

CR11

DIAGNOSTIC
MD-11-DZCRA-A

EP-DZCRA-A-DL-A
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This microfiche card contains a grid of frames. The frames are arranged in approximately 12 rows and 5 columns. Each frame contains a small, high-contrast image of data, likely a diagnostic report or a set of test results. The data is too small to be legible in this image. A small white tab is visible at the bottom center of the card.

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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 4K MEMORY
CR11 CARD READER

2.2 TEST DECKS

MAINDEC-89-D2A1-C ALPHANUMERIC TEST DECK
MAINDEC-89-D2A2-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 HANG 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 THE 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 (000000). 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.D.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.

DFCRA-0
DFCRA.SRC

CR11 DIAGNOSTIC TEST
12-MAR-76 00:00

MACY11 27(1006) 21-SEP-76 16:56 PAGE 15

:SOFTWARE SWITCH REGISTER LOCATIONS

DISPREG: 0
SWREG: 0

:LOAD STARTING ADDRESS AREA

. = 200

MOV #STACK, SP
JMP BEGIN
MOV #STACK, SP
JMP ERCR11
MOV #STACK, SP
JMP ERCM11

:NORMAL STARTING ADDRESS FOR G.D.I. 100 READER
:STARTING ADDRESS FOR CR11 ERROR FUNCTION TEST (G.D.I.)
:STARTING ADDRESS FOR CR11 ERROR FUNCTION TEST (DOCUMENTATI

. = 240

MOV #STACK, SP
JMP TESTX
MOV #STACK, SP
JMP CKSAME

:STARTING ADDRESS FOR LOOP WHICH CONTINUALLY RUNS
:ANY SINGLE SUBTEST
:STARTING ADDRESS OF TEST TO READ A SINGLE DATA
:PATTERN CONTINUOUSLY

:LOAD POINTERS AND GENERAL STORAGE

. = 600

STACK: 0
INTFLG: 0
INTVC: 230
KBCSR: 177560
KBDBR: 177562
TCSR: 177564
TDBR: 177566
SWR: 177570
DISPLAY: 177570
TMP1: 0
TIFLG: -1
TIB: 0
CSNT: 0
FLAG: 0
KCRS: 177160
KCRB1: 177162
CRB2: 177164
TRTRAP: RTI
TRFLG: 0
PROC: 0

:STACK POINTER INITIALIZED TO POINT HERE
:CONTAINS LEVEL THAT INTERRUPT IS FOUND AT
:ADDRESS OF CARD READER INTERRUPT VECTOR

:ADDRESS OF TELETYPE STATUS REGISTER
:ADDRESS OF TELETYPE DATA BUFFER

:SET TO ONE FOR MARK-SENSE CARD READER
:ADDRESS OF CARD READER STATUS REGISTER
:ADDRESS OF CARD READER DATA BUFFER
:ADDRESS TO READ ENCODED DATA
:RETURN FROM TRACE LOOP
:TOGGLED TO SWITCH BETWEEN TRACE TRAPPING AND NORMAL FLO
:STORES PROCESSOR STATUS WHEN TRACE TRAP MUST BE CLEARED
:IN A SUBTEST
:SET TO ZERO TO OUTPUT DATA ERROR HEADING

:INITIALIZE CSR AND DBR POINTERS

SETUP: JSR %7, TOUT
SUSWRP
CNTLU
CKU
MOV #1, ITMAX
MOV KCRS, CRS

:SET ITERATION MAXIMUM TO 1 ITERATION
:SET UP REGISTER POINTERS

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000656 104005 104005
000660 104002 104002
000662 104006 104006
000664 012767 000001 011252
000672 016703 177736 177736

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654 000676 016704 177734      MOV      KCRB1,CRB1
655 000702 016700 177676      MOV      INTVC,ADINT      ;LOAD ADDRESS OF INTERRUPT VECTOR
656 000706 005067 177670      CLR      INTFLG          ;INITIALIZE INTERRUPT FLAG
657 000712 005067 177726      CLR      TRFLG          ;INITIALIZE TRACE FLAG
658 000716 012767 000340 177052  MOV      #340,PSR        ;SETUP PROCESSOR STATUS
659 000724 000207          RTS              ;RETURN
660 000726 104007          BEGIN: TIT
661 000730 012702 016214      MOV      #SUBT1,R2
662 000734 004767 177712      JSR      %7,SETUP        ;INITIALIZE POINTERS AND FLAGS
663 000740 000424          BR        TEST          ;GO TO INSTRUCTION TESTS
664 000742 022767 000176 177646  RESTRT: CMP      #SWREG,SWR
665 000750 001002          BNE
666 000752 104002          CNTLU
667 000754 104006          CKU
668 000756 005767 177662          IS:   TST      TRFLG      ;CHECK FOR TRACE TRAPPING
669 000762 001004          BNE      TRAPX         ;IF SET, TRACE TRAP
670 000764 012767 000340 177004  NOTRP: MOV      #340,PSR   ;IF ZERO, CLEAR TRACE BIT
671 000772 000407          BR        TEST          ;GO TO INSTRUCTION TESTS
672 000774 032777 010000 177614  TRAPX: BIT      #10000,#SWR ;CHECK SW12
673 001002 001370          BNE      NOTRP        ;BRANCH IF SET TO CLEAR TRACE BIT
674 001004 012767 000360 176764      MOV      #360,PSR      ;SET TRACE BIT
675
676          ;TEST FOR CORRECT INITIALIZATION OF STATUS REGISTER
677 001012 012767 001022 011130  TEST:  MOV      #TEST1A,RETURN ;SETUP SCOPE LOOP RETURN ADDRESS
678 001020 104001          TEST1: SCOPE
679 001022 004767 010460          TEST1A: JSR      %7,CKBIT8    ;CHECK FOR OFF-LINE SET
680 001026 016767 176744 177612  MOV      PSR,PROC      ;STORE PROCESSOR STATUS
681 001034 005067 176736          CLR      PSR          ;CLEAR TRACE BIT
682 001040 005001          CLR      COUNT        ;INITIALIZE COUNTER
683 001042 005201          INC      COUNT        ;WAIT TO BE CERTAIN
684 001044 001376          BNE      -2           ;THAT ALL CARDS ARE
685 001046 005201          INC      COUNT        ;THRU BEFORE ISSUING
686 001050 001376          BNE      -2           ;INIT
687 001052 016767 177570 176716  MOV      PROC,PSR      ;RESTORE PROCESSOR STATUS
688 001060 000005          RESET             ;SEND OUT INIT
689 001062 005713          TST      #CRS        ;CHECK FOR STATUS REGISTER ALL ZERO
690 001064 001401          BEQ      .+4         ;BRANCH IF OK
691 001066 104000          HLT              ;STATUS REGISTER NOT CORRECTLY INITIALIZED
692          ;ONLY BITS 1 AND 6 OF THE STATUS REGISTER SHOULD BE ABLE TO BE SET TO ONE
693          ;AND READ BACK AS ONE
694 001070 052713 177776      BIS      #177776,#CRS   ;SET ALL BITS BUT 0
695 001074 022713 000102      CMP      #102,#CRS     ;ONLY BITS 1 AND 6 SHOULD BE SET
696 001100 001402          BEQ      .+6         ;BRANCH IF OK
697 001102 104000          HLT              ;STATUS REGISTER DIDN'T CONTAIN 102
698 001104 000404          BR        TEST2      ;BRANCH AFTER FAILURE
699          ;CLEARING STATUS REGISTER SHOULD CLEAR BITS 1 AND 6
700 001106 005013          CLR      #CRS        ;CLEAR BITS 1 AND 6
701 001110 005713          TST      #CRS        ;CHECK FOR ALL BITS CLEAR
702 001112 001401          BEQ      .+4         ;BRANCH IF OK
703 001114 104000          HLT              ;BIT 1 AND/OR BIT 6 DIDN'T CLEAR
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705 001116 104001          TEST2: SCOPE
706          ;START SHOULD CAUSE CARD DONE WITHIN 1 SECOND
707          ;BIT 0 SHOULD ALWAYS READ AS BEING EQUAL TO ZERO
708 001120 004767 010362      JSR      %7,CKBIT8    ;CHECK FOR OFF-LINE SET
709 001124 016767 176646 177514      MOV      PSR,PROC      ;STORE CURRENT PROCESSOR STATUS

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710 001132 005067 176640          CLR      PSR          ;CLEAR TRACE BIT
711 001136 005213                INC      @CRS         ;START READING A CARD
712 001140 032713 000001          BIT      @1,@CRS     ;CHECK BIT 0
713 001144 001401                BEQ      .+4          ;BRANCH IF NOT SET
714 001146 104000                HLT                     ;BIT 0 READ AS A ONE
715 001150 005227 000000          INC      @0          ;WAIT
716 001154 001375                BNE     .-4
717 001156 005227 000000          INC      @0
718 001162 001375                BNE     .-4
719 001164 005227 000000          INC      @0
720 001170 001375                BNE     .-4
721 001172 005227 000000          INC      @0
722 001176 001375                BNE     .-4
723 001200 005227 000000          INC      @0
724 001204 001375                BNE     .-4
725 001206 016767 177434 176562  MOV     PROC,PSR     ;RESTORE PROCESSOR STATUS
726 001214 032713 040000          BIT      @40000,@CRS ;CHECK CARD DONE
727 001220 001002                BNE     CONT2       ;CONTINUE IF SET
728 001222 104000                HLT                     ;CARD DONE DIDN'T SET WITHIN 400 MS
729 001224 000406                BR      TEST3        ;NOTE THAT FAILURE COULD BE DUE TO READ
730                                     ;NOT BEING RESET
731 001226 052713 040000  CONT2:  BIS     @40000,@CRS ;DATO TO STATUS REGISTER SHOULD CLEAR
732 001232 032713 040000          BIT      @40000,@CRS ;CARD DONE
733 001236 001401                BEQ      .+4          ;BRANCH IF IT DID
734 001240 104000                HLT                     ;DATO DIDN'T CLEAR CARD DONE
735
736 001242 104001                TEST3:  SCOPE
737                                     ;BUSY (BIT 9) SHOULD BE SET BY READING A CARD
738                                     ;IT SHOULD REMAIN SET UNTIL CARD DONE SETS, WHICH SHOULD CLEAR IT
739 001244 004767 010236          JSR     %7,CKBIT8    ;CHECK FOR OFF-LINE SET
740 001250 005013                CLR      @CRS         ;INITIALIZE STATUS REGISTER
741 001252 005213                INC      @CRS         ;READ A CARD
742 001254 032713 001000          BIT      @1000,@CRS ;CHECK BUSY
743 001260 001002                BNE     LOOP3        ;BRANCH IF SET
744 001262 104000                HLT                     ;READING A CARD DIDN'T SET BUSY
745 001264 000417                BR      TEST4
746 001265 032713 040000  LOOP3:  BIT      @40000,@CRS ;CHECK CARD DONE
747 001272 001010                BNE     DONE3        ;BRANCH IF SET
748 001274 032713 001000          BIT      @1000,@CRS ;CHECK BUSY
749 001300 001372                BNE     LOOP3        ;BRANCH IF STILL SET
750 001302 032713 040000          BIT      @40000,@CRS ;CHECK CARD DONE
751 001306 001006                BNE     TEST4        ;GO TO NEXT TEST IF SET
752 001310 104000                HLT                     ;BUSY CLEARED BEFORE CARD DONE SET
753 001312 000404                BR      TEST4
754 001314 032713 001000  DONE3:  BIT      @1000,@CRS ;CHECK BUSY
755 001320 001401                BEQ      TEST4        ;GO ON TO NEXT TEST IF CLEAR
756 001322 104000                HLT                     ;CARD DONE DIDN'T CLEAR BUSY
757
758 001324 104001                TEST4:  SCOPE
759                                     ;A TIMING ERROR SHOULD OCCUR IF DATA IS NOT READ AND NEW DATA COMES IN
760                                     ;A TIMING ERROR SHOULD SET THE SPECIAL CONDITION BIT WHEN CARD DONE OCCURS
761                                     ;COLUMN READY SHOULD BE CLEARED BY THE TIMING ERROR AND PREVENTED FROM RESETTING
762                                     ;BITS 11, 14, AND 15 SHOULD BE CLEARED BY A DATO TO THE STATUS REGISTER
763 001326 004767 010102          JSR     %7,INIT      ;INITIALIZE STATUS REGISTER
764 001332 005001                CLR      COUNT        ;INITIALIZE COUNTER
765 001334 005213                INC      @CRS         ;INITIATE READ

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766 001336 032713 140200 LOOP4: BIT #140200, @CRS ;WAIT FOR SPECIAL CONDITION, CARD DONE,
767 ;OR COLUMN READY
768 001342 001775 BEQ LOOP4 ;LOOP IF NONE OCCURRED
769 001344 032713 140000 BIT #140000, @CRS ;SPECIAL CONDITION OR CARD DONE?
770 001350 001007 BNE CK4 ;YES, BRANCH
771 001352 005201 INC COUNT ;NO, COUNT COLUMN READYS
772 001354 105713 LOOP4B: TSTB @CRS ;WAIT FOR COLUMN READY TO CLEAR
773 001356 100367 BPL LOOP4 ;IF CLEAR, RETURN TO LOOP4
774 001360 032713 140000 BIT #140000, @CRS ;CHECK FOR SPECIAL CONDITION OR CARD DONE
775 001364 001001 BNE CK4 ;BRANCH IF EITHER SET
776 001366 000772 BR LOOP4B ;OTHERWISE, CHECK AGAIN
777 001370 032713 040000 CK4: BIT #40000, @CRS ;CHECK CARD DONE
778 001374 001002 BNE .+6 ;BRANCH IF SET
779 001376 104000 HLT ;SPECIAL CONDITION SET BEFORE CARD DONE
780 001400 000403 BR CONT4
781 001402 005713 TST @CRS ;CHECK SPECIAL CONDITION
782 001404 100401 BMI .+4 ;BRANCH IF SET
783 001406 104000 HLT ;SPECIAL CONDITION WASN'T SET
784 001410 032713 004000 CONT4: BIT #4000, @CRS ;CHECK TIMING ERROR
785 001414 001001 BNE .+4 ;BRANCH IF SET
786 001416 104000 HLT ;TIMING ERROR WASN'T SET
787 001420 005301 DEC COUNT ;CHECK NUMBER OF COLUMN READYS
788 001422 100002 BPL .+6 ;BRANCH IF ANY OCCURRED
789 001424 104000 HLT ;COLUMN READY NEVER OCCURRED
790 001426 000402 BR .+6
791 001430 001401 BEQ .+4 ;BRANCH IF ONLY ONE OCCURRED
792 001432 104000 HLT ;COLUMN READY OCCURRED MORE THAN ONCE
793 001434 105713 TSTB @CRS ;CHECK COLUMN READY
794 001436 100001 BPL .+4 ;BRANCH IF NOT SET
795 001440 104000 HLT ;COLUMN READY WASN'T CLEARED
796 001442 005013 CLR @CRS ;CLEAR BITS 11,14, AND 15 VIA DATO
797 001444 032713 144000 BIT #144000, @CRS ;CHECK
798 001450 001401 BEQ .+4
799 001452 104000 HLT ;BITS 11,14, AND 15 WEREN'T ALL CLEARED

800
801
802 001454 104001 TESTS: SCOPE
803 ;SETTING READ SHOULD CAUSE COLUMN READY TO SET 80 TIMES BEFORE CARD DONE SETS
804 ;READING THE DATA BUFFER SHOULD CLEAR COLUMN READY AND PREVENT A TIMING ERROR
805 001456 004767 007752 JSR %7, INIT ;INITIALIZE STATUS REGISTER
806 001462 005001 CLR COUNT ;INITIALIZE COUNTER
807 001464 005213 INC @CRS ;INITIATE READ
808 001466 032713 140200 LOOP5: BIT #140200, @CRS ;WAIT FOR COLUMN READY, CARD DONE
809 001472 001775 BEQ .-4 ;OR SPECIAL CONDITION
810 001474 032713 040000 BIT #40000, @CRS ;CARD DONE?
811 001500 001015 BNE CK5 ;YES, BRANCH
812 001502 005713 TST @CRS ;CHECK BIT 15
813 001504 100002 BPL .+6 ;SKIP ERROR HALT IF NOT SET
814 001506 104000 HLT ;BIT 15 WAS SET
815 001510 000437 BR TEST6 ;GO TO NEXT TEST
816 001512 020127 000117 CMP COUNT, #79. ;CHECK FOR 80
817 001516 100363 BPL LOOP5 ;BRANCH IF 80 OR MORE WITHOUT CLEARING READY
818 001520 005201 INC COUNT ;INCREMENT COUNTER
819 001522 005714 TST @CRB1 ;CLEAR READY
820 001524 105713 TSTB @CRS ;MAKE SURE IT CLEARED
821 001526 100001 BPL .+4 ;BRANCH IF IT DID

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822	001530	104000		HLT			:READING DATA BUFFER DIDN'T CLEAR READY
823	001532	000755		BR	LOOP5		:LOOP
824	001534	032713	004000	BIT	#4000, 2CRS		:CHECK TIMING ERROR BIT
825	001540	001401		BEQ	.+4		:BRANCH IF NOT SET
826	001542	104000		HLT			:TIMING ERROR WAS SET
827							:NOTE THAT IF COLUMN READY SET MORE THAN 80 TIMES
828							:A TIMING ERROR WILL OCCUR AND THE COUNT WILL BE 79 (=117 OCTAL)
829	001544	000421		BR	TEST6		:BRANCH AFTER ERROR
830	001546	020127	000117	CMP	COUNT, #79.		:CHECK COUNT
831	001552	001401		BEQ	.+4		:BRANCH IF 80 COLUMN READYS OCCURRED
832	001554	104000		HLT			:COLUMN READY DIDN'T OCCUR 80 TIMES
833							:BEFORE CARD DONE
834	001556	021327	040200	CMP	2CRS, #40200		:ONLY CARD DONE AND COLUMN READY SHOULD BE SET
835	001562	001401		BEQ	.+4		
836	001564	104000		HLT			:STATUS REGISTER IN WRONG STATE
837	001566	005013		CLR	2CRS		:SHOULD CLEAR DONE BUT NOT READY
838	001570	021327	000200	CMP	2CRS, #200		:CHECK FOR ONLY READY SET
839	001574	001401		BEQ	.+4		:BRANCH IF OK
840	001576	104000		HLT			:STATUS REGISTER IN WRONG STATE
841	001600	005714		TST	2CRB1		:READING DATA BUFFER SHOULD CLEAR COLUMN READY
842	001602	005713		TST	2CRS		:CHECK STATUS REGISTER
843	001604	001401		BEQ	.+4		:BRANCH IF ALL BITS ZERO
844	001606	104000		HLT			:STATUS REGISTER NOT EQUAL TO ZERO
845							
846	001610	104001					
847				TEST6:	SCOPE		
848							:A TIMING ERROR SHOULD SET BIT 11 BEFORE CARD DONE OCCURS, EVEN IF IT OCCURS AT COLUMN 8
849	001612	004767	007616				:A DATOB TO THE LOW BYTE OF THE CRS SHOULD CLEAR BITS 15,14, AND 11
850	001616	012701	000115	JSR	%7, INIT		:INITIALIZE
851	001622	005213		MOV	#77, COUNT		:SETUP COUNTER
852	001624	105713		INC	2CRS		:START READING A CARD
853	001626	100376		LOOP6:	TSTB 2CRS		:WAIT FOR COLUMN READY
854	001630	005714		BPL	.-2		
855	001632	005301		TST	2CRB1		:CLEAR COLUMN READY
856	001634	100373		DEC	COUNT		:GO THRU LOOP FOR 1ST 78 COLUMN READY'S
857	001636	032713	144000	BPL	LOOP6		
858	001642	001775		BIT	#144000, 2CRS		:WAIT FOR CARD DONE OR TIMING ERROR
859	001644	032713	040000	BEQ	.-4		:OR SPECIAL CONDITION
860	001650	001026		BIT	#40000, 2CRS		:CARD DONE SET?
861	001652	032713	004000	BNE	ERR6		:YES, 2 POSSIBLE TEST FAILURES
862	001656	001416		BIT	#4000, 2CRS		:CHECK TIMING ERROR
863	001660	105713		BEQ	OFF6		:IF NOT SET, READER IS PROBABLY OFF-LINE
864	001662	100001		TSTB	2CRS		:CHECK COLUMN READY
865	001664	104000		BPL	.+4		:BRANCH IF CLEAR
866	001666	005713		HLT			:TIMING ERROR DIDN'T CLEAR READY
867	001670	100376		TST	2CRS		:WAIT FOR SPECIAL CONDITION
868	001672	032713	040000	BPL	.-2		
869	001676	001406		BIT	#40000, 2CRS		:CHECK CARD DONE
870	001700	105013		BEQ	OFF6		:IF NOT SET, READER IS PROBABLY OFF-LINE
871	001702	032713	144000	CLRB	2CRS		:DATOB TO LOW BYTE OF CRS
872	001706	001415		BIT	#144000, 2CRS		:CHECK BITS 15,14,11
873	001710	104000		BEQ	TEST7		:BRANCH IF CLEAR TO NEXT TEST
874				HLT			:DATOB TO LOW BYTE OF CRS DIDN'T CLEAR
875	001712	000413					:BITS 15,14 AND/OR 11
876	001714	032713	000400	BR	TEST7		:GO TO NEXT TEST
877	001720	001010		OFF6:	BIT #400, 2CRS		:CHECK BIT 8
					BNE TEST7		:BRANCH IF SET

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878 001722 104000          HLT          ;BIT 15 WAS SET, B WASN'T
879 001724 000406          BR          ;GO TO NEXT TEST
880 001726 032713 004000  ERR6:  BIT      #4000, @CRS ;TIMING ERROR SET?
881 001732 001402          BEQ      .+6 ;NO, BRANCH
882 001734 104000          HLT          ;TIMING ERROR DIDN'T SET BEFORE CARD DONE
883 001736 000401          BR          ;GO TO NEXT TEST AFTER ERROR
884 001740 104000          HLT          ;TIMING ERROR WASN'T SET
885
886 001742 104001          TEST7: SCOPE
887                                     ;NOT READING THE EIGHTIETH COLUMN OF DATA FROM THE BUFFER
888                                     ;SHOULD CAUSE A TIMING ERROR ON THE FIRST COLUMN OF THE NEXT CARD
889                                     ;SETTING EJECT SHOULD CLEAR TIMING ERROR, AND BIT 15 SHOULDN'T SET
890                                     ;INCB SHOULD START A READ
891
892 001744 004767 007464          JSR      %7, INIT ;INITIALIZE
893 001750 005213          INC      @CRS ;START READ
894 001752 012701 000120          MOV      #80, COUNT ;INITIALIZE COUNTER
895 001756 032713 140200  LOOP7: BIT      #140200, @CRS ;TEST FOR ERROR, DONE OR READY
896 001762 001775          BEQ      LOOP7 ;LOOP IF NONE SET
897 001764 005713          TST      @CRS ;CHECK ERROR
898 001766 100002          BPL      .+6 ;BRANCH IF NOT SET
899 001770 104000          HLT          ;BIT 15 WAS SET
900 001772 000455          BR          ;GO TO NEXT TEST AFTER ERROR
901 001774 032713 040000          BIT      #40000, @CRS ;CHECK FOR CARD DONE
902 002000 001013          BNE      DONE7 ;BRANCH IF SET
903 002002 005301          DEC      COUNT ;COUNT
904 002004 001402          BEQ      .+6 ;IF BOTH COLUMN READY, BRANCH
905 002006 005714          TST      @CRB1 ;CLEAR DONE
906 002010 000762          BR          LOOP7 ;LOOP
907 002012 032713 140000          BIT      #140000, @CRS ;WAIT FOR DONE OR SPECIAL CONDITION
908 002016 001775          BEQ      -4
909 002020 005713          TST      @CRS ;CHECK SPECIAL CONDITION
910 002022 100002          BPL      DONE7 ;BRANCH IF NOT SET
911 002024 104000          HLT          ;SPECIAL CONDITION WAS SET
912 002026 000437          BR          ;GO TO NEXT TEST AFTER ERROR
913 002030 005701          TST      COUNT ;TEST FOR 80 COLUMN READY'S
914 002032 001402          BEQ      .+6 ;BRANCH IF OK
915 002034 104000          HLT          ;COLUMN READY DID NOT OCCUR 80 TIMES
916 002036 000433          BR          ;GO TO NEXT TEST AFTER ERROR
917 002040 105213          INCB     @CRS ;START READ
918 002042 105713          TSTB     @CRS ;CHECK COLUMN READY
919 002044 100401          BMI      .+4 ;BRANCH IF STILL SET
920 002046 104000          HLT          ;READY DID NOT REMAIN SET
921 002050 032713 004000          BIT      #4000, @CRS ;TEST FOR TIMING ERROR
922 002054 001775          BEQ      -4 ;LOOP IF NOT SET
923 002056 105713          TST?     @CRS ;CHECK COLUMN READY
924 002060 100002          BPL      .+6 ;BRANCH IF NOT SET
925 002062 104000          HLT          ;TIMING ERROR DIDN'T CLEAR READY
926 002064 000420          BR          ;TIMING ERROR DIDN'T CLEAR READY
927 002066 112713 000002          MOVB     #2, @CRS ;SET EJECT
928 002072 032713 004000          BIT      #4000, @CRS ;CHECK TIMING ERROR
929 002076 001402          BEQ      .+6 ;BRANCH IF CLEARED
930 002100 104000          HLT          ;TIMING ERROR NOT CLEARED BY DATOB
931 002102 000411          BR          ;GO TO NEXT TEST AFTER ERROR
932 002104 032713 140000          BIT      #140000, @CRS ;WAIT FOR DONE OR SPECIAL CONDITION
933 002110 001775          BEQ      -4

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934 002112 032713 000400 BIT #400, @CRS ;CHECK BIT 8
935 002116 001003 BNE TEST8 ;BRANCH IF READER OFF-LINE
936 002120 005713 TST @CRS ;SPECIAL CONDITION SHOULDN'T SET
937 002122 100001 BPL .+4 ;SINCE DATOB CLEARED TIMING ERROR
938 002124 104000 HLT ;BIT 15 WAS SET, 8 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 004767 007300 JSR %7, INIT ;INITIALIZE STATUS REGISTER
944 002134 016767 175636 176504 MOV PSR, PROC ;STORE CURRENT PROCESSOR STATUS
945 002142 005067 175630 CLR PSR ;CLEAR TRACE BIT
946 002146 005213 INC @CRS ;START READ
947 002150 032713 140200 LOOP8: BIT #140200, @CRS ;WAIT FOR COLUMN READY OR CARD DONE
948 002154 001775 BEQ .-4 ;OR SPECIAL CONDITION
949 002156 032713 040000 BIT #40000, @CRS ;CARD DONE?
950 002162 001023 BNE DBRCK8 ;YES, GO TO CHECK STROBING OF DBR
951 002164 005713 TST @CRS ;NO, CHECK BIT 15
952 002166 100002 BPL .+6 ;BRANCH IF NOT SET
953 002170 104000 HLT ;BIT 15 WAS SET
954 002172 000441 BR TEST9 ;GO TO NEXT TEST AFTER ERROR
955 002174 005013 CLR @CRS ;DATO TO CRS - SHOULDN'T CLEAR BUSY OR READY
956 002176 022713 001200 CMP #1200, @CRS ;CHECK FOR BUSY AND READY
957 002202 001402 BEQ .+6 ;BRANCH IF STILL SET
958 002204 104000 HLT ;CRS IN WRONG STATE
959 002206 000433 BR TEST9 ;GO TO NEXT TEST AFTER ERROR
960 002210 011405 MOV @CRB1, R5 ;STORE DATA
961 002212 012701 000300 MOV #300, COUNT ;INITIALIZE COUNTER
962 002216 005301 DEC COUNT ;WAIT FOR 1 MILLISECOND (APPROX.)
963 002220 001376 BNE .-2
964 002222 021405 CMP @CRB1, R5 ;DATA UNCHANGED?
965 002224 001751 BEQ LOOP8 ;OK, CONTINUE
966 002226 104000 HLT ;DATA NOT AVAILABLE FOR 1.0 MILLISECONDS
967 002230 000422 BR TEST9 ;GO TO NEXT TEST AFTER FAILURE
968 002232 017702 176402 DBRCK8: MOV @CRB2, R2 ;STORE ENCODED DATA IN REGISTER 2
969 002236 012701 000100 MOV #100, COUNT ;SET UP COUNTER
970 002242 021405 CONT8: CMP @CRB1, R5 ;READ CARD-IMAGE DATA BUFFER
971 002244 001402 BEQ .+6 ;BRANCH IF UNCHANGED
972 002246 104000 HLT ;CRB1 READ INCORRECTLY
973 002250 000407 BR REST8 ;BRANCH TO RESTORE PROCESSOR STATUS AND EXIT
974 002252 027702 176362 CMP @CRB2, R2 ;READ ENCODED DATA BUFFER
975 002256 001402 BEQ .+6 ;BRANCH IF UNCHANGED
976 002260 104000 HLT ;CRB2 READ INCORRECTLY
977 002262 000402 BR REST8 ;BRANCH AFTER FAILURE
978 002264 005301 DEC COUNT ;COUNT DOWN
979 002266 001365 BNE CONT8 ;LOOP IF NOT DONE
980 002270 016767 176352 175500 REST8: MOV PROC, PSR ;RESTORE PROCESSOR STATUS
981
982
983 002276 104001 TEST9: SCOPE
984 ;EJECT SHOULD PREVENT FURTHER COLUMN READY'S
985 ;CARD DONE SHOULD STILL OCCUR, AND TIMING ERRORS SHOULD BE
986 ;PREVENTED IF THE CURRENT COLUMN READY IS CLEARED
987 002300 004767 007130 JSR %7, INIT ;INITIALIZE STATUS REGISTER
988 002304 016767 175466 176334 MOV PSR, PROC ;SAVE PROCESSOR STATUS
989 002312 005067 175460 CLR PSR ;CLEAR TRACE BIT

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990 002316 005213          INC      @CRS      ;START READ
991 002320 105713          TSTB    @CRS      ;WAIT FOR COLUMN READY
992 002322 001776          BEQ     .-2
993 002324 052713 000002    BIS     @2,@CRS   ;SET EJECT
994 002330 005714          TST     @CRB1    ;CLEAR COLUMN READY
995 002332 005001          CLR     COUNT    ;LOOP TAKES 11.4 MICROSECONDS ONCE THRU
996 002334 032713 044200    WAIT9: BIT    @44200,@CRS ;WAIT FOR CARD DONE, TIMING ERROR, OR
997 002340 001004          BNE     CK9      ;COLUMN READY
998 002342 005201          INC     COUNT    ;TIME FOR ABOUT 3/4 SECOND
999 002344 001373          BNE     WAIT9    ;CONTINUE WAITING
1000 002346 104000         HLT
1001 002350 000411         BR      REST9    ;NO CARD DONE OCCURRED WITHIN 3/4 SECOND
1002 002352 032713 040000    CK9:  BIT    @40000,@CRS ;CONTINUE AFTER FAILURE
1003 002356 001006         BNE     REST9    ;CHECK FOR CARD DONE
1004 002360 032713 000200    BIT    @200,@CRS ;CHECK COLUMN READY
1005 002364 001402         BEQ     .+6      ;BRANCH IF NOT SET
1006 002366 104000         HLT            ;COLUMN READY WAS SET
1007 002370 000401         BR      REST9
1008 002372 104000         HLT
1009 002374 016767 176246 175374 REST9: MOV     PROC,PSR ;EJECT DID NOT PREVENT A TIMING ERROR
1010                                     ;RESTORE PROCESSOR STATUS
1011
1012 002402 104001         TEST10: SCOPE
1013                                     ;CARD DONE SHOULD CAUSE AN INTERRUPT
1014 002404 004767 007024    JSR     %7,INIT  ;INITIALIZE
1015 002410 012710 002464    MOV     #TINT10,@ADINT ;LOAD RETURN POINTER
1016 002414 052767 000340 175354 BIS     @340,PSR  ;SET PROCESSOR TO LEVEL 7
1017 002422 016760 175350 000002 MOV     PSR,2(ADINT) ;LOAD RETURN PROCESSOR STATUS
1018 002430 042767 000340 175340 BIC     @340,PSR  ;SET PROCESSOR PRIORITY TO 0
1019 002436 012713 000103    MOV     @103,@CRS ;SET EJECT, INTERRUPT ENABLE, AND READ
1020 002442 032713 040000    BIT    @40000,@CRS ;WAIT FOR CARD DONE
1021 002445 001775         BEQ     .-4
1022 002450 016067 000002 175320 MOV     2(ADINT),PSR ;RESTORE PROCESSOR TO HIGHEST PRIORITY
1023 002456 105013         CLRB   @CRS     ;CLEAR INTERRUPT ENABLE
1024 002460 104000         HLT            ;NO INTERRUPT OCCURRED
1025 002462 000411         BR      CONT10
1026 002464 032713 040000    TINT10: BIT    @40000,@CRS ;CHECK CARD DONE
1027 002470 001001         BNE     .+4      ;BRANCH IF SET
1028 002472 104000         HLT            ;CARD DONE NOT SET
1029 002474 022626         CMP     (SP)+,(SP)+ ;RESTORE STACK POINTER
1030 002476 005713         TST     @CRS    ;MAKE SURE NO ERROR OCCURRED
1031 002500 100001         BPL     .+4
1032 002502 104000         HLT
1033 002504 105713         TSTB   @CRS     ;BIT 15 WAS SET
1034 002506 100001         BPL     .+4      ;CHECK COLUMN READY
1035 002510 104000         HLT            ;BRANCH IF NOT SET
1036 002512 005013         CLR     @CRS    ;COLUMN READY WAS SET
1037 002514 012710 000232    CONT10: MOV    @232,@ADINT ;DISABLE INTERRUPTS
1038 002520 005037 000232    CLR     @#232   ;CHANGE INTERRUPT RETURN ADDRESS
1039                                     ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1040 002524 104001         TEST11: SCOPE
1041                                     ;COLUMN READY SHOULD CAUSE AN INTERRUPT
1042 002526 004767 006702    JSR     %7,INIT  ;INITIALIZE
1043 002532 012710 002604    MOV     #TINT11,@ADINT ;LOAD RETURN POINTER
1044 002536 052767 000340 175232 BIS     @340,PSR  ;SET PROCESSOR STATUS TO LEVEL 7
1045 002544 016760 175226 000002 MOV     PSR,2(ADINT) ;LOAD RETURN PROCESSOR STATUS

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1046 002552 042767 000340 175216      BIC      #340,PSR      ;SET PROCESSOR PRIORITY TO 0
1047 002560 012713 000101      MOV      #101,ACRS   ;SET READ AND INTERRUPT ENABLE
1048 002564 105713      TSTB    ACRS        ;WAIT FOR COLUMN READY
1049 002566 100376      BPL     .-2
1050 002570 016067 000002 175200      MOV      2(ADINT),PSR ;RESTORE PROCESSOR TO HIGHEST PRIORITY
1051 002576 005013      CLR     ACRS        ;CLEAR INTERRUPT ENABLE
1052 002600 104000      HLT     ;COLUMN READY DID NOT INTERRUPT
1053 002602 000405      BR     CONT11
1054 002604 005013      TINT11: CLR    ACRS      ;CLEAR INTERRUPT ENABLE
1055 002606 105713      TSTB    ACRS        ;MAKE SURE COLUMN READY IS SET
1056 002610 100401      BMI     .+4         ;BRANCH IF SET
1057 002612 104000      HLT     ;COLUMN READY WASN'T SET
1058 002614 022626      CMP     (SP)+,(SP)+ ;RESTORE STACK POINTER
1059 002616 012710 000232      CONT11: MOV    #232,ADINT ;CHANGE INTERRUPT RETURN ADDRESS
1060 002622 005037 000232      CLR     @#232      ;TO CAUSE A HALT IF ANOTHER INTERRUPT OCCURS
1061
1062 002626 104001      TEST12: SCOPE
1063      ;CARD DONE SHOULDN'T CAUSE AN INTERRUPT IF THE PROCESSOR IS AT LEVEL 7 PRIORITY
1064 002630 004767 006600      JSR     %7,INIT     ;INITIALIZE
1065 002634 012710 002670      MOV     #TINT12,ADINT ;SETUP RETURN
1066 002640 052767 000340 175130      BIS     #340,PSR    ;SET PROCESSOR TO LEVEL 7 PRIORITY
1067 002646 016760 175124 000002      MOV     PSR,2(ADINT) ;LOAD RETURN PROCESSOR STATUS
1068 002654 012713 000103      MOV     #103,ACRS   ;SET EJECT, INTERRUPT ENABLE, AND READ
1069 002660 032713 040000      BIT     #40000,ACRS ;WAIT FOR CARD DONE
1070 002664 001775      BEQ     .-4
1071 002666 000402      BR     .+6         ;CONTINUE IF NO INTERRUPT OCCURRED
1072 002670 104000      TINT12: HLT     ;AN INTERRUPT OCCURRED
1073 002672 022626      CMP     (SP)+,(SP)+ ;RESTORE STACK POINTER
1074 002674 005013      CLR     ACRS        ;CLEAR INTERRUPT ENABLE AND EJECT
1075 002676 012710 000232      MOV     #232,ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1076 002702 005037 000232      CLR     @#232      ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1077
1078      ;FIND THE LEVEL AT WHICH AN INTERRUPT OCCURS
1079      ;PRINT OUT A MESSAGE STATING THIS LEVEL IF IT IS OTHER THAN THE STANDARD (LEVEL 6)
1080      ;MAKE CERTAIN THAT IT ALWAYS OCCURS AT THIS LEVEL
1081      ;THE MESSAGE STATING THE LEVEL IS PRINTED ONLY ONCE, AND THE PROGRAM MUST
1082      ;BE STARTED OVER AT LOCATION 200 FOR IT TO BE PRINTED AGAIN
1083
1084
1085      ;TEST FOR AN INTERRUPT ON LEVEL 7
1086      TEST13: SCOPE
1087 002706 104001      JSR     %7,INIT     ;INITIALIZE
1088 002710 004767 006520      MOV     #TINT13,ADINT ;SETUP RETURN ADDRESS
1089 002714 012710 003024      BIS     #340,PSR    ;SET PROCESSOR PRIORITY TO 7
1090 002720 052767 000340 175050      MOV     PSR,2(ADINT) ;SETUP RETURN PROCESSOR STATUS
1091 002726 016760 175044 000002      MOV     PSR,2(ADINT) ;SETUP RETURN PROCESSOR STATUS
1092 002734 042767 000340 175034      BIC     #340,PSR    ;SET PROCESSOR PRIORITY TO 0
1093 002742 052767 000300 175026      BIS     #300,PSR    ;SET PROCESSOR TO LEVEL 6 PRIORITY
1094 002750 012713 000103      MOV     #103,ACRS   ;SET EJECT INTERRUPT ENABLE, AND READ
1095 002754 032713 040000      BIT     #40000,ACRS ;WAIT FOR CARD DONE
1096 002760 001775      BEQ     .-4
1097 002762 016067 000002 175006      MOV     2(ADINT),PSR ;RESTORE PROCESSOR TO HIGHEST PRIORITY
1098 002770 005013      CLR     ACRS        ;DISABLE INTERRUPTS
1099 002772 012710 000232      MOV     #232,ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1100 002776 005037 000232      CLR     @#232      ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1101 003002 005767 175574      TST     INTFLG     ;CHECK TO SEE IF LEVEL ALREADY RECORDED
1102 003006 100044      BPL     TEST14     ;IF NO, GO TO NEXT TEST

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1102 003010 026727 175566 100007      CMP      INTFLG,#100007 ;IF SO, CHECK TO SEE
1103 003016 100440                    BMI      TEST14       ;THAT THE INTERRUPT LEVEL RECORDED
1104                                ;IS BELOW THE CURRENT LEVEL
1105 003020 104000                    HLT                               ;INTERRUPT DIDN'T OCCUR WITH STATUS
1106                                ;AT LEVEL 7, BUT PREVIOUSLY OCCURRED
1107                                ;AT OR ABOVE THIS LEVEL
1108 003022 000436                    BR       TEST14
1109 003024 032713 040000      TINT13: BIT      #40000,ACRS ;MAKE SURE CARD DONE IS SET
1110 003030 001001                    BNE     .+4           ;BRANCH IF SET
1111 003032 104000                    HLT                               ;CARD DONE WASN'T SET
1112 003034 005013                    CLR     ACRS          ;DISABLE FURTHER INTERRUPTS
1113 003036 012710 000232      MOV     #232,ADINT   ;CHANGE INTERRUPT RETURN ADDRESS
1114 003042 005037 000232      CLR     @#232       ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1115 003046 022626                    CMP     (SP)+,(SP)+  ;RESTORE STACK POINTER
1116 003050 005767 175526      TST     INTFLG      ;CHECK FOR PREVIOUS FLAG
1117 003054 100414                    BMI     SET7         ;BRANCH IF FLAG SET
1118 003056 012767 100007 175516  MOV     #100007,INTFLG ;SET FLAG AND LEVEL
1119 003064 012702 014503      MOV     #MSG4,R2    ;SETUP FOR PRINTOUT
1120 003070 004767 007056      JSR     %7,TOUT     ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1121 003074 012702 000007      MOV     #7,R2
1122 003100 004767 006630      JSR     %7,PROCT   ;PRINT LEVEL NUMBER
1123 003104 000405                    BR       TEST14
1124 003106 026727 175470 100007  SET7:  CMP     INTFLG,#100007 ;CHECK PREVIOUS LEVEL
1125 003114 100001                    BPL
1126 003116 104000                    HLT                               ;INTERRUPT PREVIOUSLY OCCURRED ONLY AT A LOWER LEVEL
1127
1128                                ;TEST FOR AN INTERRUPT ON LEVEL 6
1129                                ;SINCE THIS IS WHERE THE CARD READER NORMALLY IS, DON'T PRINT OUT A MESSAGE
1130                                ;IF IT IS FOUND HERE
1131 003120 104001                    TEST14: SCOPE
1132 003122 004767 006306      JSR     %7,INIT    ;INITIALIZE
1133 003126 012710 003216      MOV     #TINT14,ADINT ;SETUP RETURN ADDRESS
1134 003132 052767 000340 174636  BIS     #340,PSR    ;SET PROCESSOR PRIORITY TO 7
1135 003140 016760 174632 000002  MOV     PSR,2(ADINT) ;SETUP RETURN PROCESSOR STATUS
1136 003146 042767 000340 174622  BIC     #340,PSR    ;SET PROCESSOR PRIORITY TO 0
1137 003154 052767 000240 174614  BIS     #240,PSR    ;SET PROCESSOR TO LEVEL 5 PRIORITY
1138 003162 012713 000103      MOV     #103,ACRS  ;SET EJECT, INTERRUPT ENABLE, AND READ
1139 003166 032713 040000      BIT     #40000,ACRS ;WAIT FOR CARD DONE
1140 003172 001775                    BEQ     .-4
1141 003174 016067 000002 174574  MOV     2(ADINT),PSR ;RESTORE PROCESSOR TO HIGHEST PRIORITY
1142 003202 005013                    CLR     ACRS          ;DISABLE INTERRUPTS
1143 003204 012710 000232      MOV     #232,ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1144 003210 005037 000232      CLR     @#232       ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1145 003214 000426                    BR       TEST15
1146 003216 032713 040000      TINT14: BIT      #40000,ACRS ;MAKE SURE CARD DONE IS SET
1147 003222 001001                    BNE     .+4           ;BRANCH IF SET
1148 003224 104000                    HLT                               ;CARD DONE WASN'T SET
1149 003226 005013                    CLR     ACRS          ;DISABLE FURTHER INTERRUPTS
1150 003230 012710 000232      MOV     #232,ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1151 003234 005037 000232      CLR     @#232       ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1152 003240 022626                    CMP     (SP)+,(SP)+  ;RESTORE STACK POINTER
1153 003242 005767 175334      TST     INTFLG      ;CHECK FOR PREVIOUS FLAG
1154 003246 100404                    BMI     SET14        ;BRANCH IF FLAG SET
1155 003250 012767 100006 175324  MOV     #100006,INTFLG ;SET FLAG AND LEVEL
1156 003256 000405                    BR       TEST15
1157 003260 026727 175316 100006  SET14:  CMP     INTFLG,#100006 ;CHECK PREVIOUS LEVEL

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1158 003266 100001      BPL      TEST15
1159 003270 104000      HLT                      ;INTERRUPT PREVIOUSLY OCCURRED ONLY AT A LOWER LEVEL
1160
1161      :TEST FOR AN INTERRUPT ON LEVEL 5
1162 003272 104001      TEST15: SCOPE
1163 003274 004767 006134      JSR      %7,INIT          ;INITIALIZE
1164 003300 012710 003410      MOV      #TINT15,ADINT    ;SETUP RETURN ADDRESS
1165 003304 052767 000340 174464      BIS      #340,PSR         ;SET PROCESSOR PRIORITY TO 7
1166 003312 016760 174460 000002      MOV      PSR,2(ADINT)     ;SETUP RETURN PROCESSOR STATUS
1167 003320 042767 000340 174450      BIC      #340,PSR         ;SET PROCESSOR PRIORITY TO 0
1168 003326 052767 000200 174442      BIS      #200,PSR         ;SET PROCESSOR TO LEVEL 4 PRIORITY
1169 003334 012713 000103      MCV      #103,ACRS        ;SET EJECT INTERRUPT ENABLE, AND READ
1170 003340 032713 040000      BIT      #40000,ACRS      ;WAIT FOR CARD DONE
1171 003344 001775      BEQ      -4
1172 003346 016067 000002 174422      MOV      2(ADINT),PSR     ;RESTORE PROCESSOR TO HIGHEST PRIORITY
1173 003354 005013      CLR      ACRS             ;DISABLE INTERRUPTS
1174 003356 012710 000232      MOV      #232,ADINT       ;CHANGE INTERRUPT RETURN ADDRESS
1175 003362 005037 000232      CLR      A#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1176 003366 005767 175210      TST      INTFLG          ;CHECK TO SEE IF LEVEL ALREADY RECORDED
1177 003372 100044      BPL      TEST16          ;IF NO, GO TO NEXT TEST
1178 003374 026727 175202 100005      CMP      INTFLG,#100005   ;IF SO, CHECK TO SEE
1179 003402 100440      BMI      TEST16          ;THAT THE INTERRUPT LEVEL RECORDED
1180                                ;IS BELOW THE CURRENT LEVEL
1181 003404 104000      HLT                      ;INTERRUPT DIDN'T OCCUR WITH STATUS
1182                                ;AT LEVEL 5, BUT PREVIOUSLY OCCURRED
1183                                ;AT OR ABOVE THIS LEVEL
1184 003406 000436      BR      TEST16
1185 003410 032713 040000      TINT15: BIT      #40000,ACRS ;MAKE SURE CARD DONE IS SET
1186 003414 001001      BNE      .+4             ;BRANCH IF SET
1187 003416 104000      HLT                      ;CARD DONE WASN'T SET
1188 003420 005013      CLR      ACRS            ;DISABLE FURTHER INTERRUPTS
1189 003422 012710 000232      MOV      #232,ADINT       ;CHANGE INTERRUPT RETURN ADDRESS
1190 003426 005037 000232      CLR      A#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1191 003432 022626      CMP      (SP)+,(SP)+     ;RESTORE STACK POINTER
1192 003434 005767 175142      TST      INTFLG          ;CHECK FOR PREVIOUS FLAG
1193 003440 100414      BMI      SET5            ;IF FLAG SET
1194 003442 012767 100005 175132      MOV      #100005,INTFLG  ;SET FLAG AND LEVEL
1195 003450 012702 014503      MOV      #MSG4,R2        ;SETUP FOR PRINTOUT
1196 003454 004767 006472      JSR      %7,TOUT         ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1197 003460 012702 000005      MOV      #5,R2
1198 003464 004767 006244      JSR      %7,PF,OUT       ;PRINT LEVEL NUMBER
1199 003470 000405      BR      TEST16
1200 003472 026727 175104 100005      SET5: CMP      INTFLG,#100005 ;CHECK PREVIOUS LEVEL
1201 003500 100001      BPL      TEST16
1202 003502 104000      HLT                      ;INTERRUPT PREVIOUSLY OCCURRED ONLY AT A LOWER LEVEL
1203
1204      :TEST FOR AN INTERRUPT ON LEVEL 4
1205 003504 104001      TEST16: SCOPE
1206 003506 004767 005722      JSR      %7,INIT          ;INITIALIZE
1207 003512 012710 003622      MOV      #TINT16,ADINT    ;SETUP RETURN ADDRESS
1208 003516 052767 000340 174252      BIS      #340,PSR         ;SET PROCESSOR PRIORITY TO 7
1209 003524 016760 174246 000002      MOV      PSR,2(ADINT)     ;SETUP RETURN PROCESSOR STATUS
1210 003532 042767 000340 174236      BIC      #340,PSR         ;SET PROCESSOR PRIORITY TO 0
1211 003540 052767 000140 174230      BIS      #140,PSR         ;SET PROCESSOR TO LEVEL 3 PRIORITY
1212 003546 012713 000103      MOV      #103,ACRS        ;SET EJECT INTERRUPT ENABLE, AND READ
1213 003552 032713 040000      BIT      #40000,ACRS      ;WAIT FOR CARD DONE

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1214 003556 001775      BEQ      .-4
1215 003560 016067 000002 174210  MOV     2(ADINT),PSR ;RESTORE PROCESSOR TO HIGHEST PRIORITY
1216 003566 005013      CLR     @CRS ;DISABLE INTERRUPTS
1217 003570 012710 000232  MOV     @232,@ADINT ;CHANGE INTERRUPT RETURN ADDRESS
1218 003574 005037 000232  CLR     @232 ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1219 003580 005767 174776  TST     INTFLG ;CHECK TO SEE IF LEVEL ALREADY RECORDED
1220 003604 100044      BPL     TEST17 ;IF NO, GO TO NEXT TEST
1221 003606 026727 174770 100004  CMP     INTFLG,#100004 ;IF SO, CHECK TO SEE
1222 003614 100440      BMI     TEST17 ;THAT THE INTERRUPT LEVEL RECORDED
1223 ;IS BELOW THE CURRENT LEVEL
1224 003616 104000      HLT     ;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  @40000,@CRS ;MAKE SURE CARD DONE IS SET
1229 003626 001001      BNE     .+4 ;BRANCH IF SET
1230 003630 104000      HLT     ;CARD DONE WASN'T SET
1231 003632 005013      CLR     @CRS ;DISABLE FURTHER INTERRUPTS
1232 003634 012710 000232  MOV     @232,@ADINT ;CHANGE INTERRUPT RETURN ADDRESS
1233 003640 005037 000232  CLR     @232 ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1234 003644 022626      CMP     (SP)+,(SP)+ ;RESTORE STACK POINTER
1235 003646 005767 174730  TST     INTFLG ;CHECK FOR PREVIOUS FLAG
1236 003652 100414      BMI     SET4 ;BRANCH IF FLAG SET
1237 003654 012767 100004 174720  MOV     #100004,INTFLG ;SET FLAG AND LEVEL
1238 003662 012702 014503  MOV     #MSG4,R2 ;SETUP FOR PRINTOUT
1239 003666 004767 006260  JSR     %7,TOUT ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1240 003672 012702 000004  MOV     #4,R2
1241 003676 004767 006032  JSR     %7,PROCT ;PRINT LEVEL NUMBER
1242 003702 000405      BR      TEST17
1243 003704 026727 174672 100004  SET4: CMP INTFLG,#100004 ;CHECK PREVIOUS LEVEL
1244 003712 100001      BPL     TEST17
1245 003714 104000      HLT     ;INTERRUPT PREVIOUSLY OCCURRED ONLY AT A LOWER LEVEL
1246
1247 ;TEST FOR AN INTERRUPT ON LEVEL 3
1248 003716 104001  TEST17: SCOPE
1249 003720 004767 005510  JSR     %7,INIT ;INITIALIZE
1250 003724 012710 004034  MOV     #TINT17,@ADINT ;SETUP RETURN ADDRESS
1251 003730 052767 000340 174040  BIS     #340,PSR ;SET PROCESSOR PRIORITY TO 7
1252 003736 016760 174034 000002  MOV     PSR,2(ADINT) ;SETUP RETURN PROCESSOR STATUS
1253 003744 042767 000340 174024  BIC     #340,PSR ;SET PROCESSOR PRIORITY TO 0
1254 003752 052767 000100 174016  BIS     #100,PSR ;SET PROCESSOR TO LEVEL 2 PRIORITY
1255 003760 012713 000103  MOV     #103,@CRS ;SET EJECT INTERRUPT ENABLE, AND READ
1256 003764 032713 040000  BIT     #40000,@CRS ;WAIT FOR CARD DONE
1257 003770 001775      BEQ     .-4
1258 003772 016067 000002 173776  MOV     2(ADINT),PSR ;RESTORE PROCESSOR TO HIGHEST PRIORITY
1259 004000 005013      CLR     @CRS ;DISABLE INTERRUPTS
1260 004002 012710 000232  MOV     @232,@ADINT ;CHANGE INTERRUPT RETURN ADDRESS
1261 004006 005037 000232  CLR     @232 ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1262 004012 005767 174564  TST     INTFLG ;CHECK TO SEE IF LEVEL ALREADY RECORDED
1263 004016 100044      BPL     TEST18 ;IF NO, GO TO NEXT TEST
1264 004020 026727 174556 100003  CMP     INTFLG,#100003 ;IF SO, CHECK TO SEE
1265 004026 100440      BMI     TEST18 ;THAT THE INTERRUPT LEVEL RECORDED
1266 ;IS BELOW THE CURRENT LEVEL
1267 004030 104000      HLT     ;INTERRUPT DIDN'T OCCUR WITH STATUS
1268 ;AT LEVEL 3, BUT PREVIOUSLY OCCURRED
1269 ;AT OR ABOVE THIS LEVEL

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1270 004032 000436
1271 004034 032713 040000 TINT17: BR TEST18
1272 004040 001001 BIT #40000,ACRS ;MAKE SURE CARD DONE IS SET
1273 004042 104000 BNE .+4 ;BRANCH IF SET
1274 004044 005013 HLT ;CARD DONE WASN'T SET
1275 004046 012710 000232 CLR ACRS ;DISABLE FURTHER INTERRUPTS
1276 004052 005037 000232 MOV #232,ADINT ;CHANGE INTERRUPT RETURN ADDRESS
1277 004056 022626 CMP #232 ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1278 004060 005767 174516 (SP)+,(SP)+ ;RESTORE STACK POINTER
1279 004064 100414 TST INTFLG ;CHECK FOR PREVIOUS FLAG
1280 004066 012767 100003 174506 BMI SET3 ;BRANCH IF FLAG SET
1281 004074 012702 014503 MOV #100003,INTFLG ;SET FLAG AND LEVEL
1282 004100 004767 006046 MOV #MSG4,R2 ;SETUP FOR PRINTOUT
1283 004104 012702 000003 JSR %7,TOUT ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1284 004110 004767 005620 MOV #3,R2
1285 004114 000405 JSR %7,PROCT ;PRINT LEVEL NUMBER
1286 004116 026727 174460 100003 SET3: CMP TEST18
1287 004124 100001 BPL INTFLG,#100003 ;CHECK PREVIOUS LEVEL
1288 004126 104000 HLT TEST18 ;INTERRUPT PREVIOUSLY OCCURRED ONLY AT A LOWER LEVEL
1289
1290 ;TEST FOR AN INTERRUPT ON LEVEL 2
1291 004130 104001 TEST18: SCOPE
1292 004132 004767 005276 JSR %7,INIT ;INITIALIZE
1293 004136 012710 004246 MOV #TINT18,ADINT ;SETUP RETURN ADDRESS
1294 004142 052767 000340 173626 BIS #340,PSR ;SET PROCESSOR PRIORITY TO 7
1295 004150 016760 173622 000002 MOV PSR,2(ADINT) ;SETUP RETURN PROCESSOR STATUS
1296 004156 042767 000340 173612 BIC #340,PSR ;SET PROCESSOR PRIORITY TO 0
1297 004164 052767 000040 173604 BIS #040,PSR ;SET PROCESSOR TO LEVEL 1 PRIORITY
1298 004172 012713 000103 MOV #103,ACRS ;SET EJECT INTERRUPT ENABLE, AND READ
1299 004176 032713 040000 BIT #40000,ACRS ;WAIT FOR CARD DONE
1300 004202 001775 BEQ .-4
1301 004204 016067 000002 173564 MOV 2(ADINT),PSR ;RESTORE PROCESSOR TO HIGHEST PRIORITY
1302 004212 005013 CLR ACRS ;DISABLE INTERRUPTS
1303 004214 012710 000232 MOV #232,ADINT ;CHANGE INTERRUPT RETURN ADDRESS
1304 004220 005037 000232 CLR #232 ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1305 004224 005767 174352 TST INTFLG ;CHECK TO SEE IF LEVEL ALREADY RECORDED
1306 004230 100044 BPL TEST19 ;IF NO, GO TO NEXT TEST
1307 004232 026727 174344 100002 CMP INTFLG,#100002 ;IF SO, CHECK TO SEE
1308 004240 100440 BMI TEST19 ;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 TINT18: BR TEST19
1314 004246 032713 040000 BIT #40000,ACRS ;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 ACRS ;DISABLE FURTHER INTERRUPTS
1318 004260 012710 000232 MOV #232,ADINT ;CHANGE INTERRUPT RETURN ADDRESS
1319 004264 005037 000232 CLR #232 ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1320 004270 022626 CMP (SP)+,(SP)+ ;RESTORE STACK POINTER
1321 004272 005767 174304 TST INTFLG ;CHECK FOR PREVIOUS FLAG
1322 004276 100414 BMI SET2 ;BRANCH IF FLAG SET
1323 004300 012767 100002 174274 MOV #100002,INTFLG ;SET FLAG AND LEVEL
1324 004306 012702 014503 MOV #MSG4,R2 ;SETUP FOR PRINTOUT
1325 004312 004767 005634 JSR %7,TOUT ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"

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1326 004316 012702 000002      MOV      #2,R2
1327 004322 004767 00540E      JSR      %7,PROCT      ;PRINT LEVEL NUMBER
1328 004326 000405      BR
1329 004330 026727 174246 100002  SET2: CMP  INTFLG,#100002 ;CHECK PREVIOUS LEVEL
1330 004336 100001      BPL
1331 004340 104000      HLT      ;INTERRUPT PREVIOUSLY OCCURRED ONLY AT A LOWER LEVEL
1332
1333
1334                                ;TEST FOR AN INTERRUPT ON LEVEL 1
1334 004342 104001      TEST19: SCOPE
1335 004344 004767 005064      JSR      %7,INIT      ;INITIALIZE
1336 004350 012710 004460      MOV      #TINT19,%ADINT ;SETUP RETURN ADDRESS
1337 004354 052767 000340 173414      BIS      #340,PSR      ;SET PROCESSOR PRIORITY TO 7
1338 004362 016760 173410 000002      MOV      PSR,%ADINT    ;SETUP RETURN PROCESSOR STATUS
1339 004370 042767 000340 173400      LDC      #340,PSR     ;SET PROCESSOR PRIORITY TO 0
1340 004376 052767 000000 173372      BIS      #000,PSR    ;SET PROCESSOR TO LEVEL 0 PRIORITY
1341 004404 012713 000103      MOV      #103,%CRS    ;SET EJECT INTERRUPT ENABLE, AND READ
1342 004410 032713 040000      BIT      #40000,%CRS ;WAIT FOR CARD DONE
1343 004414 001775      BEQ      -4
1344 004416 016067 000002 173352      MOV      2(%ADINT),PSR ;RESTORE PROCESSOR TO HIGHEST PRIORITY
1345 004424 005013      CLR      %CRS        ;DISABLE INTERRUPTS
1346 004426 012710 000232      MOV      #232,%ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1347 004432 005037 000232      CLR      %232        ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1348 004436 005767 174140      TST      INTFLG      ;CHECK TO SEE IF LEVEL ALREADY RECORDED
1349 004442 100044      BPL      TEST20      ;IF NO, GO TO NEXT TEST
1350 004444 026727 174132 100001      CMP      INTFLG,#100001 ;IF SO, CHECK TO SEE
1351 004452 100440      BMI      TEST20      ;THAT THE INTERRUPT LEVEL RECORDED
1352                                ;IS BELOW THE CURRENT LEVEL
1353 004454 104000      HLT      ;INTERRUPT DIDN'T OCCUR WITH STATUS
1354                                ;AT LEVEL 1, BUT PREVIOUSLY OCCURRED
1355                                ;AT OR ABOVE THIS LEVEL
1356 004456 000436      BR      TEST20
1357 004460 032713 040000      TINT19: BIT  #40000,%CRS ;MAKE SURE CARD DONE IS SET
1358 004464 001001      BNE      .+4
1359 004466 104000      HLT      ;BRANCH IF SET
1360 004470 005013      CLR      %CRS        ;CARD DONE WASH'T SET
1361 004472 012710 000232      MOV      #232,%ADINT ;DISABLE FURTHER INTERRUPTS
1362 004476 005037 000232      CLR      %232        ;CHANGE INTERRUPT RETURN ADDRESS
1363 004502 022626      CMP      (SP)+,(SP)+ ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1364 004504 005767 174072      TST      INTFLG      ;RESTORE STACK POINTER
1365 004510 100414      BMI      SET1        ;CHECK FOR PREVIOUS FLAG
1366 004512 012767 100001 174062      MOV      #100001,INTFLG ;BRANCH IF FLAG SET
1367 004520 012702 014503      MOV      #MSG4,R2    ;SET FLAG AND LEVEL
1368 004524 004767 005422      JSR      %7,TOUT     ;SETUP FOR PRINTOUT
1369 004530 012702 000001      MOV      #1,R2      ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1370 004534 004767 005174      JSR      %7,PROCT   ;PRINT LEVEL NUMBER
1371 004540 000405      ER      TEST20
1372 004542 026727 174034 100001  SET1: CMP  INTFLG,#100001 ;CHECK PREVIOUS LEVEL
1373 004550 100001      BPL
1374 004552 104000      HLT      ;INTERRUPT PREVIOUSLY OCCURRED ONLY AT A LOWER LEVEL
1375
1376                                ;A TIMING ERROR SHOULDN'T CAUSE AN INTERRUPT
1377 004554 104001      TEST20: SCOPE
1378 004556 004767 004652      JSR      %7,INIT     ;INITIALIZE
1379 004562 012710 004634      MOV      #TINT20,%ADINT ;LOAD RETURN POINTER
1380 004566 052767 000340 173202      BIS      #340,PSR    ;SET PROCESSOR TO HIGHEST PRIORITY
1381 004574 016760 173176 000002      MOV      PSR,%ADINT  ;LOAD RETURN PROCESSOR STATUS

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1382 004602 012713 000101      MOV      #101, @CRS      ;SET INTERRUPT ENABLE AND READ
1383 004606 032713 004000      BIT      #4000, @CRS    ;WAIT FOR TIMING ERROR TO SET
1384 004612 001775                BEQ      -4
1385 004614 042767 000340 173154      BIC      #340, PSR      ;MOVE PROCESSOR TO LOWEST PRIORITY
1386 004622 000240                NOP                        ;CLOCK INTERRUPT IF IT OCCURRED
1387 004624 016067 000002 173144      MOV      2(ADINT), PSR  ;MOVE PROCESSOR BACK TO HIGHEST PRIORITY
1388 004632 000402                BR      .+6
1389 004634 104000      TINT20: HLT                ;TIMING ERROR CAUSED AN INTERRUPT
1390 004636 022626      CMP      (SP)+, (SP)+   ;RESTORE STACK POINTER
1391 004640 012710 000232      MOV      #232, @ADINT  ;CHANGE INTERRUPT ADDRESS TO CAUSE A
1392 004644 005037 000232      CLR      @#232         ;HALT IF AN INTERRUPT OCCURS
1393 004650 032713 040000      BIT      #40000, @CRS  ;WAIT FOR CARD DONE
1394 004654 001775                BEQ      -4
1395 004656 005013      CLR      @CRS          ;CLEAR INTERRUPT ENABLE
1396
1397 004660 104001      TEST21: SCOPE
1398                ;TEST FOR NO INTERRUPT OCCURING WITH INTERRUPT ENABLE SET AND REST CLEARED
1399 004662 004767 004546      JSR      %7, INIT      ;INITIALIZE CSR TO ZERO
1400 004666 012710 004736      MOV      @TNINT, @ADINT ;SETUP RETURN ADDRESS
1401 004672 052767 000340 173076      BIS      #340, PSR     ;SET PROCESSOR TO LEVEL 7
1402 004700 016760 173072 000002      MOV      PSR, 2(ADINT) ;STORE PROCESSOR STATUS
1403 004706 005067 173064      CLR      PSR           ;SET PROCESSOR TO LEVEL 0
1404 004712 012713 000100      MOV      #100, @CRS    ;ENABLE INTERRUPTS
1405 004716 005227 000000      INC      #0            ;WAIT AWHILE
1406 004722 001375                BNE      -4
1407 004724 016067 000002 173044      MOV      2(ADINT), PSR ;RESTORE PROCESSOR TO LEVEL 7
1408 004732 005013      CLR      @CRS          ;DISABLE FURTHER INTERRUPTS
1409 004734 000403                BR      CONT21
1410 004736 104000      TNINT:  HLT                ;AN INTERRUPT OCCURRED
1411 004740 022626      CMP      (SP)+, (SP)+  ;RESTORE STACK
1412 004742 005013      CLR      @CRS          ;DISABLE FURTHER INTERRUPTS
1413 004744 005037 000232      CONT21: CLR      @#232  ;CHANGE INTERRUPT RETURN ADDRESS TO
1414 004750 012710 000232      MOV      #232, @ADINT  ;CAUSE A HALT IF AN INTERRUPT OCCURS
1415
1416 004754 104001      TEST22: SCOPE
1417                ;CHECK FOR SIMULTANEOUS INTERRUPTS ON MORE THAN ONE LEVEL
1418 004756 004767 004452      JSR      %7, INIT      ;INITIALIZE CSR TO ZERO
1419 004762 012710 005020      MOV      @T2INT, @ADINT ;SETUP RETURN ADDRESS
1420 004766 052767 000340 173002      BIS      #340, PSR     ;SET PROCESSOR TO LEVEL 7
1421 004774 016760 172776 000002      MOV      PSR, 2(ADINT) ;STORE PROCESSOR STATUS
1422 005002 042767 000340 172766      BIC      #340, PSR     ;SET PROCESSOR TO LEVEL 0
1423 005010 012713 000103      MOV      #103, @CRS    ;SET INTERRUPT ENABLE AND EJECT A CARD
1424 005014 000001      WAIT                        ;WAIT FOR INTERRUPT
1425 005016 000776                BR      .-2
1426 005020 022626      T2INT:  CMP      (6)+, (6)+ ;RESTORE STACK POINTER
1427 005022 012710 005044      MOV      @T2INTA, @ADINT ;CHANGE RETURN ADDRESS
1428 005026 005067 172744      CLR      PSR           ;SET PROCESSOR TO LEVEL 0
1429 005032 000240                NOP                        ;WAIT
1430 005034 016067 000002 172734      MOV      2(ADINT), PSR ;RESTORE PROCESSOR TO LEVEL 7
1431 005042 000402                BR      CONT22
1432 005044 022626      T2INTA: CMP      (6)+, (6)+ ;RESTORE STACK
1433 005046 104000      HLT                ;THE INTERRUPT OCCURRED AT 2 LEVELS
1434 005050 005013      CONT22: CLR      @CRS   ;DISABLE INTERRUPTS
1435 005052 005037 000232      CLR      @#232        ;CHANGE INTERRUPT RETURN ADDRESS TO
1436 005056 012710 000232      MOV      #232, @ADINT  ;CAUSE A HALT IF AN INTERRUPT OCCURS
1437

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1438	005062	104001		TEST23: SCOPE		
1439				: ALL MODES OF ADDRESSING CRB1 OR CRB2 (DAT0,DAT0B,DAT1) SHOULD CLEAR		
1440				: COLUMN READY		
1441	005064	004767	004344	JSR	%7 INIT	: INITIALIZE
1442	005070	005213		INC	@CR5	: START READING A CARD
1443	005072	105713		TSTB	@CR5	: WAIT FOR COLUMN READY
1444	005074	100376		BPL	-2	
1445	005076	005014		CLR	@CRB1	: DAT0 TO CRB1
1446	005100	105713		TSTB	@CR5	: CHECK COLUMN READY
1447	005102	100002		BPL	CNT23A	: BRANCH IF CLEARED
1448	005104	104000		HLT		: DAT0 TO CRB1 DIDN'T CLEAR READY
1449	005106	000467		BR	TEST24	: GO TO NEXT TEST
1450	005110	105713		CNT23A: TSTB	@CR5	: WAIT FOR COLUMN READY
1451	005112	100376		BPL	-2	
1452	005114	105014		CLRB	@CRB1	: DAT0B TO LOW BYTE OF CRB1
1453	005116	105713		TSTB	@CR5	: CHECK COLUMN READY
1454	005120	100002		BPL	CNT23B	: BRANCH IF CLEARED
1455	005122	104000		HLT		: DAT0B TO CRB1 LOW BYTE DIDN'T CLEAR READY
1456	005124	000460		BR	TEST24	: GO TO NEXT TEST
1457	005126	105713		CNT23B: TSTB	@CR5	: WAIT FOR COLUMN READY
1458	005130	100376		BPL	-2	
1459	005132	105064	000001	CLRB	1(CRB1)	: DAT0B TO HIGH BYTE OF CRB1
1460	005136	105713		TSTB	@CR5	: CHECK COLUMN READY
1461	005140	100002		BPL	CNT23C	: BRANCH IF CLEARED
1462	005142	104000		HLT		: DAT0B TO CRB1 HIGH BYTE DIDN'T CLEAR READY
1463	005144	000450		BR	TEST24	: GO TO NEXT TEST
1464	005146	105713		CNT23C: TSTB	@CR5	: WAIT FOR COLUMN READY
1465	005150	100376		BPL	-2	
1466	005152	005714		TST	@CRB1	: DAT1 TO CRB1
1467	005154	105713		TSTB	@CR5	: CHECK COLUMN READY
1468	005156	100002		BPL	CNT23D	: BRANCH IF CLEARED
1469	005160	104000		HLT		: DAT1 TO CRB1 DIDN'T CLEAR READY
1470	005162	000441		BR	TEST24	: GO TO NEXT TEST
1471	005164	105713		CNT23D: TSTB	@CR5	: WAIT FOR COLUMN READY
1472	005166	100376		BPL	-2	
1473	005170	005077	173444	CLR	@CRB2	: DAT0 TO CRB2
1474	005174	105713		TSTB	@CR5	: CHECK COLUMN READY
1475	005176	100002		BPL	CNT23E	: BRANCH IF CLEARED
1476	005200	104000		HLT		: DAT0 TO CRB2 DIDN'T CLEAR READY
1477	005202	000431		BR	TEST24	: GO TO NEXT TEST
1478	005204	105713		CNT23E: TSTB	@CR5	: WAIT FOR COLUMN READY
1479	005206	100376		BPL	-2	
1480	005210	105077	173424	CLRB	@CRB2	: DAT0B TO LOW BYTE OF CRB2
1481	005214	105713		TSTB	@CR5	: CHECK COLUMN READY
1482	005216	100002		BPL	CNT23F	: BRANCH IF CLEARED
1483	005220	104000		HLT		: DAT0B TO CRB2 LOW BYTE DIDN'T CLEAR READY
1484	005222	000421		BR	TEST24	: GO TO NEXT TEST
1485	005224	105713		CNT23F: TSTB	@CR5	: WAIT FOR COLUMN READY
1486	005226	100376		BPL	-2	
1487	005230	016702	173404	MOV	CRB2,R2	: LOAD POINTER
1488	005234	105062	000001	CLRB	1(R2)	: DAT0B TO HIGH BYTE OF CRB2
1489	005240	105713		TSTB	@CR5	: CHECK COLUMN READY
1490	005242	100002		BPL	CNT23G	: BRANCH IF CLEARED
1491	005244	104000		HLT		: DAT0B TO CRB2 HIGH BYTE DIDN'T CLEAR READY
1492	005246	000407		BR	TEST24	: GO TO NEXT TEST
1493						

E03

DZCRA-D CR11 DIAGNOSTIC TEST
DZCRA.SRC 12-MAR-76 00:00

MACY11 27(1006) 21-SEP-76 16:56 PAGE 31

1494	005250	105713			CNT23G: TSTB	@CRS		;WAIT FOR COLUMN READY
1495	005252	100376			BPL	.-2		
1496	005254	005777	173360		TST	@CRB2		;DATI TO CRB2
1497	005260	105713			TSTB	@CRS		;CHECK COLUMN READY
1498	005262	104001			BPL	TEST24		;BRANCH IF CLEARED
1499	005264	104000			HLT			;DATI TO CRB2 DIDN'T CLEAR READY
1500								
1501	005266	104001			TEST24: SCOPE			
1502					;SETTING EJECT AFTER A COLUMN READY WITHOUT CLEARING THE COLUMN READY			
1503					;SHOULD SET TIMING ERROR (WHICH IN TURN SHOULD CLEAR COLUMN READY)			
1504	005270	004767	004140		JSR	%7,INIT		;INITIALIZE
1505	005274	005213			INC	@CRS		;START READING A CARD
1506	005276	105713			TSTB	@CRS		;CHECK COLUMN READY - WAIT
1507	005300	100376			BPL	.-2		
1508	005302	052713	000002		BIS	@2,@CRS		;SET EJECT
1509	005306	105713			TSTB	@CRS		;CHECK COLUMN READY
1510	005310	100402			BMI	CNT24A		;BRANCH IF STILL SET
1511	005312	104000			HLT			;SETTING EJECT CLEARED COLUMN READY
1512	005314	000421			BR	END24		;BRANCH TO WAIT FOR DONE AFTER ERROR
1513	005316	032713	004000		CNT24A: BIT	#4000,@CRS		;CHECK TIMING ERROR
1514	005322	001013			BNE	TIM24		;BRANCH IF SET
1515	005324	032713	040400		BIT	#40400,@CRS		;CHECK CARD DONE AND OFF-LINE
1516	005330	001772			BEQ	CNT24A		;LOOP IF NONE SET
1517	005332	032713	040000		BIT	#40000,@CRS		;CARD DONE SET?
1518	005336	001003			BNE	CNT24B		;YES - BRANCH TO ERROR PRINTOUT
1519	005340	004767	004142		JSR	%7,CKBIT8		;NO - BIT 8 WAS SET SO OUTPUT MESSAGE
1520	005344	000415			BR	ENDCK		;BRANCH AFTER COMING BACK ON-LINE
1521	005346	104000			CNT24B: HLT			;CARD DONE SET BUT TIMING ERROR DIDN'T
1522	005350	000413			BR	ENDCK		;BRANCH TO NEXT SECTION
1523	005352	105713			TIM24: TSTB	@CRS		;CHECK COLUMN READY
1524	005354	100001			BPL	+.4		;BRANCH IF NOT SET
1525	005356	104000			HLT			;TIMING ERROR DIDN'T CLEAR READY
1526	005360	032713	040400		END24: BIT	#40400,@CRS		;WAIT FOR CARD DONE OR OFF-LINE
1527	005364	001775			BEQ	END24		
1528	005366	032713	000400		BIT	#400,@CRS		;CHECK OFF LINE
1529	005372	001402			BEQ	ENDCK		;BRANCH IF NOT SET
1530	005374	004767	004106		JSR	%7,CKBIT8		;OUTPUT ERROR MESSAGE
1531								
1532					;CHECK SW7 AND RETURN TO TEST1 IF SET, AFTER RINGING BELL			
1533					;OTHERWISE GO INTO THE DATA TEST			
1534	005400	104001			ENDCK: SCOPE			
1535	005402	032777	000200	173206	BIT	#200,@SWR		
1536	005410	001406			BEQ	DATST		
1537	005412	004767	004044		JSR	%7,BELL		
1538	005416	005167	173222		COM	TRFLG		;TOGGLE TRACE FLAG
1539	005422	000167	173314		JMP	RESTR		

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1547 005426 012767 000056 001212 DATST: MOV #56, CDCNT ;CHECK SR FOR TYPE OF DECK BEING TESTED, AND INITIALIZE POINTERS
1548 005434 000410 BR DATST2 ;SETUP CARD COUNT TO ENTER TABLE CORRESPONDING TO NEXT C
1549 005436 022767 000176 173152 DATST1: CMP #SWREG, SWR ;SKIP NEXT INSTRUCTION
1550 005444 001002 BNE IS
1551 005446 104002 CNTLU
1552 005450 104006 CKU
1553 005452 005067 001170 IS: CLR CDCNT ;SETUP CARD COUNT TO ENTER DATA TABLE AT BEGINNING
1554 005456 005067 173166 DATST2: CLR ERFLG ;FLAG SET PREVENTS PRINTING OUT ERROR HEADING
1555 005462 032777 000020 173126 BIT #20, SWR ;CHECK BIT 4 OF SR FOR TYPE OF DECK
1556 005470 001412 BEQ ALP1 ;BRANCH IF NOT SET TO LOAD ALPHANUMERIC POINTERS
1557 005472 012767 013524 001142 MOV #BINCD, TSTART ;BIT 2 SET, LOAD BINARY TABLE POINTERS
1558 005500 012767 014222 001136 MOV #BINEND, TEND
1559 005506 012767 015627 001124 MOV #MSG15, DECK
1560 005514 000411 BR CONTD ;BRANCH AROUND ALPHANUMERIC POINTERS
1561 005516 012767 013024 001116 ALP1: MOV #ALPCD, TSTART ;LOAD ALPHANUMERIC TABLE POINTERS
1562 005524 012767 013522 001112 MOV #ALPEND, TEND
1563 005532 012767 015616 001100 MOV #MSG14, DECK
1564 005540 005767 173100 CONTD: TST TRFLG ;CHECK TRACE TRAP FLAG
1565 005544 001004 BNE TRP1 ;BRANCH IF FLAG WAS SET
1566 005546 012767 000340 172222 NOTRP1: MOV #340, PSR ;CLEAR TRACE BIT
1567 005554 000407 BR DCNT1
1568 005556 032777 010000 173032 TRP1: BIT #10000, SWR ;CHECK SW12 TO INHIBIT TRACE TRAPPING
1569 005564 001370 BNE NOTRP1 ;BRANCH IF SET
1570 005566 012767 000360 172202 MOV #360, PSR ;SET TRACE BIT
1571 005574 004767 003634 DCNT1: JSR %7, INIT ;INITIALIZE CARD READER STATUS REGISTER
1572 ;SET UP INTERRUPT SERVICING, AND START READING
1573 005600 012710 005634 MOV #SRVC, ADINT ;SETUP RETURN POINTER
1574 005604 042767 000340 172164 BIC #340, PSR ;SET PROCESSOR TO LEVEL 0
1575 005612 016760 172160 000002 MOV PSR, 2(ADINT) ;STORE CURRENT STATUS
1576 005620 004767 000714 JSR %7, MXCRD ;ADJUST POINTER AND START READING
1577 005624 052713 000101 BIS #101, CRCS ;ENABLE INTERRUPTS
1578 005630 000001 WAIT ;WAIT FOR INTERRUPTS
1579 005632 000776 BR .-2
1580
1581 ; INTERRUPT SERVICE ROUTINE WHICH RUNS DATA RELIABILITY TEST
1582 005634 005713 SRVC: TST CRCS ;CHECK SPECIAL CONDITION (BIT 15)
1583 005636 100460 BMI ERSET ;BRANCH IF SET
1584 005640 105713 TSTB CRCS ;CHECK COLUMN READY
1585 005642 100402 BMI .+6 ;BRANCH IF SET
1586 005644 000167 000542 JMP NOTCOL ;JUMP IF NOT SET
1587 005650 005267 000774 INC CLCNT ;KEEP TRACK OF COLUMN NUMBER
1588 005654 011467 000772 MOV @CRB1, DAT1 ;STORE DATA OF FIRST READ
1589 005660 105713 TSTB CRCS ;MAKE SURE COLUMN READY CLEARED
1590 005662 100006 BPL SCNT1 ;BRANCH IF IT DID
1591 005664 052767 000340 172104 BIS #340, PSR ;SET PROCESSOR TO LEVEL 7
1592 005672 104000 HLT ;READING DATA DIDN'T CLEAR COLUMN READY
1593 005674 000167 000532 JMP LASTCK ;GO TO NEXT CARD AFTER ERROR PRINTOUT
1594 005700 017767 172734 000750 SCNT1: MOV @CRB2, DATENC ;STORE ENCODED DATA
1595 005706 012701 000010 MOV #10, COUNT ;WAIT AWHILE

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1596	005712	005301			DEC	COUNT		
1597	005714	001376			BNE	.-2		
1598	005716	011467	000732		MOV	2CRB1,DAT2	:STORE DATA OF SECOND READ	
1599	005722	005067	000732		CLR	PTOFF	:CLEAR POINTER OFFSET	
1600	005726	026715	000720		CMP	DAT1,2RS	:CHECK FIRST DATA READ	
1601	005732	001053			BNE	FAIL	:PRINTOUT IF WRONG	
1602	005734	012767	000002	000716	MOV	2,PTOFF	:SET POINTER OFFSET	
1603	005742	026725	000706		CMP	DAT2,(RS)+	:CHECK SECOND READING OF SAME DATA	
1604	005746	001045			BNE	FAIL	:BRANCH IF WRONG	
1605	005750	012767	000004	000702	MOV	4,PTOFF	:SET POINTER OFFSET	
1606	005756	026725	000674		CMP	DATENC,(RS)+	:CHECK ENCODED DATA	
1607	005762	001037			BNE	FAIL	:BRANCH IF WRONG	
1608	005764	020567	000654		CMP	RS,TEND	:CHECK FOR END OF TABLE	
1609	005770	100402			BMI	+.6	:IF NOT THERE, RTI	
1610	005772	016705	000644		MOV	TSTART,RS	:MOVE POINTER TO LOOP THRU TABLE	
1611	005776	000002			RTI			
1612							:SPECIAL CONDITION BIT 15 WAS SET WHEN THE INTERRUPT SERVICE ROUTINE	
1613							:WAS ENTERED	
1614							:OUTPUT A MESSAGE AND HALT	
1615	006000	052767	000340	171770	ERSET:	BIS	240,PSR	:LOCK OUT INTERRUPTS
1616	006006	104003				KBINTT		
1617	006010	022767	000120	000630	CMP	80.,CDCNT	:CHECK FOR LAST CARD	
1618	006016	001006			BNE	ERI	:IF NOT, PRINT OUT MESSAGE	
1619	006020	022767	000120	000622	CMP	80.,CLCNT	:IF LAST CARD, CHECK FOR LAST COLUMN	
1620	006026	001002			BNE	ERI	:IF NOT, PRINT MESSAGE	
1621	006030	000167	000626		JMP	ALLDON	:IF END OF DECK, JUMP	
1622	006034	012702	015643		ER1:	MOV	8MSG16,R2	: "BIT 15 WAS SET."
1623	006040	004767	004106		JSR	7,TOUT		
1624	006044	012702	015661		MOV	8MSG17,R2	: "REMEDY THE ERROR CONDITION	
1625	006050	004767	004076		JSR	7,TOUT	:AND PRESS CONTINUE"	
1626	006054	000000			HALT			
1627	006056	000167	000350		JMP	LASTCK	:SET UP FOR NEXT CARD AND GO ON	
1628	006062	052767	000340	171706	FAIL:	BIS	240,PSR	:LOCK OUT INTERRUPTS
1629	006070	052713	000002			BIS	2,2CRS	:SET EJECT TO PREVENT TIMING ERROR
1630	006074	005714				TST	2CRB1	:MAKE SURE COLUMN READY IS CLEARED
1631	006076	032777	020000	172512		BIT	20000,2SWR	:CK SW13
1632	006104	001431				BEG	FAILCN	:CONTINUE IF NOT SET
1633	006106	005777	172504			TST	2SWR	:IF SET, CHECK FOR HALT ON ERROR
1634	006112	100003				BPL	FAILC	:BRANCH IF HALT ON ERROR NOT SET
1635	006114	000000				HALT		:HALT ON ERROR SET
1636	006116	000167	000310			JMP	LASTCK	:CONTINUE AFTER HALT
1637	006122	032713	040000		FAILC:	BIT	40000,2CRS	:CHECK FOR CARD DONE
1638	006126	001402				BEG	+.6	
1639	006130	000167	000276			JMP	LASTCK	:INHIBIT PRINTOUT AFTER CARD DONE SET
1640	006134	032713	000400			BIT	400,2CRS	:CHECK FOR OFF-LINE
1641	006140	001770				BEG	FAILC	:BRANCH IF NOT
1642	006142	022767	000120	000476		CMP	80.,CDCNT	:CHECK FOR LAST CARD
1643	006150	001002				BNE	+.6	
1644	006152	000167	000504			JMP	ALLDON	:IF LAST CARD, WAIT FOR NEXT DECK
1645	006156	004767	003324			JSR	7,CKBITB	:IF NOT LAST CARD, PRINT MESSAGE
1646	006162	004767	000352			JSR	7,NXCRC	:START NEXT CARD THRU READER
1647	006166	000002				RTI		
1648	006170	005767	172454		FAILCN:	TST	ERFLG	:TEST FLAG FOR PREVIOUS PRINTOUT
1649	006174	001006				BNE	NOHD	:IF SET, DON'T OUTPUT HEADING
1650	006176	005267	172446			INC	ERFLG	:SET FLAG
1651	006202	012702	015526			MOV	8MSG13,R2	:OUTPUT HEADING FOR DATA ERROR PRINTOUT

1652	006206	004767	003740			JSR	%7, TOUT	
1653	006212	016702	000422			MOV	DECK, R2	: OUTPUT TYPE OF DECK
1654	006216	004767	00373C			JSR	%7, TOUT	
1655	006222	004767	003314			JSR	%7, SPACE	
1656	006226	016702	000414			MOV	CD CNT, R2	: OUTPUT CARD NUMBER WHERE ERROR OCCURRED
1657	006232	004767	003476			JSR	%7, PROCT	
1658	006236	004767	003300			JSR	%7, SPACE	
1659	006242	016702	000402			MOV	CL CNT, R2	: OUTPUT COLUMN NUMBER WHERE ERROR OCCURRED
1660	006246	004767	003462			JSR	%7, PROCT	
1661	006252	004767	003264			JSR	%7, SPACE	
1662	006256	166705	000376			SUB	PTOFF, R5	: SUBTRACT OFFSET FROM POINTER TO POINT TO : ADDRESS OF DESIRED PATTERN
1663								: OUTPUT CORRECT DATA PATTERN (NOT ENCODED)
1664	006262	012502				MOV	(R5)+, R2	
1665	006264	004767	003444			JSR	%7, PROCT	
1666	006270	004767	003246			JSR	%7, SPACE	
1667	006274	016702	000352			MOV	DATA1, R2	: OUTPUT DATA READ ON FIRST READING OF BUFFER
1668	006300	004767	003430			JSR	%7, PROCT	
1669	006304	004767	003232			JSR	%7, SPACE	
1670	006310	016702	000340			MOV	DATA2, R2	: OUTPUT DATA READ ONE MILLISECOND LATER
1671	006314	004767	003414			JSR	%7, PROCT	
1672	006320	004767	003216			JSR	%7, SPACE	
1673	006324	011502				MOV	DATA3, R2	: OUTPUT CORRECT DATA PATTERN (ENCODED FORM)
1674	006326	004767	003402			JSR	%7, PROCT	
1675	006332	004767	003204			JSR	%7, SPACE	
1676	006336	016702	000314			MOV	DATAENC, R2	: OUTPUT DATA READ (ENCODED)
1677	006342	004767	003366			JSR	%7, PROCT	
1678	006346	104003				KBINTT		
1679	006350	005777	172242			TST	ASWR	: CHECK "HALT ON ERROR" SWITCH
1680	006354	100001				BPL	.+4	: BRANCH IF NOT SET
1681	006356	000000				HALT		: HALT AFTER AN ERROR
1682	006360	005713				TST	ACRS	: CHECK ERROR
1683	006362	100023				BPL	LASTCK	: BRANCH IF NOT SET
1684	006364	022767	000120	000254		CMP	#80, CDCNT	: CHECK FOR LAST CARD
1685	006372	001005				BNE	FAILC1	
1686	006374	032713	000400			BIT	#400, ACRS	
1687	006400	001423				BEQ	LASTCD	
1688	006402	000167	000254			JMP	ALLDON	
1689	006406	000167	177366			FAILC1: J	ERSET	: OUTPUT ERROR MESSAGE
1690								
1691								: INTERRUPT NOT DUE TO ERROR OR COLUMN READY
1692	006412	032713	040000			NOTCOL: BIT	#40000, ACRS	: CHECK FOR CARD DONE
1693	006416	001474				BEQ	NOTCD	: BRANCH IF NOT SET
1694	006420	022767	000120	000222		CMP	#80, CLCNT	: CHECK COLUMN COUNT
1695	006426	001401				BEQ	.+4	: SKIP ERROR HALT IF 80 COLUMNS WERE READ
1696	006430	104000				HLT		: LESS THAN EIGHTY COLUMNS WERE READ
1697	006432	022767	000120	000206		LASTCK: CMP	#80, CDCNT	: CHECK FOR LAST CARD
1698	006440	001403				BEQ	LASTCD	: BRANCH IF LAST CARD
1699	006442	004767	000072			JSR	%7, NXCRD	: IF NOT LAST CARD
1700	006446	000002				RTI		: GO ON
1701	006450	022626				LASTCD: CMP	(SP)+, (SP)+	: IF LAST CARD, RESTORE STACK POINTER
1702	006452	004767	003004			JSR	%7, BELL	: RING BELL TO SIGNIFY "PASS COMPLETE"
1703	006456	013702	000042			MOV	#42, R2	: MONITOR HOOK
1704	006462	001405				BEQ	END	
1705	006464	000005				RESET		
1706	006466	004712				LOGIC: JSR	%7, (R2)	
1707	006470	000240				NOP		

1764	006734	001375				BNE	.-4		
1765	006736	005327	000000			DEC	#0		
1766	006742	001375				BNE	.-4		
1767	006744	005327	000000			DEC	#0		
1768	006750	001375				BNE	.-4		
1769	006752	032713	040000			BIT	#40000, %CRS		; CHECK CARD DONE
1770	006756	001001				BNE	.-4		
1771	006760	104000				HLT			; CARD DONE DIDN'T SET- THIS ERROR COULD BE
1772	006762	005013				CLR	%CRS		; CAUSED BY RUNNING A CR11 WHICH HAS THE
1773									; MB29 MODULE AND NOT SETTING SWITCH REGISTER
1774									; SWITCH 10
1775									
1776	006764	032713	157377			BIT	#157377, %CRS		; ONLY BIT 8 MAY STILL BE SET
1777	006770	001401				BEQ	.-4		; BRANCH IF OK
1778	006772	104000				HLT			; STATUS REGISTER INCORRECT
1779	006774	000405				BR	ALCNT2		
1780	006776	005013			ALCNT1:	CLR	%CRS		; CLEAR ERROR
1781	007000	032713	156377			BIT	#156377, %CRS		; ONLY BITS 8 AND 9 MAY STILL BE SET
1782									; BIT 9 MAY BE SET SINCE CARD MAY NOT
1783									; YET HAVE CLEARED THE READER TO CAUSE
1784									; CARD DONE
1785	007004	001401				BEQ	.-4		
1786	007006	104000				HLT			; STATUS REGISTER INCORRECT
1787	007010	052767	000340	170760	ALCNT2:	BIS	#340, PSR		; SET PROCESSOR TO LEVEL 7
1788	007016	016760	170754	000002		MOV	PSR, 2(ADINT)		; SETUP RETURN STATUS
1789	007024	105213				INCB	%CRS		; ATTEMPT TO READ- SHOULD RESET ERROR
1790	007026	005713				TST	%CRS		; CHECK BIT 15
1791	007030	100402				BMI	ALLOK		; BRANCH IF OK
1792	007032	104000				HLT			; SETTING READ DIDN'T RESET ERROR
1793	007034	000416				BR	ALWAIT		; BRANCH TO WAIT FOR ON-LINE
1794	007036	012710	007070		ALLOK:	MOV	#SRVC1, %ADINT		; LOAD INTERRUPT RETURN ADDRESS
1795	007042	005067	170730			CLR	PSR		; SET PROCESSOR TO LEVEL 0
1796	007046	012713	000101			MOV	#101, %CRS		; ENABLE INTERRUPTS, KEEP ERROR SET BY SETTING READ
1797	007052	000240				NOP			; CLOCK IN INTERRUPT
1798	007054	016067	000002	170714		MOV	2(ADINT), PSR		; SET PROCESSOR TO LEVEL 7
1799	007062	005013				CLR	%CRS		; CLEAR INTERRUPT ENABLE AND ERROR
1800	007064	104000				HLT			; BIT 15 DIDN'T CAUSE AN INTERRUPT
1801	007066	000402				BR	.-6		
1802	007070	022626			SRVC1:	CMP	(SP)+, (SP)+		; RESTORE STACK POINTER
1803	007072	005013			ALWAIT:	CLR	%CRS		; CLEAR INTERRUPT ENABLE AND ERROR
1804	007074	012710	007132			MOV	#SRVC2, %ADINT		; CHANGE INTERRUPT RETURN ADDRESS
1805	007100	112713	000100			MOVB	#100, %CRS		; ENABLE INTERRUPTS
1806	007104	042767	000340	170664		BIC	#340, PSR		; SET PROCESSOR TO LEVEL 0
1807	007112	032713	000400			BIT	#400, %CRS		; CHECK OFF-LINE BIT
1808	007116	001375				BNE	.-4		; LOOP UNTIL CLEAR
1809	007120	016067	000002	170650		MOV	2(ADINT), PSR		; SET PROCESSOR TO LEVEL 7
1810	007126	104000				HLT			; NO INTERRUPT OCCURRED
1811	007130	000403				BR	SRVC2A		; BRANCH AROUND
1812	007132	004767	002324		SRVC2:	JSR	%7, BELL		; RING BELL
1813	007136	022626				CMP	(SP)+, (SP)+		; RESTORE STACK POINTER
1814	007140	032713	002000		SRVC2A:	BIT	#2000, %CRS		; CHECK BIT 10
1815	007144	001001				BNE	.-4		; BRANCH IF SET
1816	007146	104000				HLT			; BIT 10 NOT SET
1817	007150	032713	000400			BIT	#400, %CRS		; CHECK BIT 8
1818	007154	001401				BEQ	.-4		; BRANCH IF NOT SET
1819	007156	104000				HLT			; BIT 8 WAS SET

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1820 007160 005013          CLR      @CRS      ;DATO TO CRS
1821 007162 032713 002000  BIT      @2000,@CRS ;CHECK BIT 10
1822 007166 001401          BEQ      .+4        ;BRANCH IF NOT SET
1823 007170 104000          HLT                     ;DATO DIDN'T CLEAR ON-LINE BIT
1824 007172 022626          CMP      (SP)+,(SP)+ ;RESTORE STACK FROM INITIAL INTERRUPT
1825 007174 000167 177314  JMP      DECKCK      ;RESTART
1826
1827 007200 005067 171426  ERCR11: CLR      FLAG
1828 007204 000403          BR      TSTA
1829 007206 012767 000001 171416  ERCM11: MOV      #1,FLAG
1830 007214 104007          TSTA:  TIT
1831 007216 012702 016240  MOV      #SUBT2,R2
1832 007222 004767 171424  JSR      %7,SETUP    ;INITIALIZE REGISTERS
1833 007226 012767 007236 002714  MOV      #TSTA+2,RETURN ;SETUP SCOPE LOOP RETURN ADDRESS
1834                                     ;THE CARD READER GOING OFF-LINE SHOULD SET SPECIAL CONDITION (BIT 15) AND OFF-LINE (BIT
1835 007234 104001          TSTA:  SCOPE
1836 007236 005067 002702  CLR      ITMAX      ;RUN EACH ERROR TEST ONCE ONLY
1837 007242 004767 002166  JSR      %7,INIT     ;INITIALIZE STATUS REGISTER
1838 007246 012702 014410  MOV      #MSG3,R2    ;"PRESS CARD READER 'READ STOP'"
1839 007252 005767 171354  TST      FLAG        ;CHANGE MESSAGE FOR DOCUMENTATION READER?
1840 007256 001402          BEQ      .+6        ;NO
1841 007260 012702 014450  MOV      #MSG3A,R2   ;"PRESS CARD READER 'STOP'"
1842 007264 004767 002662  JSR      %7,TOUT
1843 007270 012702 014343  MOV      #MSG2,R2
1844 007274 004767 002652  JSR      %7,TOUT     ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
1845 007300 004767 002770  JSR      %7,CRLF4    ;MOVE MESSAGE UP ON TTY
1846 007304 000000          HALT
1847 007306 032713 000400  BIT      @400,@CRS   ;CHECK BIT 8
1848 007312 001001          BNE      .+4        ;BRANCH IF SET
1849 007314 104000          HLT                     ;OFF-LINE (BIT 8) WASN'T SET
1850 007316 005713          TST      @CRS       ;CHECK BIT 15
1851 007320 100401          BMI      .+4        ;BRANCH IF SET
1852 007322 104000          HLT                     ;BIT 15 WASN'T SET
1853 007324 012702 014224  MOV      #MSG1,R2    ;"PRESS CARD READER 'MOTOR START' AND 'READ START'";
1854 007330 005767 171276  TST      FLAG        ;CHANGE MESSAGE FOR DOCUMENTATION READER?
1855 007334 001402          BEQ      .+6        ;NO
1856 007336 012702 014307  MOV      #MSG1A,R2   ;"PRESS CARD READER 'RESET'"
1857 007342 004767 002604  JSR      %7,TOUT
1858 007346 012702 014343  MOV      #MSG2,R2
1859 007352 004767 002574  JSR      %7,TOUT     ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
1860 007356 004767 002712  JSR      %7,CRLF4    ;MOVE MESSAGE UP ON TTY
1861 007362 000000          HALT
1862 007364 032713 000400  BIT      @400,@CRS   ;WAIT FOR OFF-LINE TO CLEAR
1863 007370 001375          BNE      .-4
1864
1865                                     ;INPUT HOPPER EMPTY SHOULD SET SPECIAL CONDITION
1866 007372 104001          TESTB: SCOPE
1867 007374 004767 002034  JSR      %7,INIT     ;INITIALIZE STATUS REGISTER
1868 007400 012702 014536  MOV      #MSG5,R2    ;"REMOVE ALL CARDS FROM THE INPUT HOPPER"
1869 007404 004767 002542  JSR      %7,TOUT
1870 007410 012702 014343  MOV      #MSG2,R2    ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
1871 007414 004767 002532  JSR      %7,TOUT
1872 007420 004767 002650  JSR      %7,CRLF4    ;MOVE MESSAGE UP ON TTY
1873 007424 000000          HALT
1874 007426 032713 000400  BIT      @400,@CRS   ;CHECK BIT8
1875 007432 001001          BNE      .+4        ;BRANCH IF SET

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1876 007434 104000 HLT ;OFF-LINE (BIT 8) WASN'T SET
1877 007436 005713 TST 2CRS ;CHECK SPECIAL CONDITION BIT
1878 007440 100401 BMI .+4 ;BRANCH IF SET
1879 007442 104000 HLT ;SPECIAL CONDITION NOT SET
1880 007444 012702 014607 MOV #MSG6,R2 ;"RESTORE CARDS IN INPUT HOPPER"
1881 007450 004767 002476 JSR %7,TOUT
1882 007454 012702 014224 MOV #MSG1,R2 ;"PRESS CARD READER 'MOTOR START' AND 'READ START'"
1883 007460 005767 171146 TST FLAG ;CHANGE MESSAGE FOR DOCUMENTATION READER?
1884 007464 001402 BEQ .+6 ;NO
1885 007466 012702 014307 MOV #MSG1A,R2 ;"PRESS CARD READER 'RESET'"
1886 007472 004767 002454 JSR %7,TOUT
1887 007476 012702 014343 MOV #MSG2,R2 ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
1888 007502 004767 002444 JSR %7,TOUT
1889 007506 004767 002562 JSR %7,CRLF4 ;MOVE MESSAGE UP ON TTY
1890 007512 000000 HALT
1891 007514 032713 000400 BIT #400,2CRS ;WAIT FOR OFF-LINE TO CLEAR
1892 007520 001375 BNE .-4
1893
1894
1895 007522 104001 ;OUTPUT STACKER FULL SHOULD SET BIT 15
1896 007524 004767 001704 TESTC: SCOPE
1897 007530 012702 014653 JSR %7,INIT ;INITIALIZE STATUS REGISTER
1898 007534 005767 171072 MOV #MSG7,R2 ;"RAISE OUTPUT STACKER PRESSURE ARM ABOVE HORIZONTAL THE
1899 007540 001402 TST FLAG ;CHANGE MESSAGE FOR DOCUMENTATION READER?
1900 007542 012702 014771 BEQ .+6 ;NO
1901 007546 004767 002400 MOV #MSG7A,R2 ;"LOWER OUTPUT STACKER PLATE TO BOTTOM"
1902 007552 012702 014343 JSR %7,TOUT
1903 007556 004767 002370 MOV #MSG2,R2 ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
1904 007562 004767 002506 JSR %7,TOUT
1905 007566 000000 JSR %7,CRLF4 ;MOVE MESSAGE UP ON TTY
1906 007570 032713 000400 HALT
1907 007574 001001 BIT #400,2CRS ;CHECK BIT 8
1908 007576 104000 BNE .+4 ;BRANCH IF SET
1909 007600 005713 HLT ;OFF-LINE (BIT 8) WASN'T SET
1910 007602 100401 TST 2CRS ;CHECK SPECIAL CONDITION BIT
1911 007604 104000 BMI .+4 ;BRANCH IF SET
1912 007606 012702 014224 HLT ;SPECIAL CONDITION NOT SET
1913 007612 005767 171014 MOV #MSG1,R2 ;"PRESS CARD READER 'MOTOR START' AND 'READ START'"
1914 007616 001402 TST FLAG ;CHANGE MESSAGE FOR DOCUMENTATION READER?
1915 007620 012702 014307 BEQ .+6 ;NO
1916 007624 004767 002322 MOV #MSG1A,R2 ;"PRESS CARD READER 'RESET'"
1917 007630 012702 014343 JSR %7,TOUT
1918 007634 004767 002312 MOV #MSG2,R2 ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
1919 007640 004767 002430 JSR %7,TOUT ;MOVE MESSAGE UP ON TTY
1920 007644 000000 JSR %7,CRLF4
1921 007646 032713 000400 HALT
1922 007652 001375 BIT #400,2CRS ;WAIT FOR OFF-LINE TO CLEAR
1923 BNE .-4
1924
1925 ;A FEED ERROR SHOULD SET BIT 15
1926 007654 104001 ;THIS ERROR OCCURS WHEN THE FEED MECHANISM FAILS TO DELIVER A CARD TO THE READ STATION
1927 007656 004767 001552 TESTD: SCOPE
1928 007662 012702 014536 JSR %7,INIT ;"REMOVE ALL CARDS FROM THE INPUT HOPPER"
1929 007666 004767 002260 MOV #MSG5,R2
1930 007672 012702 014343 JSR %7,TOUT ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
1931 007676 004767 002250 MOV #MSG2,R2
JSR %7,TOUT

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1932	007702	012702	015040	MOV	#MSG8,R2	;"HOLD DOWN THE SWITCH AT THE BOTTOM OF INPUT HOPPER
1933	007706	005767	170720	TST	FLAG	;"CHANGE MESSAGE FOR DOCUMATION READER?"
1934	007712	001402		BEQ	+.6	;"NO
1935	007714	012702	015131	MOV	#MSG8A,R2	;"LIFT SWITCH UNDER RIFFLE CAP
1936	007720	004767	002226	JSR	%7,TOUT	
1937	007724	012702	014224	MOV	#MSG1,R2	;"PRESS CARD READER 'MOTOR START' AND 'READ START'"
1938	007730	005767	170676	TST	FLAG	;"CHANGE MESSAGE FOR DOCUMATION READER?"
1939	007734	001402		BEQ	+.6	;"NO
1940	007736	012702	014307	MOV	#MSG1A,R2	;"PRESS CARD READER 'RESET'"
1941	007742	004767	002204	JSR	%7,TOUT	
1942	007746	004767	002322	JSR	%7,CRLF4	;"MOVE MESSAGE UP ON TTY
1943	007752	000000		HALT		
1944	007754	032713	002000	BIT	#2000,ACRS	;"WAIT FOR CARD READER TO COME ON-LINE
1945	007760	001775		BEQ	-.4	
1946	007762	004767	001446	JSR	%7,INIT	;"INITIALIZE STATUS REGISTER
1947	007766	012713	000003	MOV	#3,ACRS	;"SET EJECT AND READ
1948	007772	005227	000000	INC	#0	;"WAIT AWHILE
1949	007776	001375		BNE	-.4	
1950	010000	005227	000000	INC	#0	
1951	010004	001375		BNE	-.4	
1952	010006	005227	000000	INC	#0	
1953	010012	001375		BNE	-.4	
1954	010014	005227	000000	INC	#0	
1955	010020	001375		BNE	-.4	
1956	010022	032713	000400	BIT	#400,ACRS	;"TEST OFF-LINE BIT
1957	010026	001001		BNE	+.4	;"BRANCH IF SET
1958	010030	104000		HLT		;"BIT 8 WAS NOT SET
1959	010032	005713		TST	ACRS	;"CHECK BIT 15
1960	010034	100401		BMI	+.4	;"BRANCH IF SET
1961	010036	104000		HLT		;"BIT 15 WAS NOT SET
1962	010040	012702	014607	MOV	#MSG6,R2	
1963	010044	004767	002102	JSR	%7,TOUT	;"RESTORE CARDS IN THE INPUT HOPPER"
1964	010050	012702	014224	MOV	#MSG1,R2	;"PRESS CARD READER 'MOTOR START' AND 'READ START'"
1965	010054	005767	170552	TST	FLAG	;"CHANGE MESSAGE FOR DOCUMATION READER?"
1966	010060	001402		BEQ	+.6	;"NO
1967	010062	012702	014307	MOV	#MSG1A,R2	;"PRESS CARD READER 'RESET'"
1968	010066	004767	002060	JSR	%7,TOUT	
1969	010072	012702	014343	MOV	#MSG2,R2	;"THEN HIT 'CONTINUE' ON THE CONSOLE"
1970	010076	004767	002050	JSR	%7,TOUT	
1971	010102	004767	002166	JSR	%7,CRLF4	;"MOVE MESSAGE UP ON TTY
1972	010106	000000		HALT		
1973	010110	032713	000400	BIT	#400,ACRS	;"WAIT FOR OFF-LINE TO CLEAR
1974	010114	001375		BNE	-.4	
1975	010116	005767	170510	TST	FLAG	;"SKIP NEXT TEST IF DOCUMATION READER
1976	010122	001402		BEQ	+.6	
1977	010124	000167	000314	JMP	TESTG	
1978						
1979						
1980						
1981	010130	104001				
1982	010132	004767	001276	JSR	%7,INIT	;"INITIALIZE STATUS REGISTER
1983	010136	012702	014410	MOV	#MSG3,R2	;"PRESS CARD READER 'READ STOP'"
1984	010142	004767	002004	JSR	%7,TOUT	
1985	010146	012702	014343	MOV	#MSG2,R2	;"THEN HIT 'CONTINUE' ON THE CONSOLE"
1986	010152	004767	001774	JSR	%7,TOUT	
1987	010156	012702	015170	MOV	#MSG9,R2	;"BLOCK THE CARD READER STATION TO

;"A MOTION ERROR SHOULD SET BIT 15
;"THIS ERROR OCCURS WHEN A CARD JAM OCCURS AT THE READ STATION

TESTE: SCOPE

1988	010162	004767	001764	JSR	%7, TOUT	; PREVENT A CARD GOING THRU, AND"
1989	010166	012702	014224	MOV	#MSG1, R2	; "PRESS CARD READER 'MOTOR START' AND 'READ START'"
1990	010172	004767	001754	JSR	%7, TOUT	
1991	010176	004767	002072	JSR	%7, CRLF4	; MOVE MESSAGE UP ON TTY
1992	010202	000000		HALT		
1993	010204	032713	002000	BIT	#2000, @CRS	; MONITOR ON-LINE TRANSITION (BIT 10)
1994	010210	001775		BEQ	.-4	; CONTINUE WHEN CARD READER COMES ON-LINE
1995	010212	012713	000003	MOV	#3, @CRS	; READ A CARD AND SET EJECT
1996	010216	032713	140000	BIT	#140000, @CRS	; CHECK DONE AND SPECIAL CONDITION BITS
1997	010222	001775		BEQ	.-4	; WAIT
1998	010224	005713		TST	@CRS	; CHECK SPECIAL CONDITION BIT
1999	010226	100401		BMI	.-+4	; CONTINUE IF SET
2000	010230	104000		HLT		; SPECIAL CONDITION NOT SET
2001	010232	012702	015272	MOV	#MSG10, R2	; "REMOVE JAMMED CARD"
2002	010236	004767	001710	JSR	%7, TOUT	
2003	010242	012702	014224	MOV	#MSG1, R2	; "PRESS CARD READER 'MOTOR START' AND 'READ START'"
2004	010246	004767	001700	JSR	%7, TOUT	
2005	010252	012702	014343	MOV	#MSG2, R2	; "THEN HIT 'CONTINUE' ON THE CONSOLE"
2006	010256	004767	001670	JSR	%7, TOUT	
2007	010262	004767	002006	JSR	%7, CRLF4	; MOVE MESSAGE UP ON TTY
2008	010266	000000		HALT		
2009	010270	032713	000400	BIT	#400, @CRS	; WAIT FOR OFF-LINE TO CLEAR
2010	010274	001375		BNE	.-4	
2011						
2012						
2013						
2014	010276	104001				
2015	010300	004767	001130	JSR	%7, INIT	; INITIALIZE STATUS REGISTER
2016	010304	012702	014410	MOV	#MSG3, R2	; "PRESS CARD READER 'READ STOP'"
2017	010310	004767	001636	JSR	%7, TOUT	
2018	010314	012702	014343	MOV	#MSG2, R2	; "THEN HIT 'CONTINUE' ON THE CONSOLE"
2019	010320	004767	001626	JSR	%7, TOUT	
2020	010324	012702	015317	MOV	#MSG11, R2	; "HOLD THE OUTPUT STACKER GATE OPEN. THEN"
2021	010330	004767	001616	JSR	%7, TOUT	
2022	010334	012702	014224	MOV	#MSG1, R2	; "PRESS CARD READER 'MOTOR START' AND
2023	010340	004767	001606	JSR	%7, TOUT	; 'READ START.'"
2024	010344	004767	001724	JSR	%7, CRLF4	; MOVE MESSAGE UP ON TTY
2025	010350	000000		HALT		
2026	010352	032713	002000	BIT	#2000, @CRS	; WAIT FOR CARD READER TO COME ON-LINE
2027	010356	001775		BEQ	.-4	
2028	010360	012701	000003	MOV	#3, COUNT	; INITIALIZE COUNTER TO READ 3 CARDS
2029	010364	012713	000003	MOV	#3, @CRS	; EJECT A CARD
2030	010370	032713	140000	BIT	#140000, @CRS	; WAIT FOR CARD DONE OR SPECIAL CONDITION
2031	010374	001775		BEQ	.-4	
2032	010376	005301		DEC	COUNT	; COUNT DOWN
2033	010400	001371		BNE	LOOPF	; READ 3 CARDS ALL TOGETHER
2034	010402	005713		TST	@CRS	; CHECK SPECIAL CONDITION BIT 15
2035	010404	100401		BMI	.-+4	; BRANCH IF SET
2036	010406	104000		HLT		; SPECIAL CONDITION NOT SET
2037	010410	012702	014224	MOV	#MSG1, R2	; "PRESS CARD READER 'MOTOR START' AND 'READ START'"
2038	010414	004767	001532	JSR	%7, TOUT	
2039	010420	012702	014343	MOV	#MSG2, R2	; "THEN HIT 'CONTINUE' ON THE CONSOLE"
2040	010424	004767	001522	JSR	%7, TOUT	
2041	010430	004767	001640	JSR	%7, CRLF4	; MOVE MESSAGE UP ON TTY
2042	010434	000000		HALT		
2043	010436	032713	000400	BIT	#400, @CRS	; WAIT FOR OFF-LINE TO CLEAR

: A STACK FAIL ERROR SHOULD SET BIT 15
: ERROR OCCURS WHEN 3 CARDS IN A ROW HAVE NOT BEEN DELIVERED PROPERLY TO THE OUTPUT STACK
TESTF: SCOPE

LOOPF:

2100
2101
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2122
2123

010676	104007		
010700	012702	016273	
010704	004767	167742	
010710	012702	016115	
010714	004767	001232	
010720	104004		
010722	016767	167674	000062
010730	062767	000002	000054
010736	032777	010000	167652
010744	001404		
010746	042767	000020	167022
010754	000403		
010756	052767	000020	167012
010764	005067	001156	
010770	012767	011002	001152
010776	000177	000010	
011002	005067	001140	
011006	000177	000000	
011012	000000		

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

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TESTX:  TIT
        MOV     #SUBT4,R2
        JSR     %7,SETUP           ;SETUP POINTERS AND FLAGS
        MOV     #STADD,R2
        JSR     PC,TOUT
        READC
        MOV     TMP1,RETRNX
        ADD     #2,RETRNX
        BIT     #10000,%SWR
        BEQ     .+12
        BIC     #20,PSR
        BR      .+10
        BIS     #20,PSR
        CLR     ITCNT
        MOV     %XLOOP,RETURN
        JMP     @RETRNX
XLOOP:  CLR     ITCNT
        JMP     @RETRNX
RETRNX: 0
    
```

:CHANGE TO FIRST ADDRESS AFTER SCOPE INSTRUCTION
:CHECK SW12
:BRANCH IF NOT SET
:CLEAR TRACE BIT
:SKIP NEXT INSTRUCTION
:SET TRACE BIT
:CLEAR ITERATION COUNTER
:LOAD RETURN ADDRESS
:JUMP TO TEST
:KEEP ITERATION COUNTER AT ZERO
:JUMP TO TEST

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2179

011014 104007
011016 012702 016316
011022 004767 167624
011026 012702 016066
011032 004767 001114
011036 104004
011040 016767 167556 000364
011046 042767 170000 000356
011054 005067 000350
011060 005067 000342
011064 005067 167560
011070 005067 175554
011074 104003
011076 032713 000400
011102 001017
011104 005213
011106 005267 000316
011112 105713
011114 100426
011116 032713 040000
011122 001015
011124 005713
011126 100371
011130 032713 000400
011134 001002
011136 104000
011140 000753
011142 004767 000314
011146 032713 000400
011152 001375
011154 000745
011156 022767 000120 175464
011164 001741
011166 104000
011170 000737
011172 011467 175454
011176 005267 175446
011202 105713
011204 100002
011206 104000
011210 000727
011212 012701 000200
011216 005301

:ROUTINE TO CHECK CARDS WHICH HAVE ALL COLUMNS IDENTICALLY PUNCHED.
:THIS ROUTINE ALLOWS SPECIFIC TYPES OF DATA FAILURES TO BE STUDIED
:EASILY THE PATTERN IS STORED, AND THEN
:EACH COLUMN OF EACH CARD IS READ TWICE AND COMPARED WITH IT. IF A
:DISCREPANCY OCCURS, THE ERROR IS PRINTED OUT ALONG WITH THE TOTAL
:NUMBER OF CARDS READ AND THE TOTAL NUMBER OF DATA ERRORS DISCOVERED
:UP TO THAT POINT (ALL PRINTOUTS ARE IN OCTAL). WHEN THE INPUT HOPPER
:IS EMPTY, THE ROUTINE RINGS THE BELL AND WAITS FOR MORE CARDS TO BE
:LOADED AND THE CARD READER TO BE PUT BACK ON-LINE.
:SW15=1 CAUSES A HALT AFTER AN ERROR, AND SW13=1 INHIBITS ERROR PRINTOUTS.

CKSAME: TIT
MOV #SUBTS,R2
JSR %7,SETUP ;INITIALIZE POINTERS
MOV #CINPAT,R2
JSR PC,TOUT
READC
MOV TMP1,CARDIM
BIC #170000,CARDIM ;CLEAR UPPER BITS OF PATTERN
CLR TOTCRD ;INITIALIZE CARD COUNT
CLR TOTERR ;INITIALIZE ERROR COUNT
CLR ERFLG ;CLEAR FLAG FOR PRINTING ERROR HEADING
CKLOOP: CLR CLCNT ;INITIALIZE COLUMN COUNT
KBINTT
BIT #400,CRS ;CHECK BIT 8
BNE CKSIT ;BRANCH IF SET TO WAIT FOR READER TO COME ON-LINE.
INC CRCS ;START READING CARD
INC TOTCRD ;INCREMENT CARD COUNT
CKLP1: TSTB CRCS ;CHECK COLUMN READY
BMI CKCOL ;BRANCH IF SET
BIT #40000,CRS ;CHECK CARD DONE
BNE CKCRD ;BRANCH IF SET
TST CRCS ;CHECK SPECIAL CONDITION
BPL CKLP1 ;LOOP IF NOT SET
BIT #400,CRS ;CHECK BIT 8
BNE CKSIT ;BRANCH IF SET TO WAIT FOR READER ON-LINE.
HLT ;SPECIAL CONDITION SET, BIT 8 CLEAR
BR CKLOOP
CKSIT: JSR %7,BELL ;RING BELL TO SIGNIFY READER OFF-LINE
CKSIT1: BIT #400,CRS ;CHECK BIT 8
BNE CKSIT1 ;LOOP IF STILL SET
BR CKLOOP ;START NEXT CARD
CKCRD: CMP #80,CLCNT ;CHECK FOR 80 COLUMNS READ
BEQ CKLOOP ;START NEXT CARD IF OK
HLT ;FINAL COLUMN COUNT WASN'T 80
BR CKLOOP ;START NEXT CARD
CKCOL: MOV CRCS,DATA1 ;READ DATA BUFFER
INC CLCNT ;COUNT COLUMNS
TSTB CRCS ;CHECK COLUMN READY
BPL .+6 ;BRANCH IF OK
HLT ;READING DBR DIDN'T CLEAR READY
BR CKLOOP ;START NEXT CARD AFTER ERROR
CKLP2: MOV #200,COUNT ;WAIT AWHILE
DEC COUNT


```

2236
2237 011462 105777 167124 :BELL ON PASS COMPLETE
2238 011466 100375 BELL: TSTB @TCSR ;WAIT FOR TTY READY
2239 011470 012777 000207 167116 BPL -4
2240 011476 012767 000001 000440 MOV @207,@TDBR ;RING BELL
2241 011504 000207 RTS @1,ITMAX ;MAKE CERTAIN ITERATION MAXIMUM IS CORRECT
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: BIT @400,@CRS ;CHECK BIT 8
2246 011512 001001 BNE +4 ;BRANCH IF SET
2247 011514 000207 RTS %7 ;RETURN IF NOT SET
2248 011516 012702 015744 MOV @MSG18,R2 ;OUTPUT MESSAGE
2249 011522 004767 000424 JSR %7,TOUT ;"BIT 8 WAS SET"
2250 011526 012702 015661 MOV @MSG17,R2 ;"REMEDY THE ERROR CONDITION
2251 011532 004767 000414 JSR %7,TOUT ;AND PRESS 'CONTINUE'"
2252 011536 000000 HALT ;WAIT FOR CONTINUE
2253 011540 000762 BR CKBIT8 ;CHECK AGAIN
2254
2255 :SUBROUTINE TO ISSUE N SPACES
2256 :N 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 SPACE: TSTB @TCSR ;WAIT FOR TTY READY
2260 011546 100375 BPL -4
2261 011550 012777 000240 167036 MOV @240,@TDBR ;OUTPUT A SPACE
2262 011556 005367 000010 DEC SPACEX ;DECREMENT COUNT
2263 011562 100367 BPL SPACE ;LOOP IF NOT DONE
2264 011564 005067 000002 CLR SPACEX ;RESET COUNT TO ZERO
2265 011570 000207 RTS %7 ;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 011574 104003 PRINT: KBINTT
2273 011576 037727 167014 020000 BIT @SMR,@20000 ;TEST FOR INHIBIT PRINT OUT
2274 011604 001401 BEQ +4 ;BRANCH TO PRINT
2275 011606 000437 BR B.CK ;INHIBIT, CHECK FOR HALT
2276 011610 012667 000114 MOV (6)+,SAVPC ;PC OF FAILING ROUTINE
2277 011614 012667 000112 MOV (6)+,SAVPSR ;PSR OR ERROR CONDITION
2278 011620 024646 CMP -(6),-(6) ;RESTORE STACK
2279 011622 004767 000414 JSR %7,CALF ;OUTPUT CARRIAGE RETURN, LINEFEED
2280 011626 010267 000070 MOV %2,SAVR2 ;SAVE R2
2281 011632 016702 000072 MOV SAVPC,%2
2282 011636 004767 000072 JSR %7,PROCT ;PRINT PC+2 IN OCTAL
2283 011642 105777 166744 TSTB @TCSR ;WAIT FOR TTY READY
2284 011646 100375 BPL -4
2285 011650 012777 000240 166736 MOV @240,@TDBR ;OUTPUT A SPACE
2286 011656 016702 000050 MOV SAVPSR,%2
2287 011662 004767 000046 JSR %7,PROCT ;PRINT PROCESSOR STATUS AT TIME OF FAILURE
2288 011666 016702 000030 MOV SAVR2,%2 ;RESTORE REGISTER 2
2289 011672 105777 166714 TSTB @TCSR ;WAIT FOR TTY READY
2290 011676 100375 BPL -4
2291 011700 012777 000240 166706 MOV @240,@TDBR

```

```

2292 011706 104003
2293 011710 005777 166702
2294 011714 100001
2295 011716 000000
2296 011720 000002
2297 011722 000000
2298 011724 000000
2299 011726 000000
2300 011730 000000
2301 011732 000000
2302
2303 011734 010367 177764
2304 011740 010467 177762
2305 011744 005004
2306 011746 005001
2307 011750 012703 000260
2308 011754 005702
2309 011756 100001
2310 011760 005203
2311 011762 006102
2312 011764 006102
2313 011766 005501
2314 011770 105777 166616
2315 011774 100375
2316 011776 010377 166612
2317 012002 005204
2318 012004 020427 000006
2319 012010 001005
2320 012012 016703 177706
2321 012016 016704 177704
2322 012022 000207
2323 012024 000241
2324 012026 005701
2325 012030 001402
2326 012032 005001
2327 012034 000261
2328 012036 006102
2329 012040 006102
2330 012042 006102
2331 012044 005501
2332 012046 010203
2333 012050 042703 177770
2334 012054 052703 000260
2335 012060 000743
2336
2337 012062 104003
2338 012064 032777 040000 166524
2339 012072 001012
2340 012074 032777 004000 166514
2341 012102 001013
2342 012104 026767 000036 000032
2343 012112 100007
2344 012114 005267 000026
2345 012120 022606
2346 012122 012667 165650
2347 012126 000177 000016

```

```

B.CK: KBINTT
      TST @SWR ;CHECK SR FOR HALT SWITCH
      BPL .+4 ;BRANCH IF NOT SET
      HALT ;HALT ON ERROR UP
      RTI ;RETURN TO MAIN LINE

SAVR2: 0
SAVR3: 0
SAVR4: 0
SAVPC: 0
SAVPSR: 0

PROCT: MOV %3,SAVR3 ;SAVE R3
      MOV %4,SAVR4 ;SAVE R4
      CLR %4 ;CLEAR R4 TO USE AS COUNTER
      CLR COUNT ;CLEAR COUNT TO USE AS CARRY FLAG
      MOV @260,%3 ;SETUP ASCII ZERO IN R3
      TST %2 ;CHECK BIT 15 OF DESIRED NUMBER
      BPL .+4 ;BRANCH IF NOT SET
      INC %3 ;CHANGE TO ASCII ONE
      ROL %2 ;ROTATE INTO RIGHTMOST BIT
      ROL %2 ;TO PREPARE FOR LOOP
      ADC COUNT ;STORE CARRY
      TSTB @TCSR ;WAIT FOR TTY READY
      BPL C.WAIT

      MOV %3,@TDBR ;OUTPUT ASCII
      INC %4 ;COUNT CHARACTERS OUTPUT
      CMP %4,@6 ;CHECK FOR DONE
      BNE C.CONT ;BRANCH IF NOT DONE
      MOV SAVR3,%3 ;RESTORE REGISTER 3
      MOV SAVR4,%4 ;RESTORE REGISTER 4
      RTS ;RETURN

C.CONT: CLC ;CLEAR CARRY
      TST COUNT ;TEST CARRY FLAG
      BEQ .+6 ;BRANCH IF NOT SET
      CLR COUNT ;CLEAR FLAG
      SEC ;SET CARRY
      ROL %2 ;ROTATE NEXT 3 BITS INTO RIGHTMOST 3
      ROL %2
      ROL %2
      ADC COUNT ;STORE CARRY
      MOV %2,%3 ;MOVE DATA FOR OUTPUT
      BIC @177770,%3 ;CLEAR ALL BUT RIGHTMOST 3 BITS
      BIS @260,%3 ;SET TO ASCII EQUIVALENT
      BR C.WAIT ;LOOP

;SCOPE AND/OR ITERATION LOOP FOR EACH TEST 2 TIMES
SCOPEC: KBINTT
      BIT @40000,@SWR ;TEST SR FOR SCOPE
      BNE D.1 ;YES,SCOPE
      BIT @4000,@SWR ;NO- TEST FOR ITERATION
      BNE D.2 ;INHIBIT ITERATION
      CMP ITCNT,ITMAX ;CHECK FOR ITERATIONS COMPLETE
      BPL D.2 ;EXIT-DONE
      INC ITCNT ;INCREMENT COUNT
      CMP (6)+,%6 ;REPOSITION STACK POINTER
      MOV (6)+,PSR ;RESTORE PROCESSOR STATUS
      JMP @RETURN ;RETURN TO RERUN TEST

```

```

2345 012132 005067 000010
2346 012136 011667 000006
2347 012142 000002
2348 012144 000001
2349 012146 000000
2350 012150 001022
2351
2352
2353
2354
2355
2356
2357 012152 142777 000177 166432
2358 012160 111267 000054
2359 012164 005202
2360 012166 121267 000046
2361 012172 001006
2362 012174 105777 166412
2363 012200 100375
2364 012202 005077 166406
2365 012206 000207
2366 012210 121227 000100
2367 012214 001003
2368 012216 004767 000020
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 000215 166336
2380 012256 105777 166330
2381 012262 100375
2382 012264 112777 000212 166322
2383 012272 000207
2384
2385
2386 012274 004767 177742
2387 012300 004767 177736
2388 012304 004767 177732
2389 012310 004767 177726
2390 012314 000207
2391
2392 012316 022767 000176 166272
2393 012324 001403
2394 012326 062716 000002
2395 012332 000504
2396 012334 012702 016055
2397 012340 004767 177606
2398 012344 016702 165626
2399 012350 004767 177360
2400 012354 012702 016040
2401 012360 004767 177566
2402 012364 005067 166232
2403 012370 012767 000007 166232

```

```

D.2: CLR ITCNT :CLEAR COUNTER
      MOV %7, RETURN :SAVE SCOPE RETURN POINTER
      RTI :RETURN IN LINE-NEXT TEST
ITMAX: 1 :MAX NUMBER OF ITERATIONS
ITCNT: 0 :COUNT LOCATION FOR ITERATION LOOP
RETURN: TEST1+2 :ADDRESS OF LAST TEST

:MOV ADDRESS OF MESSAGE TO REGISTER 2
:THEN JSR %7, TOUT
TOUT: BICB #177, @TCSR :CLEAR INT FLAG
      MOVB %2, L.EOMK :MOVE IN EOM MARKER
L.INC: INC %2 :MOVE DATA POINTER TO NEXT BYTE
L.TOUT: CMPB %2, L.EOMK :COMPARE FOR EOM
       BNE L.CNT :BRANCH IF NOT END OF MESSAGE
       TSTB @TCSR :WAIT FOR TTY READY
       BPL -4
       CLR @TDBR :OUTPUT NULL
       RTS %7 :RETURN IF EOM
L.CNT: CMPB %2, #'a :CHECK FOR CR, LF REQUEST
       BNE .+10 :BRANCH IF NOT
       JSR %7, CRLF :OUTPUT CARRIAGE RETURN, LINEFEED
       BR L.INC :LOOP
       TSTB @TCSR :WAIT FOR TTY
       BPL -4
       MOVB (2)+, @TDBR :OUTPUT NEXT CHARACTER
       BR L.TOUT :CONTINUE
L.EOMK: 0

:SUBROUTINE TO ISSUE CARRIAGE RETURN AND LINEFEED
CRLF: TSTB @TCSR :WAIT FOR TTY READY
      BPL -4
      MOVB #215, @TDBR :SEND CARRIAGE RETURN
      TSTB @TCSR :WAIT FOR TTY
      BPL -4
      MOVB #212, @TDBR :SEND LINE FEED
      RTS %7 :RETURN

:DO 4 CRLF'S TO MOVE MESSAGES ON TELETYPE
CRLF4: JSR %7, CRLF
       JSR %7, CRLF
       JSR %7, CRLF
       JSR %7, CRLF
       RTS %7

CNTLUU: CMP #SWREG, SWR
        BEQ 1$
        ADD #2, (SP)
        BR OUT
1$: MOV #SWREQ, R2
   JSR PC, TOUT
   MOV SWREG, R2
   JSR PC, PROCT
   MOV #NEWIS, R2
   JSR PC, TOUT
AGN: CLR TMP1
     MOV #7, CSNT

```

```

404 012376 105777 166204
405 012402 100375
406 012404 117767 166200 166214
407 012412 116777 166210 166174
408 012420 142767 000200 166200
409 012426 122767 000025 166172
410 012434 001005
411 012436 012702 016205
412 012442 004767 177504
413 012446 000746
414 012450 122767 000015 166150
415 012456 001430
416 012460 122767 000060 166140
417 012466 003027
418 012470 122767 000067 166130
419 012476 002423
420 012500 142767 000060 166120
421 012506 006367 166110
422 012512 006367 166104
423 012516 006367 166100
424 012522 156767 166100 166072
425 012530 005367 166074
426 012534 001404
427 012536 000717
428 012540 004767 177476
429 012544 000002
430 012546 012702 016027
431 012552 004767 177374
432 012556 000702
433
434
435
436
437 012560 016746 165222
438 012564 016746 165214
439 012570 012767 012610 165206
440 012576 022777 177777 166012
441 012604 001402
442 012606 000407
443 012610 022626
444 012612 012767 000176 165776
445 012620 012767 000174 165772
446 012626 012667 165152
447 012632 012667 165150
448 012636 000002
449 012640 022767 000176 165750
450 012646 001016
451 012650 005067 165746
452 012654 117767 165730 165740
453 012662 142767 000200 165732
454 012670 122767 000007 165724
455 012676 001002
456 012700 104002
457 012702 104006
458 012704 000002

```

```

READ: TSTB JKBCSR
      BPL READ
      MOVB JKBOBR,TIB
      MOVB TIB,JDDBR
      BICB #200,TIB
      CMPB #25,TIB
      BNE 2$
      MOV #CTLU,R2
      JSR PC,TOUT
      BR AGN
2$: CMPB #15,TIB
   BEQ 1$
   CMPB #60,TIB
   BGT INERRR
   CMPB #67,TIB
   BLT INERRR
   BICB #60,TIB
   ASL TMP1
   ASL TMP1
   ASL TMP1
   BISB TIB,TMP1
   DEC CSNT
   BEQ INERRR
   BR READ
1$: JSR %7,CRLF
OUT: RTI
INERRR: MOV #QEST,R2
      JSR PC,TOUT
      BR AGN

```

:ROUTINE TO CHECK EXISTANCE OF SWREG

```

SUSWR: MOV 6,-(SP)
      MOV 4,-(SP)
      MOV #1$,%4
      CMF #-1,%SWR
      BEQ 2$
      BR 3$
1$: CMP (SP)+,(SP)+
2$: MOV #SWREG,SWR
3$: MOV #DISPREG,DISPLAY
   MOV (SP)+,%4
   MOV (SP)+,%6
   RTI
KBINT: CMP #SWREG,SWR
      BNE 1$
      CLR TMP1
      MOVB JKBOBR,TMP1
      BICB #200,TMP1
      CMPB #7,TMP1
      BNE 1$
      CNTLU
      CKU
1$: RTI

```

012706
012712
012714
012720
012724
012730
012732
012740
012742
012750
012752
012754
012760
012764
012766
012772
012776
013002
013004
013006
013010
013012
013014
013016
013020
013022

005767 165712
001406
012702 016143
004767 177226
005067 165674
000002
122767 000007 165670
001403
016777 165654 165646
000002
011646
162716 000002
017616 000000
006316
042716 177001
062716 013004
017616 000000
000136
011574
011062
012316
012640
012376
012560
012732
012706

:TYPE THE MAIN TITLE
↑TITYP: TST TIFLG
BEQ 1\$
MOV #TITL,R2
JSR %7,TOUT
CLR TIFLG
IS: RTI
CKUU: CMPB #7,CSNT
BEQ 1\$
MOV TMP1,SWR
IS: RTI
EMTSRV: MOV (SP),-(SP)
SUB #2,(SP)
MOV @ (SP), (SP)
ASL (SP)
BIC #177001,(SP)
ADD #EMTTAB,(SP)
MOV @ (SP), (SP)
JMP @ (SP)+
EMTTAB: PRINT
SCOPEC
CNTLUU
KBINT
READ
SUSWR
CKUU
TITYP

: CALLED BY EMT HLT
: CALLED BY EMT SCOPE
: CALLED BY EMT CNTLU
: CALLED BY EMT KBINTT
: CALLED BY EMT FEADC
: CALLED BY EMT SUSWR
: CALLED BY EMT CKU
: CALLED BY EMT TIT

:DATA TABLES FOR DATA RELIABILITY TESTS

:ALPHANUMERIC DECK DATA TABLE
:FIRST VALUE FOR A COLUMN IS THE DIRECT
:CARD IMAGE FOR THAT COLUMN ON CARD 1
:THE SECOND VALUE IS THE ENCODED FORM OF THAT DATA

:COLUMN CHAR HOLLERITH

2492
2493
2494
2495
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2497
2498
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2500
2501
2502
2503
2504
2505
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2541
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2543
2544
2545
2546
2547

013024 004000
013026 000200
013030 004400
013032 000201
013034 004200
013036 000202
013040 004100
013042 000203
013044 004040
013046 000204
013050 004020
013052 000205
013054 004010
013056 000206
013060 004004
013062 000207
013064 004002
013066 000210
013070 004001
013072 000220
013074 004202
013076 000212
013100 004102
013102 000213
013104 004042
013106 000214
013110 004022
013112 000215
013114 004012
013116 000216
013120 004006
013122 000217
013124 002000
013126 000100
013130 002400
013132 000101
013134 002200
013136 000102
013140 002100
013142 000103
013144 002040
013146 000104
013150 002020
013152 000105
013154 002010
013156 000106
013160 002004
013162 000107

ALPCD: 4000
200
4400
201
4200
202
4100
203
4040
204
4020
205
4010
206
4004
207
4002
210
4001
220
4202
212
4102
213
4042
214
4022
215
4012
216
4006
217
2000
100
2400
101
2200
102
2100
103
2040
104
2020
105
2010
106
2004
107

:1 B 12
:2 A 12 1
:3 B 12 2
:4 C 12 3
:5 D 12 4
:6 E 12 5
:7 F 12 6
:8 G 12 7
:9 H 12 8
:10 I 12 9
:11 CENT 12 8 2
:12 . 12 8 3
:13 < 12 8 4
:14 (12 8 5
:15 + 12 8 6
:16 1 12 8 7
:17 - 11
:18 J 11 1
:19 K 11 2
:20 L 11 3
:21 M 11 4
:22 N 11 5
:23 O 11 6
:24 P 11 7

2548	013164	002002	2002	;25	Q	11 8
2549	013166	000110	110			
2550	013170	002001	2001	;26	R	11 9
2551	013172	000120	120			
2552	013174	002202	2202	;27	:	11 8 2
2553	013176	000112	112			
2554	013200	002102	2102	;28	\$	11 8 3
2555	013202	000113	113			
2556	013204	002042	2042	;29	*	11 8 4
2557	013206	000114	114			
2558	013210	002022	2022	;30)	11 8 5
2559	013212	000115	115			
2560	013214	002012	2012	;31	:	11 8 6
2561	013216	000116	116			
2562	013220	002006	2006	;32	BLANK	11 8 7
2563	013222	000117	117			
2564	013224	001000	1000	;33	0	0
2565	013226	000040	40			
2566	013230	001400	1400	;34	/	0 1
2567	013232	000041	41			
2568	013234	001200	1200	;35	S	0 2
2569	013236	000042	42			
2570	013240	001100	1100	;36	T	0 3
2571	013242	000043	43			
2572	013244	001040	1040	;37	U	0 4
2573	013246	000044	44			
2574	013250	001020	1020	;38	V	0 5
2575	013252	000045	45			
2576	013254	001010	1010	;39	W	0 6
2577	013256	000046	46			
2578	013260	001004	1004	;40	X	0 7
2579	013262	000047	47			
2580	013264	001002	1002	;41	Y	0 8
2581	013266	000050	50			
2582	013270	001001	1001	;42	Z	0 9
2583	013272	000060	60			
2584	013274	001202	1202	;43		0 8 2
2585	013276	000052	52			
2586	013300	001102	1102	;44	.	0 8 3
2587	013302	000053	53			
2588	013304	001042	1042	;45	%	0 8 4
2589	013306	000054	54			
2590	013310	001022	1022	;46	-	0 8 5
2591	013312	000055	55			
2592	013314	001012	1012	;47	>	0 8 6
2593	013316	000056	56			
2594	013320	001006	1006	;48	?	0 8 7
2595	013322	000057	57			
2596	013324	000000	0000	;49		BLANK
2597	013326	000000	0			
2598	013330	000400	0400	;50	1	1
2599	013332	000001	1			
2600	013334	000200	0200	;51	2	2
2601	013336	000002	2			
2602	013340	000100	0100	;52	3	3
2603	013342	000003	3			

2604	013344	000040	0040	;53	4	4
2605	013346	000004	4			
2606	013350	000020	0020	;54	5	5
2607	013352	000005	5			
2608	013354	000010	0010	;55	6	6
2609	013356	000006	6			
2610	013360	000004	0004	;56	7	7
2611	013362	000007	7			
2612	013364	000002	0002	;57	8	8
2613	013366	000010	10			
2614	013370	000001	0001	;58	9	9
2615	013372	000020	20			
2616	013374	000202	0202	;59	:	8 2
2617	013376	000012	12			
2618	013400	000102	0102	;60	*	8 3
2619	013402	000013	13			
2620	013404	000042	0042	;61	A	8 4
2621	013406	000014	14			
2622	013410	000022	0022	;62	.	8 5
2623	013412	000015	15			
2624	013414	000012	0012	;63	=	8 6
2625	013416	000016	16			
2626	013420	000006	0006	;64	"	8 7
2627	013422	000017	17			
2628	013424	004000	4000	;65	&	12
2629	013426	000200	200			
2630	013430	004400	4400	;66	A	12 1
2631	013432	000201	201			
2632	013434	004200	4200	;67	B	12 2
2633	013436	000202	202			
2634	013440	004100	4100	;68	C	12 3
2635	013442	000203	203			
2636	013444	004040	4040	;69	C	12 4
2637	013446	000204	204			
2638	013450	004020	4020	;70	E	12 5
2639	013452	000205	205			
2640	013454	004010	4010	;71	F	12 6
2641	013456	000206	206			
2642	013460	004004	4004	;72	G	12 7
2643	013462	000207	207			
2644	013464	004002	4002	;73	H	12 8
2645	013466	000210	210			
2646	013470	004001	4001	;74	I	12 9
2647	013472	000220	220			
2648	013474	004202	4202	;75	CENT	12 8 2
2649	013476	000212	212			
2650	013500	004102	4102	;76	.	12 8 3
2651	013502	000213	213			
2652	013504	004042	4042	;77	<	12 8 4
2653	013506	000214	214			
2654	013510	004022	4022	;78	(12 8 5
2655	013512	000215	215			
2656	013514	004012	4012	;79	+	12 8 6
2657	013516	000216	216			
2658	013520	004006	4006	;80	1	12 8 7
2659	013522	000217	217			

ALPEND: 217

```

2660
2661
2662
2663
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 003004
2678 013560 003100
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
    
```

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: BINARY DECK DATA TABLE
: FIRST VALUE FOR A COLUMN IS THE DIRECT CARD IMAGE OF THAT COLUMN ON CARD1
: THE SECOND VALUE IS THE ENCODED VALUE, WHICH ORS THE OCTAL REPRESENTATION OF
: ROWS ONE THRU SEVEN
BINCD: 0 ; CARD COLUMN 1
    
```

```

0
0
1 ;2
20
2 ;3
10
4 ;4
7
10 ;5
6
20 ;6
5
40 ;7
4
100 ;8
3
200 ;9
2
400 ;10
1
1000 ;11
40
2000 ;12
100
4000 ;13
200
1111 ;14
67
2222 ;15
117
3333 ;16
177
4444 ;17
207
5555 ;18
267
6666 ;19
317
7777 ;20
377
1010 ;21
46
1212 ;22
56
1313 ;23
77
1414 ;24
47
1515 ;25
67
1616 ;26
57
    
```

2716	013674	001717	1717	:27
2717	013676	000077	77	
2718	013700	002020	2020	:28
2719	013702	000105	105	
2720	013704	002121	2121	:29
2721	013706	000127	127	
2722	013710	002323	2323	:30
2723	013712	000137	137	
2724	013714	002424	2424	:31
2725	013716	000107	107	
2726	013720	002525	2525	:32
2727	013722	000127	127	
2728	013724	002626	2626	:33
2729	013726	000117	117	
2730	013730	002727	2727	:34
2731	013732	000137	137	
2732	013734	003030	3030	:35
2733	013736	000147	147	
2734	013740	003131	3131	:36
2735	013742	000167	167	
2736	013744	003232	3232	:37
2737	013746	000157	157	
2738	013750	003434	3434	:38
2739	013752	000147	147	
2740	013754	003535	3535	:39
2741	013756	000167	167	
2742	013760	003636	3636	:40
2743	013762	000157	157	
2744	013764	003737	3737	:41
2745	013766	000177	177	
2745	013770	004040	4040	:42
2747	013772	000204	204	
2748	013774	004141	4141	:43
2749	013776	000227	227	
2750	014000	004242	4242	:44
2751	014002	000216	216	
2752	014004	004343	4343	:45
2753	014006	000237	237	
2754	014010	004545	4545	:46
2755	014012	000227	227	
2756	014014	004646	4646	:47
2757	014016	000217	217	
2758	014020	004747	4747	:48
2759	014022	000237	237	
2760	014024	005050	5050	:49
2761	014026	000246	246	
2762	014028	005151	5151	:50
2763	014030	000267	267	
2764	014034	005252	5252	:51
2765	014036	000256	256	
2766	014040	005353	5353	:52
2767	014042	000277	277	
2768	014044	005454	5454	:53
2769	014046	000247	247	
2770	014050	005656	5656	:54
2771	014052	000257	257	

2772	014054	005757	5757	:55
2773	014056	000277	277	
2774	014060	006060	6060	:56
2775	014062	000305	305	
2776	014064	006161	6161	:57
2777	014066	000327	327	
2778	014070	006262	6262	:58
2779	014072	000317	317	
2780	014074	006363	6363	:59
2781	014076	000337	337	
2782	014100	006464	6464	:60
2783	014102	000307	307	
2784	014104	006565	6565	:61
2785	014106	000327	327	
2786	014110	006767	6767	:62
2787	014112	000337	337	
2788	014114	007070	7070	:63
2789	014116	000347	347	
2790	014120	007171	7171	:64
2791	014122	000367	367	
2792	014124	007272	7272	:65
2793	014126	000357	357	
2794	014130	007373	7373	:66
2795	014132	000377	377	
2796	014134	007474	7474	:67
2797	014136	000347	347	
2798	014140	007575	7575	:68
2799	014142	000367	367	
2800	014144	007676	7676	:69
2801	014146	000357	357	
2802	014150	000101	0101	:70
2803	014152	000023	23	
2804	014154	000202	0202	:71
2805	014156	000012	12	
2806	014160	000303	0303	:72
2807	014162	000033	33	
2808	014164	000404	0404	:73
2809	014166	000007	7	
2810	014170	000505	0505	:74
2811	014172	000027	27	
2812	014174	000606	0606	:75
2813	014176	000017	17	
2814	014200	000707	0707	:76
2815	014202	000037	37	
2816	014204	003210	3210	:77
2817	014206	000146	146	
2818	014210	000123	0123	:78
2819	014212	000037	37	
2820	014214	007654	7654	:79
2821	014216	000347	347	
2822	014220	004567	4567	:80
2823	014222	000237	237	
2824	014224	040057	040057	
2825	014232	020123	040503	042122
2826	014240	051040	040505	042504
2827	014245	020122	046447	052117

BINEND: MSG1: .ASCII ;/DPRESS CARD READER 'MOTOR START' AND 'READ START' ;

2828	014254	051117	051440	040524	
2829	014252	052122	020047	047101	
2830	014270	020104	051047	040505	
2831	014276	020104	052123	051101	
2832	014304	023524	057		
2833	014307	057	050100	042522	MSG1A: .ASCII ;/PRESS CARD READER 'RESET'/;
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	MSG2: .ASCII ;/THEN HIT 'CONTINUE' ON THE CONSOLE/;
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	MSG3: .ASCII ;/PRESS CARD READER 'READ STOP'/;
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	MSG3A: .ASCII ;/PRESS CARD READER 'STOP'/;
2852	014456	020123	040503	042122	
2853	014464	051040	040505	042504	
2854	014472	020122	051447	047524	
2855	014500	023520	057		
2856	014503	057	052100	042510	MSG4: .ASCII ;/THE INTERRUPT LEVEL WAS /;
2857	014510	044440	052116	051105	
2858	014516	052522	052120	046040	
2859	014524	053105	046105	053440	
2860	014532	051501	027440		
2861	014536	040057	042522	047515	MSG5: .ASCII ;/REMOVE ALL CARDS FROM THE INPUT HOPPER/;
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	MSG6: .ASCII ;/RESTORE CARDS IN THE INPUT HOPPER/;
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	MSG7: .ASCII ;/RAISE OUTPUT STACKER PRESSURE ARM SLIGHTLY ABOVE HORIZONTAL & 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	

DZCRA-D
DZCRA.SRCCR11 DIAGNOSTIC TEST
12-MAR-76 00:00

MACY11 27(1006) 21-SEP-76 16:56 PAGE 57

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	MSG7A: .ASCII ;/2LOWER 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	MSG8: .ASCII ;/2HOLD 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	MSG8A: .ASCII ;/2LIFT 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	MSG9: .ASCII ;/2BLOCK 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	015240	040440	041440	051101	
2920	015250	020104	047507	047111	
2921	015256	020107	044124	052522	
2922	015264	020054	047101	027504	
2923	015272	040057	042522	047515	MSG10: .ASCII ;/2REMOVE JAMMED CARD/;
2924	015300	042526	045040	046501	
2925	015306	042515	020104	040503	
2926	015314	042122	057		
2927	015317	057	044100	046117	MSG11: .ASCII ;/2HOLD 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	MSG12: .ASCII ;/2PLACE SPECIAL DARK-LIGHT CHECK CARDS (SEE LISTING. TESTG);
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	020654	
2944	015456	042524	052123	024507	
2945	015464	040500	020124	044124	.ASCII ;@AT THE BOTTOM OF THE INPUT STAC
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 ;@DECK 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	040505	030504	
2957	015572	051040	040505	031104	
2958	015600	020040	047503	042504	
2959	015606	020104	051040	040505	
2960	015614	027504			
2961	015616	040057	046101	044120	MSG14: .ASCII ;@ALPHA /;
2962	015624	020101	057		
2963	015627	057	041100	047111	MSG15: .ASCII ;@BINARY/;
2964	015634	051101	027531		
2965	015640	040057	044502	020124	MSG16: .ASCII ;@BIT 15 WAS SET/;
2966	015646	032461	053440	051501	
2967	015654	051440	052105	057	
2968	015661	057	051100	046505	MSG17: .ASCII ;@REMEDY THE ERROR CONDITION AND PRESS 'CONTINUE'@/;
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 ;@BIT 8 WAS SET/;
2978	015752	020070	040527	020123	
2979	015760	042523	027524		
2980	015764	040057	047503	052514	MSG19: .ASCII ;@COLUMN 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 ;@'@ = /;
2987	016034	036440	027440		
2988	016040	020057	020040	020040	NEWIS: .ASCII ;/ NEW = /;
2989	016046	042516	020127	020075	
2990	016054	057			
2991	016055	057	051500	051127	SWREQ: .ASCII ;@SWR = /;
2992	016062	036440	027440		
2993	016066	040057	040503	042122	CIMPAT: .ASCII ;@CARD IMAGE PATTERN= /;
2994	016074	044440	040515	042507	
2995	016102	050040	052101	042524	

DZCRA-D
DZCRA.SRCCR11 DIAGNOSTIC TEST
12-MAR-76 00:00

MACY11 27(1006) 21-SEP-76 16:56 PAGE 59

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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 ;/DZCRA-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 ;/UA= /;
3008 016212 027440
3009 016214 040057 047111 052123 SUBT1: .ASCII ;/INSTR + DATA TEST/;
3010 016222 020122 020053 40504
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 027520
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

```


DZCRA-D
DZCRA.SRC

CR11 DIAGNOSTIC TEST
12-MAR-76 00:00

MACY11 27(1006) 21-SEP-76 16:56 PAGE 68
CROSS REFERENCE TABLE -- MACRO NAMES

COMMEN	10							
ENDCOM	10							
ESCAPE	10							
GETPRI	10							
GETSWR	10							
INT	10840	1085	1161	1204	1247	1290	1333	
MULT	10							
NEWTST	10							
POP	10							
PUSH	10							
REPORT	10							
SETPRI	10							
SETUP	10							
SKIP	10							
SLASH	10							
STARS	10							
SWRSU	10							
TYPBIN	10							
TYPDEC	10							
TYPNAM	10							
TYPNUM	10							
TYPOCS	10							
TYPCT	10							
TYPTXT	10							
SSSCA	10							
SSNEWT	10							
SSSKIP	10							
.EQUAT	10							
.HEADE	10							
.KT11	10							
.SETUP	10							
.SWRHI	10							
.SACT1	10							
.SAPT8	10							
.SAPTH	10							
.SAPTY	10							
.SASTA	10							
.SCATC	10							
.SCMTA	10							
.SDB2D	10							
.SDB20	10							
.SDIV	10							
.SEOP	10							
.SERRO	10							
.SERRT	10							
.SMULT	10							
.SPOWE	10							
.SRAND	10							
.SRDDE	10							
.SRDOC	10							
.SREAD	10							
.SR2AZ	10							
.SSAVE	10							
.SSB2D	10							
.SSB20	10							
.SSCOP	10							

