

# CR11

DIAGNOSTIC  
MD-11-DZCRA-A

EP-DZCRA-A-DL-A  
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**digital**  
MADE IN U.S.A.

The microfiche card displays a grid of 20 frames of diagnostic data. The data is organized into columns and rows. The first column contains text-based diagnostic information, including labels like 'ENGINE', 'FUEL', and 'OIL'. The second and third columns contain graphical waveforms or plots, likely representing engine parameters over time. The fourth and fifth columns contain additional text-based data, possibly test results or status indicators. The frames are arranged in a 4x5 grid, with the first row containing 5 frames, the second row containing 5 frames, the third row containing 5 frames, and the fourth row containing 5 frames. The data is presented in a structured, tabular format, typical of diagnostic reports for aircraft systems.

B01

MACY:1 27 (1006) 21-SEP-76 16:56 PAGE 2

.REM :

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZCRA-D  
 PRODUCT NAME: CR11 DIAGNOSTIC TEST  
 PROGRAM DATE: APRIL 1976  
 MAINTAINER: DIAGNOSTIC GROUP

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CR11 DIAGNOSTIC TEST  
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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 JP---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 SWITCH 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 9 IT 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 SWITCH 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 SWITCH 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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5.2.4 TTRAP

THIS ROUTINE ALLOWS THE TRACE BIT TO BE SET AFTER THE FIRST LOOP OF THE PROGRAM. THE TRACE BIT WILL BE SET ON ALTERNATE LOOPS OF THE INSTRUCTION TEST, AND ON ALL LOOPS OF THE CHANNEL TEST UNLESS SW12 IS SET. THE FIRST INSTRUCTION EXECUTED UPON TRAPPING IS AN "RTI" WHICH RETURNS TO THE INTERRUPTED SEQUENCE. THIS CONTINUES UNTIL THE END OF THE PROGRAM LOOP IS REACHED.

5.2.5 TRAPCATCHER

THIS IS A SERIES OF INSTRUCTIONS STARTING AT LOCATION 0 DESIGNED TO DETECT AND ISOLATE UNEXPECTED TRAPS AND INTERRUPTS TO THE TRAP AND INTERRUPT VECTOR AREA OF MEMORY.

EACH VECTOR ENTRANCE ADDRESS IS LOADED WITH THE ADDRESS OF THE NEXT LOCATION. THE NEXT LOCATION IS LOADED WITH A HALT (00000). THUS AN ILLEGAL TRAP OR INTERRUPT WILL CAUSE A HALT AT THE TRAP LOCATION PLUS TWO.

IF A HALT OCCURS IN THE TRAP OR INTERRUPT AREA, EXAMINE REGISTER SIX. IT WILL CONTAIN THE CURRENT STACK ADDRESS. THE CONTENTS OF THE CURRENT STACK ADDRESS IS THE VALUE OF THE LOCATION COUNTER WHEN THE TRAP OR INTERRUPT OCCURRED.

5.2.6 ERCR11 (ERROR FUNCTION TEST)

THIS TEST CHECKS OPERATION OF THE VARIOUS ERROR SENSING FEATURES OF THE G.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.







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7. RESTRICTIONS

7.1 STARTING PROCEDURE

NONE

7.2 OPERATIONAL RESTRICTIONS

7.2.1 COMBINED INSTRUCTION AND DATA RELIABILITY TEST (SA200)

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

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

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

7.2.2 ERROR FUNCTION TEST (SA 210 FOR G.D.I. READER - SA 220 FOR DOCUMENTATION READER)

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

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

7.2.3 SINGLE DATA PATTERN TEST (SA 250)

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



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8.4 TESTING CR11'S WITH NON-STANDARD ADDRESSES

BY SUBSTITUTING INTO THE LOCATIONS KCR5, KCRB1, AND CRB2 THE ADDRESSES OF THE CRS, CRB1, AND CRB2 OF A CARD READER ASSIGNED A NON-STANDARD ADDRESS, AND SUBSTITUTING ITS INTERRUPT VECTOR ADDRESS INTO ADINT, A CR11 MAY BE TESTED AT ANY ADDRESS ASSIGNED TO IT.

9. PROGRAM DESCRIPTION

THIS SET OF TESTS IS DESIGNED TO CHECK ALL OPERATIONS OF THE CR11 CARD READER, WITH THE NECESSARY EXCEPTION THAT TIMING IN MOST CASES IS ONLY PARTIALLY TESTED. A SPECIAL TEST IS INCLUDED TO CHECK OUT THE ERROR FUNCTIONS OF THE G.D.? 100 READER, WHICH PRINTS OUT DIRECTIONS AS IT GOES ALONG. A TEST IS ALSO INCLUDED TO ISOLATE DIFFICULT DATA ERRORS USING A SPECIAL TEST DECK PUNCHED BY THE USER.

10. LISTING%

.ABS  
.TITLE DZCRA-D CR11 DIAGNOSTIC TEST  
.NLIST MD,MC,CND  
.LIST ME  
;DIAGNOSTIC FOR CR11 CARD READER  
;COPYRIGHT 1970,1971,1972, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754  
;BY RICK FADDEN  
;(MODIFIED AUGUST-71 FOR DOCUMENTATION CARD READER (JOHN RODENHISER))  
;(MODIFIED APRIL-72 FOR HARDWARE ECO)  
;MODIFIED MARCH 1976 FOR SWITCH-LESS PROCESSORS BY RON PLATUKIS  
  
;STARTING ADDRESSES ARE:  
: 200=INSTRUCTION AND DATA TEST FOR THE CR11  
: 210=ERROR FUNCTION TEST OF CR11 (GDI)  
: 220=ERROR FUNCTION TEST OF CR11 USING DOCUMENTATION READER.  
: 240=SINGLE TEST LOOP  
: 250=READ SINGLE DATA PATTERN TEST  
  
;SWITCH REGISTER SETTINGS FOR THE INSTRUCTION AND DATA TEST ARE:  
: SW04=1 FOR THE BINARY TEST DECK  
: SW05=1 TO HALT AT THE END OF A STANDARD 80 CARD TEST DECK.  
: =0 TO CONTINUE FROM ONE DECK TO THE NEXT.  
: AFTER THE LAST DECK IN THE HOPPER IS RUN, THE PROGRAM WAITS FOR THE CARD READER TO COME BACK ON-LINE, AND RUNS THRU A SERIES OF CHECKS OF OFF-LINE AND COMING ON-LINE OPERATIONS OF THE READER. WHEN THE READER IS BACK ON-LINE AND THE



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: 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. IOC READER  
: STARTING ADDRESS FOR CR11 ERROR FUNCTION TEST (G.D.I.)  
: STARTING ADDRESS FOR CR11 ERROR FUNCTION TEST (OCCUMATI

. = 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  
ERFLG: 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

620	000220	012706	000600
621	000224	000167	006756
622	000240	012706	000600
623	000244	000167	010426
624	000250	012706	000600
625	000254	000167	010534
626	000600	000000	
627	000602	000000	
628	000604	000230	
629	000606	177560	
630	000610	177562	
631	000612	177564	
632	000614	177566	
633	000616	177570	
634	000620	177570	
635	000622	000000	
636	000624	177777	
637	000626	000000	
638	000630	000000	
639	000632	000000	
640	000634	177160	
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647	000652	004767	011274
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649	000660	104002	
650	000662	104006	
651	000664	012767	000001 011252
652	000672	016703	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  NCTRP: 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 SHO'LL 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
704
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
767
768 001342 001775
769 001344 032713 140000
770 001350 001007
771 001352 005201
772 001354 105713
773 001356 100367
774 001360 032713 140000
775 001364 001001
776 001366 000772
777 001370 032713 040000
778 001374 001002
779 001376 104000
780 001400 000403
781 001402 005713
782 001404 100401
783 001406 104000
784 001410 032713 004000
785 001414 001001
786 001416 104000
787 001420 005301
788 001422 100002
789 001424 104000
790 001426 000402
791 001430 001401
792 001432 104000
793 001434 105713
794 001436 100001
795 001440 104000
796 001442 005013
797 001444 032713 144000
798 001450 001401
799 001452 104000
800
801
802 001454 104001
803
804
805 001456 004767 007752
806 001462 005001
807 001464 005213
808 001466 032713 140200
809 001472 001775
810 001474 032713 040000
811 001500 001015
812 001502 005713
813 001504 100002
814 001506 104000
815 001510 000437
816 001512 020127 000117
817 001516 100363
818 001520 005201
819 001522 005714
820 001524 105713
821 001526 100001

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LOOP4: BIT #140200, @CRS ;WAIT FOR SPECIAL CONDITION, CARD DONE,
;OR COLUMN READY
;LOOP IF NONE OCCURRED
BEQ LOOP4 ;SPECIAL CONDITION OR CARD DONE?
BIT #140000, @CRS ;YES, BRANCH
BNE CK4 ;NO, COUNT COLUMN READYS
INC COUNT ;WAIT FOR COLUMN READY TO CLEAR
LOOP4: TSTB @CRS ;IF CLEAR, RETURN TO LOOP4
BPL LOOP4 ;CHECK FOR SPECIAL CONDITION OR CARD DONE
BIT #140000, @CRS ;BRANCH IF EITHER SET
BNE CK4 ;OTHERWISE, CHECK AGAIN
BR LOOP4B ;CHECK CARD DONE
CK4: BIT #40000, @CRS ;BRANCH IF SET
BNE .+6 ;SPECIAL CONDITION SET BEFORE CARD DONE
HLT ;
BR CONT4 ;
TST @CRS ;CHECK SPECIAL CONDITION
BMI .+4 ;BRANCH IF SET
HLT ;SPECIAL CONDITION WASN'T SET
CONT4: BIT #4000, @CRS ;CHECK TIMING ERROR
BNE .+4 ;BRANCH IF SET
HLT ;TIMING ERROR WASN'T SET
DEC COUNT ;CHECK NUMBER OF COLUMN READYS
BPL .+6 ;BRANCH IF ANY OCCURRED
HLT ;COLUMN READY NEVER OCCURRED
BR .+6 ;
BEQ .+4 ;BRANCH IF ONLY ONE OCCURRED
HLT ;COLUMN READY OCCURRED MORE THAN ONCE
TSTB @CRS ;CHECK COLUMN READY
BPL .+4 ;BRANCH IF NOT SET
HLT ;COLUMN READY WASN'T CLEARED
CLR @CRS ;CLEAR BITS 11,14, AND 15 VIA DAT0
BIT #144000, @CRS ;CHECK
BEQ .+4 ;
HLT ;BITS 11,14, AND 15 WEREN'T ALL CLEARED

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TESTS: SCOPE
;SETTING READ SHOULD CAUSE COLUMN READY TO SET 80 TIMES BEFORE CARD DONE SETS
;READING THE DATA BUFFER SHOULD CLEAR COLUMN READY AND PREVENT A TIMING ERROR
JSR %7, INIT ;INITIALIZE STATUS REGISTER
CLR COUNT ;INITIALIZE COUNTER
INC @CRS ;INITIATE READ
LOOPS: BIT #140200, @CRS ;WAIT FOR COLUMN READY, CARD DONE
BEQ .-4 ;OR SPECIAL CONDITION
BIT #40000, @CRS ;CARD DONE?
BNE CK5 ;YES, BRANCH
TST @CRS ;CHECK BIT 15
BPL .+6 ;SKIP ERROR HALT IF NOT SET
HLT ;BIT 15 WAS SET
BR TEST6 ;GO TO NEXT TEST
CMP COUNT, #79 ;CHECK FOR 80
BPL LOOPS5 ;BRANCH IF 80 OR MORE WITHOUT CLEARING READY
INC COUNT ;INCREMENT COUNTER
TST @CRB1 ;CLEAR READY
TSTB @CRS ;MAKE SURE IT CLEARED
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          LOOPS5          ;LOOP
824 001534 032713 004000  CK5:  BIT          #4000, @CRS ;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          @CRS, #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          @CRS          ;SHOULD CLEAR DONE BUT NOT READY
838 001570 021327 000200  CMP          @CRS, #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          @CRB1        ;READING DATA BUFFER SHOULD CLEAR COLUMN READY
842 001602 005713          TST          @CRS          ;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          TEST6: SCOPE
847          ;A TIMING ERROR SHOULD SET BIT 11 BEFORE CARD DONE OCCURS, EVEN IF IT OCCURS AT COLUMN 8
848          ;A DATOB TO THE LOW BYTE OF THE CRS SHOULD CLEAR BITS 15,14, AND 11
849 001612 004767 007616  JSR          %7, INIT      ;INITIALIZE
850 001616 012701 000115  MOV          #77, COUNT    ;SETUP COUNTER
851 001622 005213          INC          @CRS        ;START READING A CARD
852 001624 105713          TSTB         @CRS        ;WAIT FOR COLUMN READY
853 001626 100376          BPL          .-2
854 001630 005714          TST          @CRB1        ;CLEAR COLUMN READY
855 001632 005301          DEC          COUNT      ;GO THRU LOOP FOR 1ST 78 COLUMN READYS
856 001634 100373          BPL          LOOP6
857 001636 032713 144000  BIT          #144000, @CRS ;WAIT FOR CARD DONE OR TIMING ERROR
858 001642 001775          BEQ          .-4          ;OR SPECIAL CONDITION
859 001644 032713 040000  BIT          #40000, @CRS ;CARD DONE SET?
860 001650 001026          BNE          ERR6        ;YES, 2 POSSIBLE TEST FAILURES
861 001652 032713 004000  BIT          #4000, @CRS  ;CHECK TIMING ERROR
862 001656 001416          BEQ          OFF6        ;IF NOT SET, READER IS PROBABLY OFF-LINE
863 001660 105713          TSTB         @CRS        ;CHECK COLUMN READY
864 001662 100001          BPL          .+4          ;BRANCH IF CLEAR
865 001664 104000          HLT          ;TIMING ERROR DIDN'T CLEAR READY
866 001666 005713          TST          @CRS        ;WAIT FOR SPECIAL CONDITION
867 001670 100376          BPL          .-2
868 001672 032713 040000  BIT          #40000, @CRS ;CHECK CARD DONE
869 001676 001406          BEQ          OFF6        ;IF NOT SET, READER IS PROBABLY OFF-LINE
870 001700 105013          CLRB         @CRS        ;DATOB TO LOW BYTE OF CRS
971 001702 032713 144000  BIT          #144000, @CRS ;CHECK BITS 15,14,11
872 001706 001415          BEQ          TEST7       ;BRANCH IF CLEAR TO NEXT TEST
873 001710 104000          HLT          ;DATOB TO LOW BYTE OF CRS DIDN'T CLEAR
874          ;BITS 15,14 AND/OR 11
875 001712 000413          BR          TEST7       ;GO TO NEXT TEST
876 001714 032713 000400  OFF6: BIT          #400, @CRS ;CHECK BIT 8
877 001720 001010          BNE          TEST7       ;BRANCH IF SET

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878	001722	104000		HLT			:BIT 15 WAS SET, 8 WASN'T
879	001724	000406		BR	TEST7		:GO TO NEXT TEST
880	001726	032713	004000	ERR6:	BIT	#4000,2CRS	: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	TEST7		: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	2CRS		:START READ
894	001752	012701	000120	MOV	#80,COUNT		:INITIALIZE COUNTER
895	001756	032713	140200	LOOP7:	BIT	#140200,2CRS	:TEST FOR ERROR, DONE OR READY
896	001762	001775		BEQ	LOOP7		:LOOP IF NONE SET
897	001764	005713		TST	2CRS		:CHECK ERROR
898	001766	100002		BPL		+.6	:BRANCH IF NOT SET
899	001770	104000		HLT			:BIT 15 WAS SET
900	001772	000455		BR	TEST8		:GO TO NEXT TEST AFTER ERROR
901	001774	032713	040000	BIT	#40000,2CRS		: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	2CRB1		:CLEAR DONE
906	002010	000762		BR	LOOP7		:LOOP
907	002012	032713	140000	BIT	#140000,2CRS		:WAIT FOR ' JR SPECIAL CONDITION
908	002016	001775		BEQ		-4	
909	002020	005713		TST	2CRS		:CHECK SPECIAL CONDITION
910	002022	100002		BPL	DONE7		:BRANCH IF NOT SET
911	002024	104000		HLT			:SPECIAL CONDITION WAS SET
912	002026	000437		BR	TEST8		:GO TO NEXT TEST AFTER ERROR
913	002030	005701		DONE7:	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	TEST8		:GO TO NEXT TEST AFTER ERROR
917	002040	105213		INCB	2CRS		:START READ
918	002042	105713		TSTB	2CRS		: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	#4000,2CRS		:TEST FOR TIMING ERROR
922	002054	001775		BEQ		-4	:LOOP IF NOT SET
923	002056	105713		TST?	2CRS		: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	TEST8		
927	002066	112713	000002	MOV	#2,2CRS		:SET EJECT
928	002072	032713	004000	BIT	#4000,2CRS		: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	TEST8		:GO TO NEXT TEST AFTER ERROR
932	002104	032713	140000	BIT	#140000,2CRS		: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 DATOR 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
948	002154	001775			BEQ	.-4	;WAIT FOR COLUMN READY OR CARD DONE
949	002156	032713	040000		BIT	#40000, @CRS	;OR SPECIAL CONDITION
950	002162	001023			BNE	D9RCKB	;CARD DONE?
951	002164	005713			TST	@CRS	;YES, GO TO CHECK STROBING OF DBR
952	002166	100002			BPL	.+6	;NO, CHECK BIT 15
953	002170	104000			HLT		;BRANCH IF NOT SET
954	002172	000441			BR	TEST9	;BIT 15 WAS SET
955	002174	005013			CLR	@CRS	;GO TO NEXT TEST AFTER ERROR
956	002176	022713	001200		CMP	#1200, @CRS	;DATO TO CRS - SHOULDN'T CLEAR BUSY OR READY
957	002202	001402			BEQ	.+6	;CHECK FOR BUSY AND READY
958	002204	104000			HLT		;BRANCH IF STILL SET
959	002206	000433			BR	TEST9	;CRS IN WRONG STATE
960	002210	011405			MOV	@CRB1, R5	;GO TO NEXT TEST AFTER ERROR
961	002212	012701	000300		MOV	#300, COUNT	;STORE DATA
962	002216	005301			DEC	COUNT	;INITIALIZE COUNTER
963	002220	001376			BNE	.-2	;WAIT FOR 1 MILLISECOND (APPROX.)
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		DBRCKB:	MOV	@CRB2, R2
969	002236	012701	000100		MOV	#100, COUNT	;STORE ENCODED DATA IN REGISTER 2
970	002242	021405			CONT8:	CMP	@CRB1, R5
971	002244	001402			BEQ	.+6	;SET UP COUNTER
972	002246	104000			HLT		;READ CARD-IMAGE DATA BUFFER
973	002250	000407			BR	REST8	;BRANCH IF UNCHANGED
974	002252	027702	176362		CMP	@CRB2, R2	;CRB1 READ INCORRECTLY
975	002256	001402			BEQ	+6	;BRANCH TO RESTORE PROCESSOR STATUS AND EXIT
976	002260	104000			HLT		;READ ENCODED DATA BUFFER
977	002262	000402			BR	REST8	;BRANCH IF UNCHANGED
978	002264	005301			DEC	COUNT	;CRB2 READ INCORRECTLY
979	002266	001365			BNE	CONT8	;BRANCH AFTER FAILURE
980	002270	016767	176352	175500	REST8:	MOV	PROC, PSR
981							;COUNT DOWN
982							;LOOP IF NOT DONE
983	002276	104001			TEST9:	SCOPE	;RESTORE PROCESSOR STATUS
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     ; NO CARD DONE OCCURRED WITHIN 3/4 SECOND
1001 002350 000411          BR      REST9     ; CONTINUE AFTER FAILURE
1002 002352 032713 040000    CK9:    BIT     #40000,@CRS ; CHECK FOR CARD DONE
1003 002356 001006          BNE     REST9     ;
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     ; EJECT DID NOT PREVENT A TIMING ERROR
1009 002374 016767 176246 175374 REST9:  MOV     PROC,PSR  ; RESTORE PROCESSOR STATUS
1010
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     ; BIT 15 WAS SET
1033 002504 105713          TSTB    @CRS      ; CHECK COLUMN READY
1034 002506 100001          BPL     +4        ; BRANCH IF NOT SET
1035 002510 104000          HLT     ; COLUMN READY WAS SET
1036 002512 005013          CLR     @CRS      ; DISABLE INTERRUPTS
1037 002514 012710 000232    CONT10: MOV     #232,@ADINT ; CHANGE INTERRUPT RETURN ADDRESS
1038 002520 005037 000232    CLR     @#232     ; TO CAUSE A HALT IF AN INTERRUPT OCCURS
1039
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 JSR %7,INIT ;INITIALIZE
1088 MOV #TINT13,ADINT ;SETUP RETURN ADDRESS
1089 BIS #340,PSR ;SET PROCESSOR PRIORITY TO 7
1090 MOV PSR,2(ADINT) ;SETUP RETURN PROCESSOR STATUS
1091 BIC #340,PSR ;SET PROCESSOR PRIORITY TO 0
1092 BIS #300,PSR ;SET PROCESSOR TO LEVEL 6 PRIORITY
1093 MOV #103,ACRS ;SET EJECT INTERRUPT ENABLE, AND READ
1094 BIT #40000,ACRS ;WAIT FOR CARD DONE
1095 BEQ -4
1096 MOV 2(ADINT),PSR ;RESTORE PROCESSOR TO HIGHEST PRIORITY
1097 CLR ACRS ;DISABLE INTERRUPTS
1098 MOV #232,ADINT ;CHANGE INTERRUPT RETURN ADDRESS
1099 CLR #232 ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1100 TST INTFLG ;CHECK TO SEE IF LEVEL ALREADY RECORDED
1101 BPL TEST14 ;IF NO, GO TO NEXT TEST

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## K02

DZCRA-D CR11 DIAGNOSTIC 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
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
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
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, @CRS       ; SET EJECT INTERRUPT ENABLE, AND READ
1170 003340 032713 040000      BIT      #40000, @CRS     ; 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      @CRS            ; DISABLE INTERRUPTS
1174 003356 012710 000232      MOV      #232, @ADINT    ; CHANGE INTERRUPT RETURN ADDRESS
1175 003362 005037 000232      CLR      @#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, @CRS ; 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      @CRS          ; DISABLE FURTHER INTERRUPTS
1189 003422 012710 000232      MOV      #232, @ADINT   ; CHANGE INTERRUPT RETURN ADDRESS
1190 003426 005037 000232      CLR      @#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      SETS          ; 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, PFOCT      ; PRINT LEVEL NUMBER
1199 003470 000405      BR      TEST16
1200 003472 026727 175104 100005      SETS: 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, @CRS       ; SET EJECT INTERRUPT ENABLE, AND READ
1213 003552 032713 040000      BIT      #40000, @CRS     ; WAIT FOR CARD DONE

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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 035276 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 #20,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 005401      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     TEST19
1331 004340 104000      HLT
                                     ;INTERRUPT PREVIOUSLY OCCURRED ONLY AT A LOWER LEVEL
                                     ;TEST FOR AN INTERRUPT ON LEVEL 1
1332
1333
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,2(ADINT)  ;SETUP RETURN PROCESSOR STATUS
1339 004370 042767 000340 173400      MOV      #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,ACRS      ;SET EJECT INTERRUPT ENABLE, AND READ
1342 004410 032713 040000      BIT      #40000,ACRS    ;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     ACRS           ;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,ACRS ;MAKE SURE CARD DONE IS SET
1358 004464 001001      BNE     .+4            ;BRANCH IF SET
1359 004466 104000      HLT
                                     ;CARD DONE WASN'T SET
1360 004470 005013      CLR     ACRS           ;DISABLE FURTHER INTERRUPTS
1361 004472 012710 000232      MOV      #232,ADINT    ;CHANGE INTERRUPT RETURN ADDRESS
1362 004476 005037 000232      CLR     #232          ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1363 004502 022626      CMP     (SP)+,(SP)+    ;RESTORE STACK POINTER
1364 004504 005767 174072      TST     INTFLG        ;CHECK FOR PREVIOUS FLAG
1365 004510 100414      BMI     SET1           ;BRANCH IF FLAG SET
1366 004512 012767 100001 174062      MOV      #100001,INTFLG ;SET FLAG AND LEVEL
1367 004520 012702 014503      MOV      #MSG4,R2      ;SETUP FOR PRINTOUT
1368 004524 004767 005422      JSR      %7,OUT        ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1369 004530 012702 000001      MOV      #1,R2
1370 004534 004767 005174      .SR     %7,PROCY      ;PRINT LEVEL NUMBER
1371 004540 000405      BR      TEST20
1372 004542 026727 174034 100001 SET1: CMP  INTFLG,#100001 ;CHECK PREVIOUS LEVEL
1373 004550 100001      BPL     TEST20
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,2(ADINT)  ;LOAD RETURN PROCESSOR STATUS

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1382 004602 012713 000101      MOV      #101,2CRS      ;SET INTERRUPT ENABLE AND READ
1383 004606 032713 004000      BIT      #4000,2CRS    ;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
1387 004624 016067 000002 173144      MOV      2(ADINT),PSR  ;CLOCK INTERRUPT IF IT OCCURRED
1388 004632 000402          BR
1389 004634 104000          TINT20: HLT           ;TIMING ERROR CAUSED AN INTERRUPT
1390 004636 022626          CMP      (SP)+,(SP)+  ;RESTORE STACK POINTER
1391 004640 012710 000232      MOV      #232,2ADINT  ;CHANGE INTERRUPT ADDRESS TO CAUSE A
1392 004644 005037 000232      CLR      #232        ;HALT IF AN INTERRUPT OCCURS
1393 004650 032713 040000      BIT      #40000,2CRS  ;WAIT FOR CARD DONE
1394 004654 001775          BEQ      #-4
1395 004656 005013          CLR      2CRS        ;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      #TINT,2ADINT ;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      #100,2CRS   ;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      2CRS       ;DISABLE FURTHER INTERRUPTS
1409 004734 000403          BR
1410 004736 104000          TNINT: HLT          ;AN INTERRUPT OCCURRED
1411 004740 022626          CMP      (SP)+,(SP)+ ;RESTORE STACK
1412 004742 005013          CLR      2CRS       ;DISABLE FURTHER INTERRUPTS
1413 004744 005037 000232      CON*21: CLR      #232 ;CHANGE INTERRUPT RETURN ADDRESS TO
1414 004750 012710 000232      MOV      #232,2ADINT ;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,2ADINT ;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      #103,2CRS   ;SET INTERRUPT ENABLE AND EJECT A CARD
1424 005014 000001          WAIT
1425 005016 000776          BR      #-2         ;WAIT FOR INTERRUPT
1426 005020 022626          T2INT: CMP      (6)+,(6)+ ;SIT IF TRACE BIT IS SET
1427 005022 012710 005044      MOV      #T2INTA,2ADINT ;RESTORE STACK POINTER
1428 005026 005067 172744      CLR      PSR        ;CHANGE RETURN ADDRESS
1429 005032 000240          NOP              ;SET PROCESSOR TO LEVEL 0
1430 005034 016067 000002 172734      MOV      2(ADINT),PSR ;WAIT
1431 005042 000402          BR      CON*22     ;RESTORE PROCESSOR TO LEVEL 7
1432 005044 022626          T2INTA: CMP      (6)+,(6)+ ;RESTORE STACK
1433 005046 104000          HLT           ;THE INTERRUPT OCCURRED AT 2 LEVELS
1434 005050 005013          CONT22: CLR      2CRS ;DISABLE INTERRUPTS
1435 005052 005037 000232      CLR      #232       ;CHANGE INTERRUPT RETURN ADDRESS TO
1436 005056 012710 000232      MOV      #232,2ADINT ;CAUSE A HALT IF AN INTERRUPT OCCURS
1437

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1438 005062 104001
1439
1440
1441 005064 004767 004344
1442 005070 005213
1443 005072 105713
1444 005074 100376
1445 005076 005014
1446 005100 105713
1447 005102 100002
1448 005104 104000
1449 005106 000467
1450 005110 105713
1451 005112 100376
1452 005114 105014
1453 005116 105713
1454 005120 100002
1455 005122 104000
1456 005124 000460
1457 005126 105713
1458 005130 100376
1459 005132 105064 000001
1460 005136 105713
1461 005140 100002
1462 005142 104000
1463 005144 000450
1464 005146 105713
1465 005150 100376
1466 005152 005714
1467 005154 105713
1468 005156 100002
1469 005160 104000
1470 005162 000441
1471 005164 105713
1472 005166 100376
1473 005170 005077 173444
1474 005174 105713
1475 005176 100002
1476 005200 104000
1477 005202 000431
1478 005204 105713
1479 005206 100376
1480 005210 105077 173424
1481 005214 105713
1482 005216 100002
1483 005220 104000
1484 005222 000421
1485 005224 105713
1486 005226 100376
1487 005230 016702 173404
1488 005234 105062 000001
1489 005240 105713
1490 005242 100002
1491 005244 104000
1492 005246 000407
1493

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TEST23: SCOPE
: ALL MODES OF ADDRESSING CRB1 OR CRB2 (DATO,DATOB,DATI) SHOULD CLEAR
: COLUMN READY
JSR %7 INIT : INITIALIZE
INC @CRS : START READING A CARD
TSTB @CRS : WAIT FOR COLUMN READY
BPL -2
CLR @CRB1 : DATO TO CRB1
TSTB @CRS : CHECK COLUMN READY
BPL CNT23A : BRANCH IF CLEARED
HLT : DATO TO CRB1 DIDN'T CLEAR READY
BR TEST24 : GO TO NEXT TEST
CNT23A: TSTB @CRS : WAIT FOR COLUMN READY
BPL -2
CLRB @CRB1 : DATOB TO LOW BYTE OF CRB1
TSTB @CRS : CHECK COLUMN READY
BPL CNT23B : BRANCH IF CLEARED
HLT : DATOB TO CRB1 LOW BYTE DIDN'T CLEAR READY
BR TEST24 : GO TO NEXT TEST
CNT23B: TSTB @CRS : WAIT FOR COLUMN READY
BPL -2
CLRB 1(CRB1) : DATOB TO HIGH BYTE OF CRB1
TSTB @CRS : CHECK COLUMN READY
BPL CNT23C : BRANCH IF CLEARED
HLT : DATOB TO CRB1 HIGH BYTE DIDN'T CLEAR READY
BR TEST24 : GO TO NEXT TEST
CNT23C: TSTB @CRS : WAIT FOR COLUMN READY
BPL -2
TST @CRB1 : DATI TO CRB1
TSTB @CRS : CHECK COLUMN READY
BPL CNT23D : BRANCH IF CLEARED
HLT : DATI TO CRB1 DIDN'T CLEAR READY
BR TEST24 : GO TO NEXT TEST
CNT23D: TSTB @CRS : WAIT FOR COLUMN READY
BPL -2
CLR @CRB2 : DATO TO CRB2
TSTB @CRS : CHECK COLUMN READY
BPL CNT23E : BRANCH IF CLEARED
HLT : DATO TO CRB2 DIDN'T CLEAR READY
BR TEST24 : GO TO NEXT TEST
CNT23E: TSTB @CRS : WAIT FOR COLUMN READY
BPL -2
CLRB @CRB2 : DATOB TO LOW BYTE OF CRB2
TSTB @CRS : CHECK COLUMN READY
BPL CNT23F : BRANCH IF CLEARED
HLT : DATOB TO CRB2 LOW BYTE DIDN'T CLEAR READY
BR TEST24 : GO TO NEXT TEST
CNT23F: TSTB @CRS : WAIT FOR COLUMN READY
BPL -2
MOV CRB2,R2 : LOAD POINTER
CLRB 1(R2) : DATOB TO HIGH BYTE OF CRB2
TSTB @CRS : CHECK COLUMN READY
BPL CNT23G : BRANCH IF CLEARED
HLT : DATOB TO CRB2 HIGH BYTE DIDN'T CLEAR READY
BR TEST24 : GO TO NEXT TEST

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# E03

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

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1494	005250	105713	
1495	005252	100376	
1496	005254	005777	173360
1497	005250	105713	
1498	005262	104001	
1499	005264	104000	
1500			
1501	005266	104001	
1502			
1503			
1504	005270	004767	004140
1505	005274	005213	
1506	005276	105713	
1507	005300	100376	
1508	005302	052713	000002
1509	005306	105713	
1510	005310	100402	
1511	005312	104000	
1512	005314	000421	
1513	005316	032713	004000
1514	005322	001013	
1515	005324	032713	040400
1516	005330	001772	
1517	005332	032713	040000
1518	005336	001003	
1519	005340	004767	004142
1520	005344	000415	
1521	005346	104000	
1522	005350	000413	
1523	005352	105713	
1524	005354	100001	
1525	005356	104000	
1526	005360	032713	040400
1527	005364	001775	
1528	005366	032713	000400
1529	005372	001402	
1530	005374	004767	004106
1531			
1532			
1533			
1534	005400	104001	
1535	005402	032777	000200 173206
1536	005410	001406	
1537	005412	004767	004044
1538	005416	005167	173222
1539	005422	000167	173314

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CNT23G: TSTB @CRS ;WAIT FOR COLUMN READY
        BPL .-2
        TST @CRB2 ;DATI TO CRB2
        TSTB @CRS ;CHECK COLUMN READY
        BPL TEST24 ;BRANCH IF CLEARED
        HLT ;DATI TO CRB2 DIDN'T CLEAR READY

TEST24: SCOPE
;SETTING EJECT AFTER A COLUMN READY WITHOUT CLEARING THE COLUMN READY
;SHOULD SET TIMING ERROR (WHICH IN TURN SHOULD CLEAR COLUMN READY)
        JSR %7,INIT ;INITIALIZE
        INC @CRS ;START READING A CARD
        TSTB @CRS ;CHECK COLUMN READY - WAIT
        BPL .-2
        BIS #2,@CRS ;SET EJECT
        TSTB @CRS ;CHECK COLUMN READY
        BMI CNT24A ;BRANCH IF STILL SET
        HLT ;SETTING EJECT CLEARED COLUMN READY
        BR END24 ;BRANCH TO WAIT FOR DONE AFTER ERROR

CNT24A: BIT #4000,@CRS ;CHECK TIMING ERROR
        BNE TIM24 ;BRANCH IF SET
        BIT #40400,@CRS ;CHECK CARD DONE AND OFF-LINE
        BEQ CNT24A ;LOOP IF NONE SET
        BIT #40000,@CRS ;CARD DONE SET?
        BNE CNT24B ;YES - BRANCH TO ERROR PRINTOUT
        JSR %7,CKBIT8 ;NO - BIT 8 WAS SET SO OUTPUT MESSAGE
        BR ENOCK ;BRANCH AFTER COMING BACK ON-LINE

CNT24B: HLT ;CARD DONE SET BUT TIMING ERROR DIDN'T
        BR ENOCK ;BRANCH TO NEXT SECTION

TIM24: TSTB @CRS ;CHECK COLUMN READY
        BPL .+4 ;BRANCH IF NOT SET
        HLT ;TIMING ERROR DIDN'T CLEAR READY

END24: BIT #40400,@CRS ;WAIT FOR CARD DONE OR OFF-LINE
        BEQ ENOCK
        BIT #400,@CRS ;CHECK OFF LINE
        BEQ ENOCK ;BRANCH IF NOT SET
        JSR %7,CKBIT8 ;OUTPUT ERROR MESSAGE

;CHECK SW7 AND RETURN TO TEST1 IF SET, AFTER RINGING BELL
;OTHERWISE GO INTO THE DATA TEST
ENOCK: SCOPE
        BIT #200,@SWR
        BEQ DATST
        JSR %7,BELL
        COM TRFLG ;TOGGLE TRACE FLAG
        JMP RESTR
    
```

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1540
1541
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1546
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 005057 173166 DATST2: CLR ERFLG ;FLAG SET PREVENTS PRINTING OUT ERROR HEADING
1555 005462 032777 000020 173126 BIT #20, @SWR ;CHECK BIT 4 OF SP 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 0003634 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, @XCRD ;ADJUST POINTER AND START READING
1577 005624 052713 000101 BIS #101, @CRS ;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 @CRS ;CHECK SPECIAL CONDITION (BIT 15)
1583 005636 100460 BMI ERSET ;BRANCH IF SET
1584 005640 105713 TSTB @CRS ;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 @CRS ;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				VBINTT		
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	015673		ER1:	MOV	MSG16, R2	: "BIT 15 WAS SET."
1623	006040	004767	004106		JSR	7, TOUT		
1624	006044	012702	015561		MOV	MSG17, 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			BEQ	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			BEQ	+.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			BEQ	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	NOHC	: IF SET, DON'T OUTPUT HEADING	
1650	006176	005267	172446		INC	ERFLG	: SET FLAG	
1651	006202	012702	015526		MOV	MSG13, R2	: OUTPUT HEADING FOR DATA ERROR PRINTOUT	

# H03

CCPRA-C CR11 DIAGNOSTIC TEST  
CCPRA.SRC 12-MAR-76 00:00

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1652	006206	004767	003740		JSP	%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	QSWR	: 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	QCRS	: CHECK ERROR
1683	006362	100023			BPL	LASTCK	: BRANCH IF NOT SET
1684	006364	022767	000120	000254	CMP	#80, CD CNT	: CHECK FOR LAST CARD
1685	006372	001005			BNE	FAILC1	
1686	006374	032713	000400		BIT	#400, QCRS	
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, QCRS	: CHECK FOR CARD DONE
1693	006416	001474			BEQ	NOTCD	: BRANCH IF NOT SET
1694	006420	022767	000120	000222	CMP	#80, CL CNT	: 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, CD CNT	: CHECK FOR LAST CARD
1698	006440	001403			BEQ	LASTCD	: BRANCH IF LAST CARD
1699	006442	004767	000072		JSR	%7, NXC RD	: 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	Q#42, R2	: MONITOR HOOK
1704	006462	001405			BEQ	END	
1705	006464	000005			RESET		
1706	006466	004712			LOGIC: JSP	%7, R2	
1707	006470	000240			NOP		

DZORA-C  
DZORA.SRC

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1708 006472 000240      NOP
1709 006474 000240      NOP
1710 006476 032777 000040 172112 END: BIT      #40,2SWR      :CHECK SR FOR CONTINUATION TO ANOTHER DECK
1711 006504 001002      BNE      .+6      :BRANCH TO HALT IF SWS SET
1712 006506 000167 000002      JMP      DECKCK   :CONTINUE TO ANOTHER DECK
1713 006512 000000      HALT      :DATA TEST DONE
1714
1715      :WHEN CONTINUING FROM ONE DECK TO ANOTHER, CHECK SW6 FOR TYPE
1715      :OF TESTING TO BE PERFORMED
1717 006514 005167 172124      DECKCK: COM      TRFLG      :TOGGLE TRACE FLAG
1718 006520 032777 000100 172070      BIT      #100,2SWR :CHECK SW6
1719 006526 001402      BEQ      .+6      :BRANCH IF NOT SET
1720 006530 000167 172206      JMP      RESTRT   :RERUN COMBINED INSTRUCTION AND DATA TEST
1721 006534 000167 176676      JMP      DATST1
1722
1723 006540 016705 000076      MXCRC: MOV      TSTART,R5 :LOAD R5 WITH TABLE STARTING ADDRESS
1724 006544 006367 000076      ASL      CDCNT    :MULTIPLY CARD COUNT BY FOUR
1725 006550 006367 000072      ASL      CDCNT
1726 006554 066705 000066      ADD      CDCNT,R5 :ADD OFFSET TO R5 TO POINT TO NEXT DATUM
1727 006560 006267 000062      ASR      CDCNT    :RESTORE CARD COUNT
1728 006564 006267 000056      ASR      CDCNT
1729 006570 042713 000002      BIC      #2,2CRS  :CLEAR EJECT IF SET
1730 006574 005213      INC      2CRS     :READ ANOTHER CARD
1731 006576 005267 000044      INC      CDCNT    :KEEP TRACK OF CARD NUMBER
1732 006602 005067 000042      CLR      CLCNT    :INITIALIZE COLUMN COUNT
1733 006606 000207      RTS      %7      :RETURN
1734      :INTERRUPT NOT CAUSED BY ERROR, COLUMN READY, OR CARD DONE
1735 006610 052767 000340 171160 NOTCD: BIS      #340,PSR :LOCK OUT FURTHER INTERRUPTS
1736 006616 032713 002000      BIT      #2000,2CRS :TEST ON-LINE TRANSITION BIT
1737 006622 001003      BNE      NOTCD1   :BRANCH IF SET
1738 006624 104000      HLT
1739 006626 000167 177600      JMP      LASTCK   :NO BITS SET TO CAUSE AN INTERRUPT
1740 006632 104000      NOTCD1: HLT
1741 006634 000167 177572      JMP      LASTCK   :START NEXT CARD
1742 006640 000000      DECK: 0          :ON-LINE TRANSITION CAUSED AN INTERRUPT
1743 006642 000000      TSTART: 0        :STARTING ADDRESS OF DATA TABLE
1744 006644 000000      TEND: 0          :END ADDRESS OF DATA TABLE
1745 006646 000000      CDCNT: 0         :NUMBER OF CARD BEING READ
1746 006650 000000      CLCNT: 0         :NUMBER OF COLUMN BEING CHECKED
1747 006652 000000      DAT1: 0         :DATA ON FIRST READ FROM CRB1
1748 006654 000000      DAT2: 0         :DATA ON SECOND READ OF CRB1
1749 006656 000000      DATENC: 0       :DATA READ FROM CRB2
1750 006660 000000      PTOFF: 0        :OFFSET TO POINTER FOR DATA PRINTOUT
1751 006662 004767 002574      ALLDON: JSR      %7,BELL :RING BELL
1752 006666 032713 000400      BIT      #400,2CRS :CHECK OFF-LINE BIT
1753 006672 001001      BNE      .+4      :BRANCH IF SET
1754 006674 104000      HLT      :OFF-LINE NOT SET, BUT SPECIAL CONDITION
1755      :WAS SET AFTER 80 COLUMNS OF THE 90TH CARD WERE READ
1756 006676 032777 000040 171712      BIT      #40,2SWR :CHECK SR FOR HALT AT END OF DECK
1757 006704 001403      BEQ      ALCNT    :CONTINUE IF NOT SET
1758 006706 000000      HALT
1759 006710 000167 177600      JMP      DECKCK   :END OF DECK, SWS SET
1760 006714 032777 002000 171674 ALCNT: BIT      #2000,2SWF :CHECK FOR TYPE OF TESTING
1761 006722 001025      BNE      ALCNT1   :DOES THIS CR11 USE THE M829 MODULE?
1762 006724 005027 000000      CLR      #0      :YES- BRANCH
1763 006730 005367 177772      DEC      .-2     :NO-STALL TO ALLOW CARD DONE TO SET

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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, 2CRS		: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	2CRS		: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, 2CRS		: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	2CRS		:CLEAR ERROR
1781	007000	032713	156377			BIT	#156377, 2CRS		: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	2CRS		:ATTEMPT TO READ- SHOULD RESET ERROR
1790	007026	005713				TST	2CRS		: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, 2ADINT		:LOAD INTERRUPT RETURN ADDRESS
1795	007042	005067	170730			CLR	PSR		:SET PROCESSOR TO LEVEL 0
1796	007046	012713	000101			MOV	#101, 2CRS		:ENABLE INTERRUPTS, KEEP ERROR SET BY SETTING READ
1797	007052	000240				NOF			:CLOCK IN INTERRUPT
1798	007054	016067	000002	170714		MOV	2(ADINT), PSR		:SET PROCESSOR TO LEVEL 7
1799	007062	005013				CLR	2CRS		: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	2CRS		:CLEAR INTERRUPT ENABLE AND ERROR
1804	007074	012710	007132			MOV	#SRVC2, 2ADINT		:CHANGE INTERRUPT RETURN ADDRESS
1805	007100	112713	000100			MOVB	#100, 2CRS		:ENABLE INTERRUPTS
1806	007104	042767	000340	170664		BIC	#340, PSR		:SET PROCESSOR TO LEVEL 0
1807	007112	032713	000400			BIT	#400, 2CRS		: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, 2CRS		: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, 2CRS		:CHECK BIT 8
1818	007154	001401				BEQ	.-4		:BRANCH IF NOT SET
1819	007156	104000				HLT			:BIT 9 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                                     TESTA: SCOPE
1836 007236 005067 002702  CLR      ITMAX      ;RUN EACH ERROR TEST ONCE ONLY
1837 007242 004767 002136  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                                     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
1871 007414 004767 002532  JSR      %7,TOUT     ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
1872 007420 004767 002650  JSR      %7,CRLF4    ;MOVE MESSAGE UP ON TTY
1873 007424 000000          HALT
1874 007426 032713 000400  BIT      #400,@CRS   ;CHECK BIT 8
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 STAP'"
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 ;OUTPUT STACKER FULL SHOULD SET BIT 15
1895 007522 104001 TESTC: SCOPE
1896 007524 004767 001704 JSR %7,INIT ;INITIALIZE STATUS REGISTER
1897 007530 012702 014653 MOV #MSG7,R2 ;"RAISE OUTPUT STACKER PRESSURE ARM ABOVE HORIZONTAL THE
1898 007534 005767 171072 TST FLAG ;CHANGE MESSAGE FOR DOCUMENTATION READER?
1899 007540 001402 BEQ .+6 ;NO
1900 007542 012702 014771 MOV #MSG7A,R2 ;"LOWER OUTPUT STACKER PLATE TO BOTTOM"
1901 007546 004767 002473 JSR %7,TOUT
1902 007552 012702 014343 MOV #MSG2,R2 ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
1903 007556 004767 002370 JSR %7,TOUT
1904 007562 004767 002506 JSR %7,CRLF4 ;MOVE MESSAGE UP ON TTY
1905 007566 000000 HALT
1906 007570 032713 000400 BIT #400,2CRS ;CHECK BIT 8
1907 007574 001001 BNE .+4 ;BRANCH IF SET
1908 007576 104000 HLT ;OFF-LINE (BIT 8) WASN'T SET
1909 007600 005713 TST 2CRS ;CHECK SPECIAL CONDITION BIT
1910 007602 100401 BMI .+4 ;BRANCH IF SET
1911 007604 104000 HLT ;SPECIAL CONDITION NOT SET
1912 007606 012702 014224 MOV #MSG1,R2 ;"PRESS CARD READER 'MOTOR START' AND 'READ STAP'"
1913 007612 005767 171014 TST FLAG ;CHANGE MESSAGE FOR DOCUMENTATION READER?
1914 007616 001402 BEQ .+6 ;NO
1915 007620 012702 014307 MOV #MSG1A,R2 ;"PRESS CARD READER 'RESET'"
1916 007624 004767 002322 JSR %7,TOUT
1917 007630 012702 014343 MOV #MSG2,R2
1918 007634 004767 002312 JSR %7,TOUT ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
1919 007640 004767 002430 JSR %7,CRLF4 ;MOVE MESSAGE UP ON TTY
1920 007644 000000 HALT
1921 007646 032713 000400 BIT #400,2CRS ;WAIT FOR OFF-LINE TO CLEAR
1922 007652 001375 BNE .-4
1923
1924 ;A FEED ERROR SHOULD SET BIT 15
1925 ;THIS ERROR OCCURS WHEN THE FEED MECHANISM FAILS TO DELIVER A CARD TO THE READ STATION
1926 007654 104001 TESTD: SCOPE
1927 007656 004767 001552 JSR %7,INIT
1928 007662 012702 014536 MOV #MSG5,R2 ;"REMOVE ALL CARDS FROM THE INPUT HOPPER"
1929 007666 004767 002260 JSR %7,TOUT
1930 007672 012702 014343 MOV #MSG2,R2 ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
1931 007676 004767 002250 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 DOCUMENTATION 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 DOCUMENTATION 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,@CRS	;"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,@CRS	;"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,@CRS	;"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	@CRS	;"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 DOCUMENTATION 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,@CRS	;"WAIT FOR OFF-LINE TO CLEAR
1974	010114	001375		BNE	.-4	
1975	010116	005767	170510	TST	FLAG	;"SKIP NEXT TEST IF DOCUMENTATION READER
1976	010122	001402		BEQ	.+6	
1977	010124	000167	000314	JMP	TESTG	
1978						
1979						
1980						
1981	010130	104001				;"A MOTION ERROR SHOULD SET BIT 15
1982	010132	004767	001276	JSR	%7,INIT	;"THIS ERROR OCCURS WHEN A CARD JAM OCCURS AT THE READ STATION
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

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  
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C10676 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

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 ;CHANGE TO FIRST ADDRESS AFTER SCOPE INSTRUCTION  
2\$: BIT #10000,%SWR ;CHECK SW12  
BEQ .+12 ;BRANCH IF NOT SET  
BIC #20,PSR ;CLEAR TRACE BIT  
BR .+10 ;SKIP NEXT INSTRUCTION  
BIS #20,PSR ;SET TRACE BIT  
CLR ITCNT ;CLEAR ITERATION COUNTER  
MOV %XLOOP,RETURN ;LOAD RETURN ADDRESS  
JMP @RETRNX ;JUMP TO TEST  
XLOOP: CLR ITCNT ;KEEP ITERATION COUNTER AT ZERO  
JMP @RETRNX ;JUMP TO TEST  
RETRNX: 0

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2170  
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2178  
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 #CIMPAT,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 %CRS ; START READING CARD  
INC TOTCRD ; INCREMENT CARD COUNT  
CKLP1: TSTB %CRS ; CHECK COLUMN READY  
BMI CKCOL ; BRANCH IF SET  
BIT #40000,%CRS ; CHECK CARD DONE  
BNE CKCRD ; BRANCH IF SET  
TST %CRS ; 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 %CRB1,DAT1 ; READ DATA BUFFER  
INC CLCNT ; COUNT COLUMNS  
TSTB %CRS ; CHECK COLUMN READY  
BPL .+6 ; BRANCH IF OK  
HLT ; READING DBR DIDN'T CLEAR READY  
BR CKLOOP ; START NEXT CARD AFTER ERROR  
MOV #200,COUNT ; WAIT AWHILE  
CKLP2: DEC COUNT

2180	011220	001376		BNE	CKLP2		
2181	011222	011467	175426	MOV	QCRB1, DAT2	: READ CRB1 AGAIN	
2182	011226	026767	175420	000176	CMP	DAT1, CARDIM	: COMPARE FIRST DATA TO PATTERN
2183	011234	001005		BNE	CKFAIL	: BRANCH IF FAILURE	
2184	011236	026767	175412	000166	CMP	DAT2, CARDIM	: COMPARE SECOND READING TO PATTERN
2185	011244	001001		BNE	CKFAIL	: BRANCH IF FAILURE	
2186	011246	000721		BR	CKLP1	: WAIT FOR NEXT COLUMN OR END OF CARD	
2187	011250	005267	000152	CKFAIL: INC	TOTERR	: COUNT ERRORS	
2188	011254	104003			KBINTT		
2189	011256	032777	020000	167332	BIT	#20000, QSWR	: CHECK FOR INHIBITING PRINTOUT
2190	011264	001047		BNE	CKHLT	: BRANCH AROUND PRINTOUT IF SET	
2191	011266	005767	167356	TST	ERFLG	: TEST FLAG TO PRINT HEADING	
2192	011272	001006		BNE	CKNOHD	: BRANCH IF ALREADY DONE	
2193	011274	005267	167350	INC	ERFLG	: PRINT HEADING ONCE ONLY	
2194	011300	012702	015764	MOV	#MSG19, R2	: OUTPUT HEADING	
2195	011304	004767	000642	JSR	%7, TOUT		
2196	011310	004767	000726	CKNOHD: JSR	%7, CRLF	: OUTPUT CARRIAGE RETURN, LINEFEED	
2197	011314	016702	175330	MOV	CLCNT, R2	: PRINT COLUMN NUMBER	
2198	011320	004767	000410	JSR	%7, PROCT		
2199	011324	004767	000212	JSR	%7, SPACE		
2200	011330	016702	175316	MOV	DAT1, R2	: PRINT FIRST READING	
2201	011334	004767	000374	JSR	%7, PROCT		
2202	011340	004767	000176	JSR	%7, SPACE		
2203	011344	016702	175304	MOV	DAT2, R2	: PRINT SECOND READING	
2204	011350	004767	000360	JSR	%7, PROCT		
2205	011354	004767	000162	JSR	%7, SPACE		
2206	011360	016702	000044	MOV	TOTCRD, R2	: PRINT TOTAL NUMBER OF CARDS READ	
2207	011364	004767	000344	JSR	%7, PROCT		
2208	011370	004767	000146	JSR	%7, SPACE		
2209	011374	016702	000026	MOV	TOTERR, R2	: PRINT TOTAL NUMBER OF DATA ERRORS	
2210	011400	004767	000330	JSR	%7, PROCT		
2211	011404	005777	167206	CKHLT: TST	QSWR	: CHECK SW15 TO HALT ON ERROR	
2212	011410	100002		BPL	CKDONE	: BRANCH IF NOT SET	
2213	011412	000000		HALT		: HALT ON ERROR	
2214	011414	000625		BR	CKLOOP	: CONTINUE	
2215	011416	032713	140000	CKDONE: BIT	#140000, QCRS	: WAIT FOR SPECIAL CONDITION OR DONE	
2216	011422	001775		BEQ	CKDONE		
2217	011424	000621		BR	CKLOOP	: START NEXT CARD AFTER CHECKING BIT 8	
2218	011426	000000		TOTERR: 0			
2219	011430	000000		TOTCRD: 0			
2220	011432	000000		CARDIM: 0			
2221							
2222						: ISSUE MESSAGE IF CARD READER IS OFF-LINE	
2223						: WAIT FOR BUSY TO CLEAR IN CASE CARD READER IS STILL READING A CARD	
2224						: INITIALIZE STATUS REGISTER AND USE ERROR HALT IF IT DOESN'T CLEAR PROPERLY	
2225						: NOTE THAT PROGRAM WILL HANG HERE IF BUSY REMAINS SET	
2226	011434	004767	000046	INIT: JSR	%7, CKBIT8	: SEE IF OFF-LINE BIT IS SET	
2227	011440	032713	001000	BIT	#1000, QCRS	: WAIT FOR BUSY TO CLEAR, IN CASE	
2228	011444	001375		BNE	-4	: A CARD IS STILL BEING READ	
2229	011446	005013		CLR	QCRS	: INITIALIZE STATUS REGISTER	
2230	011450	005714		TST	QCRB1	: READ DATA BUFFER TO CLEAR COLUMN READY	
2231	011452	005713		TST	QCRS	: MAKE SURE INITIALIZATION OK	
2232	011454	001401		BEQ	+.4	: BRANCH IF ALL BITS ZERO	
2233	011456	104000		HLT		: NOT ALL BITS OF STATUS REGISTER ARE ZERO	
2234	011460	000207		RTS	%7	: RETURN	
2235							

2236										
2237	011462	105777	167124							
2238	011456	100375								
2239	011470	012777	000207	167116						
2240	011476	012767	000001	000440						
2241	011504	000207								
2242										
2243										
2244										
2245	011506	032713	000400							
2246	011512	001001								
2247	011514	000207								
2248	011516	012702	015744							
2249	011522	004767	000424							
2250	011526	012702	015661							
2251	011532	004767	000414							
2252	011536	000000								
2253	011540	000762								
2254										
2255										
2256										
2257										
2258										
2259	011542	105777	167044							
2260	011546	100375								
2261	011550	012777	000240	167036						
2262	011556	005367	000010							
2263	011562	100367								
2264	011564	005067	000002							
2265	011570	000207								
2266	011572	000000								
2267										
2268										
2269										
2270										
2271										
2272	011574	104003								
2273	011576	037727	167014	020000						
2274	011604	001401								
2275	011606	000437								
2276	011610	012667	000114							
2277	011614	012667	000112							
2278	011620	024646								
2279	011622	004767	000414							
2280	011626	010267	000070							
2281	011632	016702	000072							
2282	011636	004767	000072							
2283	011642	105777	166744							
2284	011646	100375								
2285	011650	012777	000240	166736						
2286	011656	016702	000050							
2287	011662	004767	000046							
2288	011666	016702	000030							
2289	011672	105777	166714							
2290	011676	100375								
2291	011700	012777	000240	166706						

```

: BELL ON PASS COMPLETE
BELL: TSTB @TCSR ; WAIT FOR TTY READY
      BPL -4
      MOV @207,@DDBR ; RING BELL
      MOV @1,@IMAX ; MAKE CERTAIN ITERATION MAXIMUM IS CORRECT
      RTS %7 ; RETURN
    
```

```

: SUBROUTINE TO CHECK FOR BIT 8 (OFF-LINE) BEING SET IN CARD
: READER CSR, AND PRINT OUT A MESSAGE IF IT IS
CKBIT8: BIT @400,@CRS ; CHECK BIT 8
        BNE +4 ; BRANCH IF SET
        RTS %7 ; RETURN IF NOT SET
        MOV @MSG18,R2 ; OUTPUT MESSAGE
        JSR %7,TOUT ; "BIT 8 WAS SET"
        MOV @MSG17,R2 ; "REMEDY THE ERROR CONDITION
        JSR %7,TOUT ; AND PRESS 'CONTINUE'"
        HALT ; WAIT FOR CONTINUE
        BR CKBIT8 ; CHECK AGAIN
    
```

```

: SUBROUTINE TO ISSUE N SPACES
: N IS ONE PLUS VALUE CONTAINED IN SPACEX
: SPACEX IS CLEARED WITHIN THE SUBROUTINE, SO THAT A CALL ON
: SPACE WITHOUT LOADING SPACEX ISSUES ONLY ONE SPACE
SPACE: TSTB @TCSR ; WAIT FOR TTY READY
      BPL -4
      MOV @240,@DDBR ; OUTPUT A SPACE
      DEC SPACEX ; DECREMENT COUNT
      BPL SPACE ; LOOP IF NOT DONE
      CLR SPACEX ; RESET COUNT TO ZERO
      RTS %7 ; RETURN
SPACEX: 0
    
```

```

: ENTERED WITH SYSTEM TRAP CALL (HLT)
: PRINT OUT THE ERROR PC AND STATUS REGISTER
PRINT: KBINTT
      @SWR,@20000 ; TEST FOR INHIBIT PRINT OUT
      BIT +4 ; BRANCH TO PRINT
      BR B.CK ; INHIBIT, CHECK FOR HALT
      MOV (6)+,SAVPC ; PC OF FAILING ROUTINE
      MOV (6)+,SAVPSR ; PSR OR ERROR CONDITION
      CMP -(6),-(6) ; RESTORE STACK
      JSR %7,CALF ; OUTPUT CARRIAGE RETURN, LINEFEED
      MOV %2,SAVR2 ; SAVE R2
      MOV SAVPC,%2
      JSR %7,PROCT ; PRINT PC+2 IN OCTAL
      TSTB @TCSR ; WAIT FOR TTY READY
      BPL -4
      MOV @240,@DDBR ; OUTPUT A SPACE
      MOV SAVPSR,%2
      JSR %7,PROCT ; PRINT PROCESSOR STATUS AT TIME OF FAILURE
      MOV SAVR2,%2 ; RESTORE REGISTER 2
      TSTB @TCSR ; WAIT FOR TTY READY
      BPL -4
      MOV @240,@DDBR
    
```

2292	011706	104003		B.CK:	KBINTT			
2293	011710	005777	166702		TST	2SWR		:CHECK SR FOR HALT SWITCH
2294	011714	100001			BPL	.+4		:BRANCH IF NOT SET
2295	011716	000000			HALT			:HALT ON ERROR UP
2296	011720	000002			RTI			:RETURN TO MAIN LINE
2297	011722	000000		SAVR2:	0			
2298	011724	000000		SAVR3:	0			
2299	011726	000000		SAVR4:	0			
2300	011730	000000		SAVPC:	0			
2301	011732	000000		SAVPSR:	0			
2302								
2303	011734	010367	177764	PROCT:	MOV	%3,SAVR3		:SAVE R3
2304	011740	010467	177762		MOV	%4,SAVR4		:SAVE R4
2305	011744	005004			CLR	%4		:CLEAR R4 TO USE AS COUNTER
2306	011746	005001			CLR	COUNT		:CLEAR COUNT TO USE AS CARRY FLAG
2307	011750	012703	000260		MOV	260,%3		:SETUP ASCII ZERO IN R3
2308	011754	005702			TST	%2		:CHECK BIT 15 OF DESIRED NUMBER
2309	011756	100001			BPL	.+4		:BRANCH IF NOT SET
2310	011760	005203			INC	%3		:CHANGE TO ASCII ONE
2311	011762	006102			ROL	%2		:ROTATE INTO RIGHTMOST BIT
2312	011764	006102			ROL	%2		:TO PREPARE FOR LOOP
2313	011766	005501			ADC	COUNT		:STORE CARRY
2314	011770	105777	166616	C.WAIT:	TSTB	2CSR		:WAIT FOR TTY READY
2315	011774	100375			BPL	C.WAIT		
2316	011776	010377	166612		MOV	%3,%DBR		:OUTPUT ASCII
2317	012002	005204			INC	%4		:COUNT CHARACTERS OUTPUT
2318	012004	020427	000006		CMP	%4,%6		:CHECK FOR DONE
2319	012010	001005			BNE	C.CONT		:BRANCH IF NOT DONE
2320	012012	016703	177706		MOV	SAVR3,%3		:RESTORE REGISTER 3
2321	012016	016704	177704		MOV	SAVR4,%4		:RESTORE REGISTER 4
2322	012022	000207			RTS	%7		:RETURN
2323	012024	000241		C.CONT:	CLR	CARRY		:CLEAR CARRY
2324	012026	005701			TST	CARRY		:TEST CARRY FLAG
2325	012030	001402			BNE	.+6		:BRANCH IF NOT SET
2326	012032	005001			CLR	CARRY		:CLEAR FLAG
2327	012034	000261			SEC			:SET CARRY
2328	012036	006102			ROL	%2		:ROTATE NEXT 3 BITS INTO RIGHTMOST 3
2329	012040	006102			ROL	%2		
2330	012042	006102			ROL	%2		
2331	012044	005501			ADC	COUNT		:STORE CARRY
2332	012046	010203			MOV	%2,%3		:MOVE DATA FOR OUTPUT
2333	012050	042703	177770		BIC	177770,%3		:CLEAR ALL BUT RIGHTMOST 3 BITS
2334	012054	052703	000260		BIS	260,%3		:SET TO ASCII EQUIVALENT
2335	012060	000743			BR	C.WAIT		:LOOP
2336								:SCOPE AND/OR ITERATION LOOP FOR EACH TEST 2 TIMES
2337	012062	104003		SCOPE:	KBINTT			
2338	012064	032777	040000		BIT	40000,%SWR		:TEST SR FOR SCOPE
2339	012072	001012			BNE	0.1		:YES-SCOPE
2340	012074	032777	004000		BIT	40000,%SWR		:NO-TEST FOR ITERATION
2341	012102	001013			BNE	0.2		:INHIBIT ITERATION
2342	012104	026767	000036		CMPL	CNT,%MAX		:CHECK FOR ITERATIONS COMPLETE
2343	012112	100007			BPL	.+2		:EXIT-DONE
2344	012114	005267	000026		INC	CNT		:INCREMENT COUNT
2345	012120	022606		C.L:	MOV	%6,%DBR		:REPOSITION STACK POINTER
2346	012122	012667	165650		MOV	%6,%SWR		:RESTORE PROCESSOR STATUS
2347	012124	000116	000016		RTN			:RETURN TO PERFORM TEST

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DIAGNOSTIC TEST  
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2345	012132	005067	000010	
2346	011166	000006		
2347	000002			
2348	000001			
2349	000000			
2350	001022			
2351				
2352	142777	000177	166432	
2353	111267	000054		
2354	005202			
2355	121267	000046		
2356	001006			
2357	105777	166412		
2358	100375			
2359	005077	166406		
2360	000207			
2361	121227	000100		
2362	001003			
2363	004767	000020		
2364	000760			
2365	105777	166362		
2366	100375			
2367	112277	166356		
2368	000753			
2369	000000			
2370				
2371				
2372	105777	166344		
2373	100375			
2374	112777	000215	166336	
2375	105777	166330		
2376	100375			
2377	112777	000212	166322	
2378	000207			
2379				
2380				
2381				
2382				
2383				
2384				
2385				
2386	004767	177742		
2387	004767	177736		
2388	004767	177732		
2389	004767	177726		
2390	000207			
2391				
2392	022767	000176	166272	
2393	001403			
2394	062716	000002		
2395	000504			
2396	012702	016055		
2397	004767	177606		
2398	016702	165626		
2399	004767	177360		
2400	012702	016040		
2401	004767	177566		
2402	005067	166232		
2403	012767	000007	166232	

```

D 2: CLR I CNT : CLEAR COUNTER
      MOV R2,%6. RETURN : SAVE SCOPE RETURN POINTER
      RTI : RETURN IN LINE-NEXT TEST
      *MAX: 1 : MAX NUMBER OF ITERATIONS
      IT CNT: 0 : COUNT LOCATION FOR ITERATION LOOP
      RETURN. TEST*1+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, @EOMK : MOVE IN EOM MARKER
      INC: INC %2 : MOVE DATA POINTER TO NEXT BYTE
      TOUT: CMPB @%2, @EOMK : COMPARE FOR EOM
      BNE @CNT : BRANCH IF NOT END OF MESSAGE
      TSTB @TCSR : WAIT FOR TTY READY
      BPL -4
      CLR @TDBR : OUTPUT NULL
      RTS %7 : RETURN IF EOM
      CNT: CMPB @%2, #0 : CHECK FOR CRLF REQUEST
      BNE @+10 : BRANCH IF NOT
      JSR %7, CRLF : OUTPUT CARRIAGE RETURN, LINEFEED
      BR @INC : LOOP
      TSTB @TCSR : WAIT FOR TTY
      BPL -4
      MOVB @%2, @TDBR : OUTPUT NEXT CHARACTER
      BR @TOUT : CONTINUE
      @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

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

CNTLJU: CMP #SWREG, SWR
      BEQ 1$
      ADD #2, (SP)
      BR OUT
1$: MOV #SWREG, R2
      JSR PC, TOUT
      MOV SWREG, R2
      JSR PC, PROCT
      MOV #NEWS, R2
      JSR PC, TOUT
      CLR TMP1
      MOV #7, CNT

```

```

012376 105777 166204
012378 100375
012379 117767 166200 166214
012380 116777 166210 166174
012381 142767 000200 166200
012382 122767 000025 166172
012383 001005
012384 012702 016205
012385 004767 177504
012386 000746
012387 122767 000015 166150
012388 001430
012389 122767 000060 166140
012390 003027
012391 122767 000067 166130
012392 002423
012393 142767 000060 166120
012394 006367 166110
012395 006367 166104
012396 006367 166100
012397 156767 166100 166072
012398 005367 166074
012399 001404
012400 000717
012401 004767 177476
012402 000002
012403 012702 016027
012404 004767 177374
012405 000702

012567 016746 165222
012568 016746 165214
012569 012767 012610 165206
012570 022777 177777 166012
012571 001402
012572 000407
012573 022626
012574 012767 000176 165776
012575 012767 000174 165772
012576 012667 165152
012577 012667 165150
012578 000002

012640 022767 000176 165750
012641 001016
012642 005067 165746
012643 117767 165730 165740
012644 142767 000200 165732
012645 122767 000007 165724
012646 001002
012647 104002
012648 104006
012649 000002

```

```

READ: TSTB 2KBCSR
      BPL READ
      MOVB 2KBDBR,T1B
      MOVB T1B,2TDBR
      BICB #200,T1B
      CMPB #25,T1B
      BNE 2$
      MOV #CTLU,R2
      JSR PC,TOUT
      BR AGN
2$: CMPB #15,T1B
   BEQ 1$
   CMPB #60,T1B
   BGT INERRR
   CMPB #67,T1B
   BLT INERRR
   BICB #60,T1B
   ASL TMP1
   ASL TMP1
   ASL TMP1
   BICB T1B,TMP1
   DEC CSNT
   BEQ INERRR
   BR READ
1$: JSR %7,CRLF
   RTI
INERRR: MOV #QEST,R2
        JSR PC,TOUT
        BR AGN

```

:ROUTINE TO CHECK EXISTANCE OF SWREG

```

SUSWR: MOV 6,-(SP)
      MOV 4,-(SP)
      MOV #15,4
      CMF #-1,2SWR
      BEQ 2$
      BR 3$
1$: CMP (SP)+(SP)+
2$: MOV #SWREG,SWR
   MOV #DISPREG,DISPLAY
3$: MOV (SP)+,4
   MOV SP+,6
   RTI

KBINT: CMP #SWREG,SWR
      BNE 1$
      CLR TMP1
      MOVB 2KBDBR,TMP1
      BICB #200,TMP1
      CMPB #7,TMP1
      BNE 1$
      CNTR
      ORG 1
1$: RTI

```



CPY SRC

CR1, DIAGNOSTIC TEST  
12-MAR-76 00:00

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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  
  
01  
0  
016316  
012640  
012376  
012560  
012732  
012736

:TYPE THE MAIN TITLE  
↑ITYP: TST TIFLG  
BEQ 15  
MOV #ITL,R2  
JSR %7,OUT  
CLR TIFLG  
IS: RTI  
  
CKJU: CMPB #7,CSNT  
BEQ 15  
MOV TMP1,JSWR  
IS: RTI  
  
EMTSRV: MOV (SP),-(SP)  
SUB #2,(SP)  
MOV @((SP)),(SP)  
ASL (SP)  
BIC #177001,SP  
ADC #EMTAB,(SP)  
MOV @((SP)),(SP)  
JMP @((SP),+)  
  
EMTAB: PRINT  
SCOPEC  
CNTLJL  
KBINT  
READ  
SUSWP  
CKJL  
ITYP

:CALLED BY EMT HL  
:CALLED BY EMT SCOPE  
:CALLED BY EMT CNTLL  
:CALLED BY EMT KBINT  
:CALLED BY EMT FEADC  
:CALLED BY EMT SUSWP  
:CALLED BY EMT CKL  
:CALLED BY EMT \*\*\*

: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

ALPCD:	4000	:COLUMN	CHAR	HOL	EPITH
	200	:1	B		12
	4400	:2	A		12 1
	201	:3	B		12 2
	4200	:4	C		12 3
	202	:5	D		12 4
	4100	:6	E		12 5
	203	:7	F		12 6
	4040	:8	G		12 7
	204	:9	H		12 8
	4020	:10	I		12 9
	205	:11	CENT		12 8 2
	4010	:12	.		12 8 3
	206	:13	'		12 8 4
	4004	:14	'		12 8 5
	207	:15	+		12 8 6
	4002	:16	1		12 8 7
	210	:17	-		11
	4001	:18	J		11 1
	220	:19	K		11 2
	4202	:20	L		11 3
	212	:21	M		11 4
	4102	:22	N		11 5
	213	:23	C		11 6
	4042	:24	F		11 7
	214				
	4022				
	215				
	4012				
	216				
	4006				
	217				
	2000				
	100				
	2400				
	101				
	2200				
	102				
	2100				
	103				
	2040				
	104				
	2020				
	105				
	2010				
	106				
	2004				
	107				

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

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	000 16	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	!	!
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
  
```

```

;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
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	
2746	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	051120 051505
2826	014240	051040	040505	042122
2827	014245	020122	046447	042504 052117

BINEND: 237  
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
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
2839	014350	023116	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
2846	014416	020123	040503	042122
2847	014424	051040	040505	042504
2848	014430	020122	051047	040505
2849	014440	020104	052123	050117
2850	014446	027447		
2851	014450	040057	051120	051505
2852	014456	020123	040503	042122
2853	014464	051040	040505	042504
2854	014472	020122	051447	047524
2855	014500	023520	057	
2856	014503	057	052100	042510
2857	014510	044440	052116	051105
2858	014516	052522	052120	046040
2859	014524	053105	046105	053440
2860	014532	051501	027440	
2861	014536	040057	042522	047515
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
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
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

MSG1A: .ASCII ;/PRESS CARD READER 'RESET'/;

MSG2: .ASCII THEN HIT 'CONTINUE' ON THE CONSOLE/;

MSG3: .ASCII ;/PRESS CARD READER 'READ STOP' ;

MSG3A: .ASCII ;/PRESS CARD READER 'STOP'/;

MSG4: .ASCII ;/THE INTERRUPT LEVEL WAS /;

MSG5: .ASCII ;/REMOVE ALL CARDS FROM THE INPUT HOPPER/;

MSG6: .ASCII ;/RESTORE CARDS IN THE INPUT HOPPER/;

MSG7: .ASCII ;/RAISE OUTPUT STACKER PRESSURE ARM SLIGHTLY ABOVE HORIZONTAL THEN LC



```

2928 014740 044522 047532 052116
2929 014746 046101 040040 052040
2930 014754 047510 020116 047514
2931 014762 047527 020122 052111
2932 014770 057 046100 053517
2933 014771 057 047440 052125
2934 014776 051105 047440 052123
2935 015004 052520 020124 020122
2936 015012 041501 042513 020105
2937 015020 046120 052101 020105
2938 015026 047524 041040 052117
2939 015034 047524 027515
2940 015040 040057 047510 042114
2941 015046 042040 053517 020116
2942 015054 044124 020105 053523
2943 015062 041111 044103 040440
2944 015070 040124 044103 020105
2945 015076 047502 052124 046517
2946 015104 047440 020106 044124
2947 015112 020105 047111 052520
2948 015120 020124 047510 050120
2949 015126 051105 057 043111
2950 015131 057 046100 043111
2951 015134 020124 052523 042111
2952 015144 044103 044103 042116
2953 015150 051105 051040 043111
2954 015160 046106 020105 040503
2955 015166 027520
2956 015170 040057 046102 041517
2957 015176 020113 044124 020105
2958 015204 040503 042122 051040
2959 015212 040505 042504 020122
2960 015220 020123 052101 047511
2961 015226 020116 047524 050040
2962 015234 047524 042526 052116
2963 015240 040440 041440 051101
2964 015250 020104 047507 047111
2965 015256 020107 044124 052522
2966 015264 020054 047101 027504
2967 015272 040057 042522 047515
2968 015300 042526 045040 046501
2969 015306 042515 020104 040503
2970 015314 042122 057
2971 015317 057 044100 046117
2972 015324 020104 044124 020105
2973 015332 052517 050124 052125
2974 015340 051440 040524 045503
2975 015346 051105 043440 052101
2976 015354 020105 050117 047105
2977 015362 020056 044124 047105
2978 015370 057
2979 015371 057 050100 040514
2980 015376 042503 051440 042520
2981 015404 044503 046101 042040
2982 015412 051101 026513 044514
2983 015420 044107 020124 044103

```

MSG7A: .ASCII ;/2LOWER OUTPUT STACKER PLATE TO BOTTOM/;

MSG8: .ASCII ;/2HOLD DOWN THE SWITCH AT THE BOTTOM OF THE INPUT HOPPER/;

MSG8A: .ASCII ;/2LIFT SWITCH UNDER RIFFLE CAP/;

MSG9: .ASCII ;/2BLOCK THE CARD READER STATION TO PREVENT A CARD GOING THRU. AND/;

MSG10: .ASCII ;/2REMOVE JAMMED CARD/;

MSG11: .ASCII ;/2HOLD THE OUTPUT STACKER GATE OPEN. THEN/;

MSG12: .ASCII ;/2PLACE SPECIAL DARK-LIGHT CHECK CARDS (SEE LISTING. TESTG) ;

```

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
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 042557 042504 045503
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 020040 051040 040505
2960 015614 027504
2961 015616 040057 046101 044120
2962 015624 020101 057
2963 015627 057 041100 047111
2964 015634 051101 027531
2965 015640 040057 044502 020124
2966 015646 032461 053440 051501
2967 015654 051440 052105 057
2968 015661 057 051100 046505
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
2978 015752 020070 040527 020123
2979 015760 042523 027524
2980 015764 040057 047503 052514
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
2987 016034 036440 027440
2988 016040 020057 020040 020040
2989 016046 042516 020127 020075
2990 016054 057
2991 016055 057 051500 051127
2992 016062 036440 027440
2993 016066 040057 040503 042122
2994 016074 044440 040515 042507
2995 016102 050040 052101 042524

```

.ASCII ;@AT THE BOTTOM OF THE INPUT STAC

MSG13: .ASCII ;/@DECK CARD COLUMN PATTERN READ1 READ2 CODES READ/;

MSG14: .ASCII ;/@ALPHA /;

MSG15: .ASCII ;/@BINARY/;

MSG16: .ASCII ;/@BIT 15 WAS SET/;

MSG17: .ASCII ;/@REMEDY THE ERROR CONDITION AND PRESS 'CONTINUE'@/;

MSG18: .ASCII ;/@BIT 8 WAS SET/;

MSG19: .ASCII ;/@COLUMN READ1 READ2 CARDS ERRORS/;

QEST: .ASCII ;/@'@ = /;

NEWS: .ASCII ;/ NEW = /;

SWREQ: .ASCII ;/@SWR = /;

CIMPAT: .ASCII ;/@CARD IMAGE PATTERN= /;

# G05

DZCRA-D  
DZCRA.SRC

CR11 DIAGNOSTIC TEST  
12-MAR-76 00:00

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```
2996 016110 047122 020075 057
2997 016115 057 051500 040524 STAD0: .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 0504
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 00000: .ENC
```















DZCRA-D  
DZCRA.SRC

CR11 DIAGNOSTIC TEST  
12-MAR-76 00:00

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CROSS REFERENCE TABLE -- MACRO NAMES

COMMEN	10						
ENDCOM	10						
ESCAPE	10						
GETPRI	10						
GETSWR	10						
INT	1084	1085	111.	1204	1247	1290	1333
MULT	10						
NEWTST	10						
POP	10						
PUSH	10						
REPORT	10						
SETPRI	10						
SETJP	10						
SKIP	10						
SLASH	10						
STARS	10						
SWRSU	10						
TYPBIN	10						
TYPDEC	10						
TYPNAM	10						
TYPNUM	10						
TYPOCS	10						
TYPOCT	10						
TYPTXT	10						
SSESCA	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						
.SDB20	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						
.SSB20	10						
.SSB2C	10						
.SSCOP	10						

DZCRA.SRC JCL: DIAGNOSTIC TEST  
12-SEP-76 00:00

MACY11 27(1006) 21-SEP-76 16:56 PAGE 69  
CROSS REFERENCE TABLE -- MACRO NAMES

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RES. 016351 000

ERRORS DETECTED: 0  
DEFAULT GLOBALS GENERATED: 0

DZCRA.SRC/CRF/SOL=SYSMAC.CO.DZCRA.SRC  
RUN-TIME: 27 38 2 SECONDS  
RUN-TIME RATIO: 151/68=2.2  
CORE USED: 33K 65 PAGES

