTART READING A CARD
1506	005276	105713			TSTB	0CR8	ICHECK COLUMN READY - WAIT
1507	005300	100376			BPL	.-2	
1508	005302	052713	000002		BIS	02,0CR8	ISET EJECT
1509	005306	105713			TSTR	0CR8	ICHECK COLUMN READY
1510	005310	100402			BMI	CNT24A	IBRANCH IF STILL SET
1511	005312	104000			HLT		ISETTING EJECT CLEARED COLUMN READY
1512	005314	000421			RR	END24	IBRANCH TO WAIT FOR DONE AFTER ERROR
1513	005316	032713	000000	CNT24A:	RIT	00000,0CR8	ICHECK TIMING ERROR
1514	005322	001013			BNE	TIM24	IBRANCH IF SET
1515	005324	032713	000000		BIT	00000,0CR8	ICHECK CARD DONE AND OFF-LINE
1516	005330	001772			BEO	CNT24A	ILOOP IF NONE SET
1517	005332	032713	000000		BIT	00000,0CR8	ICARD DONE SET?
1518	005336	001003			BNE	CNT24A	IYES - BRANCH TO ERROR PRINTOUT
1519	005340	004737	011506		JSR	X7,CKBITA	IAND - BIT 8 WAS SET SO OUTPUT MESSAGE
1520	005344	000415			RR	ENDCK	IBRANCH AFTER COMING BACK ON-LINE
1521	005346	104000		CNT24B:	HLT		ICARD DONE SET BUT TIMING ERROR DIDN'T
1522	005350	000413			RR	ENDCK	IBRANCH TO NEXT SECTION
1523	005352	105713		TIM24:	TSTB	0CR8	ICHECK COLUMN READY
1524	005354	100001			BPL	.*8	IBRANCH IF NOT SET
1525	005356	104000			HLT		ITIMING ERROR DIDN'T CLEAR READY
1526	005360	032713	000000	END24:	BIT	00000,0CR8	WAIT FOR CARD DONE OR OFF-LINE
1527	005364	001775			BEO	END24	
1528	005366	032713	000000		BIT	0000,0CR8	ICHECK OFF LINE
1529	005372	001002			BEO	ENDCK	IBRANCH IF NOT SET
1530	005374	004737	011506		JSR	X7,CKBITA	IOUTPUT ERROR MESSAGE
1531							
1532							ICHECK SW7 AND RETURN TO TEST1 IF SET, AFTER RINGING BELL
1533							IOtherwise GO INTO THE DATA TEST
1534	005400	104001		ENDCK:	SCOPE		
1535	005402	032777	000200 173206		BIT	0200,0SWR	
1536	005410	001406			BEO	DATST	
1537	005412	004737	011462		JSR	X7,BELL	
1538	005416	005137	000644		COM	TRPLG	ITOGGLE TRACE FLAG
1539	005422	000137	000742		JMP	RESTRY	

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1540
1541
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1547 005426 012737 RRRP56 R06646
1548 005430 000410
1549 005436 022737 R00176 R00616
1550 005444 001002
1551 005446 104002
1552 005450 104006
1553 005452 005037 R06646
1554 005456 005037 R06650
1555 005462 032777 R00020 173126
1556 005470 001412
1557 005472 012737 R13524 R06642
1558 005500 012737 R14222 R06644
1559 005506 012737 R15627 R06640
1560 005514 000411
1561 005516 012737 R13024 R06642
1562 005524 012737 R13522 R06644
1563 005532 012737 R15616 R06640
1564 005540 005737 R06644
1565 005544 001004
1566 005546 012737 R00340 177776
1567 005554 000407
1568 005556 032777 R10000 173032
1569 005564 001370
1570 005566 012737 R00360 177776
1571 005574 004737 R11430
1572
1573 005600 012710 R05634
1574 005604 042737 R00340 177776
1575 005612 013760 177776 R00002
1576 005620 004737 R06540
1577 005624 052713 R00101
1578 005630 000001
1579 005632 000776
1580
1581
1582 005634 005713
1583 005636 100460
1584 005640 105713
1585 005642 100402
1586 005644 000137 R06412
1587 005650 005237 R06650
1588 005654 011437 R06652
1589 005660 105713
1590 005662 100006
1591 005664 052737 R00340 177776
1592 005672 104000
1593 005674 000137 R06632
1594 005700 017737 172736 R06656
1595 005706 012701 R00010

;*****
;DATA RELIABILITY TEST FOR CR11
;*****

;CHECK SR FOR TYPE OF DECK BEING TESTED, AND INITIALIZE POINTERS
DATST1: MOV 056, COCNT ;SETUP CARD COUNT TO ENTER TABLE CORRESPONDING TO NEXT C
;SKIP NEXT INSTRUCTION
BR DATST2
DATST1: CMP 05WREG, SWR
BNE 18
CNTLU
CKU
18: CLR COCNT ;SETUP CARD COUNT TO ENTER DATA TABLE AT BEGINNING
DATST2: CLR ERFLG ;FLAG SET PREVENTS PRINTING OUT ERROR HEADING
BIT 020, 05WR ;CHECK BIT 4 OF SR FOR TYPE OF DECK
BEQ ALP1 ;BRANCH IF NOT SET TO LOAD ALPHANUMERIC POINTERS
MOV 00INCO, TSTART ;INIT 2 SET, LOAD BINARY TABLE POINTERS
MOV 00INEND, TEND
MOV 00SG15, NECK
BR CONTD ;BRANCH AROUND ALPHANUMERIC POINTERS
ALP1: MOV 00ALPCO, TSTART ;LOAD ALPHANUMERIC TABLE POINTERS
MOV 00ALPEND, TEND
MOV 00SG14, NECK
CONTD: TST TRFLG ;CHECK TRACE TRAP FLAG
BNE TRP1 ;BRANCH IF FLAG WAS SET
NOTRP1: MOV 0340, PSR ;CLEAR TRACE BIT
BR DCNT1
TRP1: BIT 010000, 05WR ;CHECK SWIP TO INHIBIT TRACE TRAPPING
BNE NOTRP1 ;BRANCH IF SET
MOV 0360, PSR ;SET TRACE BIT
JSR 27, INIT ;INITIALIZE CARD READER STATUS REGISTER
;SET UP INTERRUPT SERVICING, AND START READING
MOV 00SRVC, 0ADINT ;SETUP RETURN POINTER
BIC 0340, PSR ;SET PROCESSOR TO LEVEL 0
MOV PSR, 2(ADINT) ;STORE CURRENT STATUS
JSR 27, NXCRO ;ADJUST POINTER AND START READING
BIS 0101, 0CRS ;ENABLE INTERRUPTS
WAIT ;WAIT FOR INTERRUPTS
BR -2

;INTERRUPT SERVICE ROUTINE WHICH RUNS DATA RELIABILITY TEST
SRVC: TST 0CRS ;CHECK SPECIAL CONDITION (BIT 15)
AMI ERSET ;BRANCH IF SET
TSTB 0CRS ;CHECK COLUMN READY
AMI 04 ;BRANCH IF SET
JMP NOTCOL ;JUMP IF NOT SET
INC CLCNT ;KEEP TRACK OF COLUMN NUMBER
MOV 0CR01, DAT1 ;STORE DATA OF FIRST READ
TSTB 0CRS ;MAKE SURE COLUMN READY CLEARED
BPL SCNT1 ;BRANCH IF IT DID
BIS 0340, PSR ;SET PROCESSOR TO LEVEL 7
MLT ;READING DATA DIDN'T CLEAR COLUMN READY
JMP LASTCK ;GO TO NEXT CARD AFTER ERROR PRINTOUT
SCNT1: MOV 0CR02, DATENC ;STORE ENCODED DATA
MOV 010, COUNT ;WAIT AWHILE
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1596	005712	005301			DEC	COUNT		
1597	005714	001376			BNE	.+2		
1598	005716	011437	006654		MOV	0CR01, DAT2	I STORE DATA OF SECOND READ	
1599	005722	005037	006660		CLR	PTOFF	ICLEAR POINTER OFFSET	
1600	005726	023715	006652		CMP	DAT1, 0R5	ICHECK FIRST DATA READ	
1601	005732	001053			BNE	FAIL	I PRINTOUT IF WRONG	
1602	005734	012737	000002	006660	MOV	02, PTOFF	ISET POINTER OFFSET	
1603	005742	023725	006654		CMP	DAT2, (R5)+	ICHECK SECOND READING OF SAME DATA	
1604	005746	001045			BNE	FAIL	I BRANCH IF WRONG	
1605	005750	012737	000004	006660	MOV	04, PTOFF	ISET POINTER OFFSET	
1606	005756	023725	006656		CMP	DATENC, (R5)+	ICHECK ENCODED DATA	
1607	005762	001037			BNE	FAIL	I BRANCH IF WRONG	
1608	005764	020537	006644		CMP	R5, TEND	ICHECK FOR END OF TABLE	
1609	005770	100402			BMI	.+6	IIF NOT THERE, RTI	
1610	005772	013705	006642		MOV	TSTART, R5	I MOVE POINTER TO LOOP THRU TABLE	
1611	005776	000002			RTI			
1612							I SPECIAL CONDITION BIT 15 WAS SET WHEN THE INTERRUPT SERVICE ROUTINE	
1613							I WAS ENTERED	
1614							I OUTPUT A MESSAGE AND HALT	
1615	006000	052737	000340	177776	ERSETI	BIS	0340, PSR	I LOCK OUT INTERRUPTS
1616	006006	104003				KBINTT		
1617	006010	022737	000120	006646		CMP	000., CDCNT	ICHECK FOR LAST CARD
1618	006016	001006				BNE	ERI	IIF NOT, PRINT OUT MESSAGE
1619	006020	022737	000120	006650		CMP	000., CLCNT	IIF LAST CARD, CHECK FOR LAST COLUMN
1620	006026	001002				BNE	ERI	IIF NOT, PRINT MESSAGE
1621	006030	000137	006662			JMP	ALLDON	IIF END OF DECK, JUMP
1622	006034	012702	015640		ERI1	MOV	0MSG16, R2	I "BIT 15 WAS SET."
1623	006040	004737	012152			JSR	07, TOUT	
1624	006044	012702	015661			MOV	0MSG17, R2	I "REMEDY THE ERROR CONDITION
1625	006050	004737	012152			JSR	07, TOUT	I AND PRESS CONTINUE"
1626	006054	000000				HALT		
1627	006056	000137	006632			JMP	LASTCK	ISET UP FOR NEXT CARD AND GO ON
1628	006062	052737	000340	177776	FAIL1	BIS	0340, PSR	I LOCK OUT INTERRUPTS
1629	006070	052713	000002			BIS	02, 0CR5	ISET EJECT TO PREVENT TIMING ERROR
1630	006074	005714				TST	0CR01	I MAKE SURE COLUMN READY IS CLEARED
1631	006076	032777	020000	172512		RTI	02R000, 0SWR	ICK SW13
1632	006104	001431				BEO	FAILCN	I CONTINUE IF NOT SET
1633	006106	005777	172504			TST	0SWR	IIF SET, CHECK FOR HALT ON ERROR
1634	006112	100003				BPL	FAILC	I BRANCH IF HALT ON ERROR NOT SET
1635	006114	000000				HALT		I HALT ON ERROR SET
1636	006116	000137	006632			JMP	LASTCK	I CONTINUE AFTER HALT
1637	006122	032713	040000		FAILC1	BIS	040000, 0CR5	ICHECK FOR CARD DONE
1638	006126	001402				REQ	.+6	
1639	006130	000137	006632			JMP	LASTCK	IINHIBIT PRINTOUT AFTER CARD DONE SET
1640	006134	032713	000400			BIS	0400, 0CR5	ICHECK FOR OFF-LINE
1641	006140	001770				BEO	FAILC	I BRANCH IF NOT
1642	006142	022737	000120	006646		CMP	000., CDCNT	ICHECK FOR LAST CARD
1643	006150	001002				BNE	.+6	
1644	006152	000137	006662			JMP	ALLDON	IIF LAST CARD, WAIT FOR NEXT DECK
1645	006156	004737	011506			JSR	07, CKBIT8	IIF NOT LAST CARD, PRINT MESSAGE
1646	006162	004737	006540			JSR	07, MXCR0	I START NEXT CARD THRU READER
1647	006166	000002				RTI		
1648	006170	005737	000650		FAILCN1	TST	ERPLG	I TEST FLAG FOR PREVIOUS PRINTOUT
1649	006174	001006				BNE	NOWD	IIF SET, DON'T OUTPUT HEADING
1650	006176	005237	000650			INC	ERPLG	ISET FLAG
1651	006202	012702	015526			MOV	0MSG13, R2	I OUTPUT HEADING FOR DATA ERROR PRINTOUT

1652	006206	004737	012152		JSR	X7,TOUT	
1653	006212	013702	006640	NOMDI	MOV	DECK,R2	IOUTPUT TYPE OF DECK
1654	006216	004737	012152		JSR	X7,TOUT	
1655	006222	004737	011542		JSR	X7,SPACE	
1656	006226	013702	006646		MOV	CDCNT,R2	IOUTPUT CARD NUMBER WHERE ERROR OCCURRED
1657	006232	004737	011734		JSR	X7,PROCT	
1658	006236	004737	011542		JSR	X7,SPACE	
1659	006242	013702	006650		MOV	CLCNT,R2	IOUTPUT COLUMN NUMBER WHERE ERROR OCCURRED
1660	006246	004737	011734		JSR	X7,PROCT	
1661	006252	004737	011542		JSR	X7,SPACE	
1662	006256	163705	006660		SUB	PTOFF,R5	I SUBTRACT OFFSET FROM POINTER TO POINT TO ADDRESS OF DESIRED PATTERN
1663							
1664	006262	012502			MOV	(R5)+,R2	IOUTPUT CORRECT DATA PATTERN (NOT ENCODED)
1665	006264	004737	011734		JSR	X7,PROCT	
1666	006270	004737	011542		JSR	X7,SPACE	
1667	006274	013702	006652		MOV	DAT1,R2	IOUTPUT DATA READ ON FIRST READING OF BUFFER
1668	006300	004737	011734		JSR	X7,PROCT	
1669	006304	004737	011542		JSR	X7,SPACE	
1670	006310	013702	006654		MOV	DAT2,R2	IOUTPUT DATA READ ONE MILLISECOND LATER
1671	006314	004737	011734		JSR	X7,PROCT	
1672	006320	004737	011542		JSR	X7,SPACE	
1673	006324	011502			MOV	ORS,R2	IOUTPUT CORRECT DATA PATTERN (ENCODED FORM)
1674	006326	004737	011734		JSR	X7,PROCT	
1675	006332	004737	011542		JSR	X7,SPACE	
1676	006336	013702	006656		MOV	DATENC,R2	IOUTPUT DATA READ (ENCODED)
1677	006342	004737	011734		JSR	X7,PROCT	
1678	006346	104003			KBINTT		
1679	006350	005777	172242		TST	OSWR	I CHECK "HALT ON ERROR" SWITCH
1680	006354	100001			RPL	.+4	I BRANCH IF NOT SET
1681	006356	000000			HALT		I HALT AFTER AN ERROR
1682	006360	005713			TST	OCRS	I CHECK ERROR
1683	006362	100023			RPL	LASTCK	I BRANCH IF NOT SET
1684	006364	022737	000120	006646	CMF	000.,CDCNT	I CHECK FOR LAST CARD
1685	006372	001005			BNE	FAILC1	
1686	006374	032713	000400		BIT	0400,OCRS	
1687	006400	001423			REQ	LASTCD	
1688	006402	000137	006662		JMP	ALLDON	
1689	006406	000137	006660	FAILC1:	JMP	ERSET	IOUTPUT ERROR MESSAGE
1690							
1691							
1692	006412	032713	000000		I INTERRUPT NOT DUE TO ERROR OR COLUMN READY		
1693	006416	001474		NOTCOL:	BIT	00000,OCRS	I CHECK FOR CARD NONE
1694	006420	022737	000120	006650	REQ	NOTCD	I BRANCH IF NOT SET
1695	006426	001401			CMF	000.,CLCNT	I CHECK COLUMN COUNT
1696	006430	104000			REQ	.+4	I SKIP ERROR HALT IF 80 COLUMNS WERE READ
1697	006432	022737	000120	006646	LASTCK:	CMF	I CHECK FOR LAST CARD
1698	006440	001403			REQ	LASTCD	I BRANCH IF LAST CARD
1699	006442	004737	006540		JSR	X7,NXCND	I IF NOT LAST CARD
1700	006446	000002			RTI		I GO ON
1701	006450	022626		LASTCD:	CMF	(SP)+,(SP)+	I IF LAST CARD, RFSSTORE STACK POINTER
1702	006452	004737	011462		JSR	X7,BELL	I RING BELL TO SIGNIFY "PASS COMPLETE"
1703	006456	013702	000042		MOV	0042,R2	I MONITOR HOOK
1704	006462	001405			REQ	END	
1705	006464	000005			RESET		
1706	006466	004712		LOGIC:	JSR	X7,(R2)	
1707	006470	000240			NOP		

1708	006472	000240			NOP		
1709	006474	000240			NOP		
1710	006476	032777	000040	172112	ENDI	040,0SWR	ICHECK SR FOR CONTINUATION TO ANOTHER DECK
1711	006504	001002			BNE	.+6	IBRANCH TO HALT IF SW5 SET
1712	006506	000137	006514		JMP	DECKCK	ICONTINUE TO ANOTHER DECK
1713	006512	000000			HALT		IDATA TEST DONE
1714							
1715							
1716							
1717	006514	005137	000644				
1718	006520	032777	000100	172070	DECKCK: COM	TRFLG	ITOGGLE TRACE FLAG
1719	006526	001402			BIT	0100,0SWR	ICHECK SW6
1720	006530	000137	000742		REQ	.+6	IBRANCH IF NOT SET
1721	006534	000137	005436		JMP	RESTRY	IRERUN COMBINED INSTRUCTION AND DATA TEST
1722					JMP	DATST1	
1723	006540	013705	006642		NXCRO: MOV	TSTART,R5	ILOAD R5 WITH TABLE STARTING ADDRESS
1724	006544	006337	006646		ASL	COCNT	IMULTIPLY CARD COUNT BY FOUR
1725	006550	006337	006646		ASL	COCNT	
1726	006554	063705	006646		ADD	COCNT,R5	IADD OFFSET TO R5 TO POINT TO NEXT DATUM
1727	006560	006237	006646		ASR	COCNT	IRESTORE CARD COUNT
1728	006564	006237	006646		ASR	COCNT	
1729	006570	042713	000002		BIC	02,0CRS	ICLEAR EJECT IF SET
1730	006574	005213			INC	0CRS	IREAD ANOTHER CARD
1731	006576	005237	006646		INC	COCNT	IKEEP TRACK OF CARD NUMBER
1732	006602	005037	006650		CLR	CLCNT	IINITIALIZE COLUMN COUNT
1733	006606	000207			RTS	RT	IRETURN
1734							
1735	006610	052737	000340	177776	IINTERRUPT NOT CAUSED BY ERROR,		COLUMN READY, OR CARD DONE
1736	006616	032713	002000		NOTCD: BIR	0340,PSR	ILOCK OUT FURTHER INTERRUPTS
1737	006622	001003			BIT	02000,0CRS	ITEST ON-LINE TRANSITION BIT
1738	006624	104000			BNE	NOTCD1	IBRANCH IF SET
1739	006626	000137	006432		HLT		IND BITS SET TO CAUSE AN INTERRUPT
1740	006632	104000			JMP	LASTCK	ISTART NEXT CARD
1741	006634	000137	006432		NOTCD1: HLT		ION-LINE TRANSITION CAUSED AN INTERRUPT
1742	006640	000000			JMP	LASTCK	ISTART NEXT CARD
1743	006642	000000			DECK: 0		IPOINTER TO LITERAL "ALPHA" OR "BINARY"
1744	006644	000000			TSTART: 0		ISTARTING ADDRESS OF DATA TABLE
1745	006646	000000			TEND: 0		IEND ADDRESS OF DATA TABLE
1746	006650	000000			COCNT: 0		INUMBER OF CARD BEING READ
1747	006652	000000			CLCNT: 0		INUMBER OF COLUMN BEING CHECKED
1748	006654	000000			DAT1: 0		IDATA ON FIRST READ FROM CR01
1749	006656	000000			DAT2: 0		IDATA ON SECOND READ OF CR01
1750	006660	000000			DATENC: 0		IDATA READ FROM CR02
1751	006662	004737	011462		PTOFF: 0		IOFFSET TO POINTER FOR DATA PRINTOUT
1752	006666	032713	000400		ALLOD: JSR	RT,BELL	IRING BELL
1753	006672	001001			BIT	0400,0CRS	ICHECK OFF-LINE BIT
1754	006674	104000			BNE	.+6	IBRANCH IF SET
1755					HLT		IOFF-LINE NOT SET, BUT SPECIAL CONDITION
1756	006676	032777	000040	171712			IMAS SET AFTER 00 COLUMNS OF THE 00TH CARD WERE READ
1757	006704	001403			BIT	040,0SWR	ICHECK SR FOR HALT AT END OF DECK
1758	006706	000000			REQ	ALCNT	ICONTINUE IF NOT SET
1759	006710	000137	006514		HALT		IEND OF DECK,SW5 SET
1760	006714	032777	002000	171674	JMP	DECKCK	ICHECK FOR TYPE OF TESTING
1761	006722	001025			ALCNT: BIT	02000,0SWR	IDOES THIS CR11 USE THE M020 MODULE?
1762	006724	005027	000000		BNE	ALCNT1	IYES- BRANCH
1763	006730	005337	006726		CLR	00	INDO-STALL TO ALLOW CARD DONE TO SET
					DEC	.-2	

1764	006734	001375			RNF	.-4	
1765	006736	005327	AAAAAA		DEC	00	
1766	006742	001375			BNE	.-4	
1767	006744	005327	AAAAAA		DEC	00	
1768	006750	001375			RNF	.-4	
1769	006752	032713	AAAAAA		RIT	040000, 0CRS	ICHECK CARD DONE
1770	006756	001001			RNF	.-4	
1771	006760	104000			HLT		
1772	006762	005013			CLR	0CRS	ICARD DONE DIDN'T SET- THIS ERROR COULD BE ICAUSED BY RUNNING A CR11 WHICH HAS THE IM820 MODULE AND NOT SETTING SWITCH REGISTER ISWITCH 10
1773							
1774							
1775							
1776	006764	032713	157377		RIT	0157377, 0CRS	IONLY BIT 8 MAY STILL BE SET
1777	006770	001401			REQ	.-4	IBRANCH IF OK
1778	006772	104000			HLT		ISTATUS REGISTER INCORRECT
1779	006774	000405			OR ALCNT2		
1780	006776	005013			ALCNT1: CLR	0CRS	ICLEAR ERROR
1781	007000	032713	156377		BIT	0156377, 0CRS	IONLY BITS 8 AND 9 MAY STILL BE SET IBIT 9 MAY BE SET SINCE CARD MAY NOT IYET HAVE CLEARED THE READER TO CAUSE ICARD DONE
1782							
1783							
1784							
1785	007004	001401			BEQ	.-4	
1786	007006	104000			HLT		ISTATUS REGISTER INCORRECT
1787	007010	052737	AAAAAA	177776	ALCNT2: RIS	0340, PSR	ISET PROCESSOR TO LEVEL 7
1788	007016	013760	177776	AAAAAA	MOV	PSR, 2(ADINT)	ISETUP RETURN STATUS
1789	007024	105213			INCR	0CRS	IATTEMPT TO READ- SHOULD RESET ERROR
1790	007026	005713			TST	0CRS	ICHECK BIT 15
1791	007030	100402			RMT	ALLOK	IBRANCH IF OK
1792	007032	104000			HLT		ISETTING READ DIDN'T RESET ERROR
1793	007034	000416			RR	ALWAIT	IBRANCH TO WAIT FOR ON-LINE
1794	007036	012710	007070		ALLOK: MOV	0SRVC1, 0ADINT	ILOAD INTERRUPT RETURN ADDRESS
1795	007042	005037	177776		CLR	PSR	ISET PROCESSOR TO LEVEL 0
1796	007046	012713	000101		MOV	0101, 0CRS	IENABLE INTERRUPTS, KEEP ERROR SET BY SETTING READ
1797	007052	000242			NOP		ICLOCK IN INTERRUPT
1798	007054	016037	000002	177776	MOV	2(ADINT), PSR	ISET PROCESSOR TO LEVEL 7
1799	007062	005013			CLR	0CRS	ICLEAR INTERRUPT ENABLE AND ERROR
1800	007064	104000			HLT		IBIT 15 DIDN'T CAUSE AN INTERRUPT
1801	007066	000402			RR	.-4	
1802	007070	022626			SRVC1: CMP	(SP)+, (SP)+	IRESTORE STACK POINTER
1803	007072	005013			ALWAIT: CLR	0CRS	ICLEAR INTERRUPT ENABLE AND ERROR
1804	007074	012710	007132		MOV	0SRVC2, 0ADINT	ICHANGE INTERRUPT RETURN ADDRESS
1805	007100	112713	000100		MOVR	0100, 0CRS	IENABLE INTERRUPTS
1806	007104	042737	000340	177776	BIC	0340, PSR	ISET PROCESSOR TO LEVEL 0
1807	007112	032713	000400		RIT	0400, 0CRS	ICHECK OFF-LINE BIT
1808	007116	001375			BNE	.-4	ILoop UNTIL CLEAR
1809	007120	016037	000002	177776	MOV	2(ADINT), PSR	ISET PROCESSOR TO LEVEL 7
1810	007126	104000			HLT		IEND INTERRUPT OCCURRED
1811	007130	000403			RR	SRVC2A	IBRANCH AROUND
1812	007132	004737	011462		SRVC2: JSR	07, BELL	IRING BELL
1813	007136	022626			CMP	(SP)+, (SP)+	IRESTORE STACK POINTER
1814	007140	032713	002000		SRVC2A: RIT	02000, 0CRS	ICHECK BIT 10
1815	007144	001001			RNE	.-4	IBRANCH IF SET
1816	007146	104000			HLT		IBIT 10 NOT SET
1817	007150	032713	000400		BIT	0400, 0CRS	ICHECK BIT 0
1818	007154	001401			REQ	.-4	IBRANCH IF NOT SET
1819	007156	104000			HLT		IBIT 0 WAS SET

1820	007160	005013		CLR	%CRS	LDATO TO CRS
1821	007162	032713	002000	BIT	02000,%CRS	ICHECK BIT 10
1822	007166	001401		REQ	.+4	IBRANCH IF NOT SET
1823	007170	104000		HLT		IDATO DIDN'T CLEAR ON-LINE BIT
1824	007172	022626		CMP	(SP)+,(SP)+	IRESTORE STACK FROM INITIAL INTERRUPT
1825	007174	000137	006510	JMP	DECKCK	IRESTART
1826						
1827	007200	005037	000632	ERCR111	CLR	FLAG
1828	007204	000403		BR	TSTA	
1829	007206	012737	000001 000632	ERCM111	MOV	01,FLAG
1830	007214	104007		TSTAI	TTY	
1831	007216	012702	016240	MOV	0010T2,R2	
1832	007222	004737	000652	JSR	X7,SETUP	INITIALIZE REGISTERS
1833	007226	012737	007236 012150	MOV	0TESTA+2,RETURN	SETUP SCOPE LOOP RETURN ADDRESS
1834				ITHE CARD READER GOING OFF-LINE SHOULD SET SPECIAL CONDITION (BIT 15) AND OFF-LINE (BIT		
1835	007234	104001		TESTAI	SCOPE	
1836	007236	005037	012144	CLR	ITMAX	IRUN EACH ERROR TEST ONCE ONLY
1837	007242	004737	011434	JSR	X7,INIT	INITIALIZE STATUS REGISTER
1838	007246	012702	014410	MOV	0MSG3,R2	"PRESS CARD READER 'READ STOP'"
1839	007252	005737	000632	TST	FLAG	ICCHANGE MESSAGE FOR DOCUMENTATION READER?
1840	007256	001402		REQ	.+6	INO
1841	007260	012702	014450	MOV	0MSG3A,R2	"PRESS CARD READER 'STOP'"
1842	007264	004737	012152	JSR	X7,TOUT	
1843	007270	012702	014343	MOV	0MSG2,R2	
1844	007274	004737	012152	JSR	X7,TOUT	"THEN HIT 'CONTINUE' ON THE CONSOLE"
1845	007300	004737	012274	JSR	X7,CRLF4	IMOVE MESSAGE UP ON TTY
1846	007304	000000		HALT		
1847	007306	032713	000400	BIT	0400,%CRS	ICHECK BIT 8
1848	007312	001001		BNE	.+4	IBRANCH IF SET
1849	007314	104000		HLT		IDOFF-LINE (BIT 8) WASN'T SET
1850	007316	005713		TST	%CRS	ICHECK BIT 15
1851	007320	100401		BMI	.+4	IBRANCH IF SET
1852	007322	104000		HLT		IRIT 15 WASN'T SET
1853	007324	012702	014224	MOV	0MSG1,R2	"PRESS CARD READER 'MOTOR START' AND 'READ START'"
1854	007330	005737	000632	TST	FLAG	ICCHANGE MESSAGE FOR DOCUMENTATION READER?
1855	007334	001402		REQ	.+6	INO
1856	007336	012702	014307	MOV	0MSG1A,R2	"PRESS CARD READER 'RESET'"
1857	007342	004737	012152	JSR	X7,TOUT	
1858	007346	012702	014343	MOV	0MSG2,R2	
1859	007352	004737	012152	JSR	X7,TOUT	"THEN HIT 'CONTINUE' ON THE CONSOLE"
1860	007356	004737	012274	JSR	X7,CRLF4	IMOVE MESSAGE UP ON TTY
1861	007362	000000		HALT		
1862	007364	032713	000400	BIT	0400,%CRS	IWAIT FOR OFF-LINE TO CLEAR
1863	007370	001375		RNF	.+4	
1864						
1865				IINPUT HOPPER EMPTY SHOULD SET SPECIAL CONDITION		
1866	007372	104001		TESTBI	SCOPE	
1867	007374	004737	011434	JSR	X7,INIT	INITIALIZE STATUS REGISTER
1868	007400	012702	014536	MOV	0MSG5,R2	"REMOVE ALL CARDS FROM THE INPUT HOPPER"
1869	007404	004737	012152	JSR	X7,TOUT	
1870	007410	012702	014343	MOV	0MSG2,R2	
1871	007414	004737	012152	JSR	X7,TOUT	"THEN HIT 'CONTINUE' ON THE CONSOLE"
1872	007420	004737	012274	JSR	X7,CRLF4	IMOVE MESSAGE UP ON TTY
1873	007424	000000		HALT		
1874	007426	032713	000400	BIT	0400,%CRS	ICHECK BIT 8
1875	007432	001001		RNF	.+4	IBRANCH IF SET

1876	007434	104000		HLT		I OFF-LINE (BIT 8) WASN'T SET
1877	007436	005713		TST	PCRS	I CHECK SPECIAL CONDITION BIT
1878	007440	100401		AMI	.+0	I BRANCH IF SET
1879	007442	104000		HLT		I SPECIAL CONDITION NOT SET
1880	007444	012702	014607	MOV	MSG6,R2	I "RESTORE CARDS IN INPUT HOPPER"
1881	007450	004737	012152	JSR	X7,TOUT	
1882	007454	012702	014224	MOV	MSG1,R2	I "PRESS CARD READER 'MOTOR START' AND 'READ START'"
1883	007460	005737	000632	TST	FLAG	I CHANGE MESSAGE FOR DOCUMENTATION READER?
1884	007464	001402		BEQ	.+6	INO
1885	007466	012702	014307	MOV	MSG1A,R2	I "PRESS CARD READER 'RESET'"
1886	007472	004737	012152	JSR	X7,TOUT	
1887	007476	012702	014343	MOV	MSG2,R2	I "THEN HIT 'CONTINUE' ON THE CONSOLE"
1888	007502	004737	012152	JSR	X7,TOUT	
1889	007506	004737	012274	JSR	X7,CRLF4	I MOVE MESSAGE UP ON TTY
1890	007512	000000		HALT		
1891	007514	032713	000400	BIT	0400,PCRS	I WAIT FOR OFF-LINE TO CLEAR
1892	007520	001375		BNE	.-4	
1893						
1894						
1895	007522	104001		I OUTPUT STACKER FULL SHOULD SET BIT 15		
1896	007524	004737	011434	TESTC: SCOPE		
1897	007530	012702	014653	JSR	X7,INIT	I INITIALIZE STATUS REGISTER
1898	007534	005737	000632	MOV	MSG7,R2	I "RAISE OUTPUT STACKER PRESSURE ARM ABOVE HORIZONTAL THE
1899	007540	001402		TST	FLAG	I CHANGE MESSAGE FOR DOCUMENTATION READER?
1900	007542	012702	014771	BEQ	.+6	INO
1901	007546	004737	012152	MOV	MSG7A,R2	I "LOWER OUTPUT STACKER PLATE TO BOTTOM"
1902	007552	012702	014343	JSR	X7,TOUT	
1903	007556	004737	012152	MOV	MSG2,R2	I "THEN HIT 'CONTINUE' ON THE CONSOLE"
1904	007562	004737	012274	JSR	X7,TOUT	
1905	007566	000000		JSR	X7,CRLF4	I MOVE MESSAGE UP ON TTY
1906	007570	032713	000400	HALT		
1907	007574	001001		BIT	0400,PCRS	I CHECK BIT 8
1908	007576	104000		BNE	.+4	I BRANCH IF SET
1909	007600	005713		HLT		I OFF-LINE (BIT 8) WASN'T SET
1910	007602	100401		TST	PCRS	I CHECK SPECIAL CONDITION BIT
1911	007604	104000		AMI	.+0	I BRANCH IF SET
1912	007606	012702	014224	HLT		I SPECIAL CONDITION NOT SET
1913	007612	005737	000632	MOV	MSG1,R2	I "PRESS CARD READER 'MOTOR START' AND 'READ START'"
1914	007616	001402		TST	FLAG	I CHANGE MESSAGE FOR DOCUMENTATION READER?
1915	007620	012702	014307	BEQ	.+6	INO
1916	007624	004737	012152	MOV	MSG1A,R2	I "PRESS CARD READER 'RESET'"
1917	007630	012702	014343	JSR	X7,TOUT	
1918	007634	004737	012152	MOV	MSG2,R2	I "THEN HIT 'CONTINUE' ON THE CONSOLE"
1919	007640	004737	012274	JSR	X7,TOUT	
1920	007644	000000		JSR	X7,CRLF4	I MOVE MESSAGE UP ON TTY
1921	007646	032713	000400	HALT		
1922	007652	001375		BIT	0400,PCRS	I WAIT FOR OFF-LINE TO CLEAR
1923				BNE	.-4	
1924						
1925				I A FEED ERROR SHOULD SET BIT 15		
1926	007654	104001		I THIS ERROR OCCURS WHEN THE FEED MECHANISM FAILS TO DELIVER A CARD TO THE READ STATION		
1927	007656	004737	011434	TESTD: SCOPE		
1928	007662	012702	014536	JSR	X7,INIT	
1929	007666	004737	012152	MOV	MSG5,R2	I "REMOVE ALL CARDS FROM THE INPUT HOPPER"
1930	007672	012702	014343	JSR	X7,TOUT	
1931	007676	004737	012152	MOV	MSG2,R2	I "THEN HIT 'CONTINUE' ON THE CONSOLE"
				JSR	X7,TOUT	

1932	007702	012702	015040	MOV	0MSG0,R2	I"HOLD DOWN THE SWITCH AT THE BOTTOM OF INPUT HOPPER
1933	007706	005737	000632	TST	FLAG	ICHANGE MESSAGE FOR DOCUMENTATION READER?
1934	007712	001402		BEG	.+6	INO
1935	007714	012702	015131	MOV	0MSG8A,R2	I"LIFT SWITCH UNDER RIFFLE CAP
1936	007720	004737	012152	JSR	X7,TOUT	
1937	007724	012702	014224	MOV	0MSG1,R2	I"PRESS CARD READER 'MOTOR START' AND 'READ START'
1938	007730	005737	000632	TST	FLAG	ICHANGE MESSAGE FOR DOCUMENTATION READER?
1939	007734	001402		BEG	.+6	INO
1940	007736	012702	014307	MOV	0MSG1A,R2	I"PRESS CARD READER 'RESET'
1941	007742	004737	012152	JSR	X7,TOUT	
1942	007746	004737	012274	JSR	X7,CRLF4	I MOVE MESSAGE UP ON TTY
1943	007752	000000		HALT		
1944	007754	032713	002000	BIT	02000,0CRS	IWAIT FOR CARD READER TO COME ON-LINE
1945	007760	001775		REQ	.-4	
1946	007762	004737	011434	JSR	X7,INIT	IINITIALIZE STATUS REGISTER
1947	007766	012713	000003	MOV	03,0CRS	ISET EJECT AND READ
1948	007772	005227	000000	INC	00	IWAIT AWHILE
1949	007776	001375		RNE	.-4	
1950	010000	005227	000000	INC	00	
1951	010004	001375		RNE	.-4	
1952	010006	005227	000000	INC	00	
1953	010012	001375		RNE	.-4	
1954	010014	005227	000000	INC	00	
1955	010020	001375		BNE	.-4	
1956	010022	032713	000400	BIT	0400,0CRS	I TEST OFF-LINE BIT
1957	010026	001001		RNE	.-4	I BRANCH IF SET
1958	010030	104000		HLT		I BIT 0 WAS NOT SET
1959	010032	005713		TST	0CRS	I CHECK BIT 15
1960	010034	100401		BMI	.-4	I BRANCH IF SET
1961	010036	104000		HLT		I BIT 15 WAS NOT SET
1962	010040	012702	014607	MOV	0MSG6,R2	
1963	010044	004737	012152	JSR	X7,TOUT	I"RESTORE CARDS IN THE INPUT HOPPER"
1964	010050	012702	014224	MOV	0MSG1,R2	I"PRESS CARD READER 'MOTOR START' AND 'READ START'
1965	010054	005737	000632	TST	FLAG	ICHANGE MESSAGE FOR DOCUMENTATION READER?
1966	010060	001402		BEG	.+6	INO
1967	010062	012702	014307	MOV	0MSG1A,R2	I"PRESS CARD READER 'RESET'
1968	010066	004737	012152	JSR	X7,TOUT	
1969	010072	012702	014343	MOV	0MSG2,R2	I"THEN HIT 'CONTINUE' ON THE CONSOLE"
1970	010076	004737	012152	JSR	X7,TOUT	
1971	010102	004737	012274	JSR	X7,CRLF4	I MOVE MESSAGE UP ON TTY
1972	010106	000000		HALT		
1973	010110	032713	000400	BIT	0400,0CRS	IWAIT FOR OFF-LINE TO CLEAR
1974	010114	001375		RNE	.-4	
1975	010116	005737	000632	TST	FLAG	I SKIP NEXT TEST IF DOCUMENTATION READER
1976	010122	001402		REQ	.+6	
1977	010124	000137	010444	JMP	TESTG	
1978						
1979						
1980						
1981	010130	104001				I A MOTION ERROR SHOULD SET BIT 15
1982	010132	004737	011434	JSR	X7,INIT	I THIS ERROR OCCURS WHEN A CARD JAM OCCURS AT THE READ STATION
1983	010136	012702	014410	MOV	0MSG3,R2	TESTE1 SCOPE
1984	010142	004737	012152	JSR	X7,TOUT	IINITIALIZE STATUS REGISTER
1985	010146	012702	014343	MOV	0MSG2,R2	I"PRESS CARD READER 'READ STOP'
1986	010152	004737	012152	JSR	X7,TOUT	
1987	010156	012702	015170	MOV	0MSG9,R2	I"THEN HIT 'CONTINUE' ON THE CONSOLE"
						I"BLOCK THE CARD READER STATION TO

1988	010162	004737	012152	JSR	X7, TOUT	IPREVENT A CARD GOING THRU, AND"
1989	010166	012702	014224	MOV	0MSG1, R2	I"PRESS CARD READER 'MOTOR START' AND 'READ START'"
1990	010172	004737	012152	JSR	X7, TOUT	
1991	010176	004737	012274	JSR	X7, CRLF4	IMOVE MESSAGE UP ON TTY
1992	010202	000000		HALT		
1993	010204	032713	002000	BIT	02000, 0CRS	IMONITOR ON-LINE TRANSITION (BIT 10)
1994	010210	001775		REQ	.-4	ICONTINUE WHEN CARD READER COMES ON-LINE
1995	010212	012713	000003	MOV	03, 0CRS	IREAD A CARD AND SET EJECT
1996	010216	032713	140000	BIT	0140000, 0CRS	ICHECK DONE AND SPECIAL CONDITION BITS
1997	010222	001775		REQ	.-4	IWAIT
1998	010224	005713		TST	0CRS	ICHECK SPECIAL CONDITION BIT
1999	010226	100401		BMI	.*4	ICONTINUE IF SET
2000	010230	104000		HLT		ISPECIAL CONDITION NOT SET
2001	010232	012702	015272	MOV	0MSG10, R2	I"REMOVE JAMMED CARD"
2002	010236	004737	012152	JSR	X7, TOUT	
2003	010242	012702	014224	MOV	0MSG1, R2	I"PRESS CARD READER 'MOTOR START' AND 'READ START'"
2004	010246	004737	012152	JSR	X7, TOUT	
2005	010252	012702	014343	MOV	0MSG2, R2	I"THEN HIT 'CONTINUE' ON THE CONSOLE"
2006	010256	004737	012152	JSR	X7, TOUT	
2007	010262	004737	012274	JSR	X7, CRLF4	IMOVE MESSAGE UP ON TTY
2008	010266	000000		HALT		
2009	010270	032713	000400	BIT	0400, 0CRS	IWAIT FOR OFF-LINE TO CLEAR
2010	010274	001375		BNE	.-4	
2011						
2012						
2013						
2014	010276	104001				
2015	010300	004737	011434	JSR	X7, INIT	IINITIALIZE STATUS REGISTER
2016	010304	012702	014410	MOV	0MSG3, R2	I"PRESS CARD READER 'READ STOP'"
2017	010310	004737	012152	JSR	X7, TOUT	
2018	010314	012702	014343	MOV	0MSG2, R2	I"THEN HIT 'CONTINUE' ON THE CONSOLE"
2019	010320	004737	012152	JSR	X7, TOUT	
2020	010324	012702	015317	MOV	0MSG11, R2	I"HOLD THE OUTPUT STACKER GATE OPEN. THEN"
2021	010330	004737	012152	JSR	X7, TOUT	
2022	010334	012702	014224	MOV	0MSG1, R2	I"PRESS CARD READER 'MOTOR START' AND
2023	010340	004737	012152	JSR	X7, TOUT	I"READ START."
2024	010344	004737	012274	JSR	X7, CRLF4	IMOVE MESSAGE UP ON TTY
2025	010350	000000		HALT		
2026	010352	032713	002000	BIT	02000, 0CRS	IWAIT FOR CARD READER TO COME ON-LINE
2027	010356	001775		REQ	.-4	
2028	010360	012701	000003	MOV	03, COUNT	IINITIALIZE COUNTER TO READ 3 CARDS
2029	010364	012713	000003	MOV	03, 0CRS	IEJECT A CARD
2030	010370	032713	140000	BIT	0140000, 0CRS	IWAIT FOR CARD DONE OR SPECIAL CONDITION
2031	010374	001775		REQ	.-4	
2032	010376	005301		DEC	COUNT	ICOUNT DOWN
2033	010400	001371		BNE	LOOPF	IREAD 3 CARDS ALL TOGETHER
2034	010402	005713		TST	0CRS	ICHECK SPECIAL CONDITION BIT 15
2035	010404	100401		BMI	.*4	I"BRANCH IF SET
2036	010406	104000		HLT		ISPECIAL CONDITION NOT SET
2037	010410	012702	014224	MOV	0MSG1, R2	I"PRESS CARD READER 'MOTOR START' AND 'READ START'"
2038	010414	004737	012152	JSR	X7, TOUT	
2039	010420	012702	014343	MOV	0MSG2, R2	I"THEN HIT 'CONTINUE' ON THE CONSOLE"
2040	010424	004737	012152	JSR	X7, TOUT	
2041	010430	004737	012274	JSR	X7, CRLF4	IMOVE MESSAGE UP ON TTY
2042	010434	000000		HALT		
2043	010436	032713	000400	BIT	0400, 0CRS	IWAIT FOR OFF-LINE TO CLEAR

IA STACK FAIL ERROR SHOULD SET BIT 15

IERROR OCCURS WHEN 3 CARDS IN A ROW HAVE NOT BEEN DELIVERED PROPERLY TO THE OUTPUT STACK

TESTF1 SCOPE

LOOPF1


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2044 010442 001375          RNE      .-0
2045
2046
2047
2048
2049
2050
2051
2052
2053
2054 010444 104001          TESTG: SCOPE
2055 010446 032777 000001 170102  RIT      01,0SWR      ICHECK SWR
2056 010454 001410          BEQ      CONTG      IRUN TEST IF NOT SET
2057 010456 004737 011462  JSR      X7,BELL     IIF SET, RING BELL AND
2058 010462 000000          HALT      IHALT
2059 010464 012737 007236 012150  MOV      @TESTA+2,RETURN ISETUP SCOPE LOOP RETURN ADDRESS TO LOOP THRU TESTS
2060 010472 000137 007234  JMP      TESTA      ISTART ERROR TESTS OVER ON CONTINUING
2061 010476 004737 011434  CONYGI: JSR      X7,INIT  IINITIALIZE STATUS REGISTER
2062 010502 005001          CLR      COUNT      IINITIALIZE COUNTER
2063 010504 005201          INC      COUNT      ISET TO INDICATE FIRST PASS
2064 010506 012702 015371  MOV      @MSG12,R2    I"PLACE SPECIAL DARK-LIGHT CHECK CARDS (SEE LISTING, YES
2065 010512 004737 012152  JSR      X7,YOUT      IAT THE BOTTOM OF THE INPUT STACK"
2066 010516 012702 014224  LOOPGI: MOV      @MSG1,R2 I"PRESS CARD READER 'MOTOR START' AND 'READ START'"
2067 010522 005737 000632  TST      FLAG        ICHANGE MESSAGE FOR OCCUMATION READER?
2068 010526 001402          BEQ      .+6         INO
2069 010530 012702 014307  MOV      @MSG1A,R2    I"PRESS CARD READER 'RESET'"
2070 010534 004737 012152  JSR      X7,YOUT
2071 010540 012702 014343  MOV      @MSG2,R2
2072 010544 004737 012152  JSR      X7,YOUT      I"THEN HIT 'CONTINUE' ON THE CONSOLE"
2073 010550 004737 012274  JSR      X7,CRLF4     IMOVE MESSAGE UP ON TTY
2074 010554 000000          HALT
2075 010556 032713 000400  RIT      @000,0CRS   IWAIT FOR OFF-LINE TO CLEAR
2076 010562 001375          RNE      .-0
2077 010564 012713 000003  MOV      @3,0CRS     IJECT THE CARD
2078 010570 032713 100000  RIT      @140000,0CRS IWAIT FOR ERROR OR CARD DONE
2079 010574 001775          BEQ      .-0
2080 010576 005713          TST      0CRS       ICHECK SPECIAL CONDITION
2081 010600 100401          RMI      .+4         ICONTINUE IF SET
2082 010602 100000          HLT      ISPECIAL CONDITION NOT SET
2083 010604 005301          DEP      COUNT      ICOUNT DOWN
2084 010606 001743          REQ      LOOPG      IIF FIRST PASS, LOOP
2085 010610 004737 011462  JSR      X7,BELL     IRING BELL
2086 010614 000000          HALT
2087 010616 012702 014224  MOV      @MSG1,R2    I"PRESS CARD READER 'MOTOR START' AND 'READ START'"
2088 010622 005737 000632  TST      FLAG        ICHANGE MESSAGE FOR OCCUMATION READER?
2089 010626 001402          BEQ      .+6         INO
2090 010630 012702 014307  MOV      @MSG1A,R2    I"PRESS CARD READER 'RESET'"
2091 010634 004737 012152  JSR      X7,YOUT
2092 010640 012702 014343  MOV      @MSG2,R2
2093 010644 004737 012152  JSR      X7,YOUT      I"THEN HIT 'CONTINUE' ON THE CONSOLE"
2094 010650 004737 012274  JSR      X7,CRLF4     IMOVE MESSAGE UP ON TTY
2095 010654 000000          HALT
2096 010656 032713 000400  RIT      @000,0CRS   IWAIT FOR OFF-LINE TO CLEAR
2097 010662 001375          RNE      .-0
2098 010664 012737 007236 012150  MOV      @TESTA+2,RETURN ISETUP SCOPE LOOP RETURN ADDRESS
2099 010672 000137 007234  JMP      TESTA      ILOOP THRU TEST ON CONTINUING

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2100
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010676 104007
010700 012702 R16273
010704 004737 000652
010710 012702 R16115
010714 004737 R12152
010720 104004
010722 013737 R00622 R11012
010730 062737 R00002 011012
010736 032777 R10000 167652 281
R10744 001404
010746 042737 R00020 177776
010754 000403
010756 052737 R00020 177776
010764 005037 R12146
010770 012737 R11002 R12150
R10776 000177 R00010
011002 005037 R12146
R11006 000177 R00000
011012 000000

ROUTINE TO LOOP THRU A SINGLE INSTRUCTION TEST
NOTE THAT SW11 MUST BE DOWN AFTER 2ND HALT

TESTX: TIT
MOV #SUBT4,R2
JSR Z7,SETUP ;SETUP POINTERS AND FLAGS
MOV #STADD,R2
JSR PC,TOUT
REAND
MOV TMP1,RETRNX
ADD #2,RETRNX ;CHANGE TO FIRST ADDRESS AFTER SCOPE INSTRUCTION
BIT #10000,PSWR ;CHECK SW12
BEQ .+12 ;BRANCH IF NOT SET
BIC #20,PSR ;CLEAR TRACE BIT
BR .+10 ;SKIP NEXT INSTRUCTION
BIS #20,PSR ;SET TRACE BIT
CLR ITCNT ;CLEAR ITERATION COUNTER
MOV #XLOOP,RETURN ;LOAD RETURN ADDRESS
JMP @RETRNX ;JUMP TO TEST
XLOOP: CLR ITCNT ;KEEP ITERATION COUNTER AT ZERO
JMP @RETRNX ;JUMP TO TEST
RETRNX: 0

2124							
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2127							
2128							
2129							
2130							
2131							
2132							
2133							
2134							
2135							
2136	011014	104007			CKSAME1	TIT	
2137	011016	012702	016316			MOV	0SUBT5,R2
2138	011022	004737	000652			JSR	X7,SETUP
2139	011026	012702	016066			MOV	0CINPAT,R2
2140	011032	004737	012152			JSR	PC,TOUT
2141	011036	104000				READC	
2142	011040	013737	000622	011432		MOV	TMP1,CARDIM
2143	011046	042737	170000	011432		BIC	0170000,CARDIM
2144	011054	005037	011430			CLR	TOTCRD
2145	011060	005037	011426			CLR	TOTERR
2146	011064	005037	000650			CLR	ERFLG
2147	011070	005037	006650		CKLOOP1	CLR	CLCNT
2148	011074	104003				KRINTY	
2149	011076	032713	000400			BIT	04000,0CRS
2150	011102	001017				RNE	CKSIT
2151	011104	005213				INC	0CRS
2152	011106	005237	011430			INC	TOTCRD
2153	011112	105713			CKLP11	TSTB	0CRS
2154	011114	100426				BMI	CKCOL
2155	011116	032713	040000			BIT	040000,0CRS
2156	011122	001015				RNE	CKCRD
2157	011124	005713				TST	0CRS
2158	011126	100371				BPL	CKLP1
2159	011130	032713	000400			BIT	0400,0CRS
2160	011134	001002				RNE	CKSIT
2161	011136	104000				HLT	
2162	011140	000753				BR	CKLOOP
2163							
2164	011142	004737	011462		CKSIT1	JSR	X7,BELL
2165	011146	032713	000400		CKSIT11	BIT	0400,0CRS
2166	011152	001375				RNF	CKSIT1
2167	011154	000745				BR	CKLOOP
2168	011156	022737	000120	006650	CKCRD1	CMF	000,CLCNT
2169	011164	001741				REQ	CKLOOP
2170	011166	104000				HLT	
2171	011170	000737				BR	CKLOOP
2172	011172	011437	006652		CKCOL1	MOV	0CRD1,DAT1
2173	011176	005237	006650			INC	CLCNT
2174	011202	105713				TSTB	0CRS
2175	011204	100002				RPL	006
2176	011206	104000				HLT	
2177	011210	000727				BR	CKLOOP
2178	011212	012701	000200			MOV	0200,COUNT
2179	011216	005301			CKLP21	DEC	COUNT

2100	011220	001376		BNE	CKLP2		
2101	011222	011437	006654	MOV	0CR01, DAT2	I READ CR11 AGAIN	
2102	011226	023737	006652	011432	CMP	DAT1, CARDIM	I COMPARE FIRST DATA TO PATTERN
2103	011234	001005		BNE	CKFAIL	I BRANCH IF FAILURE	
2104	011236	023737	006654	011432	CMP	DAT2, CARDIM	I COMPARE SECOND READING TO PATTERN
2105	011244	001001		RNE	CKFAIL	I BRANCH IF FAILURE	
2106	011246	000721		RR	CKLP1	I WAIT FOR NEXT COLUMN OR END OF CARD	
2107	011250	005237	011426	CKFAIL:	INC	TOTERR	I COUNT ERRORS
2108	011254	104003			KBINTY		
2109	011256	032777	020000	167332	BIT	020000, 0SWR	I CHECK FOR INHIBITING PRINTOUT
2190	011264	001007		BNE	CKHLT		I BRANCH AROUND PRINTOUT IF SET
2191	011266	005737	006650		TST	ERFLG	I TEST FLAG TO PRINT HEADING
2192	011272	001006		BNE	CKNOMD		I BRANCH IF ALREADY DONE
2193	011274	005237	006650		INT	ERFLG	I PRINT HEADING ONCE ONLY
2194	011300	012702	015764		MOV	0MSG19, R2	I OUTPUT HEADING
2195	011304	004737	012152		JSR	X7, TOUT	
2196	011310	004737	012242	CKNOMD:	JSR	X7, CRLF	I OUTPUT CARRIAGE RETURN, LINEFEED
2197	011314	013702	006650		MOV	CLCNT, R2	I PRINT COLUMN NUMBER
2198	011320	004737	011734		JSR	X7, PROCT	
2199	011324	004737	011542		JSR	X7, SPACE	
2200	011330	013702	006652		MOV	DAT1, R2	I PRINT FIRST READING
2201	011334	004737	011734		JSR	X7, PROCT	
2202	011340	004737	011542		JSR	X7, SPACE	
2203	011344	013702	006654		MOV	DAT2, R2	I PRINT SECOND READING
2204	011350	004737	011734		JSR	X7, PROCT	
2205	011354	004737	011542		JSR	X7, SPACE	
2206	011360	013702	011430		MOV	TOTCRD, R2	I PRINT TOTAL NUMBER OF CARDS READ
2207	011364	004737	011734		JSR	X7, PROCT	
2208	011370	004737	011542		JSR	X7, SPACE	
2209	011374	013702	011426		MOV	TOTERR, R2	I PRINT TOTAL NUMBER OF DATA ERRORS
2210	011400	004737	011734		JSR	X7, PROCT	
2211	011404	005777	167206	CKHLT:	TST	0SWR	I CHECK SW15 TO HALT ON ERROR
2212	011410	100002			BPL	CKDONE	I BRANCH IF NOT SET
2213	011412	000000			HALT		I HALT ON ERROR
2214	011414	000625			RR	CKLOOP	I CONTINUE
2215	011416	032713	140000	CKDONE:	BIT	0140000, 0CRS	I WAIT FOR SPECIAL CONDITION OR DONE
2216	011422	001775			BEQ	CKDONE	
2217	011424	000621			BR	CKLOOP	I START NEXT CARD AFTER CHECKING BIT 8
2218	011426	000000		TOTERR:	0		
2219	011430	000000		TOTCRD:	0		
2220	011432	000000		CARDIM:	0		
2221							
2222							
2223							
2224							
2225							
2226	011434	004737	011506				
2227	011440	032713	001000				
2228	011444	001375					
2229	011446	005013					
2230	011450	005714					
2231	011452	005713					
2232	011454	001001					
2233	011456	104000					
2234	011460	000207					
2235							

I ISSUE MESSAGE IF CARD READER IS OFF-LINE
 I WAIT FOR BUSY TO CLEAR IN CASE CARD READER IS STILL READING A CARD
 I INITIALIZE STATUS REGISTER AND USE ERROR HALT IF IT DOESN'T CLEAR PROPERLY
 I NOTE THAT PROGRAM WILL HANG HERE IF BUSY REMAINS SET
 INITI: JSR X7, CKBITS I SEE IF OFF-LINE BIT IS SET
 RTY 01000, 0CRS I WAIT FOR BUSY TO CLEAR, IN CASE
 BNE .-4 I A CARD IS STILL BEING READ
 CLR 0CRS I INITIALIZE STATUS REGISTER
 TST 0CR01 I READ DATA BUFFER TO CLEAR COLUMN READY
 TST 0CRS I MAKE SURE INITIALIZATION OK
 BEQ .+4 I BRANCH IF ALL BITS ZERO
 HLT I NOT ALL BITS OF STATUS REGISTER ARE ZERO
 RTS X7 I RETURN

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2236          ;BELL ON PASS COMPLETE
2237 011462 105777 167124 BELL: TSTB 0TCSR          ;WAIT FOR TTY READY
2238 011466 100375          BPL      -4
2239 011470 012777 000207 167116 MOV     0207,0TDOR    ;RING BELL
2240 011476 012737 000001 012144 MOV     01,ITMAX      ;MAKE CERTAIN ITERATION MAXIMUM IS CORRECT
2241 011504 000207          RTS       X7          ;RETURN
2242
2243          ;SUBROUTINE TO CHECK FOR BIT 8 (OFF-LINE) BEING SET IN CARD
2244          ;READER CSR, AND PRINT OUT A MESSAGE IF IT IS
2245 011506 032713 000400 CKBIT8: RIT     0400,0CRS    ;CHECK BIT 8
2246 011512 001001          RNE     -4          ;BRANCH IF SET
2247 011514 000207          RTS       X7          ;RETURN IF NOT SET
2248 011516 012702 015744 MOV     0MSG10,R2     ;OUTPUT MESSAGE
2249 011522 004737 012152 JSR     X7,TOUT       ;"BIT 8 WAS SET"
2250 011526 012702 015661 MOV     0MSG17,R2     ;"REMEDY THE ERROR CONDITION
2251 011532 004737 012152 JSR     X7,TOUT       ;AND PRESS 'CONTINUE'"
2252 011536 000000          HALT
2253 011540 000762          BR      CKBIT8       ;CHECK AGAIN
2254
2255          ;SUBROUTINE TO ISSUE N SPACES
2256          ;IN IS ONE PLUS VALUE CONTAINED IN SPACEX
2257          ;SPACEX IS CLEARED WITHIN THE SUBROUTINE, SO THAT A CALL ON
2258          ;SPACE WITHOUT LOADING SPACEX ISSUES ONLY ONE SPACE
2259 011542 105777 167044 SPACE1: TSTR    0TCSR          ;WAIT FOR TTY READY
2260 011546 100375          BPL      -4
2261 011550 012777 000240 167036 MOV     0240,0TDOR    ;OUTPUT A SPACE
2262 011556 005337 011572 DEC     SPACEX        ;DECREMENT COUNT
2263 011562 100367          BPL      SPACE       ;LOOP IF NOT DONE
2264 011564 005037 011572 CLR     SPACEX        ;RESET COUNT TO ZERO
2265 011570 000207          RTS       X7          ;RETURN
2266 011572 000000          SPACEX: 0
2267
2268
2269
2270          ;ENTERED WITH SYSTEM TRAP CALL (HLT)
2271          ;PRINT OUT THE ERROR PC AND STATUS REGISTER
2272          PRINT: KRINTY
2273 011576 037727 167016 020000 BIT     0SWR,020000    ;TEST FOR INHIBIT PRINT OUT
2274 011604 001401          BEQ     -4          ;BRANCH TO PRINT
2275 011606 000437          BR      R,CK        ;INHIBIT, CHECK FOR HALT
2276 011610 012637 011730 MOV     (6)+, SAVPC    ;PC OF FAILING ROUTINE
2277 011614 012637 011732 MOV     (6)+, SAVPSR   ;PSR OR ERROR CONDITION
2278 011620 024646          CMP     -(6), -(6)    ;RESTORE STACK
2279 011622 004737 012242 JSR     X7,CRLF       ;OUTPUT CARRIAGE RETURN, LINEFEED
2280 011626 010237 011722 MOV     X2, SAVR2     ;SAVE R2
2281 011632 013702 011730 MOV     SAVPC, X2
2282 011636 004737 011734 JSR     X7, PROCT     ;PRINT PC+2 IN OCTAL
2283 011642 105777 166744 TSTR    0TCSR          ;WAIT FOR TTY READY
2284 011646 100375          RPL      -4
2285 011650 012777 000240 166736 MOV     0240, 0TDBR    ;OUTPUT A SPACE
2286 011656 013702 011732 MOV     SAVPSR, X2
2287 011662 004737 011734 JSR     X7, PROCT     ;PRINT PROCESSOR STATUS AT TIME OF FAILURE
2288 011666 013702 011722 MOV     SAVR2, X2     ;RESTORE REGISTER 2
2289 011672 105777 166714 TSTR    0TCSR          ;WAIT FOR TTY READY
2290 011676 100375          BPL      -4
2291 011700 012777 000240 166706 MOV     0240,0TDOR
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2292	011706	104003		B.CK:	K0INTT		
2293	011710	005777	166702		TST	0SWR	ICHECK SR FOR HALT SWITCH
2294	011714	100001			BPL	.+4	I BRANCH IF NOT SET
2295	011716	000000			HALT		IHALT ON ERROR UP
2296	011720	000002			RTI		I RETURN TO MAIN LINE
2297	011722	000000		SAVR2:	0		
2298	011724	000000		SAVR3:	0		
2299	011726	000000		SAVR4:	0		
2300	011730	000000		SAVPC:	0		
2301	011732	000000		SAVPSR:	R		
2302							
2303	011734	010337	011724	PROCT:	MOV	R3,SAVR3	ISAVE R3
2304	011740	010437	011726		MOV	R4,SAVR4	ISAVE R4
2305	011744	005004			CLR	R4	ICLEAR R4 TO USE AS COUNTER
2306	011746	005001			CLR	COUNT	ICLEAR COUNT TO USE AS CARRY FLAG
2307	011750	012703	000260		MOV	0260, R3	ISETUP ASCII ZERO IN R3
2308	011754	005702			TST	R2	ICHECK BIT 15 OF DESIRED NUMBER
2309	011756	100001			BPL	.+4	I BRANCH IF NOT SET
2310	011760	005203			INC	R3	ICCHANGE TO ASCII ONE
2311	011762	006102			ROL	R2	IROTATE INTO RIGHTMOST BIT
2312	011764	006102			ROL	R2	I TO PREPARE FOR LOOP
2313	011766	005501			ADC	COUNT	ISTORE CARRY
2314	011770	105777	166616	C.WAIT:	TSTR	0TCSR	IWAIT FOR TTY READY
2315	011774	100375			BPL	C.WAIT	
2316	011776	010377	166612		MOV	R3, 0TDRR	IOUTPUT ASCII
2317	012002	005204			INC	R4	ICOUNT CHARACTERS OUTPUT
2318	012004	020427	000006		CMP	R4, 06	ICHECK FOR DONE
2319	012010	001005			BNE	C.CONT	I BRANCH IF NOT DONE
2320	012012	013703	011724		MOV	SAVR3,R3	I RESTORE REGISTER 3
2321	012016	013704	011726		MOV	SAVR4,R4	I RESTORE REGISTER 4
2322	012022	000207			RTS	R7	I RETURN
2323	012024	000241		C.CONT:	CLC		ICLEAR CARRY
2324	012026	005701			TST	COUNT	I TEST CARRY FLAG
2325	012030	001402			REQ	.+4	I BRANCH IF NOT SET
2326	012032	005001			CLR	COUNT	ICLEAR FLAG
2327	012034	000261			SEC		ISET CARRY
2328	012036	006102			ROL	R2	IROTATE NEXT 3 BITS INTO RIGHTMOST 3
2329	012040	006102			ROL	R2	
2330	012042	006102			ROL	R2	
2331	012044	005501			ADC	COUNT	ISTORE CARRY
2332	012046	010203			MOV	R2, R3	IMOVE DATA FOR OUTPUT
2333	012050	042703	177770		RIC	0177770,R3	ICLEAR ALL BUT RIGHTMOST 3 BITS
2334	012054	052703	000260		RIS	0260, R3	ISET TO ASCII EQUIVALENT
2335	012060	000743			RR	C.WAIT	I LOOP
2336							
2337	012062	104003					ISCOPE AND/OR ITERATION LOOP FOR EACH TEST 2 TIMES
2338	012064	032777	000000 166524	SCOPEC:	K0INTT		
2339	012072	001012			BIT	000000, 0SWR	I TEST SR FOR SCOPE
2340	012074	032777	004000 166514		RNE	D.1	IYES,SCOPE
2341	012102	001013			BIT	000000, 0SWR	I NO- TEST FOR ITERATION
2342	012104	023737	012146 012144		RNE	D.2	IINHIBIT ITERATION
2343	012112	100007			CMP	ITCNT,ITMAX	ICHECK FOR ITERATIONS COMPLETE
2344	012114	005237	012146		BPL	D.2	IEXIT-DONE
2345	012120	022606			INC	ITCNT	IINCREMENT COUNT
2346	012122	012637	177776	D.11	CMP	(6)+, R6	I REPOSITION STACK POINTER
2347	012126	000177	000016		MOV	(6)+, PSR	I RESTORE PROCESSOR STATUS
					JMP	0RPTURN	I RETURN TO RERUN TEST

2348	012132	005037	R12146		D,21	CLR	ITCNT		ICLEAR COUNTER
2349	012136	011637	R12150			MOV	0X6,	RETURN	ISAVE SCOPE RETURN POINTER
2350	012142	0000A2				RTY			IRETURN INLINE-NEXT TEST
2351	012144	000001			ITMAX:	1			IMAX NUMBER OF ITERATIONS
2352	012146	000000			ITCNT:	0			ICOUNT LOCATION FOR ITERATION LOOP
2353	012150	001022			RETURN:	TEST1+2			IADDRESS OF LAST TEST
2354									
2355									
2356									
2357	012152	142777	R00177	166432					
2358	012160	111237	R12240						
2359	012164	005202							
2360	012166	121237	R12240						
2361	012172	001006							
2362	012174	105777	166412						
2363	012200	100375							
2364	012202	005077	166406						
2365	012206	000207							
2366	012210	121227	R00100						
2367	012214	001003							
2368	012216	004737	R12242						
2369	012222	000760							
2370	012224	105777	166362						
2371	012230	100375							
2372	012232	112277	166356						
2373	012236	000753							
2374	012240	000000							
2375									
2376									
2377	012242	105777	166344						
2378	012246	100375							
2379	012250	112777	R00215	166336					
2380	012256	105777	166330						
2381	012262	100375							
2382	012264	112777	R00212	166322					
2383	012272	000207							
2384									
2385									
2386	012274	004737	R12242						
2387	012300	004737	R12242						
2388	012304	004737	R12242						
2389	012310	004737	R12242						
2390	012314	000207							
2391									
2392	012316	022737	R00176	R00616					
2393	012324	001403							
2394	012326	062716	R00002						
2395	012332	000504							
2396	012334	012702	R16055						
2397	012340	004737	R12152						
2398	012344	013702	R00176						
2399	012350	004737	011734						
2400	012354	012702	R16000						
2401	012360	004737	012152						
2402	012364	005037	R00622						
2403	012370	012737	R00007	R00630					

2404	012376	105777	166204		READ:	TSTR	OKACSR
2405	012402	100375				RPL	READ
2406	012404	117737	166200	RRR626		MOVR	OKADR, TIR
2407	012412	113777	RRR626	166174		MOVR	TIR, OTDR
2408	012420	142737	RRR200	RRR626		BICR	0200, TIR
2409	012426	122737	RRR25	RRR626		CMPR	025, TIR
2410	012434	001005				RNE	28
2411	012436	012702	R16205			MOV	0CYLU, R2
2412	012442	004737	012152			JSR	PC, TOUT
2413	012446	RRR746				RR	AGN
2414	012450	122737	RRR15	RRR626	28:	CMPR	015, TIR
2415	012456	001430				REQ	18
2416	012460	122737	RRR60	RRR626		CMPR	060, TIR
2417	012466	003027				BGT	INERR
2418	012470	122737	RRR67	RRR626		CMPR	067, TIR
2419	012476	002423				BLT	INERR
2420	012500	142737	RRR60	RRR626		BICR	060, TIR
2421	012506	006337	RRR622			ASL	TMP1
2422	012512	006337	RRR622			ASL	TMP1
2423	012516	006337	RRR622			ASL	TMP1
2424	012522	153737	RRR626	RRR622		BISB	TIR, TMP1
2425	012530	005337	RRR630			DEC	CSNT
2426	012534	001004				BEG	INERR
2427	012536	000717				RR	READ
2428	012540	004737	R12242		18:	JSR	X7, CRLF
2429	012544	000002			OUT:	RTI	
2430	012546	012702	R16027		INERR:	MOV	00EST, R2
2431	012552	004737	012152			JSR	PC, TOUT
2432	012556	000702				RR	AGN
2433							
2434							
2435							
2436	012560	013746	RRR006		SUSWR:	MOV	6, -(SP)
2437	012564	013746	RRR004			MOV	4, -(SP)
2438	012570	012737	R12610	RRR004		MOV	010, 4
2439	012576	022777	177777	166012		CMR	0-1, 0SWR
2440	012604	001402				REQ	28
2441	012606	RRR407				RR	38
2442	012610	022626			18:	CMR	(SP)+, (SP)+
2443	012612	012737	RRR176	RRR616	28:	MOV	0SWREG, SWR
2444	012620	012737	RRR174	RRR620		MOV	0DISPREG, DISPLAY
2445	012626	012637	RRR004		38:	MOV	(SP)+, 4
2446	012632	012637	RRR006			MOV	(SP)+, 6
2447	012636	RRR002				RTI	
2448							
2449	012640	022737	RRR176	RRR616	KBINT:	CMR	0SWREG, SWR
2450	012646	RRR016				BNP	18
2451	012650	005037	RRR622			CLR	TMP1
2452	012654	117737	165730	RRR622		MOVR	OKADR, TMP1
2453	012662	142737	RRR200	RRR622		BICR	0200, TMP1
2454	012670	122737	RRR007	RRR622		CMPR	07, TMP1
2455	012676	001002				RNE	18
2456	012700	104002				CNTLU	
2457	012702	104006				CKU	
2458	012704	RRR002			18:	RTI	
2459							

2460					JTYPE	TME	MAIN	TITLE	
2461	012706	005737	000624		TITTYPI	TST		TIFLG	
2462	012712	001406				REQ		IS	
2463	012714	012702	016143			MOV		@TITL,R2	
2464	012720	004737	012152			JSR		X7,TOUT	
2465	012724	005037	000624			CLR		TIFLG	
2466	012730	000002			ISI	RTI			
2467									
2468	012732	122737	000007	000630	CKUUI	CMPR		07,CSNT	
2469	012740	001403				REQ		IS	
2470	012742	013777	000622	165646		MOV		TMP1,0SWR	
2471	012750	000002			ISI	RTI			
2472									
2473	012752	011646			EMTSRVI	MOV		(SP),-(SP)	
2474	012754	162716	000002			SUB		#2,(SP)	
2475	012760	017616	000000			MOV		0(SP),(SP)	
2476	012764	006316				ASL		(SP)	
2477	012766	042716	177001			BIC		0177001,(SP)	
2478	012772	062716	013004			ADD		0EMTTAB,(SP)	
2479	012776	017616	000000			MOV		0(SP),(SP)	
2480	013002	000136				JMP		0(SP)+	
2481									
2482	013004	011574			EMTTAB:	PRINT			ICALLED BY EMT WLT
2483	013006	012062				SCOPEC			ICALLED BY EMT SCOPE
2484	013010	012316				CNTLUU			ICALLED BY EMT CNTLU
2485	013012	012640				K0INT			ICALLED BY EMT K0INTY
2486	013014	012376				READ			ICALLED BY EMT READC
2487	013016	012560				SUSWR			ICALLED BY EMT SUSWR
2488	013020	012732				CKUUI			ICALLED BY EMT CKU
2489	013022	012706				TITTYPI			ICALLED BY EMT TIT
2490									
2491									

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2500 013024 004000
2501 013026 000200
2502 013030 004400
2503 013032 000201
2504 013034 004200
2505 013036 000202
2506 013040 004100
2507 013042 000203
2508 013044 004040
2509 013046 000204
2510 013050 004020
2511 013052 000205
2512 013054 004010
2513 013056 000206
2514 013060 004004
2515 013062 000207
2516 013064 004002
2517 013066 000210
2518 013070 004001
2519 013072 000220
2520 013074 004202
2521 013076 000212
2522 013100 004102
2523 013102 000213
2524 013104 004042
2525 013106 000214
2526 013110 004022
2527 013112 000215
2528 013114 004012
2529 013116 000216
2530 013120 004006
2531 013122 000217
2532 013124 002000
2533 013126 000100
2534 013130 002400
2535 013132 000101
2536 013134 002200
2537 013136 000102
2538 013140 002100
2539 013142 000103
2540 013144 002040
2541 013146 000104
2542 013150 002020
2543 013152 000105
2544 013154 002010
2545 013156 000106
2546 013160 002004
2547 013162 000107

DATA TABLES FOR DATA RELIABILITY TESTS

ALPHANUMERIC DECK DATA TABLE

IFIRST VALUE FOR A COLUMN IS THE DIRECT
ICARD IMAGE FOR THAT COLUMN ON CARD 1

ITHE SECOND VALUE IS THE ENCODED VALUE OF THAT DATA

ALPCN:	4000	ICOLUMN	CHAR	HOLLERITH
	200	11	B	12
	4400	12	A	12 1
	201			
	4200	13	B	12 2
	202			
	4100	14	C	12 3
	203			
	4040	15	D	12 4
	204			
	4020	16	E	12 5
	205			
	4010	17	F	12 6
	206			
	4004	18	B	12 7
	207			
	4002	19	M	12 8
	210			
	4001	110	I	12 9
	220			
	4202	111	CENT	12 0 2
	212			
	4102	112	.	12 0 3
	213			
	0042	113	4	12 0 4
	214			
	4022	114	(12 0 5
	215			
	4012	115	o	12 0 6
	216			
	4006	116	1	12 0 7
	217			
	2000	117	-	11
	100			
	2400	118	J	11 1
	101			
	2200	119	K	11 2
	102			
	2100	120	L	11 3
	103			
	2040	121	M	11 4
	104			
	2020	122	N	11 5
	105			
	2010	123	O	11 6
	106			
	2004	124	P	11 7
	107			

2548	013164	002002	2002	125	Q	11 0
2549	013166	000110	110			
2550	013170	002001	2001	126	R	11 0
2551	013172	000120	120			
2552	013174	002202	2202	127	I	11 0 2
2553	013176	000112	112			
2554	013200	002102	2102	128	S	11 0 3
2555	013202	000113	113			
2556	013204	002042	2042	129	O	11 0 4
2557	013206	000114	114			
2558	013210	002022	2022	130	J	11 0 5
2559	013212	000115	115			
2560	013214	002012	2012	131	F	11 0 6
2561	013216	000116	116			
2562	013220	002006	2006	132	BLANK	11 0 7
2563	013222	000117	117			
2564	013224	001000	1000	133	A	A
2565	013226	000040	40			
2566	013230	001400	1400	134	/	A 1
2567	013232	000041	41			
2568	013234	001200	1200	135	B	0 2
2569	013236	000042	42			
2570	013240	001100	1100	136	T	A 3
2571	013242	000043	43			
2572	013244	001040	1040	137	U	A 4
2573	013246	000044	44			
2574	013250	001020	1020	138	V	0 5
2575	013252	000045	45			
2576	013254	001010	1010	139	W	A 6
2577	013256	000046	46			
2578	013260	001004	1004	140	X	A 7
2579	013262	000047	47			
2580	013264	001002	1002	141	Y	A A
2581	013266	000050	50			
2582	013270	001001	1001	142	Z	A 9
2583	013272	000060	60			
2584	013274	001202	1202	143		A A 2
2585	013276	000052	52			
2586	013300	001102	1102	144	.	A 0 3
2587	013302	000053	53			
2588	013304	001042	1042	145	X	0 0 4
2589	013306	000054	54			
2590	013310	001022	1022	146	-	A 0 5
2591	013312	000055	55			
2592	013314	001012	1012	147	>	0 0 6
2593	013316	000056	56			
2594	013320	001006	1006	148	?	0 A 7
2595	013322	000057	57			
2596	013324	000000	0000	149		BLANK
2597	013326	000000	0			
2598	013330	000400	0400	150	1	1
2599	013332	000001	1			
2600	013334	000200	0200	151	2	2
2601	013336	000002	2			
2602	013340	000100	0100	152	3	3
2603	013342	000003	3			

2604	013344	000040	0040	153	A	4
2605	013346	000004	4			
2606	013350	000020	0020	154	5	5
2607	013352	000005	5			
2608	013354	000010	0010	155	6	6
2609	013356	000006	6			
2610	013360	000004	0004	156	7	7
2611	013362	000007	7			
2612	013364	000002	0002	157	8	8
2613	013366	000010	10			
2614	013370	000001	0001	158	9	9
2615	013372	000020	20			
2616	013374	000202	0202	159	I	A 2
2617	013376	000012	12			
2618	013400	000102	0102	160	0	0 3
2619	013402	000013	13			
2620	013404	000042	0042	161	A	0 4
2621	013406	000014	14			
2622	013410	000022	0022	162	'	0 5
2623	013412	000015	15			
2624	013414	000012	0012	163	"	0 6
2625	013416	000016	16			
2626	013420	000006	0006	164	"	0 7
2627	013422	000017	17			
2628	013424	004000	4000	165	B	12
2629	013426	000200	200			
2630	013430	004400	4400	166	A	12 1
2631	013432	000201	201			
2632	013434	004200	4200	167	B	12 2
2633	013436	000202	202			
2634	013440	004100	4100	168	C	12 3
2635	013442	000203	203			
2636	013444	004040	4040	169	D	12 4
2637	013446	000204	204			
2638	013450	004020	4020	170	E	12 5
2639	013452	000205	205			
2640	013454	004010	4010	171	F	12 6
2641	013456	000206	206			
2642	013460	004004	4004	172	G	12 7
2643	013462	000207	207			
2644	013464	004002	4002	173	H	12 8
2645	013466	000210	210			
2646	013470	004001	4001	174	I	12 9
2647	013472	000220	220			
2648	013474	004202	4202	175	CENT	12 0 2
2649	013476	000212	212			
2650	013500	004102	4102	176	.	12 0 3
2651	013502	000213	213			
2652	013504	004042	4042	177	.	12 0 4
2653	013506	000214	214			
2654	013510	004022	4022	178	(12 0 5
2655	013512	000215	215			
2656	013514	004012	4012	179	.	12 0 6
2657	013516	000216	216			
2658	013520	004006	4006	180	I	12 0 7
2659	013522	000217	217			

ALPENDING 217

2660
2661
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2664 013524 000000
2665 013526 000000
2666 013530 000001
2667 013532 000020
2668 013534 000002
2669 013536 000010
2670 013540 000004
2671 013542 000007
2672 013544 000010
2673 013546 000006
2674 013550 000020
2675 013552 000005
2676 013554 000040
2677 013556 000004
2678 013560 000100
2679 013562 000003
2680 013564 000200
2681 013566 000002
2682 013570 000400
2683 013572 000001
2684 013574 001000
2685 013576 000040
2686 013600 002000
2687 013602 000100
2688 013604 004000
2689 013606 000200
2690 013610 001111
2691 013612 000067
2692 013614 002222
2693 013616 000117
2694 013620 003333
2695 013622 000177
2696 013624 004444
2697 013626 000207
2698 013630 005555
2699 013632 000267
2700 013634 006666
2701 013636 000317
2702 013640 007777
2703 013642 000377
2704 013644 001010
2705 013646 000046
2706 013650 001212
2707 013652 000056
2708 013654 001313
2709 013656 000077
2710 013660 001414
2711 013662 000047
2712 013664 001515
2713 013666 000067
2714 013670 001616
2715 013672 000057

BINARY DECK DATA TABLE
FIRST VALUE FOR A COLUMN IS THE DIRECT CARD IMAGE OF THAT COLUMN ON CARD
THE SECOND VALUE IS THE ENCODED VALUE, WHICH ORS THE OCTAL REPRESENTATION OF
ROWS ONE THRU SEVEN

BINCD:	ICARD COLUMN :
0	
0	
1	12
20	
2	13
10	
4	14
7	
10	15
6	
20	16
5	
40	17
4	
100	18
3	
200	19
2	
400	110
1	
1000	111
40	
2000	112
100	
4000	113
200	
1111	114
67	
2222	115
117	
3333	116
177	
4444	117
207	
5555	118
267	
6666	119
317	
7777	120
377	
1010	121
46	
1212	122
56	
1313	123
77	
1414	124
47	
1515	125
67	
1616	126
57	

2716	013674	001717	1717	127
2717	013676	000077	77	
2718	013700	002020	2020	120
2719	013702	000105	105	
2720	013704	002121	2121	129
2721	013706	000127	127	
2722	013710	002323	2323	130
2723	013712	000137	137	
2724	013714	002424	2424	131
2725	013716	000107	107	
2726	013720	002525	2525	132
2727	013722	000127	127	
2728	013724	002626	2626	133
2729	013726	000117	117	
2730	013730	002727	2727	134
2731	013732	000137	137	
2732	013734	003030	3030	135
2733	013736	000147	147	
2734	013740	003131	3131	136
2735	013742	000167	167	
2736	013744	003232	3232	137
2737	013746	000157	157	
2738	013750	003434	3434	138
2739	013752	000147	147	
2740	013754	003535	3535	139
2741	013756	000167	167	
2742	013760	003636	3636	140
2743	013762	000157	157	
2744	013764	003737	3737	141
2745	013766	000177	177	
2746	013770	004040	4040	142
2747	013772	000204	204	
2748	013774	004141	4141	143
2749	013776	000227	227	
2750	014000	004242	4242	144
2751	014002	000216	216	
2752	014004	004343	4343	145
2753	014006	000237	237	
2754	014010	004545	4545	146
2755	014012	000227	227	
2756	014014	004646	4646	147
2757	014016	000217	217	
2758	014020	004747	4747	148
2759	014022	000237	237	
2760	014024	005050	5050	149
2761	014026	000246	246	
2762	014030	005151	5151	150
2763	014032	000267	267	
2764	014034	005252	5252	151
2765	014036	000256	256	
2766	014040	005353	5353	152
2767	014042	000277	277	
2768	014044	005454	5454	153
2769	014046	000247	247	
2770	014050	005656	5656	154
2771	014052	000257	257	

2772	014054	005757	5757	155	
2773	014056	000277	277		
2774	014060	006060	6060	156	
2775	014062	000305	305		
2776	014064	006161	6161	157	
2777	014066	000327	327		
2778	014070	006262	6262	158	
2779	014072	000317	317		
2780	014074	006363	6363	159	
2781	014076	000337	337		
2782	014100	006464	6464	160	
2783	014102	000307	307		
2784	014104	006565	6565	161	
2785	014106	000327	327		
2786	014110	006767	6767	162	
2787	014112	000337	337		
2788	014114	007070	7070	163	
2789	014116	000347	347		
2790	014120	007171	7171	164	
2791	014122	000367	367		
2792	014124	007272	7272	165	
2793	014126	000357	357		
2794	014130	007373	7373	166	
2795	014132	000377	377		
2796	014134	007474	7474	167	
2797	014136	000347	347		
2798	014140	007575	7575	168	
2799	014142	000367	367		
2800	014144	007676	7676	169	
2801	014146	000357	357		
2802	014150	000101	0101	170	
2803	014152	000023	23		
2804	014154	000202	0202	171	
2805	014156	000012	12		
2806	014160	000303	0303	172	
2807	014162	000033	33		
2808	014164	000404	0404	173	
2809	014166	000007	7		
2810	014170	000505	0505	174	
2811	014172	000027	27		
2812	014174	000606	0606	175	
2813	014176	000017	17		
2814	014200	000707	0707	176	
2815	014202	000037	37		
2816	014204	003210	3210	177	
2817	014206	000146	146		
2818	014210	000123	0123	178	
2819	014212	000037	37		
2820	014214	007656	7656	179	
2821	014216	000347	347		
2822	014220	004567	4567	180	
2823	014222	000237	237		
2824	014224	040057	051120	051505	
2825	014232	020123	040503	042122	
2826	014240	051040	040505	042504	
2827	014246	020122	046447	052117	

BINEND: MSG11 .ASCII //OPRESS CARD READER 'MOTOR START' AND 'READ START'//

2828	014254	051117	051440	040524		
2829	014262	052122	020047	047101		
2830	014270	020104	051047	040505		
2831	014276	020104	052123	051101		
2832	014304	023524	057			
2833	014307	057	050100	042522	MSG1A1	.ASCII 1/0PRESS CARD READER 'RESET'/1
2834	014314	051523	041440	051101		
2835	014322	020104	042522	042101		
2836	014330	051105	023440	042522		
2837	014336	042523	023524	057		
2838	014343	057	052100	042510	MSG21	.ASCII 1/0TMEN HIT 'CONTINUE' ON THE CONSOLE/1
2839	014350	020116	044510	020124		
2840	014356	041447	047117	044524		
2841	014364	052516	023505	047440		
2842	014372	020116	044124	020105		
2843	014400	047503	051516	046117		
2844	014406	027505				
2845	014410	040057	051120	051505	MSG31	.ASCII 1/0PRESS CARD READER 'READ STOP'/1
2846	014416	020123	040503	042122		
2847	014424	051040	040505	042504		
2848	014432	020122	051047	040505		
2849	014440	020104	052123	050117		
2850	014446	027447				
2851	014450	040057	051120	051505	MSG3A1	.ASCII 1/0PRESS CARD READER 'STOP'/1
2852	014456	020123	040503	042122		
2853	014464	051040	040505	042504		
2854	014472	020122	051447	047524		
2855	014500	023520	057			
2856	014503	057	052100	042510	MSG41	.ASCII 1/0THE INTERRUPT LEVEL WAS /1
2857	014510	044440	052116	051105		
2858	014516	052522	052120	046040		
2859	014524	053105	046105	053440		
2860	014532	051501	027440			
2861	014536	040057	042522	047515	MSG51	.ASCII 1/0REMOVE ALL CARDS FROM THE INPUT HOPPER/1
2862	014544	042526	040440	046114		
2863	014552	041440	051101	051504		
2864	014560	043040	047522	020115		
2865	014566	044124	020105	047111		
2866	014574	052520	020124	047510		
2867	014602	050120	051105	057		
2868	014607	057	051100	051505	MSG61	.ASCII 1/0RESTORE CARDS IN THE INPUT HOPPER/1
2869	014614	047524	042522	041440		
2870	014622	051101	051504	044440		
2871	014630	020116	044124	020105		
2872	014636	047111	052520	020124		
2873	014644	047510	050120	051105		
2874	014652	057				
2875	014653	057	051100	044501	MSG71	.ASCII 1/0RAISE OUTPUT STACKER PRESSURE ARM SLIGHTLY ABOVE HORIZONTAL 0 THEN LO
2876	014660	042523	047440	052125		
2877	014666	052520	020124	052123		
2878	014674	041501	042513	020122		
2879	014702	051120	051505	052523		
2880	014710	042522	040440	046522		
2881	014716	051440	044514	044107		
2882	014724	046124	020131	041101		
2883	014732	053117	020105	047510		

2884	014740	044522	047532	052116	
2885	014746	046101	040040	052040	
2886	014754	042510	020116	047514	
2887	014762	042527	020122	052111	
2888	014770	057			
2889	014771	057	046100	053517	MSG7A1 .ASCII //LOWER OUTPUT STACKER PLATE TO BOTTOM//
2890	014776	051105	047440	052125	
2891	015004	052520	020124	052123	
2892	015012	041501	042513	020122	
2893	015020	046120	052101	020105	
2894	015026	047524	041040	052117	
2895	015034	047524	027515		
2896	015040	040057	047510	042114	MSG81 .ASCII //HOLD DOWN THE SWITCH AT THE BOTTOM OF THE INPUT HOPPER//
2897	015046	042040	053517	020116	
2898	015054	044124	020105	053523	
2899	015062	052111	044103	040440	
2900	015070	020124	044124	020105	
2901	015076	047502	052124	046517	
2902	015104	047440	020106	044124	
2903	015112	020105	047111	052520	
2904	015120	020124	047510	050120	
2905	015126	051105	057		
2906	015131	057	046100	043111	MSG9A1 .ASCII //LIFT SWITCH UNDER RIFFLE CAP//
2907	015136	020124	053523	052111	
2908	015144	044103	052440	042116	
2909	015152	051105	051040	043111	
2910	015160	046106	020105	040503	
2911	015166	027520			
2912	015170	040057	046102	041517	MSG91 .ASCII //BLOCK THE CARD READER STATION TO PREVENT A CARD GOING THRU, AND//
2913	015176	020113	044124	020105	
2914	015204	040503	042122	051040	
2915	015212	040505	042504	020122	
2916	015220	052123	052101	047511	
2917	015226	020116	047524	050040	
2918	015234	042522	042526	052116	
2919	015242	040440	041440	051101	
2920	015250	020104	047507	047111	
2921	015256	020107	044124	052522	
2922	015264	020054	047101	027504	
2923	015272	040057	042522	047515	MSG101 .ASCII //REMOVE JAMMED CARD//
2924	015300	042526	045040	046501	
2925	015306	042515	020104	040503	
2926	015314	042122	057		
2927	015317	057	044100	046117	MSG111 .ASCII //HOLD THE OUTPUT STACKER GATE OPEN. THEN//
2928	015324	020104	044124	020105	
2929	015332	052517	050124	052125	
2930	015340	051440	040524	045503	
2931	015346	051105	043440	052101	
2932	015354	020105	050117	047105	
2933	015362	020056	044124	047105	
2934	015370	057			
2935	015371	057	050100	040514	MSG121 .ASCII //PLACE SPECIAL DARK-LIGHT CHECK CARDS (SEE LISTING, TESTS)//
2936	015376	042503	051440	042520	
2937	015404	044503	046101	042040	
2938	015412	051101	026513	044514	
2939	015420	044107	020124	044103	

2940	015426	041505	020113	040503					
2941	015434	042122	020123	051450					
2942	015442	042505	046040	051511					
2943	015450	044524	043516	020054					
2944	015456	042524	052123	024507					
2945	015464	040500	020124	044124		.ASCII	10AT THE BOTTOM OF THE INPUT STACK//		
2946	015472	020105	047502	052124					
2947	015500	046517	047440	020106					
2948	015506	044124	020105	047111					
2949	015514	052520	020124	052123					
2950	015522	041501	027513						
2951	015526	040057	042504	045503	MSG13:	.ASCII	//OCECK CARD COLUMN PATTERN READ1 READ2 CODED READ//		
2952	015534	020040	020040	040503					
2953	015542	042122	020040	047503					
2954	015550	052514	047115	050040					
2955	015556	052101	042524	047122					
2956	015564	051040	040503	030504					
2957	015572	051040	040503	031104					
2958	015600	020040	047503	042504					
2959	015606	020104	051040	040505					
2960	015614	027504							
2961	015616	040057	046101	044120	MSG14:	.ASCII	//OALPHA //		
2962	015624	020101	057						
2963	015627	057	041100	047111	MSG15:	.ASCII	//OBINARY//		
2964	015634	051101	027531						
2965	015640	040057	044502	020124	MSG16:	.ASCII	//OBIY 15 WAS SET//		
2966	015646	032461	053440	051501					
2967	015654	051440	052105	057					
2968	015661	057	051100	046505	MSG17:	.ASCII	//OREMEDY THE ERROR CONDITION AND PRESS 'CONTINUE'0//		
2969	015666	042105	020131	044124					
2970	015674	020105	051105	047522					
2971	015702	020122	047503	042116					
2972	015710	052111	047511	020116					
2973	015716	047101	020104	051120					
2974	015724	051505	020123	041447					
2975	015732	047117	044524	052516					
2976	015740	023505	027500						
2977	015744	040057	044502	020124	MSG18:	.ASCII	//OBIY A WAS SET//		
2978	015752	020070	040527	020123					
2979	015760	042523	027524						
2980	015764	040057	047503	052514	MSG19:	.ASCII	//OCOLUMN READ1 READ2 CARDS ERRORS//		
2981	015772	047115	051040	040505					
2982	016000	030504	051040	040505					
2983	016006	031104	020040	040503					
2984	016014	042122	020123	051105					
2985	016022	047522	051522	057					
2986	016027	057	037500	020100	QEST:	.ASCII	//O70 # //		
2987	016034	036440	027440						
2988	016040	020057	020040	020040	NEWS:	.ASCII	// NFW # //		
2989	016046	042516	020127	020075					
2990	016054	057							
2991	016055	057	051500	051127	SHREQ:	.ASCII	//OSWR # //		
2992	016062	036440	027440						
2993	016066	040057	040503	042122	CIMPAT:	.ASCII	//OCARD IMAGE PATTERN# //		
2994	016074	044440	040515	042507					
2995	016102	050040	052101	042524					

DZCRA-D
DZCRA.SRC

CR11 DIAGNOSTIC TEST

MACY11 27(732) 21-APR-76 16119 PAGE 58

```
2996 016110 047122 020075 057
2997 016115 057 051500 040524 STADD: .ASCII //STARTING ADDRESS = //
2998 016122 052122 047111 020107
2999 016130 042101 051104 051505
3000 016136 020123 020075 057
3001 016143 057 040100 055104 TITL: .ASCII //00DZCRA-D CR11 DIAGNOSTIC TEST//
3002 016150 051103 026501 020104
3003 016156 020040 051103 030461
3004 016164 042040 040511 047107
3005 016172 051517 044524 020103
3006 016200 042524 052123 057
3007 016205 057 052536 036500 CTLU: .ASCII //U00 //
3008 016212 027440
3009 016214 040057 047111 052123 SUBT1: .ASCII //INSTR * DATA TEST//
3010 016222 020122 020053 040504
3011 016230 040524 052040 051505
3012 016236 027524
3013 016240 040057 051103 030461 SUBT2: .ASCII //CR11 ERROR FUNCTION TEST//
3014 016246 042440 051122 051117
3015 016254 043040 047125 052103
3016 016262 047511 020116 042524
3017 016270 052123 057
3018 016273 057 051500 047111 SUBT4: .ASCII //SINGLE TEST LOOP//
3019 016300 046107 020105 042524
3020 016306 052123 046040 047517
3021 016314 027524
3022 016316 040057 044523 043516 SUBT5: .ASCII //SINGLE DATA PATTERN TEST//
3023 016324 042514 042040 052101
3024 016332 020101 040520 052124
3025 016340 051105 020116 042524
3026 016346 052123 057
3027 000001 .END
```

ADINT	=X000000	CONT2	001226	ITMAX	012144	NOTRP1	005546	SUBMR	012560
AGN	012364	CONT21	004744	KBCSR	000606	NXCRO	006540	SUBMR0	104009
ALCNT	006714	CONT22	005050	KBDBR	000610	OFF6	001714	SWR	000616
ALCNT1	006776	CONT4	001410	KBINT	012640	OUT	012544	SWRE0	000176
ALCNT2	007010	CONT8	002242	KBINTT	104003	PC	=X000007	SWRE0	016059
ALLDON	006662	COUNT	=X000001	KCR01	000636	PRINT	011574	TC0R	000612
ALLOK	007036	CR01	=X000004	KCR8	000634	PROC	000646	T00R	000614
ALPCD	013024	CR02	000640	LASTCD	000650	PROCT	011734	TEND	006644
ALPEND	013522	CRLF	012242	LASTCK	000632	PSR	= 177776	TEST	001012
ALP1	005516	CRLF4	012274	LOGIC	000666	PTOFF	000660	TESTA	007234
ALWAIT	007072	CR8	=X000003	LOOPF	010364	QEST	016027	TEST0	007372
BEGIN	000726	CONT	000630	LOOPG	010516	READ	012376	TESTC	007522
BELL	011462	CTLU	016205	LOOP3	001266	READC	= 104004	TESTD	007654
BINCD	013524	C.CONT	012024	LOOP4	001336	RESTRY	000742	TESTE	010130
BINEND	014222	C.WAIT	011770	LOOP40	001354	REST0	002270	TESTF	010276
B.CK	011706	DATENC	006656	LOOP5	001466	REST9	002374	TESTG	010444
CARDIM	011432	DATST	005426	LOOP6	001624	RETRNX	011012	TESTH	010676
CDCNT	006646	DATST1	005436	LOOP7	001756	RETURN	012150	TESTI	001020
CIMPAT	016066	DATST2	005456	LOOP8	002150	R0	=X000000	TESTIA	001022
CKBIT0	011506	DAT1	006652	L.CNT	012210	R1	=X000001	TESTIO	002402
CKCOL	011172	DAT2	006654	L.EDMK	012240	R2	=X000002	TESTI1	002524
CKCRD	011156	DBRCK0	002232	L.INC	012164	R3	=X000003	TESTI2	002626
CKDONE	011416	DCNT1	005574	L.YOUT	012166	R4	=X000004	TESTI3	002706
CKFAIL	011250	DECK	006640	MSG1	014224	R5	=X000005	TESTI4	003120
CKHLT	011404	DECKCK	006514	MSG1A	014307	SAVPC	011730	TESTI5	003272
CKLOOP	011070	DISPLA	000620	MSG10	015272	SAVPSR	011732	TESTI6	003504
CKLP1	011112	DISPRE	000174	MSG11	015317	SAVR2	011722	TESTI7	003716
CKLP2	011216	DONE3	001314	MSG12	015371	SAVR3	011724	TESTI8	004130
CKNOHD	011310	DONE7	002030	MSG13	015526	SAVR4	011726	TESTI9	004342
CKSAME	011014	D.1	012120	MSG14	015616	SCONT1	005700	TEST2	001116
CKBIT	011142	D.2	012132	MSG15	015627	SCOPE	= 104001	TEST20	004554
CKBIT1	011146	EMTSRV	012752	MSG16	015640	SCOPEC	012062	TEST21	004660
CKU	= 104006	EMTTAB	013004	MSG17	015661	SETUP	000652	TEST22	004754
CKUU	012732	END	006476	MSG18	015744	SET1	004542	TEST23	005062
CK4	001370	ENDCK	005400	MSG19	015764	SET14	003260	TEST24	005266
CK5	001534	END24	005360	MSG2	014343	SET2	004330	TEST3	001242
CK9	002352	ERCM11	007206	MSG3	014410	SET3	004116	TEST4	001324
CLCNT	006650	ERCR11	007200	MSG3A	014450	SET4	003704	TEST5	001454
CNTLU	= 104002	ERFLG	000650	MSG4	014503	SET5	003472	TEST6	001610
CNTLUU	012316	ERR6	001726	MSG5	014536	SET7	003106	TEST7	001742
CNT23A	005110	ERSET	006000	MSG6	014607	SP	=X000006	TEST8	002126
CNT23B	005126	ER1	006034	MSG7	014653	SPACE	011542	TEST9	002276
CNT23C	005146	FAIL	006062	MSG7A	014771	SPACEX	011572	TIA	000626
CNT23D	005164	FAILC	006122	MSG8	015040	SRVC	005634	TIFL6	000624
CNT23E	005204	FAILCN	006170	MSG8A	015131	SRVC1	007070	TIM24	005352
CNT23F	005224	FAILC1	006406	MSG9	015170	SRVC2	007132	TINT10	002464
CNT23G	005250	FLAG	000632	NEWS	016040	SRVC2A	007140	TINT11	002604
CNT24A	005316	HLT	= 104000	NOHD	006212	STACK	000600	TINT12	002670
CNT24B	005346	INERRR	012546	NOP	= 000240	STADD	016115	TINT13	003024
CONYD	005540	INIT	011434	NOTCN	006610	SUBT1	016214	TINT14	003216
CONYG	010476	INTFLG	000602	NOTCD1	006632	SUBT2	016240	TINT15	003410
CONT10	002514	INTVC	000604	NOTCOL	006412	SUBT4	016273	TINT16	003622
CONT11	002616	ITCNT	012146	NOTRP	000764	SUBT5	016316	TINT17	004034

DZCRA-B CR11 DIAGNOSTIC TEST
DZCRA.SRC SYMBOL TABLE

MACV11 27(732) 21-APR-76 16119 PAGE 61

TINT18 004246
TINT19 004468

TITTYP 012706
TMP1 000622

TOUT P12152
TRAPX 000774

TSTA RP7214
TSTART 006642

XLOOP 011002
. 016391

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

*,DZCRA/SOL/ENIAMA=DZCRA.SRC
RUN-TIME: 0 18 .7 SECONDS
RUN-TIME RATIO: 86/27=3.1
CORE USED: 6K (11 PAGES)