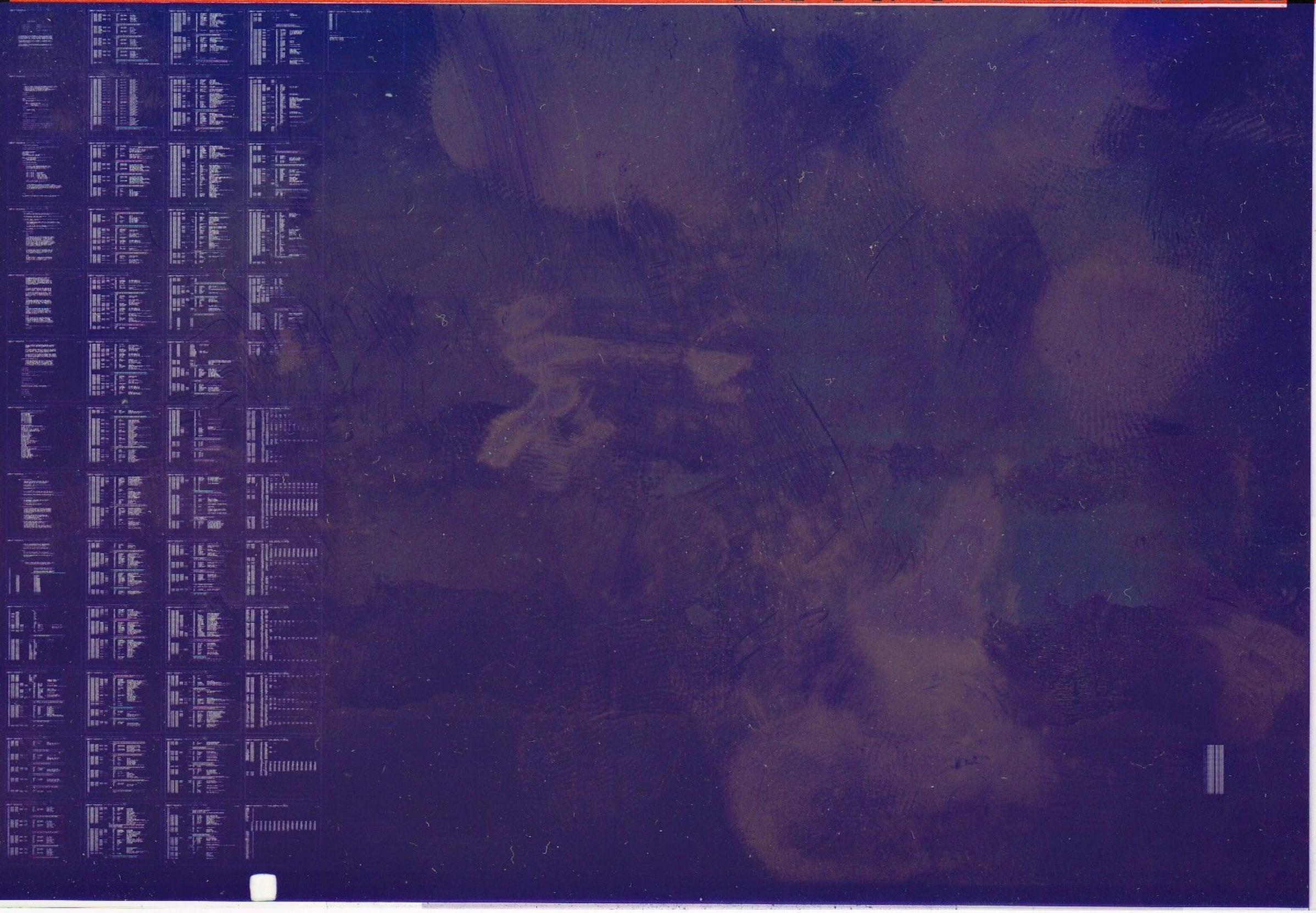
DR11-B,
DA11-B

DR11B/DA11-B
NPR DIA
CZDRBHO

AH-8644H-MC
FICHE 1 OF 1

digital



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IDENTIFICATION

PRODUCT CODE: AC-8643H-MC

PRODUCT NAME: CZDRBH0 DR11-B/DA11-B NPR DIA

PRODUCT DATE: MAY 1983

MAINTAINER: DIAGNOSTIC ENGINEERING

1. ABSTRACT

1.1 THIS IS A LOGIC TEST OF THE 'NPR GENERAL INTERFACE" -DR11B.
THERE IS A SPECIAL MAINTENANCE FEATURE THAT ALLOWS TESTING
OF NPRS WITHOUT A CUSTOMERS DEVICE ATTACHED.
1.2 THERE IS A SECOND TEST INCLUDED FOR EXERCISING THE DA11B
INTERPROCESSER LINK. THE DR11B TEST SHOULD BE RUN IN
IN EACH COMPUTER BEFOUR TESTING THE DA11B.

2. REQUIREMENTS

2.1 EQUIPMENT

2.1.1 FOR THE DR11B

PDP-11 STANDARD COMPUTER
DR11B
NOTE: WITH OR WITHOUT HARDWARE SWITCH REGISTER
2.1.2 FOR THE DA11B

2 PDP-11 STANDARD COMPUTERS
1 DA11B CONSISTING OF 2 M7229 MODULES AND 2
BC08R CABLES.
NOTE: WITH OR WITHOUT HARDWARE SWITCH REGISTER

2.2 STORAGE

2.2.1 PROGRAM STORAGE - THE ROUTINE USES MEMORY
FROM 0 TO 14000.

3. LOADING PROCEDURE

3.1 METHOD

PROCEDURE FOR NORMAL BINARY TAPES SHOULD BE FOLLOWED.

4. DR11B STARTING PROCEDURE

4.1 CONTROL SWITCH SETTING

STARTING AT SA 200 ALL SWITCHES SHOULD BE DOWN OR ZERO.

NOTE: IF ALL SWITCHES ARE DOWN, IT IS ASSUMED THAT THE
BR LEVEL OF THE DR11B IS = 5. SEE OPERATIONAL SWITCH
SETTINGS, SECTION 5.1.2.

4.2 STARTING ADDRESS OR ADDRESSES

(A) 200 = TEST OF LOGIC USING MAINTENANCE FEATURE M968 IN C04,D04

4.3 PROGRAM AND/OR OPERATOR ACTION

LOAD PROGRAM INTO MEMORY.
LOAD STARTING ADDRESS
PRESS START.
THE PROGRAM WILL LOOP, 'END PASS' WILL BE
TYPED AT THE END OF THE PROGRAM.

NOTE: IF SOFTWARE SWITCH REGISTER IS SELECTED THEN THE
FOLLOWING WILL BE PRINTED:
SWR= XXXXXX NEW=
(REFER TO SECTION 5.1 FOR OPERATOR OPTIONS)

5. DR11B OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

5.1.1 AT SA 200 .. THE INSTRUCTION AND LOGIC TEST.
WITH ALL SWITCHES DOWN THE PROGRAM WILL PRINT
OUT ON ERRORS AND CONTINUE IN TEST. ('END
PASS' TYPED AT COMPLETION OF A PASS)

5.1.2 SWITCH SETTINGS ARE

SW15 = 1 OR UP ... HALT ON ERROR
SW14 = 1 OR UP ... SCOPE LOOP
SW13 = 1 OR UP ... INHIBIT PRINTOUT
SW12 = 1 OR UP ... INHIBIT TRACE TRAP
SW11 = 1 OR UP ... INHIBIT ITERATIONS
SW02 TO SW00 = 4 ... BR LEVEL OF DR11B = 4
= 5 ... BR LEVEL OF DR11B = 5
= 6 ... BR LEVEL OF DR11B = 6

NOTE: IF SW02 TO SW00 = 0, THE BR LEVEL OF
THE DR11B IS ASSUMED TO BE = 5.

5.1.3
IF THE DIAGNOSTIC IS RUN ON A CPU WITHOUT A SWITCH
REGISTER THEN A SOFTWARE SWITCH REGISTER IS USED WHICH ALLOWS
THE USER THE SAME SWITCH OPTIONS AS THE HARDWARE SWITCH REGISTER.
IF THE HARDWARE SWITCH REGISTER DOES NOT EXIST OR IF ONE DOES
AND IT CONTAINS ALL ONES (177777) THEN THE SOFTWARE SWITCH
REGISTER (LOC. 176) IS USED.

CONTROL:

THIS PROGRAM ALSO SUPPORTS THE DYNAMIC LOADING OF THE SOFTWARE SWITCH
REGISTER (LOC. 176) FROM THE TTY. THIS CAN BE ACCOMPLISHED BY

DOING THE FOLLOWING:

1) TYPE CONTROL G <^G>; THIS WILL ALLOW THE TTY TO ENTER DATA INTO LOC. 176 AT SELECTED POINTS WITHIN THE PROGRAM.

2) THE MACHINE WILL THEN TYPE: SWR=XXXXXXNEW= (XXXXXX IS THE OCTAL CONTENTS OF THE SOFTWARE SWITCH REGISTER.)

3) AFTER THE ''NEW='' HAS BEEN TYPED THEN THE OPERATOR CAN DO ONE OF THE FOLLOWING AT THE TTY:

   A) TYPE A NUMBER TO BE LOADED INTO LOC. 176 FOLLOWED BY A <CR>. (ONLY NUMBERS BETWEEN 0-7 WILL BE ACCEPTED AND ONLY 6 NUMBERS WILL BE ALLOWED)

      IF A <CR> IS THE FIRST KEY DEPRESSED THE SOFTWARE SWITCH REGISTER CONTENTS WILL NOT BE CHANGED.

   B) IF A CONTROL U <^U> IS DEPRESSED THEN THE PROGRAM WILL SEND YOU BACK TO STEP 2.

5.2. SUBROUTINE ABSTRACTS

BEGIN SA 200

5.2.1 SCOPE

THIS SUBROUTINE CALL IS PLACED BETWEEN EACH SUBTEST IN THE INSTRUCTION SECTION. IT RECORDS THE STARTING ADDRESS OF EACH SUB-TEST AS IT IS BEING ENTERED. IF A SCOPE LOOP IS REQUESTED, IT WILL JUMP TO THE START OF THE SUBTEST THAT THE SCOPE LOOP IS REQUESTED FOR. IF SCOPE LOOP IS NOT REQUESTED, THERE WILL BE EITHER A FIXED OR RANDOM NUMBER OF ITERATIONS ON THAT SUBTEST BEFORE THE NEXT SUBTEST IS ENTERED. SWITCH 11 ON A 1 INHIBITS ITERATION OF SUBTESTS.
NOTE: SUPPORTS ^G ROUTINE FOR DYNAMIC LOADING OF SOFTWARE SWITCH REGISTER

5.2.2 HALT

IS A ROUTINE THAT PRINTS-OUT AN ADDRESS THAT TAGS THE FAILING SUBTEST,THE CP STATUS REGISTER AND THE DR11B STATUS REGISTER AT THE TIME OF FAILURE.
NOTE: SUPPORTS ^G ROUTINE FOR DYNAMIC LOADING OF SOFTWARE SWITCH REGISTER

5.2.3 LODBUF

THE INBUF BUFFER IS LOADED WITH AN INCREMENTING PATTERN (0,1,2,3,...) BEGINNING AT THE STARTING ADDRESS OF INBUF. THE NUMBER OF WORDS LOADED IS DETERMINED BY THE CONTENTS OF BUFLEN.

5.2.4 CHKBFF

THE CHKBUF BUFFER IS LOADED WITH A MODIFIED INCREMENTING PATTERN (0,0,2,2,4,4,6,6,...) BEGINNING AT THE STARTING ADDRESS OF CHKBUF. THE NUMBER OF WORDS LOADED IS DETERMINED BY THE CONTENTS OF BUFLEN. THIS BUFFER IS LOADED ONLY FOR TESTS WHICH USE THE MAINTENANCE MODE OF THE DR11-B WHICH HAS A SPECIAL ALTERNATING DATI-DATO SEQUENCE OF OPERATION.

5.2.5 INTA

THE IE BIT IS CLEARED IN THE DRST THEN THE DRST IS CHECKED FOR THE ABSENCE OF AN ERROR AND THE PRESENCE OF READY. THE DRWC IS CHECKED TO SEE THAT IT IS EQUAL TO ZERO. THE CORRECT CONTENTS

OF THE DRBA ARE CALCULATED AND CHECKED. THERE IS A JSR TO THE NORMAL SUB-ROUTINE BEFORE THIS ROUTINE IS EXITED. THE PROGRAM WILL HALT IF ERROR IS SET, READY IS CLEAR, OR READY AND ERROR ARE CLEAR.

5.2.6 DATCHK

THIS ROUTINE IS ENTERED TO CHECK INBUF AFTER A MAINTENANCE MODE OPERATION. THE CONTENTS OF INBUF AND THE CONTENTS OF CHKBUF ARE CHECKED TO SEE THAT THEY ARE THE SAME. THE NUMBER OF COMPARISONS MADE IS DETERMINED BY THE CONTENTS OF BUFLEN.

5.2.7 NORMAL

THE ROUTINE IS ENTERED FROM INTA AND FROM SOME TESTS WHICH DON'T USE INTA. THE NUMBER OF THE DRINV+2 IS PUT INTO DRINV AND THE DRVS IS CLEARED. IF THE DR11-B INTERRUPTS UNDER THESE CONDITIONS THE PDP-11 WILL HALT AT DRVS. THE PROCESSOR STATUS WORD IS RESTORED TO LEVEL 7 AND THE ROUTINE IS EXITED.

5.2.8 DATOCK

AFTER A STRING OF DATO'S HAS BEEN COMPLETED THIS ROUTINE CHECKS THAT THE CORRECT DATA PATTERN (52525) WAS TRANSFERRED TO INBUF. THE NUMBER OF COMPARISONS MADE IS DETERMINED BY THE CONTENTS OF BUFLEN. AN ADDITIONAL CHECK IS MADE ON BUFLEN+2 TO INSURE THAT TOO MANY WORDS WEREN'T TRANSFERRED.

5.2.9 ERRCHK

THIS ROUTINE CLEARS IE A.. HALTS IF ERROR IS SET.

5.2.10 TRAPCATCHER

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

EACH VECTOR ENTRANCE ADDRESS IS LOADED WITH THE ADDRESS
OF THE NEXT LOCATION. THE NEXT LOCATION IS LOADED WITH
A HALT (000000). THUS AN ILLEGAL TRAP OR INTERRUPT WILL
CAUSE A HALT AT THE TRAP LOCATION PLUS TWO.

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

5.3 PROGRAM AND/OR OPERATOR ACTION

5.3.1 LOADING AND STARTING AT 200 WITH ALL SWITCHES DOWN
IS THE INSTRUCTION AND LOGIC TEST. IF AN ERROR
IS DETECTED HERE, THERE WILL BE A PRINTOUT. WHEN
AN ERROR IS DETECTED AND IT IS NECESSARY TO SCOPE
ON IT, PLACE SW15 UP TO HALT ON ERROR, THEN SW14 UP
TO LOOP ON ERROR, THEN SW13 UP TO DELETE PRINTOUTS.

6. DR11B ERRORS

6.1 ERROR PRINTOUT

THE PC OF THE FAILING TEST AND THE CP STATUS WILL BE PRINTED.

6.2 ERROR RECOVERY

DEPRESS CONTINUE TO RESTART SECTION

7. DR11B RESTRICTIONS

7.1 STARTING RESTRICTION

NONE

7.2 OPERATIONAL RESTRICTION

M968 MUST BE IN SLOTS C04/D04 - FOR DIAGNOSTIC TESTING
SHOULD BE IN A02/B02 FOR NORMAL USER OPERATION.

8. MISCELLANEOUS

8.1 EXECUTION TIME

ABOUT 2 MINUTES

9. PROGRAM DESCRIPTION

THE FOLLOWING IS A GENERAL LIST OF FUNCTIONS TESTED.

CAN ALL REG BE ADDRESSED WITHOUT ERROR
RESET CLEAR DRWC
RESET CLEAR DRBA
CAN ALL DRWC BITS BE SET
CAN 15-1 IN DRBA BE SET
FNCT1 SET & CLEARED
FNCT2 SET & CLEARED
FNCT3 SET & CLEARED
XBA16 SET & CLEARED
XBA17 SET & CLEARED
IE SET & CLEARED
CYCLE SET & CLEARED

MAINT SET & CLEARED
ALL DRST R/W BITS CAN BE SET & CLEARED
ALL DRST R/W SET, RESET TO 0, RDY IS SET, NEX IS CLEARED, GO IS 0
DRWC HOLD ALT. 0'S & 1'S AND ALT. 1'S & 0'S
DRBA HOLD ALT. 0'S & 1'S AND ALT. 1'S & 0'S
INC PATTERN TO WRAP-AROUND IN DRWC
INC PATTERN TO WRAP-AROUND IN DRBA
NO INT. AT LEVEL 7
NO INT. AT LEVEL 6
NO INT. AT LEVEL 5
DOES INT. AT LEVEL 4
NO MAINTBRD A02/B02
MAINTBRD C04/D04
FNCT BITS CONTROL DSTAT BITS
RESET 0'S DRDB
ALL DRDB BITS CAN BE SET
DRDB HOLD ALT. 1'S & 0'S AND ALT. 0'S & 1'S
INC TO WRAP-AROUND IN DRDB
RESET SETS ONLY RDY IN DRST
BA00 READS AS 0
1 DAT1 NPR
1 DAT0 NPR
BA0F FORCES ERROR & IS CLEARED BY CLEARING DRBA OR RESET
GO CLEARS RDY
DAT0 TO DIODE MEM CAUSES NEX
DO WITHOUT CLEARING PREVIOUS ERROR CAUSES ANOTHER INT.
10 DAT1'S (BURST)
10 DAT0'S (BURST)
200 DAT1'S (BURST)
200 DAT0'S (BURST)
200 DAT1'S (NON-BURST)
200 DAT0'S (NON-BURST)
FUNCT BITS INC WITH MAINT MODE XFERS
10 MAINT MODE XFERS
200 MAINT MODE XFERS

10. LISTING

11. FLOW CHART(S)

12. DA11B STARTING PROCEDURE

12.1 THERE ARE TWO STARTING LOCATIONS; ONE FOR THE COMPUTER THAT WILL BE THE SLAVE AND ANOTHER FOR THE COMPUTER THAT WILL BE THE MASTER.

12.2 SLAVE COMPUTER, LOAD ADDRESS 1006 AND PRESS START. PROCESSOR WILL HALT.

12.3 MASTER COMPUTER, LOAD ADDRESS 1000 AND PRESS START. PROCESSOR WILL HALT.

12.4 SLAVE COMPUTER, PRESS CONTINUE (OR CNTRL AND CONT ON AN 11/34 OR 11/04), (ON SWITCHLESS PROCESSOR TOGGLE THE HALT/CONT SWITCH).

12.5 MASTER COMPUTER, PRESS CONTINUE (OR CNTRL AND CONT ON AN 11/34 OR 11/04, (ON SWITCHLESS PROCESSOR TOGGLE THE HALT/CONT SWITCH).

13. DA11B OPERATING PROCEDURE

13.1 THE PROGRAM WILL LOOP AFTER STARTING AND PRINT OUT ANY ERRORS. THE PROGRAM WILL HALT AFTER NON RECOVERABLE ERRORS.

13.2 THE MAINT MODULE MUST BE IN A02/B02 AND THE THE DA11B MUST BE IN C04/D04 .

14. DA11B PROGRAM DISCRIPTION

14.1 THE SLAVE COMPUTER STARTS BY ENTERING A BACKGROUND TO WAIT FOR AN INTERUPT WITH THE INTERUPT ENABLED. THE FIRST INTERUPT THAT COMES SHOULD BE THE READY INTERUPT SET UP WHEN THE MASTER HIT THE START KEY. THE INTERUPT CAUSES THE SLAVE TO ENTER THE INTERUPT SERVICE ROUTINE.

14.2 THE INTERUPT SERVICE ROUTINE DETERMINS WHAT INTERUPT CAME UP AND IF IT SHOULD HAVE COME UP. IF THE INTERUPT WAS THE ONE EXPECTED THAN THE THAN THE PROGRAM GOES TO THE TO THE PROPER JOB ROUTINE, SJ08XX FOR SLAVE SERVICE AND J08XX FOR THE MASTER ROUTINE.

14.3 THE NEXT THING THAT SHOULD HAPPEN IS THE MASTER SHOULD ISSUE AN INTERUPT TO THE SLAVE . THIS IS A SIGNAL FOR THE SLAVE TO ACCEPT THE WORD COUNT,OFFSET,AND TWO CHECK SUM WORDS. THE SLAVE ACCEPTS A WORD AT A TIME FROM THE DATA BUFFER EACH TIME THE MASTER TOGGLES FUNCTION BIT 3. EACH TIME IT READS A WORD THE SLAVE SENDS THE WORD BACK TO THE MASTER FOR VERIFICATION.

14.4 AFTER THE SLAVE HAS RECIEVED ALL THE PARAMETERS
IT SETS ITS DIRECTION BIT TO THE OPPOSIT DIRECTION
AS THE MASTER AND STARTS THE NPR TRANSFER.

14.5 THE MASTER SETS UP THE TYPE OF TRANSFERS AND
CHECKS THE DATA WHEN IT COMES BACK FROM THE SLAVE.

15. DA11B ERRORS

15.1 THE PC OF THE FAILING TEST, THE CP STATUS AND
THE DR11B STATUS REGISTER WILL BE PRINTED AFTER AN ERROR.

15.2 THERE IS NO ERROR RECOVERY FOR THE DA11B TEST BECAUSE
THE OTHER COMPUTER WILL GET OUT OF SINC WHEN AN
ERROR OCCURS.

16. ECO CHANGES

CHGG1 - CHANGES 1 THRU 5 REPLACED THE INTERRUPT ENABLE COMMAND
WITH A DATA TRANSFER BEFORE ISSUING AN INTERRUPT.
THIS WAS NECESSARY DUE TO HARDWARE CHANGES.

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                                ;       MODIFIED FOR SOFTWARE SWITCH REGISTER
                                ;       INCLUDING DYNAMIC LOADING OF SWR
                                ;
                                ;       MODIFIED TO ELIMINATE BAOF ERROR WHEN
                                ;       DMA TRANSFERS CROSS A 32K BOUNDRY
                                ;;**************************************************************************
                                ;;**************************************************************************

000240                          NOP=000240
104400                          SCOPE=TRAP
104000                          HLT=EMT
000001                          BIT0=000001
000002                          BIT1=000002
000004                          BIT2=000004
000010                          BIT3=000010
000020                          BIT4=000020
000040                          BIT5=000040
000100                          BIT6=000100
000200                          BIT7=000200
000400                          BIT8=000400
001000                          BIT9=001000
002000                          BIT10=002000
004000                          BIT11=004000
010000                          BIT12=010000
020000                          BIT13=020000
040000                          BIT14=040000
100000                          BIT15=100000

000004                          BUSERR=000004
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                                ;LOAD TRAP CATCHER INTO 0 THRU 777.

                    000000              .=0
                    000030              .=30
000030  011506                          PRINT
000032  000340                          340
                    000034              .=34
000034  012274                          SCOPEC
000036  000340                          340
                    000046              .=46
000046  007452                          $ENDAD
                    000052              .=52
000052  000000                          0
                    000176              .=176
000176  000000                          SWREG:  0
                    000200              .=200
000200  012706  014210                  MOV     #BUFF,%6            ;SET UP STACK LIMIT
000204  005077  000606                  CLR     @PSW
000210  023737  000042  000046          CMP     @#42,@#46           ;ARE WE IN ACT11 AUTO MODE?
000216  001404                          BEQ     1$                  ;SKIP TITLE IF YES
000220  012702  013035                  MOV     #$TITLE,%2          ;PRINT THE TITLE

000224  004767  012654                  JSR     %7,TTOUT
000230  000167  000646          1$:     JMP     SUSWR
                    001000              .=1000


                                ;;**********************************************************************
                                ;       START OF BACK-TO-BACK DR11-B
                                ;;**********************************************************************


001000  000000          MSTART: HALT                        ;MASTER START
001002  000167  006622          JMP     MS1
001006  000000          SSTART: HALT                        ;SLAVE START
001010  000167  006674          JMP     SS1
001014  177570          SR:     177570
001016  177776          PSW:    177776
001020  172410          DRWC:   172410
001022  172412          DRBA:   172412
001024  172414          DRST:   172414
001026  172416          DRDB:   172416
001030  000126          DRVS:   126
001032  000240          DRINL:  240
001034  000124          DRINV:  124
001036  052525          NPR1:   52525
001040  173000          DIOMEM: 173000
001042  014212          INBUF:  XINBUF
001044  015214          CHKBUF: XCHKBU
001046  000000          BUFLEN: HALT
001050  000000          LENCHK: HALT
001052  000000          BRWAIT: HALT
001054  000000          WCLEN:  HALT
001056  000000          RDYCHK: HALT
001060  177560          TKS:    177560
```

```
                                TKB:    177562
                                TPS:    177564
                                TPB:    177566
                                FNCCNT: HALT
                                INBUF1: HALT
                                PASCNT: 0                       ;NUMBER OF PASSES COMPLETED
                                TEMP:   0                       ;TEMPORARY STORAGE
                                TEMP2:  0                       ;TEMPORARY STORAGE

001102  013746  000006          SUSWR:  MOV     @#6,-(SP)       ;SAVE VECTORS
001106  013746  000004                  MOV     @#4,-(SP)
001112  012737  001132  000004          MOV     #64$,@#4        ;SET UP FOR TIMEOUT
001120  022777  177777  177666          CMP     #-1,@SR         ;REFERENCE HARDWARE SWITCH REGISTER
001126  001402                          BEQ     65$
001130  000404                          BR      66$
001132  022626                  64$:    CMP     (SP)+,(SP)+     ;ADJUST STACK
001134  012767  000176  177652  65$:    MOV     #SWREG,SR       ;POINT TO SOFTWARE SWITCH REG
001142  012637  000004          66$:    MOV     (SP)+,@#4       ;RESTORE VECTORS
001146  012637  000006                  MOV     (SP)+,@#6
001152  022767  000176  177634          CMP     #SWREG,SR       ;IS SWREG USED
001160  001005                          BNE     BEGIN
001162  005737  000042                  TST     @#42            ;ARE WE IN AUTO MODE?
001166  001002                          BNE     BEGIN           ;IF SO, SKIP SWREG INPUT
001170  004767  011262                  JSR     PC,CNTLU        ;ALLOW SWREG TO BE LOADED
001174  012777  000340  177614  BEGIN:  MOV     #340,@PSW       ;PROC. AT LEVEL #7
001202  012767  001174  011156          MOV     #BEGIN,RETURN


                        ;;**************************************************************
                        ;       TEST 0 CAN ALL DR11-B REG BE ADDRESSED WITHOUT ERROR?
                        ;;**************************************************************


001210  104400                          SCOPE
001212  012767  001252  176564          MOV     #ERRA,BUSERR    ;BUS ERROR VECTOR TO ERRA
001220  010700                          MOV     %7,%0           ;PC TO R0
001222  005277  177572                  INC     @DRWC           ;ADDRESS DRWC
001226  010700                          MOV     %7,%0           ;PC TO R0
001230  005277  177566                  INC     @DRBA           ;ADDRESS DRBA
001234  010700                          MOV     %7,%0           ;PC TO R0
001236  005077  177562                  CLR     @DRST           ;ADDRESS DRST
001242  010700                          MOV     %7,%0           ;PC TO R0
001244  005277  177556                  INC     @DRDB           ;ADDRESS DRDB
001250  000401                          BR      .+4             ;MADE IT - BRANCH OVER HALT
001252  104000                  ERRA:   HLT                     ;BUS ERROR, R0 HAS PC OF ERROR
001254  012767  000006  176522          MOV     #6,BUSERR       ;RESTORE #6 TO BUS ERROR VECTOR
001262  104400                          SCOPE


                        ;;**************************************************************
                        ;       TEST 1 DOES RESET CLEAR DRWC?
                        ;;**************************************************************


001264  012767  000010  011070          MOV     #10,ICOUNT
001272  012777  177777  177520          MOV     #-1,@DRWC       ;ALL ONES TO DRWC
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                                ;;*****************************************************************
                                ;       TEST2 DOES RESET CLEAR DRBA?
                                ;;*****************************************************************

001300  004767  011100                  JSR     %7,CKSWR
001304  000005                          RESET                   ;INIT
001306  005777  177506                  TST     @DRWC           ;LOOKING FOR Z-BIT TO SET
001312  001401                          BEQ     .+4             ;DID DRWC GET CLEARED?
001314  104000                          HLT                     ;DRWC NOT CLEAR
001316  104400                          SCOPE

001320  104400                          SCOPE
001322  012777  177777  177472          MOV     #-1,@DRBA       ;ALL ONES TO DRBA
001330  004767  011050                  JSR     %7,CKSWR
001334  000005                          RESET                   ;INIT
001336  005777  177460                  TST     @DRBA           ;LOOKING FOR Z-BIT TO SET
001342  001401                          BEQ     .+4             ;DID DRBA GET CLEARED?
001344  104000                          HLT                     ;DRBA NOT CLEAR

                                ;;*****************************************************************
                                ;       TEST3 CAN ALL DRWC BITS BE SET?
                                ;;*****************************************************************

001346  104400                          SCOPE
001350  012767  004000  011004          MOV     #4000,ICOUNT
001356  012777  177777  177434          MOV     #-1,@DRWC       ;SET ALL BITS IN DRWC
001364  022777  177777  177426          CMP     #-1,@DRWC       ;LOOKING FOR Z-BIT TO SET
001372  001401                          BEQ     .+4             ;SEE IF ALL BITS GOT SET
001374  104000                          HLT                     ;ALL BITS AREN'T SET

                                ;;*****************************************************************
                                ;       TEST4 CAN BITS 15-01 IN DRBA BE SET?
                                ;;*****************************************************************

001376  104400                          SCOPE
001400  012777  177776  177414          MOV     #-2,@DRBA       ;SET BITS 15-01 IN DRBA
001406  022777  177776  177406          CMP     #-2,@DRBA       ;LOOKING FOR Z-BIT TO SET
001414  001401                          BEQ     .+4             ;SEE IF BITS 15-01 GOT SET
001416  104000                          HLT                     ;BITS 15-01 AREN'T SET

                                ;;*****************************************************************
                                ;       TEST6 TEST THAT FNCT1 CAN BE SET AND CLEARED
                                ;;*****************************************************************

001420  104400                          SCOPE
001422  052777  000002  177374          BIS     #BIT1,@DRST     ;SET FNCT1
001430  032777  000002  177366          BIT     #BIT1,@DRST     ;TEST FNCT1
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                                                    BNE     .+4             ;IS IT SET?
001436  001001                                      HLT                     ;FNCT1 IS CLEAR
001440  104000
001442  042777  000002  177354                      BIC     #BIT1,@DRST     ;CLEAR FNCT1
001450  032777  000002  177346                      BIT     #BIT1,@DRST     ;TEST FNCT1
001456  001401                                      BEQ     .+4             ;WAS IT CLEAR
001460  104000                                      HLT                     ;FNCT1 WAS SET


                                        ;;**************************************************************************
                                        ;       TEST7 TEST THAT FNCT2 CAN BE SET AND CLEARED
                                        ;;**************************************************************************


001462  104400                                      SCOPE
001464  052777  000004  177332                      BIS     #BIT2,@DRST     ;SET FNCT2
001472  032777  000004  177324                      BIT     #BIT2,@DRST     ;TEST FNCT2
001500  001001                                      BNE     .+4             ;IS IT SET?
001502  104000                                      HLT                     ;FNCT2 IS CLEAR
001504  042777  000004  177312                      BIC     #BIT2,@DRST     ;CLEAR FNCT2
001512  032777  000004  177304                      BIT     #BIT2,@DRST     ;TEST FNCT2
001520  001401                                      BEQ     .+4             ;WAS IT CLEAR?
001522  104000                                      HLT                     ;FNCT2 WAS SET


                                        ;;**************************************************************************
                                        ;       TEST10 TEST THAT FNCT3 CAN BE SET AND CLEARED
                                        ;;**************************************************************************


001524  104400                                      SCOPE
001526  052777  000010  177270                      BIS     #BIT3,@DRST     ;SET FNCT3
001534  032777  000010  177262                      BIT     #BIT3,@DRST     ;TEST FNCT3
001542  001001                                      BNE     .+4             ;IS IT SET?
001544  104000                                      HLT                     ;FNCT3 IS CLEAR
001546  042777  000010  177250                      BIC     #BIT3,@DRST     ;CLEAR FNCT3
001554  032777  000010  177242                      BIT     #BIT3,@DRST     ;TEST FNCT3
001562  001401                                      BEQ     .+4             ;WAS IT CLEAR?
001564  104000                                      HLT                     ;FNCT3 WAS SET


                                        ;;**************************************************************************
                                        ;       TEST11 TEST THAT XBA16 CAN BE SET AND CLEARED
                                        ;;**************************************************************************


001566  104400                                      SCOPE
001570  052777  000020  177226                      BIS     #BIT4,@DRST     ;SET XBA16
001576  032777  000020  177220                      BIT     #BIT4,@DRST     ;TEST XBA16
001604  001001                                      BNE     .+4             ;IS IT SET?
001606  104000                                      HLT                     ;XBA16 IS CLEAR
001610  042777  000020  177206                      BIC     #BIT4,@DRST     ;CLEAR XBA16
001616  032777  000020  177200                      BIT     #BIT4,@DRST     ;TEST XBA16
001624  001401                                      BEQ     .+4             ;IS IT CLEAR
001626  104000                                      HLT                     ;XBA16 WAS SET


                                        ;;**************************************************************************
                                        ;       TEST12 TEST THAT XBA17 CAN BE SET AND CLEARED
```

```
                                ;;*****************************************************************
001630  104400                  SCOPE
001632  052777  000040  177164  BIS     #BIT5,@DRST     ;SET XBA17
001640  032777  000040  177156  BIT     #BIT5,@DRST     ;TEST XBA17
001646  001001                  BNE     .+4             ;IS IT SET?
001650  104000                  HLT                     ;XBA17 IS CLEAR
001652  042777  000020  177144  BIC     #BIT4,@DRST     ;CLEAR XBA17
001660  032777  000020  177136  BIT     #BIT4,@DRST     ;TEST XBA17
001666  001401                  BEQ     .+4             ;IS IT CLEAR?
001670  104000                  HLT                     ;XBA17 WAS SET

                                ;;*****************************************************************
                                ;       TEST13 TEST THAT IE CAN BE SET AND CLEARED
                                ;;*****************************************************************
001672  104400                  SCOPE
001674  052777  000100  177122  BIS     #BIT6,@DRST     ;SET IE
001702  032777  000100  177114  BIT     #BIT6,@DRST     ;TEST IE
001710  0010C1                  BNE     .+4             ;IS IT SET?
001712  104000                  HLT                     ;IE IS CLEAR
001714  042777  000100  177102  BIC     #BIT6,@DRST     ;CLEAR IE
001722  032777  000100  177074  BIT     #BIT6,@DRST     ;TEST IE
001730  001401                  BEQ     .+4             ;IS IT CLEAR?
001732  104000                  HLT                     ;IE WAS SET

                                ;;*****************************************************************
                                ;       TEST14 TEST THAT CYCLE CAN BE SET AND CLEARED
                                ;;*****************************************************************
001734  104400                  SCOPE
001736  052777  000400  177060  BIS     #BIT8,@DRST     ;SET CYCLE
001744  032777  000400  177052  BIT     #BIT8,@DRST     ;TEST CYCLE
001752  001001                  BNE     .+4             ;IS IT SET?
001754  104000                  HLT                     ;CYCLE WAS CLEAR
001756  042777  000400  177040  BIC     #BIT8,@DRST     ;CLEAR CYCLE
001764  032777  000400  177032  BIT     #BIT8,@DRST     ;TEST CYCLE
001772  001401                  BEQ     .+4             ;IS IT CLEAR?
001774  104000                  HLT                     ;CYCLE WAS SET

                                ;;*****************************************************************
                                ;       TEST15 TEST THAT MAINT CAN BE SET AND CLEARED
                                ;;*****************************************************************
001776  104400                  SCOPE
002000  052777  010000  177016  BIS     #BIT12,@DRST    ;SET MAINT
002006  032777  010000  177010  BIT     #BIT12,@DRST    ;TEST MAINT
002014  001001                  BNE     .+4             ;IS IT SET?
002016  104000                  HLT                     ;MAINT WAS CLEAR
002020  042777  010000  176776  BIC     #BIT12,@DRST    ;CLEAR MAINT
002026  032777  010000  176770  BIT     #BIT12,@DRST    ;TEST MAINT
002034  001401                  BEQ     .+4             ;IS MAINT CLEAR?
002036  104000                  HLT                     ;MAINT WAS SET

                                ;;*****************************************************************
                                ;       TEST 16 TEST THAT ALL DRST R/W BITS CAN BE SET AND CLEARED
                                ;;*****************************************************************
002040  104400                  SCOPE
002042  052777  010576  176754  BIS     #10576,@DRST    ;SET FOLLOWING: MAINT(12), CYCLE(08),IE(06),XBA17(05),
                                ;                       XBA16(04),FNCT3(03),FUNCT2(02),FNCT1(01)
```

```
   770  002050  032777  000002  176746          BIT     #BIT1,@DRST     ;TEST FNCT1
   771  002056  001001                          BNE     .+4             ;IS IT SET?
   772  002060  104000                          HLT                     ;FNCT1 IS CLEAR
   773  002062  032777  000004  176734          BIT     #BIT2,@DRST     ;TEST FNCT2
   774  002070  001001                          BNE     .+4             ;IS IT SET?
   775  002072  104000                          HLT                     ;FNCT2 IS CLEAR
   776  002074  032777  000010  176722          BIT     #BIT3,@DRST     ;TEST FNCT3
   777  002102  001001                          BNE     .+4             ;IS IT SET?
   778  002104  104000                          HLT                     ;FNCT3 IS CLEAR
   779  002106  032777  000020  176710          BIT     #BIT4,@DRST     ;TEST XBA16
   780  002114  001001                          BNE     .+4             ;IS IT SET?
   78'  002116  104000                          HLT                     ;XBA16 IS CLEAR
   782  002120  032777  000040  176676          BIT     #BIT5,@DRST     ;TEST XBA17
   783  002126  001001                          BNE     .+4             ;IS IT SET?
   784  002130  104000                          HLT                     ;XBA17 IS CLEAR
   785  002132  032777  000100  176664          BIT     #BIT6,@DRST     ;TEST IE
   786  002140  001001                          BNE     .+4             ;IS IT SET?
   787  002142  104000                          HLT                     ;IE IS CLEAR
   788  002144  032777  000400  176652          BIT     #BIT8,@DRST     ;TEST CYCLE
   789  002152  001001                          BNE     .+4             ;IS CYCLE SET?
   790  002154  104000                          HLT                     ;CYCLE IS CLEAR
   791  002156  032777  010000  176640          BIT     #BIT12,@DRST    ;TEST MAINT
   792  002164  001001                          BNE     .+4             ;IS MAINT SET?
   793  002166  104000                          HLT                     ;MAINT IS CLEAR
   794  002170  042777  010576  176626          BIC     #10576,@DRST    ;CLEAR ALL R/W BITS IN DRST
   795  002176  032777  000002  176620          BIT     #BIT1,@DRST     ;TEST FNCT1
   796  002204  001401                          BEQ     .+4             ;IS FNCT1 CLEAR?
   797  002206  104000                          HLT                     ;FNCT1 IS SET
   798  002210  032777  000004  176606          BIT     #BIT2,@DRST     ;TEST FNCT2
   799  002216  001401                          BEQ     .+4             ;IS FNCT2 CLEAR?
   800  002220  104000                          HLT                     ;FNCT2 IS SET
   801  002222  032777  000010  176574          BIT     #BIT3,@DRST     ;TEST FNCT3
   802  002230  001401                          BEQ     .+4             ;IS FNCT3 CLEAR?
   803  002232  104000                          HLT                     ;FNCT3 IS SET
   804  002234  032777  000020  176562          BIT     #BIT4,@DRST     ;TEST XBA16
   805  002242  001401                          BEQ     .+4             ;IS XBA16 CLEAR
   806  002244  104000                          HLT                     ;XBA16 IS SET
   807  002246  032777  000040  176550          BIT     #BIT5,@DRST     ;TEST XBA17
   808  002254  001401                          BEQ     .+4             ;IS XBA17 CLEAR?
   809  002256  104000                          HLT                     ;XBA17 IS SET
   810
   811  002260  032777  000100  176536          BIT     #BIT6,@DRST     ;TEST IE
   812  002266  001401                          BEQ     .+4             ;IS IE CLEAR?
   813  002270  104000                          HLT                     ;IE IS SET
   814  002272  032777  000400  176524          BIT     #BIT8,@DRST     ;TEST CYCLE
   815  002300  001401                          BEQ     .+4             ;IS CYCLE CLEAR?
   816  002302  104000                          HLT                     ;CYCLE IS SET
   817  002304  032777  010000  176512          BIT     #BIT12,@DRST    ;TEST MAINT
   818  002312  001401                          BEQ     .+4             ;IS MAINT CLEAR?
   819  002314  104000                          HLT                     ;MAINT IS SET
   820
   821                          ;;*****************************************************************
   822                          ;       TEST17 ALL R/W BITS IN DRST CAN BE SET AND RESET TO ZERO, THAT READY
   823                          ;       IS SET, NEX IS CLEAR, AND GO IS READ AS A 0.
   824                          ;;*****************************************************************
   825  002316  104400                          SCOPE
```

```
826  002320  012767  000010  010034          MOV     #10,ICOUNT
827  002326  052777  010576  176470          BIS     #10576,@DRST    ;SET FOLLOWING: MAINT(12),CYCLE(08),IE(06),XBA17(05),
828                                                                  ;               XBA16(04),FNCT3(03),FNCT2(02),FNCT1(01)
829  002334  017701  176464                  MOV     @DRST,%1        ;MOVE (DRST) TO R1
830  002340  052701  167201                  BIS     #167201,%1      ;SETS BITS IN R1 THAT WERE NOT SET IN DRST
831  002344  005201                          INC     %1              ;R1 SHOULD GO FROM -1 TO ZERO
832  002346  001401                          BEQ     .+4             ;WERE ALL DRST R/W BITS SET?
833  002350  104000                          HLT                     ;NOT ALL BITS WERE SET
834  002352  004767  010026                  JSR     %7,CKSWR
835  002356  000005                          RESET                   ;CLEAR ALL DRST R/W BITS
836  002360  017701  176440                  MOV     @DRST,%1        ;MOVE (DRST) TO R1
837  002364  042701  127200                  BIC     #127200,%1      ;CLEAR ALL BITS EXCEPT R/W BITS, NEX, AND GO
838  002370  001401                          BEQ     .+4             ;SHOULD EQUAL ZERO
839  002372  104000                          HLT                     ;RESET DIDN'T LEAVE DRST AS IT SHOULD HAVE
840
841                                  ;;*****************************************************************
842                                  ;       TEST20 CAN DRWC HOLD ALTERNATE ONE'S AND ZERO'S
843                                  ;;*****************************************************************
844  002374  104400                          SCOPE
845  002376  012767  004000  007756          MOV     #4000,ICOUNT
846  002404  012777  052525  176406          MOV     #052525,@DRWC   ;ALT 0'S AND 1'S TO DRWC
847  002412  022777  052525  176400          CMP     #052525,@DRWC   ;LOOKING FOR Z-BIT TO SET
848  002420  001401                          BEQ     .+4             ;DOES DRWC HAVE THE CORRECT PATTERN?
849  002422  104000                          HLT                     ;DRWC DOESN'T HAVE THE CORRECT PATTERN
850  002424  012777  125252  176366          MOV     #125252,@DRWC   ;ALT 1'S AND 0'S TO DRWC
851  002432  022777  125252  176360          CMP     #125252,@DRWC   ;LOOKING FOR Z-BIT TO SET
852  002440  001401                          BEQ     .+4             ;DOES DRWC HAVE THE CORRECT PATTERN?
853  002442  104000                          HLT                     ;DRWC DOESN'T HAVE THE CORRECT PATTERN
854
855                                  ;;*****************************************************************
856                                  ;       TEST21 CAN DRBA HOLD ALTERNATE ONE'S AND ZERO'S
857                                  ;;*****************************************************************
858  002444  104400                          SCOPE
859  002446  012777  052524  176346          MOV     #052524,@DRBA   ;ALT 0'S AND 1'S TO DRBA
860  002454  022777  052524  176340          CMP     #052524,@DRBA   ;LOOKING FOR Z-BIT TO SET
861  002462  001401                          BEQ     .+4             ;DOES DRBA HAVE THE CORRECT PATTERN?
862  002464  104000                          HLT                     ;DRBA DOESN'T HAVE THE CORRECT PATTERN
863  002466  012777  125252  176326          MOV     #125252,@DRBA   ;ALT 1'S AND 0'S TO DRBA
864  002474  022777  125252  176320          CMP     #125252,@DRBA   ;LOOKING FOR Z-BIT TO SET
865  002502  001401                          BEQ     .+4             ;DOES DRBA HAVE THE CORRECT PATTERN?
866  002504  104000                          HLT                     ;DRBA DOESN'T HAVE THE CORRECT PATTERN
867
868                                  ;;*****************************************************************
869                                  ;       TEST22 INCREMENTING PATTERN TO WRAP-AROUND IN DRWC
870                                  ;;*****************************************************************
871  002506  104400                          SCOPE
872  002510  005067  007646                  CLR     ICOUNT
873  002514  005001                          CLR     %1              ;SET-UP
874  002516  005077  176276                  CLR     @DRWC           ;SET-UP
875  002522  020177  176272          INCWC:  CMP     %1,@DRWC        ;SEE IF THEY ARE EQUAL
876  002526  001401                          BEQ     .+4             ;ARE THEY EQUAL?
877  002530  104000                          HLT                     ;THEY'RE NOT EQUAL
878  002532  005277  176262                  INC     @DRWC           ;GET NEXT NUMBER
879  002536  005201                          INC     %1              ;GET NEXT NUMBER
880  002540  001370                          BNE     INCWC           ;DONE WITH TEST?  IF NOT CONTINUE
881
```

```
                                ;;*****************************************************************
                                ;       TEST23 INCREMENTING PATTERN TO WRAP-AROUND IN DRBA
                                ;;*****************************************************************
002542  104400                          SCOPE
002544  005001                          CLR     %1              ;SET-UP
002546  005077  176250                  CLR     @DRBA           ;SET-UP
002552  020177  176244          INCBA:  CMP     %1,@DRBA        ;SEE IF THEY ARE EQUAL
002556  001401                          BEQ     .+4             ;ARE THEY EQUAL?
002560  104000                          HLT                     ;THEY'RE NOT EQUAL
002562  062777  000002  176232          ADD     #2,@DRBA        ;GET NEXT NUMBER
002570  062701  000002                  ADD     #2,%1           ;GET NEXT NUMBER
002574  001366                          BNE     INCBA           ;DONE WITH TEST?  IF NOT CONTINUE

                                ;;*****************************************************************
                                ;       TEST25 TEST THAT DR11-B DOES NOT INTERRUPT WITH PROC AT LEVEL 7
                                ;;*****************************************************************
002576  104400                          SCOPE
002600  012767  004000  007554          MOV     #4000,ICOUNT
002606  012777  000340  176202          MOV     #340,@PSW       ;STATUS AT LEVEL 7
002614  032777  000200  176202          BIT     #BIT7,@DRST     ;CHECK READY BIT
002622  001010                          BNE     P7INV           ;IS IT SET
002624  004767  007554                  JSR     %7,CKSWR
002630  000005                          RESET                   ;INIT TO SET READY
002632  032777  000200  176164          BIT     #BIT7,@DRST     ;SEE IF READY IS SET NOW
002640  001001                          BNE     .+4             ;IS READY SET?
002642  104000                          HLT                     ;READY CAN'T BE SET BY INIT
002644  012777  002720  176162  P7INV:  MOV     #P7ERR,@DRINV   ;SET UP INT VECTOR
002652  012737  000340  000126          MOV     #340,@#126
                                ;**********
002660  012777  177777  176132  CHGG1:  MOV     #-1,@DRWC       ;SET WORD COUNT TO -1
002666  016777  176150  176126          MOV     INBUF,@DRBA     ;SET BUSS ADDRESS LOC
002674  052777  000101  176122          BIS     #101,@DRST      ;SET I.E. AND GO BITS
002702  012704  000012                  MOV     #10.,%4         ;ALLOW 11/60 AND 11/70 TIME TO INTERRUPT
002706  077401                  ITIME1: SOB     %4,ITIME1
                                ;**********
002710  042777  000100  176106          BIC     #BIT6,@DRST     ;DR11-B DIDN'T INTERRUPT - CLEAR IE
002716  000405                          BR      X1
002720  022626                  P7ERR:  CMP     (%6)+,(%6)+     ;RESTORE STACK
002722  042777  000100  176074          BIC     #BIT6,@DRST     ;CLEAR IE
002730  104000                          HLT                     ;DR11-B INTERRUPTED, BUT IT SHOULDN'T HAVE

                                ;;*****************************************************************
                                ;       TEST26 TEST THAT DR11-B DOES NOT INTERRUPT WITH PROC AT LEVEL 6
                                ;;*****************************************************************
002732  104400                  X1:     SCOPE
002734  012777  000300  176054          MOV     #300,@PSW       ;STATUS AT LEVEL 6
002742  032777  000200  176054          BIT     #BIT7,@DRST     ;CHECK READY BIT
002750  001010                          BNE     P6INV           ;IS IT SET?
002752  004767  007426                  JSR     %7,CKSWR
002756  000005                          RESET                   ;INIT TO SET READY
002760  032777  000200  176036          BIT     #BIT7,@DRST     ;SEE IF READY IS SET NOW
002766  001001                          BNE     .+4             ;IS READY SET?
002770  104000                          HLT                     ;READY CAN'T BE SET BY INIT
002772  012777  003046  176034  P6INV:  MOV     #P6ERR,@DRINV   ;SET UP INT VECTOR
```

```
   938  003000  012737  000340  000126          MOV     #340,@#126
   939                          ;**********
   940  003006  012777  177777  176004  CHGG2:  MOV     #-1,@DRWC       ;SET WORD COUNT TO -1
   941  003014  016777  176022  176000          MOV     INBUF,@DRBA     ;SET BUSS ADDRESS LOC
   942  003022  052777  000101  175774          BIS     #101,@DRST      ;SET I.E. AND GO BITS
   943  003030  012704  000012                  MOV     #10.,%4         ;ALLOW 11/60 AND 11/70 TIME TO INTERRUPT
   944  003034  077401                  ITIME2: SOB     %4,ITIME2
   945                          ;**********
   946  003036  042777  000100  175760          BIC     #BIT6,@DRST     ;DR11-B DIDN'T INTERRUPT - CLEAR IE
   947  003044  000405                          BR      X2
   948  003046  022626                  P6ERR:  CMP     (%6)+,(%6)+     ;RESTORE STACK
   949  003050  042777  000100  175746          BIC     #BIT6,@DRST     ;CLEAR IE
   950  003056  104000                          HLT                     ;DR11-B INTERRUPTED, BUT IT SHOULDN'T HAVE
   951
   952
   953                          ;;**************************************************************************
   954                          ;       TEST27 TEST THE DR11-B INTERRUPT WITH PROC AT LEVEL 5
   955                          ;;**************************************************************************
   956  003060  104400          X2:     SCOPE
   957  003062  012777  000240  175726          MOV     #240,@PSW       ;STATUS AT LEVEL 5
   958  003070  032777  000200  175726          BIT     #BIT7,@DRST     ;CHECK READY BIT
   959  003076  001010                          BNE     P5INV           ;IS IT SET?
   960  003100  004767  007300                  JSR     %7,CKSWR
   961  003104  000005                          RESET                   ;INIT TO SET READY
   962  003106  032777  000200  175710          BIT     #BIT7,@DRST     ;SEE IF READY IS SET NOW
   963  003114  001001                          BNE     .+4             ;IS IT SET?
   964  003116  104000                          HLT                     ;RDY CAN'T BE SET BY INIT
   965  003120  017767  175670  175750  P5INV:  MOV     @SR,TEMP        ;GET SWITCH SETTINGS
   966  003126  042767  177770  175742          BIC     #177770,TEMP    ;ISOLATE BR LEVEL
   967  003134  012777  003222  175672          MOV     #P5ERR,@DRINV   ;SET UP INT VECTOR
   968  003142  012737  000340  000126          MOV     #340,@#126
   969                          ;**********
   970  003150  012777  177777  175642  CHGG3:  MOV     #-1,@DRWC       ;SET WORD COUNT TO -1
   971  003156  016777  175660  175636          MOV     INBUF,@DRBA     ;SET BUSS ADDRESS LOC
   972  003164  052777  000101  175632          BIS     #101,@DRST      ;SET I.E. AND GO BITS
   973  003172  012704  000012                  MOV     #10.,%4         ;ALLOW 11/60 AND 11/70 TIME TO INTERRUPT
   974  003176  077401                  ITIME3: SOB     %4,ITIME3
   975                          ;**********
   976  003200  042777  000100  175616          BIC     #BIT6,@DRST     ;DR11-B DIDN'T INTERRUPT - CLEAR IE
   977  003206  022767  000006  175662          CMP     #6,TEMP         ;BR LEVEL = 6 ?
   978  003214  001001                          BNE     1$              ;NO, EVERYTHING IS OK
   979  003216  104000                          HLT                     ;DR11-B WITH BR = 6 SHOULD HAVE INTERRUPTED
   980  003220  000411                  1$:     BR      X3
   981  003222  022626                  P5ERR:  CMP     (%6)+,(%6)+     ;RESTORE STACK
   982  003224  042777  000100  175572          BIC     #BIT6,@DRST     ;CLEAR IE
   983  003232  022767  000006  175636          CMP     #6,TEMP         ;BR LEVEL = 6 ?
   984  003240  001401                          BEQ     X3              ;YES, EVERYTHING IS OK
   985  003242  104000                          HLT                     ;DR11-B WITH BR NOT = 6 SHOULD NOT HAVE INTERRUPTED
   986
   987                          ;;**************************************************************************
   988                          ;       TEST30 TEST THE DR11-B INTERRUPT WITH PROC AT LEVEL 4
   989                          ;;**************************************************************************
   990  003244  104400          X3:     SCOPE
   991  003246  012777  000200  175542          MOV     #200,@PSW       ;STATUS AT LEVEL 4
   992  003254  032777  000200  175542          BIT     #BIT7,@DRST     ;CHECK READY BIT
   993  003262  001010                          BNE     P4INV           ;IS IT SET?
```

```
  994  003264  004767  007114                JSR     %7,CKSWR
  995  003270  000005                       RESET                   ;INIT TO SET READY
  996  003272  032777  000200  175524       BIT     #BIT7,@DRST     ;SEE IF READY IS SET NOW
  997  003300  001001                       BNE     .+4             ;IS IT SET
  998  003302  104000                       HLT                     ;READY CAN'T BE SET BY INIT
  999  003304  017767  175504  175564 P4INV: MOV     @SR,TEMP        ;GET SWITCH SETTINGS
 1000  003312  042767  177770  175556       BIC     #177770,TEMP    ;ISOLATE BR LEVEL
 1001  003320  012777  003414  175506       MOV     #P4INT,@DRINV   ;SET UP INT VECTOR
 1002  003326  012737  000340  000126       MOV     #340,@#126
 1003                                ;**********
 1004  003334  012777  177777  175456 CHGG4: MOV     #-1,@DRWC       ;SET WORD COUNT TO -1
 1005  003342  016777  175474  175452       MOV     INBUF,@DRBA     ;SET BUSS ADDRESS LOC
 1006  003350  052777  000101  175446       BIS     #101,@DRST      ;SET I.E. AND GO BITS
 1007  003356  012704  000012               MOV     #10.,%4         ;ALLOW 11/60 AND 11/70 TIME TO INTERRUPT
 1008  003362  077401                ITIME4: SOB     %4,ITIME4
 1009                                ;**********
 1010  003364  005077  175434               CLR     @DRST           ;CLEAR IE
 1011  003370  012777  000126  175436       MOV     #126,@DRINV     ;RESTORE INTERRUPT VECTOR
 1012  003376  022767  000004  175472       CMP     #4,TEMP         ;BR LEVEL = 4 ?
 1013  003404  001401                       BEQ     1$              ;YES, EVERYTHING IS OK
 1014  003406  104000                       HLT                     ;DR11-B DIDN'T INTERRUPT
 1015  003410  000167  000026          1$:  JMP     X4
 1016  003414  005077  175404       P4INT: CLR     @DRST           ;CLEAR IE
 1017  003420  022626                       CMP     (%6)+,(%6)+     ;REPOSITION THE STACK AFTER AN INTERRUPT
 1018  003422  012777  000126  175404       MOV     #126,@DRINV     ;RESTORE INTERRUPT VECTOR
 1019  003430  022767  000004  175440       CMP     #4,TEMP         ;BR LEVEL = 4 ?
 1020  003436  001001                       BNE     X4              ;NO, EVERYTHING IS OK
 1021  003440  104000                       HLT                     ;DR11-B WITH BR = 4 SHOULD NOT HAVE INTERRUPTED
 1022
 1023
 1024                                ;;*****************************************************************
 1025                                ;       TEST30A TEST THAT DR11-B DOES INTERRUPT WITH PROC AT LEVEL 3
 1026                                ;;*****************************************************************
 1027  003442  104400                X4:     SCOPE
 1028  003444  012777  000140  175344       MOV     #140,@PSW       ;STATUS AT LEVEL 3
 1029  003452  032777  000200  175344       BIT     #BIT7,@DRST     ;CHECK READY BIT
 1030  003460  001010                       BNE     P3INV           ;IS IT SET?
 1031  003462  004767  006716               JSR     %7,CKSWR
 1032  003466  000005                       RESET                   ;INIT TO SET READY
 1033  003470  032777  000200  175326       BIT     #BIT7,@DRST     ;SEE IF READY IS SET NOW
 1034  003476  001001                       BNE     .+4             ;IS IT SET
 1035  003500  104000                       HLT                     ;READY CAN'T BE SET BY INIT
 1036  003502  012777  003572  175324 P3INV: MOV     #P3INT,@DRINV   ;SET UP INT VECTOR
 1037  003510  012737  000340  000126       MOV     #340,@#126
 1038                                ;**********
 1039  003516  012777  177777  175274 CHGG5: MOV     #-1,@DRWC       ;SET WORD COUNT TO -1
 1040  003524  016777  175312  175270       MOV     INBUF,@DRBA     ;SET BUSS ADDRESS LOC
 1041  003532  052777  000101  175264       BIS     #101,@DRST      ;SET I.E. AND GO BITS
 1042  003540  012704  000012               MOV     #10.,%4         ;ALLOW 11/60 AND 11/70 TIME TO INTERRUPT
 1043  003544  077401                ITIME5: SOB     %4,ITIME5
 1044                                ;**********
 1045  003546  005077  175252               CLR     @DRST           ;CLEAR IE
 1046  003552  012777  000126  175254       MOV     #126,@DRINV     ;RESTORE INTERRUPT VECTOR
 1047  003560  005037  000126               CLR     @#126           ;RESTORE TRAP CATCHER
 1048  003564  104000                       HLT                     ;DR11-B DIDN'T INTERRUPT
 1049  003566  000167  000020               JMP     X5
```

```
1050  003572  005077  175226          P3INT:  CLR     @DRST           ;CLEAR IE
1051  003576  022626                          CMP     (%6)+,(%6)+     ;REPOSITION THE STACK AFTER AN INTERRUPT
1052  003600  012777  000126  175226          MOV     #126,@DRINV     ;RESTORE INTERRUPT VECTOR
1053  003606  005037  000126                  CLR     @#126           ;RESTORE TRAP CATCHER
1054
1055
1056                                  ;;*****************************************************************
1057                                  ;       TEST31 TEST THAT FNCT BITS CONTROL DSTAT BITS (M968 MUST BE USED IN USER SLOTS)
1058                                  ;;*****************************************************************
1059  003612  104400                  X5:     SCOPE
1060  003614  005077  175204                  CLR     @DRST           ;CLEAR FUNCTION BITS
1061  003620  032777  000016  175176          BIT     #16,@DRST       ;CHECK FUNCTION BITS
1062  003626  001401                          BEQ     .+4             ;FUNCTION BITS CLEAR?
1063  003630  104000                          HLT                     ;FUNCTION BITS NOT CLEAR
1064  003632  052777  000002  175164          BIS     #BIT1,@DRST     ;SET FNCT1
1065  003640  032777  001000  175156          BIT     #BIT9,@DRST     ;CHECK DSTAT C
1066  003646  001001                          BNE     .+4             ;IS IT SET?
1067  003650  104000                          HLT                     ;DSTAT C IS CLEAR
1068  003652  032777  006000  175144          BIT     #6000,@DRST     ;CHECK THAT DSTAT A AND DSTAT B ARE CLEAR
1069  003660  001401                          BEQ     .+4             ;ARE THEY CLEAR?
1070  003662  104000                          HLT                     ;DSTAT A AND/OR DSTAT B IS SET
1071  003664  005077  175134                  CLR     @DRST           ;CLEAR DRST
1072  003670  052777  000004  175126          BIS     #BIT2,@DRST     ;SET FNCT2
1073  003676  032777  002000  175120          BIT     #BIT10,@DRST    ;CHECK DSTAT B
1074  003704  001001                          BNE     .+4             ;IS IT SET?
1075  003706  104000                          HLT                     ;DSTAT B IS CLEAR
1076  003710  032777  005000  175106          BIT     #5000,@DRST     ;CHECK THAT DSTAT A AND DSTAT C ARE CLEAR
1077  003716  001401                          BEQ     .+4             ;ARE THEY CLEAR?
1078  003720  104000                          HLT                     ;DSTAT A AND/OR DSTAT B IS SET
1079  003722  005077  175076                  CLR     @DRST           ;CLEAR DRST
1080  003726  052777  000010  175070          BIS     #BIT3,@DRST     ;SET FNCT3
1081  003734  032777  004000  175062          BIT     #BIT11,@DRST    ;CHECK DSTAT A
1082  003742  001001                          BNE     .+4             ;IS IT SET?
1083  003744  104000                          HLT                     ;DSTAT A IS CLEAR
1084  003746  032777  003000  175050          BIT     #3000,@DRST     ;CHECK THAT DSTAT B AND DSTAT C ARE CLEAR
1085  003754  001401                          BEQ     .+4             ;ARE THEY CLEAR?
1086  003756  104000                          HLT                     ;DSTAT B AND/OR DSTAT C IS SET
1087  003760  005077  175040                  CLR     @DRST           ;CLR DRST
1088                                  ;;*****************************************************************
1089                                  ;       TEST 33 TEST FOR 1 DATI NPR TRANSFER (WITH M968 IN USER SLOTS)
1090                                  ;;*****************************************************************
1091  003764  104400                          SCOPE
1092  003766  005777  175032          TNPR1:  TST     @DRST           ;CHECK ERROR BIT
1093  003772  100027                          BPL     NPRRDY          ;IS IT CLEAR?
1094  003774  032777  020000  175022          BIT     #BIT13,@DRST    ;CHECK ATTN
1095  004002  001401                          BEQ     .+4             ;IS ATTN CLEAR
1096  004004  104000                          HLT                     ;ATTN IS SET
1097  004006  032777  040000  175010          BIT     #BIT14,@DRST    ;CHECK NEX
1098  004014  001410                          BEQ     N1413           ;IS NEX CLEAR?
1099  004016  042777  040000  175000          BIC     #BIT14,@DRST    ;TRY TO CLEAR NEX
1100  004024  032777  040000  174772          BIT     #BIT14,@DRST    ;CHECK AGAIN
1101  004032  001401                          BEQ     .+4             ;NEX STILL SET
1102  004034  104000                          HLT                     ;NEX CAN'T BE CLEARED BY MOVING A 0 TO IT
1103  004036  005077  174760          N1413:  CLR     @DRBA           ;TRY TO CLEAR BAOF
1104  004042  005777  174756                  TST     @DRST           ;CHECK ERROR BIT AGAIN
1105  004046  001401                          BEQ     .+4             ;IS IT CLEAR
```

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1106  004050  104000                          HLT                     ;ERROR CAUSED BY SOMETHING OTHER THAN NEX,ATTN, OR BAOF
1107  004052  012777  177777  174740  NPRRDY: MOV     #-1,@DRWC       ;SET UP FOR 1 TRANSFER
1108  004060  012777  001036  174734          MOV     #NPR1,@DRBA     ;TRANSFER FROM BUS ADDRESS IN NPR1
1109  004066  005077  174734                  CLR     @DRDB           ;GET READY TO RECEIVE DATA
1110  004072  012767  052525  174736          MOV     #52525,NPR1     ;SET UP TRANSFER DATA
1111  004100  012777  004144  174726          MOV     #INTB,@DRINV    ;INTERRUPT VECTOR TO INTB
1112  004106  012777  000005  174714          MOV     #5,@DRVS        ;INTERRUPT PRIORITY TO LEVEL 5
1113  004114  005077  174676                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
1114  004120  012777  000101  174676          MOV     #101,@DRST      ;IE AND DO TO DRST
1115  004126  005067  000002                  CLR     1$+2            ;WAIT FOR NPR AND INTERRUPT
1116  004132  005227  000001          1$:     INC     #1
1117  004136  001375                          BNE     1$
1118  004140  104000                          HLT                     ;NO DR11-B INTERRUPT
1119  004142  000424                          BR      T33CLR          ;CLEAR IE
1120  004144  004767  003204          INTB:   JSR     %7,ERRCHK
1121  004150  005777  174644                  TST     @DRWC           ;TEST DRWC
1122  004154  001401                          BEQ     .+4             ;IS DRWC EQUAL TO ZERO?
1123  004156  104000                          HLT                     ;DRWC NOT EQUAL TO ZERO
1124  004160  022777  001040  174634          CMP     #NPR1+2,@DRBA   ;COMPARE CORRECT DRBA WITH DRBA
1125  004166  001401                          BEQ     .+4             ;IS THE DRBA CORRECT?
1126  004170  104000                          HLT                     ;DRBA IS WRONG
1127  004172  022777  052525  174626          CMP     #52525,@DRDB    ;CHECK FOR CORRECT DATA
1128  004200  001401                          BEQ     .+4             ;DATA GET TRANSFERRED?
1129  004202  104000                          HLT                     ;BAD DATA IN DRDB
1130  004204  004767  003054                  JSR     %7,NORMAL
1131  004210  022626                          CMP     (%6)+,(%6)+     ;RESTORE STACK
1132  004212  000403                          BR      TNPRO           ;GO TO NEXT TEST (NPR OUT)
1133  004214  005077  174604          T33CLR: CLR     @DRST           ;CLEAR IE
1134  004220  000662                          BR      TNPR1           ;TRY TEST AGAIN
1135                                  ;;*****************************************************************
1136                                  ;       TEST 34 TEST FOR 1 DATO NPR TRANSFER (WITH M968 IN USER SLOTS)
1137                                  ;;*****************************************************************
1138  004222  104400                  TNPRO:  SCOPE
1139  004224  012777  177777  174566          MOV     #-1,@DRWC       ;SET UP FOR 1 TRANSFER
1140  004232  012777  001036  174562          MOV     #NPR1,@DRBA     ;TRANSFER TO BUS ADDRESS IN NPR1
1141  004240  005067  174572                  CLR     NPR1            ;GET READY TO RECEIVE DATA
1142  004244  012777  052525  174554          MOV     #52525,@DRDB    ;SET UP TO TRANSFER DATA
1143  004252  012777  004316  174554          MOV     #INTC,@DRINV    ;INTERRUPT VECTOR TO INTC
1144  004260  016777  174546  174542          MOV     DRINL,@DRVS     ;INTERRUPT STATUS TO LEVEL DRINL
1145  004266  005077  174524                  CLR     @PSW            ;PROC STATUS TO ZERO
1146  004272  012777  000103  174524          MOV     #103,@DRST      ;IE, FNCT1(C1 CONTROL), AND DO TO DRST
1147  004300  005067  000002                  CLR     1$+2            ;WAIT FOR NPR AND INTER
1148  004304  005227  000001          1$:     INC     #1
1149  004310  001375                          BNE     1$
1150  004312  104000                          HLT                     ;NO DR11-B INTERRUPT
1151  004314  000424                          BR      T34CLR          ;CLEAR IE
1152  004316  004767  003032          INTC:   JSR     %7,ERRCHK
1153  004322  005777  174472                  TST     @DRWC           ;TEST DRWC
1154  004326  001401                          BEQ     .+4             ;IS DRWC EQUAL TO ZERO?
1155  004330  104000                          HLT                     ;DRWC EQUAL TO ZERO
1156  004332  022777  001040  174462          CMP     #NPR1+2,@DRBA   ;COMPARE CORRECT DRBA WITH DRBA
1157  004340  001401                          BEQ     .+4             ;IS THE DRBA CORRECT?
1158  004342  104000                          HLT                     ;DRBA IS WRONG
1159
1160  004344  026727  174466  052525          CMP     NPR1,#52525     ;CHECK FOR CORRECT DATA
1161  004352  001401                          BEQ     .+4             ;CORRECT DATA TRANSFERRED?
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1162  004354  104000                          HLT                     ;BAD DATA
1163  004356  004767  002702                  JSR     %7,NORMAL
1164  004362  022626                          CMP     (%6)+,(%6)+     ;RESTORE STACK
1165  004364  000403                          BR      T35             ;GO TO NEXT TEST
1166  004366  005077  174432        T34CLR:   CLR     @DRST           ;CLEAR IE
1167  004372  000713                          BR      TNPRO           ;TRY TEST AGAIN
1168
1169                                ;;*************************************************************
1170                                ;       TEST 35 STRING OF 10 DATI'S (WITH M968 IN USER SLOTS)
1171                                ;;*************************************************************
1172  004374  104400                T35:      SCOPE
1173  004376  012767  000020  174442          MOV     #20,BUFLEN      ;LENGTH OF BUFFER=20
1174  004404  004767  002416                  JSR     %7,LODBUF       ;LOAD THE BUFFER WITH INCREMENTING PATTERN
1175  004410  006267  174432                  ASR     BUFLEN          ;BUFLEN=10
1176  004414  016767  174426  174432          MOV     BUFLEN,WCLEN    ;PREPARE NUMBER FOR DRWC
1177  004422  005467  174426                  NEG     WCLEN           ;2'S COMPLEMENT OF BUFLEN
1178  004426  016777  174422  174364          MOV     WCLEN,@DRWC     ;SET UP DRWC
1179  004434  016777  174402  174360          MOV     INBUF,@DRBA     ;SET UP DRBA
1180  004442  012777  177777  174356          MOV     #-1,@DRDB       ;MAINT AIDE
1181  004450  012777  007130  174356          MOV     #INTA,@DRINV    ;INT VECTOR TO INTA
1182  004456  016777  174350  174344          MOV     DRINL,@DRVS     ;INT VECTOR TO PRIORITY DRINL
1183  004464  005077  174326                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
1184  004470  012777  000101  174326          MOV     #101,@DRST      ;IE AND DO TO DRST
1185  004476  000777                          BR      .               ;WAIT FOR INTERRUPT
1186  004500  022777  000007  174320          CMP     #7,@DRDB        ;CHECK THAT WORD #10 OF INBUF IS IN DRBA
1187  004506  001401                          BEQ     .+4             ;IS IT?
1188  004510  104000                          HLT                     ;BAD DATA IN DRDB
1189
1190                                ;;*************************************************************
1191                                ;       TEST 36 STRING OF 10 DATO'S (WITH M968 IN USER SLOTS)
1192                                ;;*************************************************************
1193  004512  104400                          SCOPE
1194  004514  012767  000020  174324          MOV     #20,BUFLEN      ;LENGTH OF BUFFER=20
1195  004522  004767  002300                  JSR     %7,LODBUF       ;LOAD THE BUFFER WITH INCREMENTING PATTERN
1196  004526  006267  174314                  ASR     BUFLEN          ;BUFLEN=10
1197  004532  016767  174310  174314          MOV     BUFLEN,WCLEN    ;PREPARE NUMBER FOR DRWC
1198  004540  005467  174310                  NEG     WCLEN           ;2'S COMPLEMENT OF BUFLEN
1199  004544  016777  174304  174246          MOV     WCLEN,@DRWC     ;SET UP DRWC
1200  004552  016777  174264  174242          MOV     INBUF,@DRBA     ;SET UP DRBA
1201  004560  012777  052525  174240          MOV     #52525,@DRDB    ;SET UP DRDB
1202  004566  012777  007130  174240          MOV     #INTA,@DRINV    ;INTERRUPT VECTOR TO INTA
1203  004574  016777  174232  174226          MOV     DRINL,@DRVS     ;INTERRUPT VECTOR TO PRIORITY DRINL
1204  004602  005077  174210                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
1205  004606  012777  000103  174210          MOV     #103,@DRST      ;IE, FNCT1(C1 CONTROL), AND DO TO DRST
1206  004614  000777                          BR      .               ;WAIT FOR INTERRUPT
1207  004616  004767  002464                  JSR     %7,DATOCK       ;CHECK INBUF
1208
1209                                ;;*************************************************************
1210                                ;       TEST 37 STRING OF 200 DATI'S
1211                                ;;*************************************************************
1212  004622  104400                          SCOPE
1213  004624  012767  000200  174214          MOV     #200,BUFLEN     ;LENGTH OF BUFFER=200
1214  004632  004767  002170                  JSR     %7,LODBUF       ;LOAD THE BUFFER WITH INCREMENTING PATTERN
1215  004636  016767  174204  174210          MOV     BUFLEN,WCLEN    ;PREPARE NUMBER FOR DRWC
1216  004644  005467  174204                  NEG     WCLEN           ;2'S COMPLEMENT OF BUFLEN
1217  004650  016777  174200  174142          MOV     WCLEN,@DRWC     ;SET UP DRWC
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1218  004656  016777  174160  174136          MOV     INBUF,@DRBA     ;SET UP DRBA
1219  004664  012777  177777  174134          MOV     #-1,@DRDB       ;MAINT AIDE
1220  004672  012777  007130  174134          MOV     #INTA,@DRINV    ;INT VECTOR TO INTA
1221  004700  016777  174126  174122          MOV     DRINL,@DRVS     ;INT VECTOR TO PRIORITY DRINL
1222  004706  005077  174104                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
1223  004712  012777  000101  174104          MOV     #101,@DRST      ;IE AND DO TO DRST
1224  004720  000777                          BR      .               ;WAIT FOR INTERRUPT
1225  004722  022777  000177  174076          CMP     #177,@DRDB      ;CHECK THAT WORD #200 OF INBUF IS IN DRBA
1226  004730  001401                          BEQ     .+4             ;IS IT?
1227  004732  104000                          HLT                     ;BAD DATA IN DRDB
1228                                  ;;**********************************************************************
1229                                  ;       TEST 40 STRING OR 200 DATO'S
1230                                  ;;**********************************************************************
1231  004734  104400                  SCOPE
1232  004736  012767  000201  174102          MOV     #201,BUFLEN     ;LENGTH OF BUFFER=201
1233  004744  004767  002056                  JSR     %7,LODBUF       ;LOAD THE BUFFER WITH INCREMENTING PATTERN
1234  004750  005367  174072                  DEC     BUFLEN          ;BUFLEN=200
1235  004754  016767  174066  174072          MOV     BUFLEN,WCLEN    ;PREPARE NUMBER FOR DRWC
1236  004762  005467  174066                  NEG     WCLEN           ;2'S COMPLEMENT OF BUFLEN
1237  004766  016777  174062  174024          MOV     WCLEN,@DRWC     ;SET UP DRWC
1238  004774  016777  174042  174020          MOV     INBUF,@DRBA     ;SET UP DRBA
1239  005002  012777  052525  174016          MOV     #52525,@DRDB    ;SET UP DRDB
1240  005010  012777  007130  174016          MOV     #INTA,@DRINV    ;INTERRUPT VECTOR TO INTA
1241  005016  016777  174010  174004          MOV     DRINL,@DRVS     ;INTERRUPT VECTOR TO PRIORITY DRINL
1242  005024  005077  173766                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
1243  005030  012777  000103  173766          MOV     #103,@DRST      ;IE, FNCT1, AND DO TO DRST
1244  005036  000777                          BR      .               ;WAIT FOR INTERRUPT
1245  005040  004767  002242                  JSR     %7,DATOCK       ;CHECK INBUF
1246
1247                                  ;;**********************************************************************
1248                                  ;       TEST 42 TEST THAT DOING A DATO TO THE DIODE MEMORY CAUSES NEX
1249                                  ;;**********************************************************************
1250  005044  104400                  SCOPE
1251  005046  012777  177776  173744          MOV     #-2,@DRWC       ;SET UP DRWC
1252  005054  016777  173760  173740          MOV     DIOMEM,@DRBA    ;SET UP DRBA
1253  005062  012777  005116  173744          MOV     #NEXCHK,@DRINV  ;INTERRUPT VECTOR TO NEXCHK
1254  005070  016777  173736  173732          MOV     DRINL,@DRVS     ;INTERRUPT STATUS TO LEVEL DRINL
1255  005076  005077  173714                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
1256  005102  012777  000163  173714          MOV     #163,@DRST      ;IE, FNCT1, XBA17, XBA16, AND GO TO DRST
1257  005110  005237  177560                  INC     @#177560        ;WAIT FOR INTERRUPT
1258  005114  104000                          HLT                     ;NO DR11-B INTERRUPT
1259  005116  042777  000100  173700  NEXCHK: BIC     #BIT6,@DRST     ;CLEAR  INTERRUPT  ENABLE
1260  005124  005777  173674                  TST     @DRST           ;TEST DRST
1261  005130  001001                          BNE     .+4             ;ERROR SET?
1262  005132  104000                          HLT                     ;ERROR NOT SET
1263  005134  105777  173664                  TSTB    @DRST           ;TEST FOR READY
1264  005140  001001                          BNE     .+4             ;READY SET?
1265  005142  104000                          HLT                     ;READY ISN'T SET
1266  005144  032777  040000  173652          BIT     #BIT14,@DRST    ;CHECK NEX
1267  005152  001001                          BNE     .+4             ;NEX SET?
1268  005154  104000                          HLT                     ;NEX IS CLEAR
1269  005156  042777  040000  173640          BIC     #BIT14,@DRST    ;CLEAR NEX
1270  005164  022626                          CMP     (%6)+,(%6)+     ;RESTORE THE STACK
1271  005166  004767  002072                  JSR     %7,NORMAL
1272
1273                                  ;;**********************************************************************
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1274                                    ;       TEST 43 TEST THAT CROSSING A 32K BOUNDRY DOES NOT CAUSE
1275                                    ;       A BAOF AND DOES NOT FORCE AN ERROR
1276                                    ;;*****************************************************************
1277  005172  104400                            SCOPE
1278  005174  012767  000010  005160            MOV     #10,ICOUNT
1279  005202  012777  177760  173610            MOV     #-20,@DRWC      ;SET UP DRWC
1280  005210  012777  177776  173604            MOV     #-2,@DRBA       ;SET UP DRBA FOR PROC STATUS ADDRESS
1281  005216  012777  005252  173610            MOV     #BAOFCK,@DRINV  ;INTERRUPT VECTOR TO BAOFCK
1282  005224  016777  173602  173576            MOV     DRINL,@DRVS     ;INTERRUPT STATUS TO LEVEL DRINL
1283  005232  005077  173560                    CLR     @PSW            ;LET THE DR11-B INTERRUPT
1284  005236  012777  000163  173560            MOV     #163,@DRST      ;IE, FNCT1, XBA17, XBA16, AND GO TO DRST
1285  005244  005237  177560                    INC     @#177560        ;WAIT FOR INTERRUPT
1286  005250  104000                            HLT                     ;NO DR11-B INTERRUPT
1287  005252  042777  000100  173544  BAOFCK:  BIC     #BIT6,@DRST     ;CLEAR INTERRUPT  ENABLE
1288  005260  022626                            CMP     (%6)+,(%6)+     ;RESTORE THE STACK
1289  005262  005777  173536                    TST     @DRST           ;TEST DRST
1290  005266  100401                            BMI     .+4             ;ERROR SET?
1291  005270  104000                            HLT                     ;ERROR NOT SET
1292  005272  105777  173526                    TSTB    @DRST           ;TEST FOR READY
1293  005276  100401                            BMI     .+4             ;READY SET?
1294  005300  104000                            HLT                     ;READY ISN'T SET
1295  005302  042777  040000  173514            BIC     #BIT14,@DRST    ;CLEAR NEX
1296  005310  032777  060000  173506            BIT     #60000,@DRST    ;CHECK NEX AND ATTN
1297  005316  001401                            BEQ     .+4             ;ARE THEY CLEAR?
1298  005320  104000                            HLT                     ;NEX AND/OR ATTN IS SET
1299  005322  005777  173476                    TST     @DRST           ;TEST FOR ERROR
1300  005326  100001                            BPL     .+4             ;IS ERROR CLEAR?
1301  005330  104000                            HLT                     ;ERROR IS SET
1302  005332  005077  173464                    CLR     @DRBA           ;CLEAR BUS ADDRESS REGISTER
1303
1304  005336  004767  005042                    JSR     %7,CKSWR
1305  005342  000005                            RESET                   ;INIT
1306  005344  004767  001714                    JSR     %7,NORMAL
1307
1308                                    ;;*****************************************************************
1309                                    ;       TEST 44 TEST THAT RESET CLEARS DRDB
1310                                    ;;*****************************************************************
1311  005350  104400                            SCOPE
1312  005352  012767  000010  005002            MOV     #10,ICOUNT
1313  005360  012777  177777  173440            MOV     #-1,@DRDB       ;ALL ONES TO DRBA
1314  005366  004767  005012                    JSR     %7,CKSWR
1315  005372  000005                            RESET                   ;INIT
1316  005374  005777  173426                    TST     @DRDB           ;LOOKING FOR Z-BIT TO SET
1317  005400  001401                            BEQ     .+4             ;DID DRDB GET CLEARED?
1318  005402  104000                            HLT                     ;DRDB NOT CLEAR
1319
1320                                    ;;*****************************************************************
1321                                    ;       TEST 45 TEST THAT ALL DRDB BITS CAN BE SET
1322                                    ;;*****************************************************************
1323  005404  104400                            SCOPE
1324  005406  012767  004000  004746            MOV     #4000,ICOUNT
1325  005414  012777  177777  173404            MOV     #-1,@DRDB       ;SET ALL BITS IN DRDB
1326  005422  022777  177777  173376            CMP     #-1,@DRDB       ;LOOKING FOR Z-BIT TO SET
1327  005430  001401                            BEQ     .+4             ;SEE IF ALL BITS GOT SET
1328  005432  104000                            HLT                     ;ALL DRDB BITS AREN'T SET
1329
```

```
                                        ;;*****************************************************************
                                        ;       TEST 46 TEST THAT DRDB CAN HOLD ALTERNATE ONE'S AND ZERO'S
                                        ;;*****************************************************************
005434  104400                          SCOPE
005436  012777  052525  173362          MOV     #052525,@DRDB   ;ALT 0'S AND 1'S TO DRDB
005444  022777  052525  173354          CMP     #052525,@DRDB   ;LOOKING FOR Z-BIT TO SET
005452  001401                          BEQ     .+4             ;DOES DRDB HAVE THE CORRECT PATTERN?
005454  104000                          HLT                     ;DRDB IS WRONG
005456  012777  125252  173342          MOV     #125252,@DRDB   ;ALT 1'S AND 0'S TO DRDB
005464  022777  125252  173334          CMP     #125252,@DRDB   ;LOOKING FOR Z-BIT TO SET
005472  001401                          BEQ     .+4             ;DOES DRDB HAVE THE CORRECT PATTERN
005474  104000                          HLT                     ;DRDB IS WRONG

                                        ;;*****************************************************************
                                        ;       TEST 47 INCREMENTING PATTERN TO WRAP-AROUND IN DRDB
                                        ;;*****************************************************************
005476  104400                          SCOPE
005500  005067  004656                  CLR     ICOUNT
005504  005001                          CLR     %1              ;SET-UP
005506  005077  173314                  CLR     @DRDB           ;SET-UP
005512  020177  173310          INCDB:  CMP     %1,@DRDB        ;SEE IF THEY ARE EQUAL
005516  001401                          BEQ     .+4             ;ARE THEY EQUAL?
005520  104000                          HLT                     ;THEY'RE NOT EQUAL
005522  005277  173300                  INC     @DRDB           ;GET NEXT NUMBER
005526  005201                          INC     %1              ;GET NEXT NUMBER
005530  001370                          BNE     INCDB           ;DONE WITH TEST? IF NOT CONTINUE

                                        ;;*****************************************************************
                                        ;       TEST 50 TEST THAT RESET SETS READY AND CLEARS ALL OTHER
                                        ;       DRST BITS (WITH M968 INSERTED)
                                        ;;*****************************************************************
005532  104400                          SCOPE
005534  004767  004644                  JSR     %7,CKSWR
005540  000005                          RESET                   ;INIT
005542  032777  000200  173254          BIT     #BIT7,@DRST     ;CHECK DRST
005550  001001                          BNE     .+4             ;IS READY SET?
005552  104000                          HLT                     ;READY IS CLEAR
005554  032777  177577  173242          BIT     #177577,@DRST   ;CHECK DRST
005562  001401                          BEQ     .+4             ;ARE THEY ALL CLEAR?
005564  104000                          HLT                     ;A BIT OTHER THAN READY IS SET IN THE DRST

                                        ;;*****************************************************************
                                        ;       TEST 51 TEST THAT BA00 READS AS A ZERO WITH MAINT BOARD INSERTED
                                        ;;*****************************************************************
005566  104400                          SCOPE
005570  012767  004000  004564          MOV     #4000,ICOUNT
005576  032777  000001  173216          BIT     #BIT0,@DRBA     ;TEST BIT 0 OF DRBA
005604  001401                          BEQ     .+4             ;IS IT CLEAR?
005606  104000                          HLT                     ;BA00 IS SET


                                        ;;*****************************************************************
                                        ;       TEST 52 TEST THAT GO CLEARS READY
                                        ;;*****************************************************************
005610  104400                          SCOPE
```

```
1386  005612  012767  004000  004542          MOV     #4000,ICOUNT
1387  005620  012777  177600  173172          MOV     #-200,@DRWC     ;SET-UP DRWC
1388  005626  016777  173210  173166          MOV     INBUF,@DRBA     ;SET-UP DRBA
1389  005634  105777  173164                  TSTB    @DRST           ;CHECK READY
1390  005640  100401                          BMI     .+4             ;IS READY SET?
1391  005642  104000                          HLT                     ;READY IS CLEAR
1392  005644  012777  000011  173152          MOV     #11,@DRST       ;FNCT3 (NON-BURST) AND GO TO DRST
1393  005652  105777  173146                  TSTB    @DRST           ;CHECK READY
1394  005656  100001                          BPL     .+4             ;IS READY CLEAR?
1395  005660  104000                          HLT                     ;READY IS STILL SET
1396  005662  005067  173170                  CLR     RDYCHK          ;CLEAR READY CHECK
1397  005666  105777  173132          TSTRDY: TSTB    @DRST           ;CHECK READY
1398  005672  100406                          BMI     DONE            ;IF SET GO TO DONE
1399  005674  062767  000004  173154          ADD     #4,RDYCHK       ;CHECKING TIME FOR READY TO BE SET
1400  005702  100401                          BMI     .+4             ;IF RDYCHK GETS NEGATIVE IT TOOK TOO LONG
1401  005704  000770                          BR      TSTRDY          ;CHECK AGAIN
1402  005706  104000                          HLT                     ;READY GOT CLEARED BUT NEVER SET AGAIN
1403  005710  000240                  DONE:   NOP                     ;GO TO NEXT TEST
1404                                  ;;**********************************************************************
1405                                  ;TEST 55 TEST THAT GIVING A DO WITHOUT CLEARING A PREVIOUS ERROR
1406                                  ;CAUSES ANOTHER INTERRUPT
1407                                  ;FOR THIS TEST, THE NORMAL INTERRUPT MECHANISM SHOULD BE WORKING
1408                                  ;;**********************************************************************
1409  005712  104400                          SCOPE
1410  005714  012777  177760  173076          MOV     #-20,@DRWC      ;SET-UP DRWC
1411  005722  016777  173112  173072          MOV     DIOMEM,@DRBA    ;SET-UP DRBA
1412  005730  012777  005764  173076          MOV     #ERRDO,@DRINV   ;INTERRUPT VECTOR TO ERRDO
1413  005736  012777  000140  173064          MOV     #140,@DRVS      ;INTERRUPT STATUS TO LEVEL 4
1414  005744  005077  173046                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
1415  005750  012777  000163  173046          MOV     #163,@DRST      ;IE, XBA17,XBA16,FNCT1 AND GO TO DRST
1416  005756  005277  173076                  INC     @TKS            ;WAIT FOR INTERUPT
1417  005762  104000                          HLT                     ;NO DR11-B INTERRUPT
1418  005764  005777  173034          ERRDO:  TST     @DRST           ;TEST DRST
1419  005770  100401                          BMI     .+4             ;ERROR SET?
1420  005772  104000                          HLT                     ;ERROR IS CLEAR - SHOULD HAVE NEX
1421  005774  012777  006046  173032          MOV     #ERRDO1,@DRINV  ;INTERRUPT VECTOR TO ERRDO1
1422  006002  005077  173014                  CLR     @DRBA           ;PREVENT CAUSING ANOTHER ERROR
1423  006006  042777  000062  173010          BIC     #62,@DRST       ;CLEAR XBA17, XBA16, AND FNCT1
1424  006014  012777  177777  172776          MOV     #-1,@DRWC       ;SET-UP DRWC
1425  006022  005277  172776                  INC     @DRST           ;DO TO DRST
1426  006026  005067  000002                  CLR     1$+2
1427  006032  005227  000001          1$:     INC     #1
1428  006036  001375                          BNE     1$
1429  006040  104000                          HLT                     ;NO DR11-B INTERRUPT
1430  006042  162706  000004                  SUB     #4,%6           ;FAKE AN INTERRUPT WITH STACK
1431  006046  005777  172752          ERRDO1: TST     @DRST           ;CHECK ERROR
1432  006052  100401                          BMI     .+4             ;ERROR SET?
1433  006054  104000                          HLT                     ;ERROR IS CLEAR - SHOULD BE SET BECAUSE
1434                                                                  ;PREVIOUS ERROR WAS NOT CLEARED
1435  006056  062706  000010                  ADD     #10,%6          ;REPOSITION THE STACK
1436  006062  004767  001176                  JSR     %7,NORMAL
1437
1438                                  ;;**********************************************************************
1439                                  ;       TEST 56 STRING OF 200 DATI'S NON-BURST MODE
1440                                  ;;**********************************************************************
1441  006066  104400                          SCOPE
```

```
1442  006070  012767  000200  172750          MOV     #200,BUFLEN     ;LENGTH OF BUFFER=200
1443  006076  004767  000724                  JSR     %7,LODBUF       ;LOAD THE BUFFER WITH INCREMENTING PATTERN
1444  006102  016767  172740  172744          MOV     BUFLEN,WCLEN    ;PREPARE NUMBER FOR DRWC
1445  006110  005467  172740                  NEG     WCLEN           ;2'S COMPLEMENT OF BUFLEN
1446  006114  016777  172734  172676          MOV     WCLEN,@DRWC     ;SET-UP DRWC
1447  006122  016777  172714  172672          MOV     INBUF,@DRBA     ;SET-UP DRBA
1448  006130  012777  177777  172670          MOV     #-1,@DRDB       ;MAINT AIDE
1449  006136  012777  007130  172670          MOV     #INTA,@DRINV    ;INT VECTOR TO INTA
1450  006144  016777  172662  172656          MOV     DRINL,@DRVS     ;INT VECTOR TO PRIORITY DRINL
1451  006152  005077  172640                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
1452  006156  012777  000111  172640          MOV     #111,@DRST      ;IE, FNCT3, AND DO TO DRST
1453  006164  005267  172662                  INC     BRWAIT          ;USE A WAIT OR BR. INSTRUCTION
1454  006170  032767  000001  172654          BIT     #BIT0,BRWAIT    ;SEE WHICH ONE
1455  006176  001403                          BEQ     DATINB          ;BIT 0 CLEAR=BR.
1456  006200  000001                          WAIT                    ;WAIT FOR INTERRUPT
1457  006202  000240                          NOP
1458  006204  000401                          BR      .+4
1459  006206  000777                  DATINB: BR      .
1460  006210  022777  000177  172610          CMP     #177,@DRDB      ;CHECK THAT WORD #200 OF INBUF IS IN DRBA
1461  006216  001401                          BEQ     .+4             ;IS IT?
1462  006220  104000                          HLT                     ;BAD DATA IN DRDB
1463
1464                                  ;;*******************************************************************
1465                                  ;       TEST 57 STRING OF 200 DATO'S NON-BURST MODE
1466                                  ;;*******************************************************************
1467  006222  104400                          SCOPE
1468  006224  012767  000201  172614          MOV     #201,BUFLEN     ;LENGTH OF BUFFER=201
1469  006232  004767  000570                  JSR     %7,LODBUF       ;LOAD THE BUFFER WITH INCREMENTING PATTERN
1470  006236  005367  172604                  DEC     BUFLEN          ;BUFLEN=200
1471  006242  016767  172600  172604          MOV     BUFLEN,WCLEN    ;PREPARE NUMBER FOR DRWC
1472  006250  005467  172600                  NEG     WCLEN           ;2'S COMPLEMENT OF BUFLEN
1473  006254  016777  172574  172536          MOV     WCLEN,@DRWC     ;SET UP DRWC
1474
1475  006262  016777  172554  172532          MOV     INBUF,@DRBA     ;SET UP DRBA
1476  006270  012777  052525  172530          MOV     #52525,@DRDB    ;SET UP DRDB
1477  006276  012777  007130  172530          MOV     #INTA,@DRINV    ;INTERRUPT VECTOR TO INTA
1478  006304  016777  172522  172516          MOV     DRINL,@DRVS     ;INTERRUPT VECTOR TO PRIORITY DPINL
1479  006312  005077  172500                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
1480  006316  012777  000113  172500          MOV     #113,@DRST      ;IE, FNCT3, FNCT1, AND DO TO DRST
1481  006324  005267  172522                  INC     BRWAIT          ;USE A WAIT OR BR. INSTRUCTION
1482  006330  032767  000001  172514          BIT     #BIT0,BRWAIT    ;BIT 0 CLEAR=BR.
1483  006336  001403                          BEQ     DATONB
1484  006340  000001                          WAIT                    ;WAIT FOR INTERRUPT
1485
1486  006342  000240                          NOP
1487
1488  006344  000401                          BR      .+4
1489  006346  000777                  DATONB: BR      .
1490  006350  004767  000732                  JSR     %7,DATOCK       ;CHECK INBUF
1491
1492                                  ;;*******************************************************************
1493                                  ;       TEST 60 TEST THAT FUNCTION BITS INCREMENT WITH MAINT MODE TRANSFERS
1494                                  ;;*******************************************************************
1495
1496  006354  104400                          SCOPE
1497  006356  012767  000010  172462          MOV     #10,BUFLEN      ;SET-UP BUFLEN FOR LODBUF AND CHKBUFF
```

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1498  006364  016777  172452  172430          MOV     INBUF,@DRBA     ;SET-UP DRBA
1499  006372  004767  000430                  JSR     %7,LODBUF       ;LOAD INBUF
1500  006376  004767  000462                  JSR     %7,CHKBFF       ;LOAD CHKBUF
1501  006402  005077  172416                  CLR     @DRST           ;INIT FOR STARTING
1502  006406  012767  000001  172454          MOV     #1,FNCCNT       ;GET READY FOR CHECKING
1503  006414  012767  000001  172424          MOV     #1,BUFLEN       ;CHANGE IS NECESSARY FOR INTA ROUTINE
1504
1505  006422  016767  172414  172442          MOV     INBUF,INBUF1    ;SAVE INBUF
1506  006430  012777  007130  172376  MFLOOP: MOV     #INTA,@DRINV    ;INTERRUPT VECTOR TO INTA
1507
1508  006436  016777  172370  172364          MOV     DRINL,@DRVS     ;INTERRUPT VECTOR PRIORITY TO DRINL
1509  006444  005077  172346                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
1510  006450  012777  177777  172342          MOV     #-1,@DRWC       ;SET-UP FOR 1 TRANSFER
1511  006456  052777  010101  172340          BIS     #10101,@DRST    ;MAINT, IE, AND DO TO DRST
1512
1513  006464  000001                          WAIT                    ;WAIT FOR INTERRUPT
1514  006466  000240                          NOP                     ;FAKE-OUT RETURN ADDRESS CHANGING
1515  006470  117701  172330                  MOVB    @DRST,%1        ;LOWER BYTE OF DRST TO R1
1516  006474  042701  000600                  BIC     #600,%1         ;GET RID OF READY AND CYCLE BECAUSE OF MAINT MODE
1517  006500  006201                          ASR     %1              ;MOVE IT RIGHT ONE PLACE
1518  006502  126701  172362                  CMPB    FNCCNT,%1       ;CHECK AGAINST FNCCNT
1519  006506  001401                          BEQ     .+4             ;SHOULD BE EQUAL
1520  006510  104000                          HLT                     ;FUNCTION BITS DIDN'T INCREMENT IN MAINT MODE
1521  006512  005267  172352                  INC     FNCCNT          ;GET READY FOR NEXT PASS
1522  006516  022767  000010  172344          CMP     #10,FNCCNT      ;ONLY 10 BECAUSE FNCT3-1 GO TO ZERO
1523  006524  001404                          BEQ     MFCHK           ;IF ITS EQUAL GO CHECK DATA
1524  006526  062767  000002  172306          ADD     #2,INBUF        ;FAKE-OUT INTA ROUTINE
1525  006534  000735                          BR      MFLOOP          ;DO IT AGAIN
1526  006536  012767  000007  172302  MFCHK:  MOV     #7,BUFLEN       ;SET UP FOR DATCHK (10 FNCT CHECKS, 7 TRANSFERS
1527  006544  016767  172322  172270          MOV     INBUF1,INBUF    ;RESTORE INBUF
1528  006552  004767  000446                  JSR     %7,DATCHK       ;CHECK DATA
1529
1530                                  ;;*****************************************************************
1531                                  ;       TEST 61 TEST FOR 10 MAINT MODE TRANSFERS
1532                                  ;;*****************************************************************
1533  006556  104400                  SCOPE
1534  006560  012767  000010  172260          MOV     #10,BUFLEN      ;BUFLEN=10
1535  006566  016767  172254  172260          MOV     BUFLEN,WCLEN    ;PREPARE NUMBER FOR DRWC
1536  006574  005467  172254                  NEG     WCLEN           ;2'S COMPLEMENT OF BUFLEN
1537  006600  004767  000222                  JSR     %7,LODBUF       ;LOAD IN BUFFER WITH INCREMENTING PATTERN
1538  006604  004767  000254                  JSR     %7,CHKBFF       ;LOAD CHECK BUFFER WITH MODIFIED INCREMENTING PATTERN
1539  006610  016777  172240  172202          MOV     WCLEN,@DRWC     ;SET UP DRWC
1540  006616  016777  172220  172176          MOV     INBUF,@DRBA     ;SET UP DRBA
1541  006624  012777  177777  172174          MOV     #-1,@DRDB       ;MAINT AIDE
1542  006632  012777  007130  172174          MOV     #INTA,@DRINV    ;INTERRUPT VECTOR TO INTA
1543  006640  016777  172166  172162          MOV     DRINL,@DRVS     ;INTERRUPT STATUS AT PRIORITY DRINL
1544  006646  005077  172144                  CLR     @PSW            ;LET DR11-B INTERRUPT
1545  006652  012777  010101  172144          MOV     #10101,@DRST    ;MAINT, IE, AND DO TO DRST
1546  006660  000777                          BR      .               ;WAIT FOR INTERRUPT
1547  006662  004767  000336                  JSR     %7,DATCHK
1548
1549                                  ;;*****************************************************************
1550                                  ;       TEST 62 TEST FOR 200 NPR TRANSFERS IN MAINT MODE
1551                                  ;;*****************************************************************
1552  006666  104400                  SCOPE
1553  006670  012767  000200  172150          MOV     #200,BUFLEN     ;LENGTH OF BUFFER = 200
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 1554  006676  016767  172144  172150          MOV     BUFLEN,WCLEN    ;PREPARE NUMBER FOR DRWC
 1555  006704  005467  172144                  NEG     WCLEN           ;2'S COMPLEMENT OF BUFLEN
 1556  006710  004767  000112                  JSR     %7,LODBUF       ;LOAD INBUF WITH INCREMENTING PATTERN
 1557  006714  004767  000144                  JSR     %7,CHKBFF       ;LOAD CHKBUF WITH MODIFIED INCREMENTED PATTERN
 1558  006720  016777  172130  172072          MOV     WCLEN,@DRWC     ;SET UP DRWC
 1559  006726  016777  172110  172066          MOV     INBUF,@DRBA     ;SET UP DRBA
 1560  006734  012777  000001  172064          MOV     #1,@DRDB        ;MAINT AIDE
 1561  006742  012777  007130  172064          MOV     #INTA,@DRINV    ;INT VECTOR TO INTA
 1562  006750  016777  172056  172052          MOV     DRINL,@DRVS     ;INT VECTOR AT PRIORITY DRINL
 1563  006756  005077  172034                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
 1564  006762  012777  010101  172034          MOV     #010101,@DRST   ;FOLLOWING TO DRST:  MAINT(12),IE(06),DO(00)
 1565  006770  005267  172056                  INC     BRWAIT          ;USE A WAIT OR BR. INSTRUCTION
 1566  006774  032767  000001  172050          BIT     #BIT0,BRWAIT    ;SEE WHICH ONE
 1567  007002  001403                          BEQ     BRANCH          ;BIT 0 CLEAR = BR.
 1568  007004  000001                          WAIT
 1569  007006  000240                          NOP
 1570  007010  000401                          BR      .+4
 1571  007012  000777                  BRANCH: BR      .
 1572  007014  004767  000204                  JSR     %7,DATCHK       ;CHECK THAT CORRECT DATA WAS TRANSFERRED
 1573  007020  104400                          SCOPE
 1574  007022  000167  000356                  JMP     END             ;DO IT ALL AGAIN.
 1575  007026  016702  172010          LODBUF: MOV     INBUF,%2        ;MOVE STARTING ADDRESS OF INBUF TO R2
 1576  007032  005067  172012                  CLR     LENCHK          ;CLEAR LENGTH CHECK
 1577  007036  005022                          CLR     (%2)+           ;CLEAR STARTING ADDRESS OF INBUFF AND INC BY 2
 1578  007040  005267  172004          LOADA:  INC     LENCHK          ;INC LENGTH CHECK BY 1
 1579  007044  026767  172000  171774          CMP     LENCHK,BUFLEN   ;CHECK FOR DONE
 1580  007052  001403                          BEQ     LDEXIT          ;IS INBUF FILLED?
 1581  007054  016722  171770                  MOV     LENCHK,(%2)+    ;LOAD NEXT BUFFER WORD
 1582  007060  000767                          BR      LOADA           ;CONTINUE CHECKING
 1583  007062  000207                  LDEXIT: RTS     %7              ;EXIT
 1584  007064  016702  171754          CHKBFF: MOV     CHKBUF,%2       ;STARTING ADDRESS OF CHECK-BUFFER TO R2
 1585  007070  005067  171754                  CLR     LENCHK          ;CLEAR LENGTH CHECK
 1586  007074  005003                          CLR     %3              ;CLEAR R3
 1587  007076  010322                  CHKA:   MOV     %3,(%2)+        ;MOVE R3 TO CHKBUF ADDRESS AND INC BY 2
 1588  007100  010322                          MOV     %3,(%2)+        ;MOVE R3 TO NEXT CHKBUF ADDRESS AND INC BY 2
 1589  007102  062767  000002  171740          ADD     #2,LENCHK       ;ADD 2 TO LENGTH CHECK
 1590  007110  026767  171734  171730          CMP     LENCHK,BUFLEN   ;CHECK FOR DONE
 1591  007116  100003                          BPL     .+10            ;IS CHECK-BUFFER FILLED?
 1592  007120  062703  000002                  ADD     #2,%3           ;NEXT NUMBER FOR BUFFER
 1593  007124  000764                          BR      CHKA            ;CONTINUE FILLING
 1594  007126  000207                          RTS     %7              ;EXIT
 1595  007130  042777  000100  171666  INTA:   BIC     #BIT6,@DRST     ;CLEAR IE
 1596  007136  005777  171662                  TST     @DRST           ;CHECKING FOR ERROR
 1597  007142  100001                          BPL     .+4             ;ERROR SET?
 1598  007144  104000                          HLT                     ;ERROR BIT IS SET
 1599  007146  105777  171652                  TSTB    @DRST           ;CHECKING READY BIT
 1600  007152  100401                          BMI     .+4             ;IS READY SET
 1601  007154  104000                          HLT                     ;FALSE INTERRUPT - ERROR AND READY ARE CLEAR
 1602  007156  005777  171636                  TST     @DRWC           ;TEST1 FOR DRWC=0
 1603  007162  001401                          BEQ     .+4             ;WAS IT EQUAL?
 1604  007164  104000                          HLT                     ;DRWC NOT =0
 1605  007166  016702  171654                  MOV     BUFLEN,%2       ;BUFFER LENGTH TO R2
 1606  007172  066702  171650                  ADD     BUFLEN,%2       ;NUMBER OF TRANSFERS TIMES 2
 1607  007176  066702  171640                  ADD     INBUF,%2        ;CORRECT DRBA
 1608  007202  027702  171614                  CMP     @DRBA,%2        ;CHECKING DRBA
 1609  007206  001401                          BEQ     .+4             ;IS DRBA CORRECT?
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1610  007210  104000                        HLT                     ;DRBA NOT CORRECT
1611  007212  062716  000002                ADD     #2,(%6)         ;RETURN ADDRESS TO RETURN ADDRESS +2
1612  007216  004767  000042                JSR     %7,NORMAL
1613  007222  000002                        RTI                     ;EXIT
1614
1615  007224  016702  171614        DATCHK: MOV     CHKBUF,%2       ;STARTING ADDRESS OF CHECK BUFFER TO R2
1616  007230  016703  171606                MOV     INBUF,%3        ;STARTING ADDRESS OF IN BUFFER TO R3
1617  007234  005067  171610                CLR     LENCHK          ;CLEAR LENGTH CHECK
1618  007240  005267  171604        COMPAR: INC     LENCHK          ;MAKE A COMPARISON
1619  007244  022223                        CMP     (%2)+,(%3)+     ;IS THE DATA CORRECT?
1620  007246  001401                        BEQ     .+4             ;BRANCH IF OK
1621  007250  104000                        HLT                     ;BAD DATA
1622  007252  026767  171572  171566        CMP     LENCHK,BUFLEN   ;SEE IF THE BUFFER HAS BEEN CHECKED
1623  007260  001367                        BNE     COMPAR          ;BUFFER CHECKED?
1624  007262  000207                        RTS     %7
1625  007264  012777  001030  171542  NORMAL: MOV     #DRVS,@DRINV    ;RESTORE DR11-B INTERRUPT VECTOR
1626  007272  005077  171532                CLR     @DRVS           ;RESTORE DR11-B INTERRUPT STATUS
1627  007276  012777  000340  171512        MOV     #340,@PSW       ;RESTORE PROC TO PRIORITY LEVEL 7
1628  007304  000207                        RTS     %7              ;EXIT
1629  007306  012702  052525        DATOCK: MOV     #52525,%2       ;DATO NUMBER TO R2
1630  007312  016703  171524                MOV     INBUF,%3        ;STARTING ADDRESS OF IN BUFFER TO R3
1631  007316  005067  171526                CLR     LENCHK          ;CLEAR LENGTH CHECK
1632  007322  005267  171522        COMPRR: INC     LENCHK          ;MAKE A COMPARISON
1633  007326  020223                        CMP     %2,(%3)+        ;IS THE DATA CORRECT?
1634  007330  001401                        BEQ     .+4             ;BRANCH IF OK
1635  007332  104000                        HLT                     ;BAD DATA
1636  007334  026767  171510  171504        CMP     LENCHK,BUFLEN   ;SEE IF THE BUFFER HAS BEEN CHECKED
1637  007342  001367                        BNE     COMPRR          ;BUFFER CHECKED?
1638  007344  020223                        CMP     %2,(%3)+        ;CHECK END OF BUFFER + 1
1639  007346  001001                        BNE     .+4             ;SEE IF TOO MANY WORDS WERE TRANSFERRED
1640  007350  104000                        HLT                     ;TOO MANY
1641  007352  000207                        RTS     %7              ;EXIT
1642  007354  042777  000100  171442  ERRCHK: BIC     #BIT6,@DRST     ;CLEAR IE
1643  007362  005777  171436                TST     @DRST           ;CHECKING FOR ERROR
1644  007366  100001                        BPL     .+4             ;ERROR SET?
1645  007370  104000                        HLT                     ;ERROR BIT IS SET
1646  007372  105777  171426                TSTB    @DRST           ;CHECKING READY BIT
1647  007376  100401                        BMI     .+4             ;IS RDY SET
1648  007400  104000                        HLT                     ;FALSE ENTRY - ERROR AND READY ARE CLEAR
1649  007402  000207                        RTS     %7              ;EXIT
1650
1651                                ;;*****************************************************************
1652                                ;       END OF PASS
1653                                ;;*****************************************************************
1654  007404  012737  000207  177566  END:    MOV     #207,@#177566           ;RING BELL
1655  007412  105737  177564                TSTB    @#177564
1656  007416  100375                        BPL     .-4
1657  007420  005267  171450                INC     PASCNT          ;KEEP TRACK OF PASSES COMPLETED
1658  007424  012702  013017                MOV     #$ENPAS,%2      ;PRINT 'END PASS'
1659  007430  004767  003450                JSR     %7,TTOUT
1660
1661
1662  007434  042777  000020  171354  END1:   BIC     #20,@PSW        ;CLEAR T-BIT
1663  007442  013702  000042                MOV     @#42,%2
1664  007446  001405                        BEQ     TRTRAP
1665  007450  000005                        RESET
```

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1666  007452  004712                  $ENDAD: JSR     %7,(2)
1667  007454  000240                          NOP
1668  007456  000240                          NOP
1669  007460  000240                          NOP
1670                                  ;;*****************************************************************
1671                                  ;       ROUTINE TO CHECK FOR TRACE TRAP TO BE RUN WITH PROGRAM
1672                                  ;;*****************************************************************
1673
1674  007462  004767  002716          TRTRAP: JSR     %7,CKSWR        ;CHECK FOR CONT G
1675  007466  032777  010000  171320          BIT     #10000,@SR      ;SHOULD WE RUN WITH TRACE TRAP
1676  007474  001417                          BEQ     YESTR           ;YES
1677  007476  005767  000104                  TST     YESTR1          ;NO, HAVE WE RUN WITH TRACE TRAP ON?
1678  007502  001411                          BEQ     TRPA            ;IF SO RESTORE PREVIOUS CONTENTS
1679  007504  016767  000076  170302          MOV     YESTR1,14
1680  007512  016767  000072  170276          MOV     YESTR2,16
1681  007520  042777  000020  171270          BIC     #20,@PSW        ;CLEAR TRACE TRAP
1682  007526  000167  171442          TRPA:   JMP     BEGIN           ;START OF TEST WITH TRACE OFF
1683  007532  000000                  TRPB:   0
1684
1685                                  ;;*****************************************************************
1686                                  ;       SAVE OLD CONTENTS, SET UP FOR TRACE TRAP
1687                                  ;;*****************************************************************
1688  007534  016767  170254  000044  YESTR: MOV     14,YESTR1       ;SAVE ODT PC
1689  007542  016767  170250  000040          MOV     16,YESTR2       ;SAVE ODT STATUS
1690  007550  012767  007612  170236          MOV     #YESRT,14       ;NEW TRAP VECTOR
1691  007556  005067  170234                  CLR     16              ;NEW CONDITION CODES
1692  007562  005077  171230                  CLR     @PSW
1693  007566  005167  177740                  COM     TRPB
1694  007572  100403                          BMI     .+10
1695  007574  052777  000020  171214          BIS     #20,@PSW        ;SET TRACE TRAP
1696  007602  000167  171366                  JMP     BEGIN           ;START OF TEST WITH TRACE ON
1697
1698  007606  000000                  YESTR1: 0                       ;STORAGE FOR ODT PC
1699  007610  000000                  YESTR2: 0                       ;STORAG FOR ODT STATUS
1700  007612  000002                  YESRT:  RTI                     ;RETURN TO PROGRAM FROM TRAP
1701  007614  000000                          HALT                    ;RTI FAILED
1702
1703
1704                                  ;;*****************************************************************
1705                                  ;       BUS TO BUS TEST (DR11-B TO DR11-B)
1706                                  ;;*****************************************************************
1707
1708
1709          000000                  R0=%0
1710          000001                  R1=%1
1711          000002                  R2=%2
1712          000003                  R3=%3
1713          000004                  R4=%4
1714          000005                  R5=%5
1715          000006                  R6=%6
1716          000007                  R7=%7
1717          000007                  PC=%7
1718          000006                  SP=%6
1719
1720          000001                  GO=1
1721          000002                  FNCT1=2         ;OUTPUT MODE
```

```
                        000004                  FNCT2=4         ;OUTPUT DIRECTION
                        000010                  FNCT3=10        ;OUTPUT INTER REQ
                        000020                  XBA16=20
                        000040                  XBA17=40
                        000100                  IE=100
                        000200                  READY=200
                        000400                  CYCLE=400
                        001000                  DSTATA=1000     ;INPUT MODE
                        002000                  DSTATB=2000     ;INPUT DIRECTION
                        004000                  DSTATC=4000     ;INPUT INTR REQ
                        010000                  MAINT=10000
                        020000                  ATTN=20000
                        040000                  NEX=40000
                        100000                  ERROR=100000

007616  000004                  NWRDXF: 4                       ;# OF WORDS TRANSFERRED UNDER FLAG CONTROL PRIOR TO NPR
007620  000000                  NEXJOB: 0                       ;HOLDS ADDRESS OF READY INTERRUPT ROUTINE
007622  000000                          0                       ;HOLDS ADDRESS OF ERROR INTERRUPT ROUTINE
007624  000000                  JBFLAG: 0                       ;JOB FLAG
007626  000000                  JBCNT:  0                       ;JOB COUNT
                                ;;**************************************************************
                                ;MASTER START
                                ;;**************************************************************
007630  000240                  MS1:    NOP
007632  005067  177770                  CLR     JBCNT           ;CLEAR JOB COUNT
007636  012706  014210                  MOV     #BUFF,R6        ;SETUP STACK
007642  004767  000256                  JSR     R7,SETVEC       ;SET UP INTERRUPT VECTORS
007646  005067  177752                  CLR     JBFLAG          ;CLEAR JOB FLAG
007652  012767  010304  177740          MOV     #JOBA0,NEXJOB   ;DO JOBA0 FIRST
007660  012767  000000  177734          MOV     #0,NEXJOB+2     ;NO ERROR RECOVERY
007666  012777  000340  171122          MOV     #340,@PSW       ;LOCK OUT INTERRUPTS
007674  012777  000100  171122          MOV     #IE,@DRST       ;SET INTERRUPT ENABLE
007702  005077  171110                  CLR     @PSW            ;DROP PRIOTIRY TO ZERO
007706  000425                  BACKGD  BR      BACKGD          ;WAIT FOR JOBS IN BACKGROUND


                                ;;**************************************************************
                                ;       SLAVE START
                                ;;**************************************************************

007710  000240                  SS1:    NOP
007712  012706  014210                  MOV     #BUFF,R6
007716  004767  000202                  JSR     R7,SETVEC       ;SET UP INTERRUPT VECTORS
007722  005067  177676                  CLR     JBFLAG
007726  012767  010526  177664          MOV     #SJOB1,NEXJOB   ;FOR READY INTERRUPT
007734  012767  010544  177660          MOV     #SJOB2,NEXJOB+2 ;FOR ERROR INTERRUPT
007742  012777  000340  171046          MOV     #340,@PSW       ;RAISE CP PRIORITY TO 7
007750  012777  000100  171046          MOV     #IE,@DRST       ;SET INTERRUPT ENABLE
007756  005077  171034                  CLR     @PSW            ;DROP CP PRIORITY TO 0 AND ENTER BACKGROUND


                                ;;**************************************************************
                                ;       BACKGROUND PROGRAM; WAITS FOR JBFLAG TO SET
                                ;;**************************************************************
```

```
1778  007762  005200                  BACKGD: INC     R0
1779  007764  005201                          INC     R1
1780  007766  005202                          INC     R2
1781  007770  005203                          INC     R3
1782  007772  005204                          INC     R4
1783  007774  005205                          INC     R5
1784  007776  020005                          CMP     R0,R5
1785  010000  001402                          BEQ     .+6
1786  010002  104000                          HLT
1787  010004  000000                          HALT                    ;BACKGROUND TEST FAILED
1788  010006  020104                          CMP     R1,R4
1789  010010  001402                          BEQ     .+6
1790  010012  104000                          HLT
1791  010014  000000                          HALT                    ;BACKGROUND TEST FAILED
1792  010016  020203                          CMP     R2,R3
1793  010020  001402                          BEQ     .+6
1794  010022  104000                          HLT
1795  010024  000000                          HALT                    ;BACKGROUND TEST FAILED
1796  010026  005767  177572                 TST     JBFLAG          ;ANY JOBS?
1797  010032  001753                          BEQ     BACKGD          ;BRANCH IF NONE
1798  010034  004567  000032                 JSR     R5,SAVALL       ;YES & EXECUTE JOB WHOSE ADDRESS IS IN JBFLAG
1799  010040  005067  177554                 CLR     NEXJOB
1800  010044  005067  177552                 CLR     NEXJOB+2
1801  010050  016767  177550  167756        MOV     JBFLAG,34
1802  010056  005067  177542                 CLR     JBFLAG
1803  010062  104400                          TRAP                    ;TRAP THROUGH JBFLAG AT 34
1804  010064  004567  000016                 JSR     R5,RESALL
1805  010070  000734                          BR      BACKGD
1806
1807                                  ;;*****************************************************************
1808                                  ;       SUBROUTINE TO PUSH ALL REGISTERS ONTO THE STACK
1809                                  ;;*****************************************************************
1810
1811  010072  010446                  SAVALL: MOV     R4,-(R6)        ;R5 WAS PUSHED BY JSR
1812  010074  010346                          MOV     R3,-(R6)
1813  010076  010246                          MOV     R2,-(R6)
1814  010100  010146                          MOV     R1,-(R6)
1815  010102  010046                          MOV     R0,-(R6)
1816  010104  000115                          JMP     (R5)            ;R5 HOLDS RETURN ADDRESS
1817
1818                                  ;;*****************************************************************
1819                                  ;       SUBROUTINE TO POP ALL REGISTERS OFF THE STACK
1820                                  ;;*****************************************************************
1821
1822  010106  005726                  RESALL: TST     (R6)+
1823  010110  012600                          MOV     (R6)+,R0
1824  010112  012601                          MOV     (R6)+,R1
1825  010114  012602                          MOV     (R6)+,R2
1826  010116  012603                          MOV     (R6)+,R3
1827  010120  012604                          MOV     (R6)+,R4
1828  010122  000205                          RTS     R5
1829
1830                                  ;;*****************************************************************
1831                                  ;       ROUTINE TO SET UP INTERRUPT VECTORS
1832                                  ;;*****************************************************************
1833
```

```
 1834  010124  016700  170704          SETVEC: MOV     DRINV,R0        ;R0 IS VECTOR ADDRRSS
 1835  010130  012720  010204                  MOV     #DRINS,(R0)+    ;PUT SERVICE ADDRESS INTO VECTOR
 1836  010134  016710  170672                  MOV     DRINL,(R0)      ;PUT PRIORITY INTO VECTOR+2
 1837  010140  012767  011506  167662          MOV     #PRINT,30       ;SET UP EMT ADDRESS
 1838  010146  016767  170660  167656          MOV     DRINL,32        ;SET UP EMT PRIORITY LEVEL
 1839  010154  005067  167654                  CLR     34
 1840  010160  016767  170646  167650          MOV     DRINL,36        ;SET UP TRAP ADDRESS
 1841  010166  005000                          CLR     R0              ;INITIALIZE REGISTERS
 1842  010170  005001                          CLR     R1
 1843  010172  005002                          CLR     R2
 1844  010174  005003                          CLR     R3
 1845  010176  005004                          CLR     R4
 1846  010200  005005                          CLR     R5
 1847  010202  000207                          RTS     R7
 1848                                  ;;*****************************************************************
 1849                                  ;       PRIMARY INTERRUPT SERVICE ROUTINE.
 1850                                  ;       SETS UP JBLFAG WITH ADDRESS OF JOB TO BE RUNSTARS
 1851                                  ;;*****************************************************************
 1852
 1853  010204  005767  177414          DRINS:  TST     JBFLAG          ;HAS THE PREVIOUS INTERRUPT BEEN SERVICED?
 1854  010210  001402                          BEQ     DRIN0
 1855  010212  104000                          HLT
 1856  010214  000000                          HALT                    ;NO
 1857  010216  032777  004000  170600  DRIN0:  BIT     #DSTATC,@DRST   ;CHECK FOR ERROR
 1858  010224  001411                          BEQ     DRIN3           ;BRANCH IF NO ERROR
 1859  010226  005767  177370                  TST     NEXJOB+2        ;IS THERE AN ERROR SERVICE ROUTINE?
 1860  010232  001002                          BNE     DRIN1           ;BRANCH IF THERE IS.
 1861  010234  104000                          HLT
 1862  010236  000000                          HALT                    ;ERROR INTERRUPT, NO ERROR SERVICE.
 1863  010240  016767  177356  177356  DRIN1:  MOV     NEXJOB+2,JBFLAG ;SET UP JOBFLAG WITH ADDRESS OF SERVICE ROUTINE
 1864  010246  000002                          RTI
 1865  010250  105777  170550          DRIN3:  TSTB    @DRST           ;CHECK READY
 1866  010254  100402                          BMI     DRIN2           ;BRANCH IF SET
 1867  010256  104000                          HLT
 1868  010260  000000                          HALT                    ;INTERRUPT WITHOUT ERROR OR READY
 1869  010262  005767  177332          DRIN2:  TST     NEXJOB          ;IS THERE A READY SERVICE ROUTINE
 1870  010266  001002                          BNE     .+6             ;BRANCH IF THERE IS.
 1871  010270  104000                          HLT
 1872  010272  000000                          HALT                    ;READY INTERRUPT, NO READY SERVICE
 1873  010274  016767  177320  177322          MOV     NEXJOB,JBFLAG   ;SET UP JOBFLAG WITH SERVICE ROUTINE ADDRESS
 1874  010302  000002                          RTI
 1875
 1876                                  ;;*****************************************************************
 1877                                  ;       MASTER'S INTERRUPT SERVICE ROUTINES
 1878                                  ;       ROUTINE A, SEGMENT 0
 1879                                  ;       FILL BUFFER AND TRANSMIT
 1880                                  ;;*****************************************************************
 1881  010304  012700  011450          JOBA0:  MOV     #LISTA,R0       ;R0 IS XMIT LIST ADDRESS
 1882  010310  012701  011462                  MOV     #LISTA1,R1      ;LISTA1 WILL BE REC LIST
 1883  010314  012021                          MOV     (R0)+,(R1)+     ;START WITH BUS ADDRESSES EQUAL
 1884  010316  012002                          MOV     (R0)+,R2        ;R2 HOLDS WORD COUNT OF XMIT
 1885  010320  010211                          MOV     R2,(R1)         ;MAKE REC WORD COUNT THE SAME
 1886  010322  005402                          NEG     R2              ;MAKE WORD COUNT POSITIVE
 1887  010324  006302                          ASL     R2              ;TRANSFORM INTO BYTE COUNT
 1888  010326  060241                          ADD     R2,-(R1)        ;ADD TO REC BUS ADDRESS
 1889  010330  005010                          CLR     (R0)            ;CLEAR OFFSET IN XMIT LIST
```

```
 1890  010332  024040                          CMP     -(R0),-(R0)     ;LEAVE R0=LISTA=XMIT LIST
 1891
 1892  010334  022767  000100  177264          CMP     #100,JBCNT      ;ENOUGH PASSES FOR BELL?
 1893  010342  003010                          BGT     JOBA0A          ;BRANCH IF NOT ENOUGH
 1894  010344  105737  177564          JOBA0B: TSTB    @#177564        ;TTY READY?
 1895  010350  100375                          BPL     JOBA0B
 1896  010352  012737  000207  177566          MOV     #207,@#177566   ;RING BELL
 1897  010360  005067  177242                  CLR     JBCNT           ;RESET JOB COUNT
 1898  010364  004767  000704          JOBA0A: JSR     R7,SETBUF       ;FILL UP XMIT BUFFER WITH SPECIAL BINARY COUNT
 1899  010370  012700  011450                  MOV     #LISTA,R0
 1900  010374  004767  000370                  JSR     R7,MXMIT        ;TRANSMIT DATA TO SLAVE
 1901  010400  012767  010416  177212          MOV     #JOBA1,NEXJOB   ;JOBA1 IS NEXT
 1902  010406  012767  000000  177206          MOV     #0,NEXJOB+2     ;NO ERROR RECOVERY
 1903  010414  000002                          RTI                     ;RETURN TO BACKGROUND VIA TRAP
 1904
 1905                                  ;;*****************************************************************
 1906                                  ;       ROUTINE A, SEGMENT 1
 1907                                  ;       FLUSH A BUFFER AND RECEIVE DATA
 1908                                  ;;*****************************************************************
 1909
 1910  010416  012700  011462          JOBA1:  MOV     #LISTA1,R0      ;PUT REC LIST ADDRESS INTO R0
 1911  010422  004767  000574                  JSR     R7,FLUSH        ;FLUSH BUFFER
 1912  010426  012700  011462                  MOV     #LISTA1,R0
 1913  010432  004767  000406                  JSR     R7,MREC         ;RECEIVE DATA FRCM SLAVE
 1914  010436  012767  010454  177154          MOV     #JOBA2,NEXJOB   ;JOBA2 IS NEXT
 1915  010444  012767  000000  177150          MOV     #0,NEXJOB+2     ;NO ERROR RECOVERY
 1916  010452  000002                          RTI
 1917
 1918                                  ;;*****************************************************************
 1919                                  ;       ROUTINE A, SEGMENT 2
 1920                                  ;       CHECKS TRANSMITTED DATA WITH RECEIVED
 1921                                  ;;*****************************************************************
 1922
 1923  010454  012700  011450          JOBA2:  MOV     #LISTA,R0       ;XMIT BUFFER LIST
 1924  010460  012701  011462                  MOV     #LISTA1,R1      ;REC BUFFER LIST
 1925  010464  004767  000652                  JSR     R7,BUFCHK       ;COMPARE THE TWO BUFFERS
 1926  010470  042777  000100  170326          BIC     #IE,@DRST       ;GLITCH INTERRUPT
 1927  010476  012777  000100  170320          MOV     #IE,@DRST
 1928  010504  012767  010304  177106          MOV     #JOBA0,NEXJOB   ;REPEAT JOBA0
 1929  010512  012767  000000  177102          MOV     #0,NEXJOB+2
 1930  010520  005267  177102                  INC     JBCNT           ;ADVANCE COUNT
 1931  010524  000002                          RTI
 1932
 1933                                  ;;*****************************************************************
 1934                                  ;       SLAVE'S INTERRUPT SERVICE ROUTINES
 1935                                  ;
 1936                                  ;       JOB1:  IGNORE FIRST READY INTERRUPT
 1937                                  ;;*****************************************************************
 1938
 1939  010526  012767  000000  177064  SJOB1:  MOV     #0,NEXJOB       ;NO MORE READY INTERRUPTS
 1940  010534  012767  010544  177060          MOV     #SJOB2,NEXJOB+2 ;UNTIL ATTN INTERRUPT
 1941  010542  000002                          RTI
 1942
 1943                                  ;;*****************************************************************
 1944                                  ;       JOB2:  WAIT FOR COMMAND
 1945                                  ;;*****************************************************************
```

```
1946
1947  010544  032777  004000  170252  SJ0B2:  BIT     #DSTATC,@DRST   ;TEST FOR INTER
1948  010552  001002                  BNE     SJ0B2A
1949  010554  104000                  HLT
1950  010556  000000                  HALT                            ;ERROR OTHER THAN DSTATC
1951  010560  005001          SJ0B2A: CLR     R1                      ;SET UP FOR PARAMETERS
1952  010562  016702  170236          MOV     DRST,R2                 ;R2 IS STATUS ADDRESS
1953  010566  012703  000010          MOV     #FNCT3,R3               ;R3 IS FUNCTION BIT 3
1954  010572  012704  004000          MOV     #DSTATC,R4              ;R4 IS INTERUPT BIT
1955  010576  016705  170224          MOV     DRDB,R5                 ;R5 IS DATA BUFFER ADDRESS
1956  010602  012700  011476          MOV     #LISTB+2,R0             ;STORE PARAMETERS HERE STARTING WITH WORD COUNT
1957  010606  004767  000122          JSR     R7,HNDSHK               ;GET PARAMETERS
1958  010612  012700  011474          MOV     #LISTB,R0               ;R0 IS TOP OF LIST
1959  010616  016010  000004          MOV     4(R0),(R0)              ;MOVE OFFSET TO TOP
1960  010622  066710  170214          ADD     INBUF,(R0)              ;TOP OF LIST IS BUFFER START + OFFSET
1961  010626  012077  170170          MOV     (R0)+,@DRBA             ;SET UP BUS ADDRESS
1962  010632  012077  170162          MOV     (R0)+,@DRWC             ;SET UP WORD COUNT
1963  010636  005077  170162          CLR     @DRST                   ;CLEAR ALL FUNCTION BITS
1964  010642  032777  002000  170154  SJ0B2B: BIT     #DSTATB,@DRST   ;WHICH DIRECTION
1965  010650  001405                  BEQ     SJ0B2C                  ;BRANCH IF RECIEVE (LEAVE FNCT1 CLEAR FOR DATI'S)
1966  010652  032777  000400  170144  SJ0B2B: BIT     #CYCLE,@DRST    ;WAIT FOR MASTER TO SET CYCLE
1967  010660  001774                  BEQ     SJ0B2B                  ;BRANCH IF NOT SET
1968  010662  000412                  BR      SJ0B2D                  ;GO DO THE COMAND
1969  010664  012700  011474          MOV     #LISTB,R0
1970  010670  004767  000356          JSR     R7,BLUSH                ;BLUSH THE BUFFER
1971  010674  052777  000004  170122  SJ0B2C: BIS     #FNCT2,@DRST    ;SET FNCT2 FOR DATO'S
1972  010702  042777  000400  170114          BIC     #CYCLE,@DRST    ;CLEAR CYCLE
1973  010710  052777  000101  170106  SJ0B2D: BIS     #IE!GO,@DRST    ;EXECUTE COMMAND AND INTERRUPT WHEN DONE
1974  010716  012767  010526  176674          MOV     #SJ0B1,NEXJOB   ;IGNORE READY INTERRUPT
1975  010724  012767  010544  176670          MOV     #SJ0B2,NEXJOB+2 ;WAIT FOR ATTN INTERRUPT
1976  010732  000002                  RTI
1977
1978                                  ;;**************************************************************
1979                                  ;       SLAVE ROUTINE TO ACCEPT PARAMETERS FROM MASTER
1980                                  ;;**************************************************************
1981
1982  010734  011515          HNDSHK: MOV     (R5),(R5)               ;ECHO PARAMETER
1983  010736  011520                  MOV     (R5),(R0)+              ;STORE PARAMETER
1984  010740  050312                  BIS     R3,(R2)                 ;REPLY WITH FNCT3
1985  010742  030412          HNDSH1: BIT     R4,(R2)                 ;WAIT FOR ATTN TO DROP
1986  010744  001376                  BNE     HNDSH1
1987  010746  040312                  BIC     R3,(R2)                 ;DROP FNCT3
1988  010750  005201                  INC     R1                      ;CHECK NUMBER
1989  010752  020167  176640          CMP     R1,NWRDXF
1990  010756  002401                  BLT     HNDSH2                  ;BRANCH IF NOT DONE YET
1991  010760  000207                  RTS     R7
1992  010762  030412          HNDSH2: BIT     R4,(R2)                 ;WAIT FOR NEXT WORD
1993  010764  001776                  BEQ     HNDSH2                  ;BRANCH IF ATTN CLEAR
1994  010766  000762                  BR      HNDSHK                  ;GET ANOTHER PARAMETER
1995
1996                                  ;;**************************************************************
1997                                  ;       MASTER TRANSMIT ROUTINE
1998                                  ;       ENTER WITH TRANSFER LIST IN R0
1999                                  ;;**************************************************************
2000
2001  010770  005777  170030  MXMIT:  TST     @DRST                   ;MAKE SURE ERROR IS CLEAR
```

```
2002  010774  100002                          BPL     MXMIT1          ;AND READY IS SET
2003  010776  104000                          HLT
2004  011000  000000                          HALT                    ;ERROR IS SET
2005  011002  105777  170016        MXMIT1:   TSTB    @DRST
2006  011006  100402                          BMI     MXMIT2
2007  011010  104000                          HLT
2008  011012  000000                          HALT                    ;READY NOT SET
2009  011014  012777  000000  170002  MXMIT2: MOV     #0,@DRST        ;SET UP FUNCTION FOR DATI'S
2010  011022  004767  000102                  JSR     R7,PRMXFR       ;TRANSFER PARAMETERS OF LIST WHOSE ADDRESS IS IN R0
2011  011026  042777  000400  167770          BIC     #CYCLE,@DRST    ;MAKE SURE CYCLE IS CLEAR
2012  011034  052777  000101  167762          BIS     #IE!GO,@DRST    ;EXECUTE COMMAND AND INTERRUPT WHEN DONE
2013  011042  000207                          RTS     R7
2014
2015                                  ;;*****************************************************************
2016                                  ;       MASTER RECEIVE ROUTINE
2017                                  ;       ENTER WITH TRANSFER LIST IN R0
2018                                  ;;*****************************************************************
2019  011044  005777  167754        MREC:     TST     @DRST           ;MAKE SURE ERROR IS CLEAR
2020  011050  100002                          BPL     MREC1           ;AND READY SET.
2021  011052  104000                          HLT
2022  011054  000000                          HALT                    ;ERROR SET
2023  011056  105777  167742        MREC1:    TSTB    @DRST
2024  011062  100402                          BMI     MREC2
2025  011064  104000                          HLT
2026  011066  000000                          HALT                    ;READY CLEAR
2027  011070  012777  000004  167726  MREC2:  MOV     #FNCT2,@DRST    ;SET UP FUNCTION FOR DATO'S
2028  011076  004767  000026                  JSR     R7,PRMXFR       ;TRANSFER PARAMETERS OF LIST WHOSE ADDRESS IS IN R0
2029  011102  032777  002000  167714  MREC3:  BIT     #DSTATB,@DRST   ;WAIT FOR SLAVE TO CLEAR DIRECTION
2030  011110  001374                          BNE     MREC3           ;BRANCH IF SET
2031  011112  042777  000400  167704          BIC     #CYCLE,@DRST    ;CLEAR CYCLE
2032  011120  052777  000101  167676          BIS     #IE!GO,@DRST    ;EXECUTE COMMAND AND INTERRUPT WHEN DONE.
2033  011126  000207                          RTS     R7
2034
2035                                  ;;*****************************************************************
2036                                  ;       ROUTINE TO TRANSFER AND CHECK PARAMETERS UNDER FLAG CONTROL
2037                                  ;       ENTER WITH R0 POINTING TO TRANSFER LIST
2038                                  ;;*****************************************************************
2039
2040  011130  012077  167666        PRMXFR:   MOV     (R0)+,@DRBA     ;FIRST WORD IN LIST IS ADDRESS
2041  011134  011077  167660                  MOV     (R0),@DRWC      ;SECOND WORD IN LIST IS WORD COUNT
2042  011140  005001                          CLR     R1              ;R1 COUNTS PARAMETERS TRANSFERRED
2043  011142  016702  167656                  MOV     DRST,R2         ;R2 IS THE STATUS ADDRESS
2044  011146  012703  000010                  MOV     #FNCT3,R3       ;R3 USED FOR FUNCTION BIT 3
2045  011152  012704  004000                  MOV     #DSTATC,R4      ;R4 USED FOR INTERUPT BIT
2046  011156  016705  167644                  MOV     DRDB,R5         ;R5 IS THE DATA BUFFER ADDRESS
2047  011162  011015                PRMXF1:   MOV     (R0),(R5)       ;SET UP DRDB WITH PARAMETER
2048  011164  050312                          BIS     R3,(R2)         ;CALL SLAVE'S ATTN
2049  011166  030412                PRMXF2:   BIT     R4,(R2)         ;WAIT FOR REPLY
2050  011170  001776                          BEQ     PRMXF2          ;BRANCH IF ATTN CLEAR
2051  011172  022015                          CMP     (R0)+,(R5)      ;COMPARE PARAMETER SENT WITH SLAVE'S ECHO
2052  011174  001402                          BEQ     PRMXF3          ;BRANCH IF EQUAL
2053  011176  104000                          HLT
2054  011200  000000                          HALT                    ;PARAMETER DID NOT ECHO
2055  011202  040312                PRMXF3:   BIC     R3,(R2)         ;DROP SLAVE'S ATTN
2056  011204  030412                PRMXF4:   BIT     R4,(R2)         ;WAIT FOR REPLY
2057  011206  001376                          BNE     PRMXF4          ;BRANCH IF ATTN SET
```

```
2058  011210  005201                    INC     R1              ;ADVANCE PARAMETER COUNT
2059  011212  020167  176400            CMP     R1,NWRDXF       ;ALL PARAMETER XFERRED?
2060  011216  002761                    BLT     PRMXF1          ;BRANCH IF NOT DONE
2061  011220  000207                    RTS     R7              ;RETURN WHEN ALL PARAMETERS TRANSFERRED AND CHECKED.
2062
2063                              ;;*****************************************************************
2064                              ;       ROUTINE TO CLEAR BUFFER
2065                              ;       ENTER WITH R0 POINTING TO TRANSFER LIST
2066                              ;;*****************************************************************
2067
2068  011222  005005              FLUSH:  CLR     R5              ;SET R5 TO ZIP
2069  011224  004767  000030              JSR     R7,BSETUP       ;SET UP REGISTERS
2070  011230  004767  000004      FLUSH1: JSR     R7,BUFPUT       ;STORE ITEM IN BUFFER
2071  011234  002775                      BLT     FLUSH1
2072  011236  000436                      BR      BUFOUT          ;STOP WHEN BUFFER FULL
2073
2074  011240  010521              BUFPUT: MOV     R5,(R1)+        ;PUT R5 INTO BUFFER
2075  011242  060503                      ADD     R5,R3           ;INCLUDE IN CHECKSUM
2076  011244  005504                      ADC     R4
2077  011246  005202                      INC     R2              ;ADVANCE WORD COUNT
2078  011250  000207                      RTS     R7              ;RETURN WITH STATUS SET
2079
2080                              ;;*****************************************************************
2081                              ;       ROUTINE TO FILL BUFFER WITH ALL ONE'S
2082                              ;       ENTER WITH R0 POINTING TO TRANSFER LIST
2083                              ;;*****************************************************************
2084  011252  012705  177777      BLUSH:  MOV     #-1,R5          ;SET R5 TO ALL ONE'S
2085  011256  000762                      BR      FLUSH+2
2086
2087                              ;REGISTER SETUP ROUTINE
2088  011260  012001              BSETUP: MOV     (R0)+,R1        ;R1 IS BUS ADDRESS
2089  011262  012002                      MOV     (R0)+,R2        ;R2 IS WORD COUNT
2090  011264  005720                      TST     (R0)+           ;SKIP OVER OFFSET
2091  011266  005003                      CLR     R3              ;CLEAR LOW CHECKSUM
2092  011270  005004                      CLR     R4              ;CLEAR HIGH CHECKSUM
2093  011272  000207                      RTS     R7              ;RETURN
2094
2095                              ;;*****************************************************************
2096                              ;       ROUTINE TO FILL BUFFER WITH FLOATING 1'S AND FLOATING 0'S PATTERN
2097                              ;       ENTER WITH R0 POINTING TO TRANSFER LIST
2098                              ;;*****************************************************************
2099
2100  011274  004767  177760      SETBUF: JSR     R7,BSETUP       ;SET UP REGISTERS
2101  011300  012705  000001      SETBF1: MOV     #1,R5           ;SET UP R5 WITH START PATTERN
2102  011304  004767  177730      SETBF2: JSR     R7,BUFPUT       ;NUMBER TO BUFFER
2103  011310  002011                      BGE     BUFOUT
2104  011312  005105                      COM     R5
2105  011314  004767  177720              JSR     R7,BUFPUT       ;COMPLEMENT OF NUMBER TO BUFFER
2106  011320  002005                      BGE     BUFOUT
2107  011322  005105                      COM     R5              ;MOVE PATTERN ONE BIT
2108  011324  000241                      CLC                     ;POSITION TO THE LEFT
2109  011326  006105                      ROL     R5
2110  011330  103763                      BCS     SETBF1          ;IF CARRY SET, START PATTERN OVER
2111  011332  000764                      BR      SETBF2
2112  011334  010320              BUFOUT: MOV     R3,(R0)+        ;MOVE LOW CHECK TO LIST
2113  011336  010420                      MOV     R4,(R0)+        ;MOVE HIGH CHECK TO LIST
```

```
2114  011340  000207                          RTS     R7              ;RETURN
2115
2116                                  ;;*****************************************************************
2117                                  ;       ROUTINE TO COMPARE TWO BUFFERS
2118                                  ;       BUFFER LIST #1 IS IN R1
2119                                  ;       BUFFER LIST #2 IS IN R0.  #2 CHECKED FOR PROPER CHECKSUM
2120                                  ;;*****************************************************************
2121
2122  011342  010046                  BUFCHK: MOV     R0,-(R6)        ;SAVE LIST#2 ON STACK
2123  011344  010146                          MOV     R1,-(R6)        ;SAVE LIST#1 ON STACK
2124  011346  004767  000036                  JSR     R7,CHKSUM       ;VERIFY INTEGRITY OF CHECK BUFFER (#2)
2125  011352  012600                          MOV     (R6)+,R0        ;RECOVER 1ST LIST POINTER
2126  011354  012001                          MOV     (R0)+,R1        ;BUS ADDRESS #1
2127  011356  012002                          MOV     (R0)+,R2        ;WORD COUNT #1
2128  011360  012600                          MOV     (R6)+,R0        ;RECOVER 2ND LIST POINTER
2129  011362  012003                          MOV     (R0)+,R3        ;BUS ADDRESS #2
2130  011364  020220                          CMP     R2,(R0)+        ;COMPARE WORD COUNTS
2131  011366  003402                          BLE     BUFCK1          ;BRANCH IF EQUAL OR LESS THAN
2132  011370  104000                          HLT                     ;BUFFER 2 IS LONGER THAN 1
2133  011372  000000                          HALT
2134
2135  011374  022123                  BUFCK1: CMP     (R1)+,(R3)+     ;COMPARE BUFFERS
2136  011376  001401                          BEQ     BUFCK2
2137  011400  104000                          HLT                     ;DATA ERROR
2138  011402  005202                  BUFCK2: INC     R2              ;ADVANCE COUNT
2139  011404  002773                          BLT     BUFCK1          ;BRANCH IF NOT DONE
2140  011406  000207                          RTS     R7              ;RETURN; STACK IS CLEAR
2141
2142                                  ;;*****************************************************************
2143                                  ;       ROUTINE TO CHECK SUM OF BUFFER
2144                                  ;       ENTER WITH R0 POINTING TO TRANSFER LIST
2145                                  ;;*****************************************************************
2146  011410  004767  177644          CHKSUM: JSR     R7,BSETUP       ;SET UP REGISTERS
2147  011414  004767  000016          CHKSM1: JSR     R7,GETBUF       ;GET ITEM FROM BUFFER
2148  011420  002775                          BLT     CHKSM1          ;BRANCH IF NOT DONE
2149  011422  020320                          CMP     R3,(R0)+        ;COMPARE LOW ORDER CHECKS
2150  011424  001003                          BNE     CHKSM2
2151  011426  020420                          CMP     R4,(R0)+        ;COMPARE HIGH ORDER CHECKS
2152  011430  001001                          BNE     CHKSM2
2153  011432  000207                          RTS     R7              ;RETURN IF CHECKSUM OK.
2154  011434  104000                  CHKSM2: HLT                     ;ORIGINAL BUFFER CHECKSUM DOES NOT AGREE WITH PRESENT
2155
2156  011436  012105                  GETBUF: MOV     (R1)+,R5        ;GET ITEM OUT OF BUFFER
2157  011440  060503                          ADD     R5,R3           ;ADD TO CHECKSUM
2158  011442  005504                          ADC     R4
2159  011444  005202                          INC     R2              ;ADVANCE WORD COUNT
2160  011446  000207                          RTS     R7
2161
2162  011450  014212                  LISTA   XINBUF                  ;START OF XMIT BUFFER
2163  011452  177605                          -123.                   ;WORD COUNT
2164  011454  000000                          0                       ;OFFSET
2165  011456  000000                          0                       ;CHECKSUM LOW
2166  011460  000000                          0                       ;CHECKSUM HIGH
2167
2168  011462  000000                  LISTA1: 0                       ;START OF REC BUFFER
2169  011464  000000                          0                       ;WORD COUNT
```

```
2170  011466  000000                          0                       ;OFFSET
2171  011470  000000                          0                       ;CHECKSUM LOW
2172  011472  000000                          0                       ;CHECKSUM HIGH
2173
2174  011474  014212                  LISTB:  XINBUF                  ;SLAVE'S ECHO BUFFER
2175  011476  000000                          0
2176  011500  000000                          0
2177  011502  000000                          0
2178  011504  000000                          0
2179
2180
2181                                  ;;**********************************************************************
2182                                  ;       ENTERED WITH SYSTEM TRAP CALL(HLT)
2183                                  ;       PRINT OUT THE ERROR PC AND STATUS REGISTER
2184                                  ;;**********************************************************************
2185
2186
2187  011506  004767  000672          PRINT:  JSR     %7,CKSWR
2188  011512  037727  167276  020000          BIT     @SR,#20000      ;TEST FOR INHIBIT PRINT OUT
2189  011520  001067                          BNE     1$              ;IF SO, BRANCH OVER PRINT
2190  011522  012667  000204                  MOV     (6)+,SAVPC      ;PC OF FAILING ROUTINE
2191  011526  012667  000202                  MOV     (6)+,SAVCC      ;CC OF ERROR CONDITION
2192  011532  024646                          CMP     -(6),-(6)       ;REPOSITION THE STACK
2193  011534  012777  000215  167324          MOV     #215,@TPB       ;CR
2194  011542  105777  167316                  TSTB    @TPS
2195  011546  100375                          BPL     .-4
2196  011550  012777  000212  167310          MOV     #212,@TPB       ;LINE FEED
2197  011556  105777  167302                  TSTB    @TPS
2198  011562  100375                          BPL     .-4
2199  011564  010267  000134                  MOV     %2,SAVR2        ;SAVE R2
2200  011570  010367  000132                  MOV     %3,SAVR3        ;SAVE R3
2201  011574  010467  000130                  MOV     %4,SAVR4        ;SAVE R4
2202  011600  016702  000126                  MOV     SAVPC,%2
2203  011604  004767  000126                  JSR     %7,PRTAB        ;PRINT OCTAL NUMBER
2204  011610  012777  000240  167250          MOV     #240,@TPB
2205  011616  105777  167242                  TSTB    @TPS            ;SPACE BETWEEN WORDS
2206  011622  100375                          BPL     .-4
2207  011626  016702  000104                  MOV     SAVCC,%2
2208  011630  004767  000102                  JSR     %7,PRTAB        ;PRINT OCTAL NUMBER
2209  011634  012777  000240  167224          MOV     #240,@TPB       ;PRINT SPACE
2210  011642  105777  167216                  TSTB    @TPS            ;PRINTER DONE
2211  011646  100375                          BPL     .-4             ;BRANCH WHEN NOT DONE
2212  011650  017702  167150                  MOV     @DRST,%2        ;GET DR11B STATUS
2213  011654  004767  000056                  JSR     %7,PRTAB        ;PRINT OCTAL NUMBER
2214  011660  016702  000040                  MOV     SAVR2,%2
2215  011664  016703  000036                  MOV     SAVR3,%3
2216  011670  016704  000034                  MOV     SAVR4,%4
2217  011674  004767  000504                  JSR     %7,CKSWR
2218  011700  005777  167110          1$:     TST     @SR             ;CHECK SR FOR HALT SWITCH
2219  011704  100001                          BPL     .+4
2220  011706  000000                          HALT                    ;HALT ON ERROR UP IN SWR
2221  011710  023737  000042  000046          CMP     @#42,@#46       ;ARE WE IN ACT11 AUTO MODE?
2222  011716  001001                          BNE     .+4             ;BRANCH ON NO
2223  011720  000000                          HALT                    ;HALT ON ERROR IF IN ACT11 AUTO MODE
2224  011722  000002                          RTI                     ;RETURN TO MAINLINE
2225  011724  000000                  SAVR2:  0
```

```
2226  011726  000000                    SAVR3:  0
2227  011730  000000                    SAVR4:  0
2228  011732  000000                    SAVPC:  0
2229  011734  000000                    SAVCC:  0
2230
2231  011736  005067  000260            PRTAB:  CLR     BINCT
2232  011742  005067  000252                    CLR     WGTCT
2233  011746  012704  012226                    MOV     #LIST,%4        ;GET LIST ADDRESS
2234  011752  142777  000177  167104          BICB    #177,@TPS       ;CLR INT FLAG
2235  011760  012767  000005  000236          MOV     #5,ASCNT
2236  011766  012767  000007  000220          MOV     #7,SEVEN
2237  011774  012767  000001  000214          MOV     #1,DECML
2238  012002  105777  167056          WAIT1:  TSTB    @TPS
2239  012006  100375                          BPL     WAIT1
2240  012010  005702                          TST     %2
2241  012012  100404                          BMI     MINUS           ;NEG SIGN PRINT 1
2242  012014  012777  000260  167044          MOV     #260,@TPB       ;POS SIGN PRINT 0
2243  012022  000403                          BR      START
2244  012024  012777  000261  167034  MINUS:  MOV     #261,@TPB
2245  012032  016703  000156          START:  MOV     SEVEN,%3        ;PUT MASK IN R3
2246  012036  010267  000150                  MOV     %2,TOODLE       ;GET READY TO DOODLE NUMBER IN TOODLE
2247  012042  005167  000144                  COM     TOODLE          ;COMPENSATES FOR COMPLEMENT DURING BIC
2248  012046  046703  000140                  BIC     TOODLE,%3       ;AND IN OCTAL CHARACTER
2249  012052  001410                          BEQ     WRTOC           ;ZERO, WRITE 0 IN LIST
2250  012054  066767  000136  000136  MKNUM:  ADD     DECML,WGTCT     ;COUNT UP TO
2251  012062  005267  000134                  INC     BINCT           ;AND RECORD
2252  012066  026703  000126                  CMP     WGTCT,%3        ;SAME BINARY WEIGHT
2253  012072  001370                          BNE     MKNUM           ;KEEP COUNTN
2254  012074  062767  000260  00012U  WRTOC:  ADD     #260,BINCT      ;ADD ASCII PREFIX
2255  012102  016724  000114                  MOV     BINCT,(4)+      ;WRITE ASCII CHAR IN LIST
2256  012106  066767  000102  000102          ADD     SEVEN,DECML     ;EXPAND BINARY WEIGHT
2257  012114  005067  000100                  CLR     WGTCT
2258  012120  005057  000076                  CLR     BINCT
2259  012124  005367  000074                  DEC     ASCNT
2260  012130  001410                          BEQ     XLIST           ;5 CHAR IN LIST
2261  012132  012703  000003                  MOV     #3,%3           ;SET X3 FOR ADD LOOP
2262  012136  066767  000052  000050  MOADD:  ADD     SEVEN,SEVEN     ;MAKING SEVENTY BY SEVEN
2263  012144  005303                          DEC     %3
2264  012146  001373                          BNE     MOADD
2265  012150  000730                          BR      START           ;NX SEVEN SET GET NX OCTAL
2266  012152  012767  000005  000044  XLIST:  MOV     #5,ASCNT        ;SEND 5 CHAR TO TTY
2267  012160  105777  166700          WAIT2:  TSTB    @TPS
2268  012164  100375                          BPL     WAIT2
2269  012166  014477  166674                  MOV     -(4),@TPB
2270  012172  005367  000026                  DEC     ASCNT
2271  012176  001401                          BEQ     HDFHM           ;FINISH PRINTING GET NXT NUM
2272  012200  000767                          BR      WAIT2
2273  012202  105777  166656          HDFHM:  TSTB @TPS
2274  012206  100375                          BPL     .-4
2275  012210  000207                          RTS     %7              ;HEAD FOR HOME
2276  012212  000000                  TOODLE: 0
2277  012214  000000                  SEVEN:  0
2278  012216  000000                  DECML:  0
2279  012220  000000                  WGTCT:  0
2280  012222  000000                  BINCT:  0
2281  012224  000000                  ASCNT:  0
```

```
                                LIST:   0
                                        0
                                        0
                                        0
                                        0
                                ;;******************************************************************
                                ;       SCOPE LOOP ROUTINE ENTERED BY USER TRAP
                                ;;******************************************************************

                                SCOPEA: JSR     %7,CKSWR
                                        BIT     #40000,@SR
                                        BNE     SCOPEB          ;SCOPE, BIT IS A ONE
                                        MOV     @%6,RETURN      ;NO - SAVE PC FOR NEXT TIME
                                        RTI                     ;RETURN IN SEQUENCE
                                SCOPEB: CMP     (6)+,%6         ;REPOSITION THE STACK
                                        MOV     (6)+,@PSW
                                        JMP     @RETURN         ;SCOPE RETURN

                                ;;******************************************************************
                                ;       SCOPE OR/AND ITERATION LOOP FOR EACH TEST 4000 TIMES
                                ;;******************************************************************

                                SCOPEC: JSR     %7,CKSWR
                                        BIT     #40000,@SR      ;TEST SR FOR SCOPE
                                        BNE     SCOPEB          ;YES SCOPE
                                        TST     PASCNT          ;FIRST PASS (PASCNT=0) ?
                                        BEQ     SCOPEG          ;BR IF YES, INHIBIT ITERATIONS
                                        JSR     %7,CKSWR
                                        BIT     #4000,@SR       ;TEST FOR ITERATION
                                        BNE     SCOPEG          ;INHIBIT ITERATION
                                        CMP     SCOPEF,ICOUNT
                                        BEQ     SCOPEG          ;EXIT - DONE
                                        INC     SCOPEF          ;INCREMENT COUNT
                                        BR      SCOPEB          ;LOOP SOME MORE
                                SCOPEG: CLR     SCOPEF          ;CLEAR COUNT
                                        MOV     @%6,RETURN      ;SAVE SCOPE RETURN POINTER
                                        RTI                     ;RETURN INLINE-NEXT TEST
                                ICOUNT: 4000
                                SCOPEF: 0                       ;COUNT LOCATION FOR ITERATION LOOP
                                RETURN: BEGIN                   ;ADDRESS OF LAST TEST
                                        .EVEN
                                        JMP     200

                                ;;******************************************************************
                                ;       CHECK SWITCH REGISTER ROUTINE. CHECKS FOR ^G TO ALLOW CHANGING
                                ;       OF LOC. 176.
                                ;;******************************************************************
                                        TEMPST: .WORD   0
                                        COUNT:  .WORD   0
                                        RDSW:   .WORD   0
                                        TIB:    .WORD   0

                                CKSWR:  CMP     #SWREG,SR       ;SOFTWARE SWITCH REGISTER PRESENT
```

```
 2338  012412  001133                          BNE     OUT
 2339  012414  105777  166440                  TSTB    @TKS            ;YES,WAIT FOR
 2340  012420  100130                          BPL     OUT             ;READY, GET CHARACTER
 2341  012422  017767  166434  177752          MOV     @TKB,TIB        ;AND STRIP OFF
 2342  012430  042767  177600  177744          BIC     #177600,TIB     ;THE GARBAGE
 2343  012436  022767  000007  177736          CMP     #7,TIB          ;IS IT A <^G>
 2344  012444  001116                          BNE     OUT
 2345  012446  012702  012756                  MOV     #$CNTG,%2
 2346  012452  004767  000426                  JSR     PC,TTOUT
 2347  012456  012702  012770          CNTLU:  MOV     #$MSWR,%2
 2348  012462  004767  000416                  JSR     PC,TTOUT
 2349  012466  017702  166322                  MOV     @SR,%2
 2350  012472  004767  177240                  JSR     %7,PRTAB
 2351  012476  012702  013000                  MOV     #$MNEW,%2
 2352  012502  004767  000376                  JSR     PC,TTOUT
 2353  012506  005037  012374                  CLR     @#TEMPST
 2354  012512  005067  177656          $READ:  CLR     TEMPST
 2355  012516  012767  000007  177652          MOV     #7,COUNT
 2356  012524  004767  000154          1$:     JSR     PC,TTIN         ;GO  READ A CHARACTER
 2357  012530  042767  177600  177644          BIC     #177600,TIB     ;STRIP OFF GARBAGE
 2358  012536  122767  000025  177636          CMPB    #25,TIB         ;IS IT A ^U?
 2359  012544  001001                          BNE     2$              ;BRANCH IF NOT
 2360  012546  000743                  3$:     BR CNTLU                ;START OVER
 2361  012550  122767  000015  177624  2$:     CMPB    #15,TIB         ;IS IT A <CR>?
 2362  012556  001011                          BNE     4$              ;BRANCH IF NOT
 2363  012560  012702  012764                  MOV     #$CRLF,%2
 2364  012564  004767  000314                  JSR     %7,TTOUT
 2365  012570  022767  000007  177600          CMP     #7,COUNT        ;WAS IT FIRST CHARACTER
 2366  012576  001036                          BNE     7$              ;CHANGE SWR IF NOT FIRST ONE
 2367  012600  000440                  8$:     BR      OUT             ;GET OUT
 2368  012602  122767  000060  177572  4$:     CMPB    #60,TIB
 2369  012610  003004                          BGT     5$
 2370  012612  122767  000067  177562          CMPB    #67,TIB
 2371  012620  002005                          BGE     6$
 2372  012622  012702  013011          5$:     MOV     #$QUEST,%2
 2373  012626  004767  000252                  JSR     PC,TTOUT
 2374  012632  000745                          BR      3$              ;START OVER IF NOT LEGAL CHARACTER
 2375  012634  006367  177534          6$:     ASL     TEMPST
 2376  012640  006367  177530                  ASL     TEMPST
 2377  012644  006367  177524                  ASL     TEMPST
 2378  012650  142767  000060  177524          BICB    #60,TIB         ;GET NITTY-GRITTY
 2379  012656  156767  177520  177510          BISB    TIB,TEMPST
 2380  012664  005367  177506                  DEC     COUNT           ;ONLY WANT 6   DIGITS
 2381  012670  001754                          BEQ     5$
 2382  012672  000714                          BR      1$
 2383  012674  016777  177474  166112  7$:     MOV     TEMPST,@SR      ;CHANGE SWITCH REGISTER CONTENTS
 2384  012702  000207                  OUT:    RTS     %7              ;RETURN TO PROGRAM
 2385                                  ;;**************************************************************
 2386                                  ;       TTY READ SUBROUTINE**********
 2387                                  ;;**************************************************************
 2388
 2389
 2390
 2391  012704  005077  166150          TTIN:   CLR     @TKS
 2392  012710  005077  166146                  CLR     @TKB
 2393  012714  005067  177462                  CLR     TIB
```

```
2394  012720  005277  166134                  INC     @TKS
2395  012724  105777  166130          TTIN1:  TSTB    @TKS
2396  012730  100375                          BPL     TTIN1
2397  012732  017767  166124  177442          MOV     @TKB,TIB
2398  012740  105777  166120          TTIN2:  TSTB    @TPS
2399  012744  100375                          BPL     TTIN2
2400  012746  116777  177430  166112          MOVB    TIB,@TPB
2401
2402  012754  000207                          RTS     %7
2403  012756  057137  020107  000046  $CNTG:  .ASCIZ   '_^G &'
2404  012764  020137  000046          $CRLF:  .ASCIZ   '_ &'
2405  012770  051537  051127  020075  $MSWR:  .ASCIZ   '_SWR= &'
2406  012776  000046
2407  013000  020040  042516  036527  $MNEW:  .ASCIZ   '  NEW= &'
2408  013006  023040     000
2409  013011     137  020077  023137  $QUEST: .ASCIZ   '_? _&'
2410  013016     000
2411  013017     137  047105  020104  $ENPAS: .ASCIZ   '_END PASS   &'
2412  013024  040520  051523  020040
2413  013032  023040     000
2414  013035     137  041440  042132  $TITLE: .ASCIZ   '_ CZDRBH0 DR11-B/DA11-B NPR DIA   _&'
2415  013042  041122  030110  042040
2416  013050  030522  026461  027502
2417  013056  040504  030461  041055
2418  013064  047040  051120  042040
2419  013072  040511  020040  057440
2420  013100  000046
2421                                          .EVEN
2422
2423  013102  000000                  OFL:    0                               ;FIRST CHAR FLAG
2424
2425
2426                                  ;;*****************************************************************
2427                                  ;       TTY ASCII OUTPUT ROUTINE
2428                                  ;;*****************************************************************
2429
2430
2431  013104  105712                  TTOUT:  TSTB    (2)             ;CHECK FOR NULL CHARACTER
2432  013106  001403                          BEQ     1$              ;IF NOT, TYPE THE CHARACTER
2433  013110  122712  000046                 CMPB    #'&,(2)         ;CHECK FOR TERMINATOR
2434  013114  001005                          BNE     .EMPTY
2435  013116  042777  000100  165740  1$:     BIC     #100,@TPS
2436  013124  005002                          CLR     %2              ;CLEAR POINTER TO CHARACTER
2437  013126  000207                          RTS     %7              ;RETURN
2438  013130  122712  000137          .EMPTY: CMPB    #'_,(2)         ;CRLF CHAR?
2439  013134  001411                          BEQ     .RET
2440  013136  122712  000041                 CMPB    #'!,(2)         ;CHECK FOR RETURN TERMINATOR
2441  013142  001414                          BEQ     .REST
2442  013144  105777  165714          1$:     TSTB    @TPS
2443  013150  100375                          BPL     1$
2444  013152  112277  165710                 MOVB    (2)+,@TPB       ;TYPE CHARACTER
2445  013156  000752                          BR      TTOUT
2446  013160  005202                  .RET:   INC     %2
2447  013162  010267  000020                 MOV     %2,.SAV         ;SET UP NEW POINTER
2448  013166  012702  013202                 MOV     #.RETR,%2
2449  013172  000767                          BR      .RET-6
```

```
 2450  013174  016702  000006          .REST:  MOV     .SAV,%2
 2451  013200  000741                          BR      TTOUT
 2452
 2453  013202     015     012     041  .RETR:  .BYTE   15,12,'!
 2454          013206                          .EVEN
 2455  013206  000000                  .SAV:   0
 2456          014210                          .=.+1000
 2457  014210  000000                  BUFF:   0                ;FOR STACK POINTER 100 LOCATIONS
 2458  014212  014212                  XINBUF: .
 2459          015214                          .=.+1000
 2460  015214  015214                  XCHKBU: .
 2461          000001                          .END
```

```
ASCNT   012224  2235* 2259* 2266* 2270* 2281#
ATTN  = 020000  1733#
BACKGD  007762  1757  1778#  1797  1805
BADFCK  005252  1281  1287#
BEGIN   001174   566   568   570#   571  1682  1696  2323
BINCT   012222  2231* 2251* 2254* 2255  2258* 2280#
BIT0  = 000001   472#  1376  1454  1482  1566
BIT1  = 000002   473#   656   657   660   661   770   795  1064
BIT10 = 002000   482#  1073
BIT11 = 004000   483#  1081
BIT12 = 010000   484#   755   756   759   760   791   817
BIT13 = 020000   485#  1094
BIT14 = 040000   486#  1097  1099  1100  1266  1269  1295
BIT15 = 100000   487#
BIT2  = 000004   474#   673   674   677   678   773   798  1072
BIT3  = 000010   475#   690   691   694   695   776   801  1080
BIT4  = 000020   476#   703   704   707   708   720   721   779   804
BIT5  = 000040   477#   716   717   782   807
BIT6  = 000100   478#   729   730   733   734   785   811   919   922   946   949   976   982
                1259  1287  1595  1642
BIT7  = 000200   479#   902   906   930   934   958   962   992   996  1029  1033  1364
BIT8  = 000400   480#   742   743   746   747   788   814
BIT9  = 001000   481#  1065
BLUSH   011252  1970  2084#
BRANCH  007012  1567  1571#
BRWAIT  001052   542#  1453* 1454  1481* 1482  1565* 1566
BSETUP  011260  2069  2088#  2100  2146
BUFCHK  011342  1925  2122#
BUFCK1  011374  2131  2135#  2139
BUFCK2  011402  2136  2138#
BUFF    014210   507  1749  1765  2457#
BUFLEN  001046   540#  1173* 1175* 1176  1194* 1196* 1197  1213* 1215  1232* 1234* 1235  1442*
                1444  1468* 1470* 1471  1497* 1503* 1526* 1534* 1535  1553* 1554  1579  1590
                1605  1606  1622  1636
BUFOUT  011334  2072  2103  2106  2112#
BUFPUT  011240  2070  2074#  2102  2105
BUSERR= 000004   489#   580*  591*
CHGG1   002660   912#
CHGG2   003006   940#
CHGG3   003150   970#
CHGG4   003334  1004#
CHGG5   003516  1039#
CHKA    007076  1587#  1593
CHKBFF  007064  1500  1538  1557  1584#
CHKBUF  001044   539#  1584  1615
CHKSM1  011414  2147#  2148
CHKSM2  011434  2150  2152  2154#
CHKSUM  011410  2124  2146#
CKSWR   012404   602   618   834   904   932   960   994  1031  1304  1314  1362  1674  2187
                2217  2292  2306  2311  2337#
CNTLU   012456   569  2347#  2360
COMPAR  007240  1618#  1623
COMPRR  007322  1632#  1637
COUNT   012376  2333#  2355* 2365  2380*
CYCLE = 000400  1728#  1966  1972  2011  2031
DATCHK  007224  1528  1547  1572  1615#
```

```
DATINB  006206  1455  1459#
DATOCK  007306  1207  1245  1490  1629#
DATONB  006346  1483  1489#
DECML   012216  2237* 2250  2256* 2278#
DIOMEM  001040   537# 1252  1411
DONE    005710  1398  1403#
DRBA    001022   530#  584*  617*  620   643*  644   859*  860   863*  864   887*  888   891*
                 913*  941*  971*  1005* 1040* 1103* 1108* 1124  1140* 1156  1179* 1200* 1218*
                1238* 1252* 1280* 1302* 1376  1388* 1411* 1422* 1447* 1475* 1498* 1540* 1559*
                1608  1961* 2040*
DRDB    001026   532#  588*  1109* 1127  1142* 1180* 1186  1201* 1219* 1225  1239* 1313* 1316
                1325* 1326  1334* 1335  1338* 1339  1349* 1350  1353* 1448* 1460  1476* 1541*
                1560* 1955  2046
DRINL   001032   534# 1144  1182  1203  1221  1241  1254  1282  1450  1478  1508  1543  1562
                1836  1838  1840
DRINS   010204  1835  1853#
DRINV   001034   535#  909*  937*  967*  1001* 1011* 1018* 1036* 1046* 1052* 1111* 1143* 1181*
                1202* 1220* 1240* 1253* 1281* 1412* 1421* 1449* 1477* 1506* 1542* 1561* 1625*
                1834
DRIN0   010216  1854  1857#
DRIN1   010240  1860  1863#
DRIN2   010262  1866  1869#
DRIN3   010250  1858  1865#
DRST    001024   531#  586*  656*  657   660*  661   673*  674   677*  678   690*  691   694*
                 695   703*  704   707*  708   716*  717   720*  721   729*  730   733*  734
                 742*  743   746*  747   755*  756   759*  760   768*  770   773   776   779
                 782   785   788   791   794*  795   798   801   804   807   811   814   817
                 827*  829   836   902   906   914*  919*  922*  930   934   942*  946*  949*
                 958   962   972*  976*  982*  992   996   1006* 1010* 1016* 1029  1033  1041*
                1045* 1050* 1060* 1061  1064* 1065  1068  1071* 1072* 1073  1076  1079* 1080*
                1081  1084  1087* 1092  1094  1097  1099* 1100  1104  1114* 1133* 1146* 1166*
                1184* 1205* 1223* 1243* 1256* 1259* 1260  1263  1266  1269* 1284* 1287* 1289
                1292  1295* 1296  1299  1364  1367  1389  1392* 1393  1397  1415* 1418  1423*
                1425* 1431  1452* 1480* 1501* 1511* 1515  1545* 1564* 1595* 1596  1599  1642*
                1643  1646  1755* 1771* 1857  1865  1926* 1927* 1947  1952  1963* 1964  1966
                1971* 1972* 1973* 2001  2005  2009* 2011* 2012* 2019  2023  2027* 2029  2031*
                2032* 2043  2212
DRVS    001030   533# 1112* 1144* 1182* 1203* 1221* 1241* 1254* 1282* 1413* 1450* 1478* 1508*
                1543* 1562* 1625  1626*
DRWC    001020   529#  582*  601*  604   632*  633   846*  847   850*  851   874*  875   878*
                 912*  940*  970*  1004* 1039* 1107* 1121  1139* 1153  1178* 1199* 1217* 1237*
                1251* 1279* 1387* 1410* 1424* 1446* 1473* 1510* 1539* 1558* 1602  1962* 2041*
DSTATA= 001000  1729#
DSTATB= 002000  1730#  1964  2029
DSTATC= 004000  1731#  1857  1947  1954  2045
END     007404  1574  1654#
END1    007434  1662#
ERRA    001252   580   590#
ERRCHK  007354  1120  1152  1642#
ERRDO   005764  1412  1418#
ERRDO1  006046  1421  1431#
ERROR = 100000  1735#
FLUSH   011222  1911  2068#  2085
FLUSH1  011230  2070#  2071
FNCCNT  001070   549#  1502*  1518  1521*  1522
FNCT1 = 000002  1721#
```

```
FNCT2 = 000004  1722#  1971  2027
FNCT3 = 000010  1723#  1953  2044
GETBUF  011436  2147  2156#
GO    = 000001  1720#  1973  2012  2032
HDFHM   012202  2271  2273#
HLT   = 104000   471#   590   606   622   635   646   659   663   676   680   693   697   706
                 710   719   723   732   736   745   749   758   762   772   775   778   781
                 784   787   790   793   797   800   803   806   809   813   816   819   833
                 839   849   853   862   866   877   890   908   923   936   950   964   979
                 985   998  1014  1021  1035  1048  1063  1067  1070  1075  1078  1083  1086
                1096  1102  1106  1118  1123  1126  1129  1150  1155  1158  1162  1188  1227
                1258  1262  1265  1268  1286  1291  1294  1298  1301  1318  1328  1337  1341
                1352  1366  1369  1378  1391  1395  1402  1417  1420  1429  1433  1462  1520
                1598  1601  1604  1610  1621  1635  1640  1645  1648  1786  1790  1794  1855
                1861  1867  1871  1949  2003  2007  2021  2025  2053  2132  2137  2154
HNDSHK  010734  1957  1982#  1994
HNDSH1  010742  1985#  1986
HNDSH2  010762  1990  1992#  1993
ICOUNT  012362   600*   631*   826*   845*   872*   900*  1278*  1312*  1324*  1347*  1375*  1386*  2314
                2321#
IE    = 000100  1726#  1755  1771  1926  1927  1973  2012  2032
INBUF   001042   538#   913   941   971  1005  1040  1179  1200  1218  1238  1388  1447  1475
                1498  1505  1524*  1527*  1540  1559  1575  1607  1616  1630  1960
INBUF1  001072   550#  1505*  1527
INCBA   002552   888#   893
INCDB   005512  1350#  1355
INCWC   002522   875#   880
INTA    007130  1181  1202  1220  1240  1449  1477  1506  1542  1561  1595#
INTB    004144  1111  1120#
INTC    004316  1143  1152#
ITIME1  002706   916#
ITIME2  003034   944#
ITIME3  003176   974#
ITIME4  003362  1008#
ITIME5  003544  1043#
JBCNT   007626  1743#  1748*  1892  1897*  1930*
JBFLAG  007624  1742#  1751*  1767*  1796  1801  1802*  1853  1863*  1873*
JOBA0   010304  1752  1881#  1928
JOBA0A  010364  1893  1898#
JOBA0B  010344  1894#  1895
JOBA1   010416  1901  1910#
JOBA2   010454  1914  1923#
LDEXIT  007062  1580  1583#
LENCHK  001050   541#  1576*  1578*  1579  1581  1585*  1589*  1590  1617*  1618*  1622  1631*  1632*
                1636
LIST    012226  2233  2282#
LISTA   011450  1881  1899  1923  2162#
LISTA1  011462  1882  1910  1912  1924  2168#
LISTB   011474  1956  1958  1969  2174#
LOADA   007040  1578#  1582
LODBUF  007026  1174  1195  1214  1233  1443  1469  1499  1537  1556  1575#
MAINT = 010000  1732#
MFCHK   006536  1523  1526#
MFLOOP  006430  1506#  1525
MINUS   012024  2241  2244#
MKNUM   012054  2250#  2253
```

```
MOADD   012136            2262#   2264
MREC    011044            1913    2019#
MREC1   011056            2020    2023#
MREC2   011070            2024    2027#
MREC3   011102            2029#   2030
MSTART  001000             523#
MS1     007630             524    1747#
MXMIT   010770            1900    2001#
MXMIT1  011002            2002    2005#
MXMIT2  011014            2006    2009#
NEX   = 040000            1734#
NEXCHK  005116            1253    1259#
NEXJOB  007620            1740#   1752*   1753*   1768*   1769*   1799*   1800*   1859    1863    1869    1873    1901*   1902*
                          1914*   1915*   1928*   1929*   1939*   1940*   1974*   1975*
NOP   = 000240             469#
NORMAL  007264            1130    1163    1271    1306    1436    1612    1625#
NPRRDY  004052            1093    1107#
NPR1    001036             536#   1108    1110*   1124    1140    1141*   1156    1160
NWRDXF  007616            1739#   1989    2059
N1413   004036            1098    1103#
OFL     013102            2423#
OUT     012702            2338    2340    2344    2367    2384#
PASCNT  001074             551#   1657*   2309
PRINT   011506             495    1837    2187#
PRMXFR  011130            2010    2028    2040#
PRMXF1  011162            2047#   2060
PRMXF2  011166            2049#   2050
PRMXF3  011202            2052    2055#
PRMXF4  011204            2056#   2057
PRTAB   011736            2203    2208    2213    2231#   2350
PSW     001016             508*    528#    570*    901*    929*    957*    991*   1028*   1113*   1145*   1183*   1204*   1222*
                          1242*   1255*   1283*   1414*   1451*   1479*   1509*   1544*   1563*   1627*   1662*   1681*   1692*
                          1695*   1754*   1756*   1770*   1772*   2298*
P3INT   003572            1036    1050#
P3INV   003502            1030    1036#
P4INT   003414            1001    1016#
P4INV   003304             993     999#
P5ERR   003222             967     981#
P5INV   003120             959     965#
P6ERR   003046             937     948#
P6INV   002772             931     937#
P7ERR   002720             909     921#
P7INV   002644             903     909#
RDSW    012400            2334#
RDYCHK  001056             544#   1396*   1399*
READY = 000200            1727#
RESALL  010106            1804    1822#
RETURN  012366             571*   2295*   2299    2319*   2323#
SAVALL  010072            1798    1811#
SAVCC   011734            2191*   2207    2229#
SAVPC   011732            2190*   2202    2228#
SAVR2   011724            2199*   2214    2225#
SAVR3   011726            2200*   2215    2226#
SAVR4   011730            2201*   2216    2227#
SCOPE = 104400             470#    579     592     607     616     630     642     655     672     689     702     715     728
                           741     754     767     825     844     858     871     885     899     928     956     990    1027
```

		1059	1091	1138	1172	1193	1212	1231	1250	1277	1311	1323	1333	1346
		1361	1374	1385	1409	1441	1467	1496	1533	1552	1573			
SCOPEA	012240	2292#												
SCOPEB	012262	2294	2297#	2308	2317									
SCOPEC	012274	498	2306#											
SCOPEF	012364	2314	2316*	2318*	2322#									
SCOPEG	012350	2310	2313	2315	2318#									
SETBF1	011300	2101#	2110											
SETBF2	011304	2102#	2111											
SETBUF	011274	1898	2100#											
SETVEC	010124	1750	1766	1834#										
SEVEN	012214	2236*	2245	2256	2262*	2277#								
SJOB1	010526	1768	1939#	1974										
SJOB2	010544	1769	1940	1947#	1975									
SJOB2A	010560	1948	1951#											
SJOB2B	010652	1966#	1967											
SJOB2C	010664	1965	1969#											
SJOB2D	010710	1968	1973#											
SR	001014	527#	558	562*	565	965	999	1675	2188	2218	2293	2307	2312	2337
		2349	2383*											
SSTART	001006	525#												
SS1	0C7710	526	1764#											
START	012032	2243	2245#	2265										
SUSWR	001102	514	555#											
SWREG	000176	505#	562	565	2337									
TEMP	001076	552#	965*	966*	977	983	999*	1000*	1012	1019				
TEMPST	012374	2332#	2353*	2354*	2375*	2376*	2377*	2379*	2383					
TEMP2	001100	553#												
TIB	012402	2335#	2341*	2342*	2343	2357*	2358	2361	2368	2370	2378*	2379	2393*	2397*
		2400												
TKB	001062	546#	2341	2392*	2397									
TKS	001060	545#	1416*	2339	2391*	2394*	2395							
TNPRO	004222	1132	1138#	1167										
TNPR1	003766	1092#	1134											
TOODLE	012212	2246*	2247*	2248	2276#									
TPB	001066	548#	2193*	2196*	2204*	2209*	2242*	2244*	2269*	2400*	2444*			
TPS	001064	547#	2194	2197	2205	2210	2234*	2238	2267	2273	2398	2435*	2442	
TRPA	007526	1678	1682#											
TRPB	007532	1683#	1693*											
TRTRAP	007462	1664	1674#											
TSTRDY	005666	1397#	1401											
TTIN	012704	2356	2391#											
TTIN1	012724	2395#	2396											
TTIN2	012740	2398#	2399											
TTOUT	013104	513	1659	2346	2348	2352	2364	2373	2431#	2445	2451			
T33CLR	004214	1119	1133#											
T34CLR	004366	1151	1166#											
T35	004374	1165	1172#											
WAIT1	012002	2238#	2239											
WAIT2	012160	2267#	2268	2272										
WCLEN	001054	543#	1176*	1177*	1178	1197*	1198*	1199	1215*	1216*	1217	1235*	1236*	1237
		1444*	1445*	1446	1471*	1472*	1473	1535*	1536*	1539	1554*	1555*	1558	
WGTCT	012220	2232*	2250*	2252	2257*	2279#								
WRTOC	012074	2249	2254#											
XBA16 =	000020	1724#												
XBA17 =	000040	1725#												

```
XCHKBU  015214   539  2460#
XINBUF  014212   538  2162   2174   2458#
XLIST   012152  2260  2266#
X1      002732   920   928#
X2      003060   947   956#
X3      003244   980   984    990#
X4      003442  1015  1020   1027#
X5      003612  1049  1059#
YESRT   007612  1690  1700#
YESTR   007534  1676  1688#
YESTR1  007606  1677  1679   1688*  1698#
YESTR2  007610  1680  1689*  1699#
$CNTG   012756  2345  2403#
$CRLF   012764  2363  2404#
$ENDAD  007452   501  1666#
$ENPAS  013017  1658  2411#
$MNEW   013000  2351  2407#
$MSWR   012770  2347  2405#
$QUEST  013011  2372  2409#
$READ   012512  2354#
$TITLE  013035   511  2414#
.     = 015216   493#  494#  497#  500#  502#  504#  506#  515#  589  605  621  634  645
                 658   662   675   679   692   696   705   709   718  722  731  735  744
                 748   757   761   771   774   777   780   783   786  789  792  796  799
                 802   805   808   812   815   818   832   838   848  852  861  865  876
                 889   907   935   963   997  1034  1062  1066  1069 1074 1077 1082 1085
                1095  1101  1105  1122  1125  1128  1154  1157  1161 1185 1187 1206 1224
                1226  1244  1261  1264  1267  1290  1293  1297  1300 1317 1327 1336 1340
                1351  1365  1368  1377  1390  1394  1400  1419  1432 1458 1459 1461 1488
                1489  1519  1546  1570  1571  1591  1597  1600  1603 1609 1620 1634 1639
                1644  1647  1656  1694  1785  1789  1793  1870  2195 2198 2206 2211 2219
                2222  2274  2454#  2456#  2458  2459#  2460
.EMPTY  013130  2434  2438#
.REST   013174  2441  2450#
.RET    013160  2439  2446#  2449
.RETR   013202  2448  2453#
.SAV    013206  2447*  2450   2455#
```

```
COMMEN      1#
ENDCOM      1#
ESCAPE      1#
GETPRI      1#
GETSWR      1#
MULT        1#
NEWTST      1#
POP         1#
PUSH        1#
REPORT      1#
SETPRI      1#
SETUP       1#
SKIP        1#
SLASH       1#
STARS       1#   461#   466   518   520   574   576   595   597   611   613   625   627   637   639
           650   652   667   669   684   686   699   701   712   714   725   727   738   740   751
           753   764   766   821   824   841   843   855   857   868   870   882   884   896   898
           925   927   953   955   987   989  1024  1026  1056  1058  1088  1090  1135  1137  1169
          1171  1190  1192  1209  1211  1228  1230  1247  1249  1273  1276  1308  1310  1320  1322
          1330  1332  1343  1345  1357  1360  1371  1373  1382  1384  1404  1408  1438  1440  1464
          1466  1492  1494  1530  1532  1549  1551  1651  1653  1670  1672  1685  1687  1704  1706
          1744  1746  1760  1762  1774  1776  1807  1809  1818  1820  1830  1832  1848  1851  1876
          1880  1905  1908  1918  1921  1933  1937  1943  1945  1978  1980  1996  1999  2015  2018
          2035  2038  2063  2066  2080  2083  2095  2098  2116  2120  2142  2145  2181  2184  2287
          2289  2301  2303  2328  2331  2385  2387  2426  2428
SWRSU       1#
TYPBIN      1#
TYPDEC      1#
TYPNAM      1#
TYPNUM      1#
TYPOCS      1#
TYPOCT      1#
TYPTXT      1#
$$ESCA      1#
$$NEWT      1#
$$SKIP      1#
.EQUAT      1#
.HEADE      1#   461#
.KT11       1#
.SETUP      1#
.SWRHI      1#
.$ACT1      1#
.$APTB      1#
.$APTH      1#
.$APTY      1#
.$ASTA      1#
.$CATC      1#
.$CMTA      1#
.$DB2D      1#
.$DB2O      1#
.$DIV       1#
.$EOP       1#
.$ERRO      1#
.$ERRT      1#
.$MULT      1#
.$POWE      1#
```

```
.$RAND      1#
.$RDDE      1#
.$RDOC      1#
.$READ      1#
.$R2AZ      1#
.$SAVE      1#
.$SB2D      1#
.$SB2O      1#
.$SCOP      1#
.$SIZE      1#
.$SUPR      1#
.$TRAP      1#
.$TYPB      1#
.$TYPD      1#
.$TYPE      1#
.$TYPO      1#
.$40CA      1#
.1170       1#


. ABS.  015216     000


 ERRORS DETECTED:  0

 CZDRBH,CZDRBH/CRF/NL:TOC/SOL=SYSMAC.SML,CZDRBH.P11
 RUN-TIME: 8 10 .? SECONDS
 RUN-TIME RATIO: 59/20=2.8
 CORE USED:  35K  (70 PAGES)
```