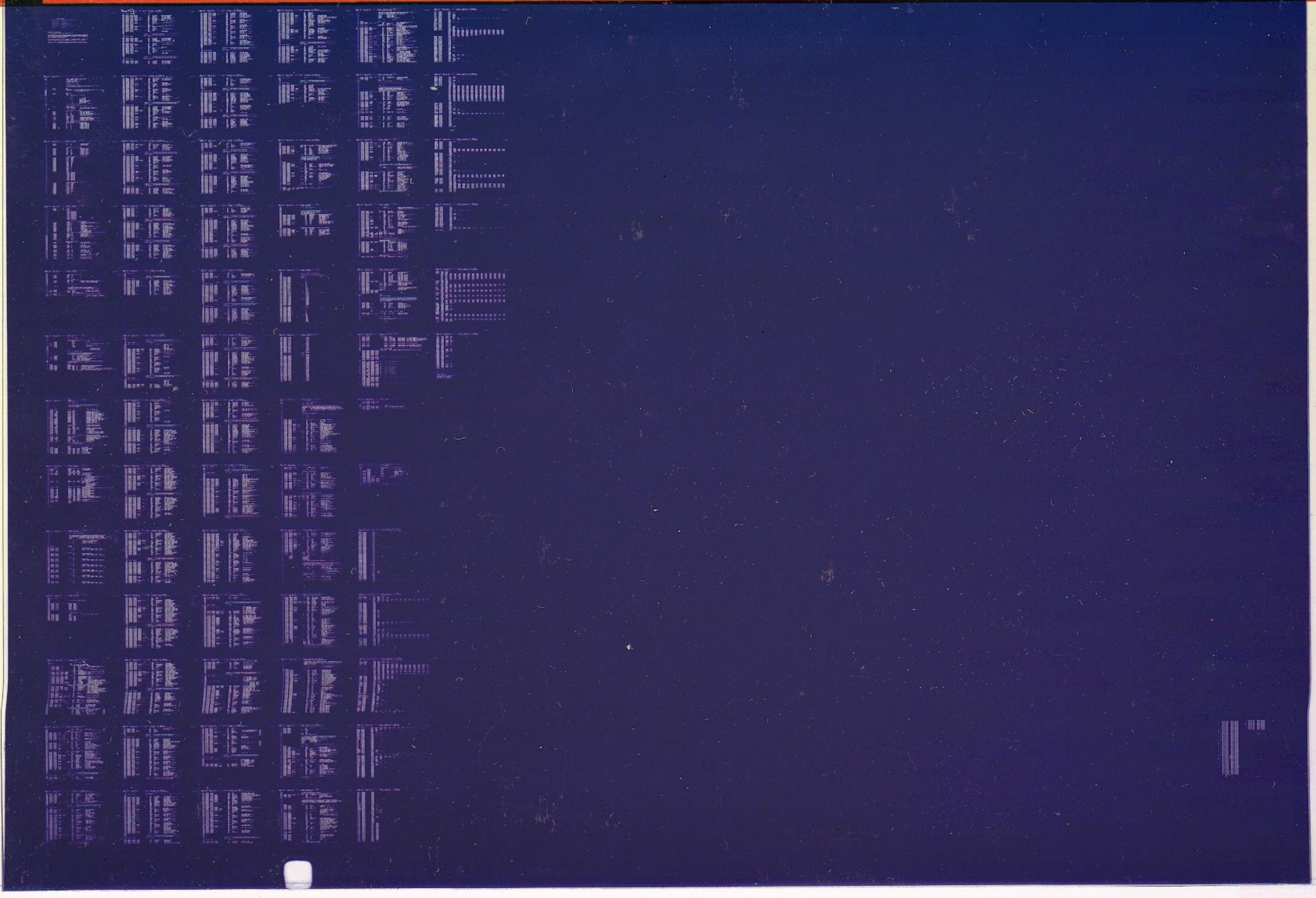
DRV11-J

DIAG TST PRT1
CNDRCA0

AH-T448A-MC
FICHE 1 OF 1



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IDENTIFICATION

PRODUCT NAME: CNDRCA0 DRV11J DIAG TST PRT1

PRODUCT CODE: AC-T447A-MC

PRODUCT DATE: DECEMBER,1982

MAINTAINER: DIAGNOSTICS SERVICES/ISS

AUTHOR: W.HEAVEY

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                                ;;GPA   .HEADER ^/CNDRCA  DRV11J DIAG TST PRT1/,1982,^/BILL HEAVEY/
                                .TITLE  CNDRCA  DRV11J DIAG TST PRT1
                                ;*COPYRIGHT (C) 1982
                                ;*DIGITAL EQUIPMENT CORP.
                                ;*MAYNARD, MASS. 01754
                                ;*
                                ;*PROGRAM BY BILL HEAVEY
                                ;*
                                ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                                ;*PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.
                                ;*
000001                          $TN=1
160000                          $SWR=160000     ;;HALT ON ERROR, LOOP ON TEST, INHIBIT ERROR TYPOUT
                                ;* EDITED TO PERMIT DRV'S TO RUN ON FALCON (KXT11).              ;;GPA
                                ;*                G. PASQUANTONIO, JULY '81                    ;;GPA
                                ;*
165400                          $SWR=165400
000001                          $TN=1
                                .SBTTL  OPERATIONAL SWITCH SETTINGS
                                ;*
                                ;*      SWITCH                  USE
                                ;*      ------          --------------------
                                ;*        15            HALT ON ERROR
                                ;*        14            LOOP ON TEST
                                ;*        13            INHIBIT ERROR TYPEOUTS
                                ;*        11            INHIBIT ITERATIONS
                                ;*         9            LOOP ON ERROR
                                ;*         8            LOOP ON TEST IN SWR<7:0>
                                .SBTTL  BASIC DEFINITIONS

                                ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
001100                          STACK=  1100
                                .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
                                .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL

                                ;*MISCELLANEOUS DEFINITIONS
000011                          HT=     11              ;;CODE FOR HORIZONTAL TAB
000012                          LF=     12              ;;CODE FOR LINE FEED
000015                          CR=     15              ;;CODE FOR CARRIAGE RETURN
000200                          CRLF=   200             ;;CODE FOR CARRIAGE RETURN-LINE FEED
177776                          PS=     177776          ;;PROCESSOR STATUS WORD
                                .EQUIV  PS,PSW
177774                          STKLMT= 177774          ;;STACK LIMIT REGISTER
177772                          PIRQ=   177772          ;;PROGRAM INTERRUPT REQUEST REGISTER
177570                          DSWR=   177570          ;;HARDWARE SWITCH REGISTER
177570                          DDISP=  177570          ;;HARDWARE DISPLAY REGISTER
                                ;*****  THE FOLLOWING ODT START ADDRESS FOR SBC 11/21 IS ADDED
170000                          ODTST=  170000
                                ;*GENERAL PURPOSE REGISTER DEFINITIONS
000000                          R0=     %0              ;;GENERAL REGISTER
000001                          R1=     %1              ;;GENERAL REGISTER
000002                          R2=     %2              ;;GENERAL REGISTER
000003                          R3=     %3              ;;GENERAL REGISTER
000004                          R4=     %4              ;;GENERAL REGISTER
000005                          R5=     %5              ;;GENERAL REGISTER
000006                          R6=     %6              ;;GENERAL REGISTER
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(1)             000007                  R7=     %7              ;;GENERAL REGISTER
(1)             000006                  SP=     %6              ;;STACK POINTER
(1)             000007                  PC=     %7              ;;PROGRAM COUNTER
(1)
(1)                                     ;*PRIORITY LEVEL DEFINITIONS
(1)             000000                  PR0=    0               ;;PRIORITY LEVEL 0
(1)             000040                  PR1=    40              ;;PRIORITY LEVEL 1
(1)             000100                  PR2=    100             ;;PRIORITY LEVEL 2
(1)             000140                  PR3=    140             ;;PRIORITY LEVEL 3
(1)             000200                  PR4=    200             ;;PRIORITY LEVEL 4
(1)             000240                  PR5=    240             ;;PRIORITY LEVEL 5
(1)             000300                  PR6=    300             ;;PRIORITY LEVEL 6
(1)             000340                  PR7=    340             ;;PRIORITY LEVEL 7
(1)
(1)                                     ;*''SWITCH REGISTER'' SWITCH DEFINITIONS
(1)             100000                  SW15=   100000
(1)             040000                  SW14=   40000
(1)             020000                  SW13=   20000
(1)             010000                  SW12=   10000
(1)             004000                  SW11=   4000
(1)             002000                  SW10=   2000
(1)             001000                  SW09=   1000
(1)             000400                  SW08=   400
(1)             000200                  SW07=   200
(1)             000100                  SW06=   100
(1)             000040                  SW05=   40
(1)             000020                  SW04=   20
(1)             000010                  SW03=   10
(1)             000004                  SW02=   4
(1)             000002                  SW01=   2
(1)             000001                  SW00=   1
(1)                                     .EQUIV  SW09,SW9
(1)                                     .EQUIV  SW08,SW8
(1)                                     .EQUIV  SW07,SW7
(1)                                     .EQUIV  SW06,SW6
(1)                                     .EQUIV  SW05,SW5
(1)                                     .EQUIV  SW04,SW4
(1)                                     .EQUIV  SW03,SW3
(1)                                     .EQUIV  SW02,SW2
(1)                                     .EQUIV  SW01,SW1
(1)                                     .EQUIV  SW00,SW0
(1)
(1)                                     ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
(1)             100000                  BIT15=  100000
(1)             040000                  BIT14=  40000
(1)             020000                  BIT13=  20000
(1)             010000                  BIT12=  10000
(1)             004000                  BIT11=  4000
(1)             002000                  BIT10=  2000
(1)             001000                  BIT09=  1000
(1)             000400                  BIT08=  400
(1)             000200                  BIT07=  200
(1)             000100                  BIT06=  100
(1)             000040                  BIT05=  40
(1)             000020                  BIT04=  20
(1)             000010                  BIT03=  10
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    (1)           000004                BIT02=  4
    (1)           000002                BIT01=  2
    (1)           000001                BIT00=  1
    (1)                                 .EQUIV  BIT09,BIT9
    (1)                                 .EQUIV  BIT08,BIT8
    (1)                                 .EQUIV  BIT07,BIT7
    (1)                                 .EQUIV  BIT06,BIT6
    (1)                                 .EQUIV  BIT05,BIT5
    (1)                                 .EQUIV  BIT04,BIT4
    (1)                                 .EQUIV  BIT03,BIT3
    (1)                                 .EQUIV  BIT02,BIT2
    (1)                                 .EQUIV  BIT01,BIT1
    (1)                                 .EQUIV  BIT00,BIT0
    (1)
    (1)                                 ;*BASIC "CPU" TRAP VECTOR ADDRESSES
    (1)           000004                ERRVEC= 4                 ;;TIME OUT AND OTHER ERRORS
    (1)           000010                RESVEC= 10                ;;RESERVED AND ILLEGAL INSTRUCTIONS
    (1)           000014                TBITVEC=14                ;;"T" BIT
    (1)           000014                TRTVEC= 14                ;;TRACE TRAP
    (1)           000014                BPTVEC= 14                ;;BREAKPOINT TRAP (BPT)
    (1)           000020                IOTVEC= 20                ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
    (1)           000024                PWRVEC= 24                ;;POWER FAIL
    (1)           000030                EMTVEC= 30                ;;EMULATOR TRAP (EMT) **ERROR**
    (1)           000034                TRAPVEC=34                ;;"TRAP" TRAP
    (1)           000060                TKVEC=  60                ;;TTY KEYBOARD VECTOR
    (1)           000064                TPVEC=  64                ;;TTY PRINTER VECTOR
    (1)                                 ;*****  THE FOLLOWING BREAK VECTOR AND LINE CLOCK VECTOR ARE INCLUDED
    (1)           000100                LKVEC=  100               ;;LINE CLOCK VECTOR
    (1)           000140                BRKVEC= 140               ;;BREAK VECTOR
    (1)           000240                PIRQVEC=240               ;;PROGRAM INTERRUPT REQUEST VECTOR
 5694             174160                ABASE=  174160            ;BASE ADDRESS
 5695             000001                ADEVM=  1                 ;DEFAULT TO ONE DRV11J
 5696             100000                RDY=    BIT15
 5697             000400                DIR=    BIT8
 5698             001000                IE=     BIT9
 5699
 5700                                   ;CHIP COMMAND SUMMARY
 5701             000020                CIRMR=  20                ;CLEAR IRR AND IMR
 5702             000030                CSIRMR= 30                ;CLEAR SINGLE IRR AND IMR BIT
 5703
 5704             000040                CIMR=   40                ;CLEAR IMR
 5705             000050                CSIMR=  50                ;CLEAR SINGLE IMR BIT
 5706             000060                SIMR=   60                ;SET ALL IMR BITS
 5707             000070                SSIMR=  70                ;SET SINGLE IMR BITS
 5708
 5709             000100                CIRR=   100               ;CLEAR IRR
 5710             000110                CSIRR=  110               ;CLEAR SINGLE IRR BITS
 5711             000120                SIRR=   120               ;SET ALL IRR BITS
 5712             000130                SSIRR=  130               ;SET SINGLE IRR BITS
 5713
 5714             000140                CHPISR= 140               ;CLEAR HIGHEST PRIORITY ISR BIT
 5715             000160                CISR=   160               ;CLEAR ISR
 5716             000170                CSISR=  170               ;CLEAR SINGLE ISR BIT
 5717
 5718             000200                LMD04=  200               ;LOAD MODE BITS M0-M4
 5719             000240                LMD57=  240               ;LOAD MODE BITS M5-M7
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 5720
 5721                                   ;CHIP MODE BIT PRESELECTION
 5722            000240                 MISR=   240
 5723            000244                 MIMR=   244
 5724            000250                 MIRR=   250
 5725            000254                 MACR=   254
 5726
 5727                                   ;CHIP WRITE PRESELECTION
 5728            000300                 PACR=   300             ;PRESELECT AUTO CLEAR REG. FOR WRITING
 5729            000260                 PIMR=   260             ;PRESELECT IMR REG. FOR WRITING
 5730            000340                 PVMA=   340             ;PRESELECT VECTOR MEMORY ADDRESS
 5731
 5732                                   .SBTTL  TRAP CATCHER
  (1)
  (1)            000000                         .=0
  (1)                                   ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
  (1)                                   ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
  (1)                                   ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
  (1)            000174                 .=174
  (1)  000174    000000                 DISPREG: .WORD  0               ;;SOFTWARE DISPLAY REGISTER
  (1)  000176    000000                 SWREG:   .WORD  0               ;;SOFTWARE SWITCH REGISTER
  (1)                                   .SBTTL  STARTING ADDRESS(ES)
  (1)  000200    000137  001402                 JMP     @#START ;;JUMP TO STARTING ADDRESS OF PROGRAM
 5733            000100                 .=100
 5734  000100    000104  000200  000002         .WORD   104,200,2       ;IF 'B EVENT' ON Q BUS IS CONNECTED
 5735                                                                   ;IGNORE IT'S INTERRUPT - JUST DO A RTI
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5737                                    .SBTTL  ACT11 HOOKS
 (1)
 (2)                                    ;;*****************************************************************
 (1)                                    ;HOOKS REQUIRED BY ACT11
 (1)          000106                            $SVPC=.                 ;SAVE PC
 (1)          000046                            .=46
 (1)  000046  013022                            $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
 (1)          000052                            .=52
 (1)  000052  000000                            .WORD   0               ;;2)SET LOC.52 TO ZERO
 (1)          000106                            .=$SVPC                 ;; RESTORE PC
5738          001000                            .=1000
5739                                                                    ;LONGEST TEST TIME
5740                                                                    ;1ST PASS RUN TIME
5741                                                                    ;ADDITIONAL RUN TIME
5742                                    .SBTTL  APT PARAMETER BLOCK
 (1)
 (2)                                    ;;*****************************************************************
 (1)                                    ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
 (2)                                    ;;*****************************************************************
 (1)          001000                            .$X=.   ;;SAVE CURRENT LOCATION
 (1)          000024                            .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
 (1)  000024  000200                            200     ;;FOR APT START UP
 (1)          000044                            .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
 (1)  000044  001000                            $APTHDR ;;POINT TO APT HEADER BLOCK
 (1)          001000                            .=.$X   ;;RESET LOCATION COUNTER
 (2)                                    ;;*****************************************************************
 (1)                                    ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
 (1)                                    ;INTERFACE SPEC.
 (1)
 (1)  001000                            $APTHD:
 (1)  001000  000000                    $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
 (1)  001002  001170                    $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
 (1)  001004  000006                    $TSTM:  .WORD   6.      ;;RUN TIM OF LONGEST TEST
 (1)  001006  000024                    $PASTM: .WORD   20.     ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
 (1)  001010  000024                    $UNITM: .WORD   20.     ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
 (1)  001012  000031                            .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
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 5743                                   .SBTTL  COMMON TAGS
  (1)
  (2)                                   ;;**********************************************************************
  (1)                                   ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
  (1)                                   ;*USED IN THE PROGRAM.
  (1)
  (1)           001100                          .=1100
  (1)  001100                           $CMTAG:                         ;;START OF COMMON TAGS
  (1)  001100  000000                           .WORD   0
  (1)  001102     000                   $TSTNM: .BYTE   0               ;;CONTAINS THE TEST NUMBER
  (1)  001103     000                   $ERFLG: .BYTE   0               ;;CONTAINS ERROR FLAG
  (1)  001104  000000                   $ICNT:  .WORD   0               ;;CONTAINS SUBTEST ITERATION COUNT
  (1)  001106  000000                   $LPADR: .WORD   0               ;;CONTAINS SCOPE LOOP ADDRESS
  (1)  001110  000000                   $LPERR: .WORD   0               ;;CONTAINS SCOPE RETURN FOR ERRORS
  (1)  001112  000000                   $ERTTL: .WORD   0               ;;CONTAINS TOTAL ERRORS DETECTED
  (1)  001114     000                   $ITEMB: .BYTE   0               ;;CONTAINS ITEM CONTROL BYTE
  (1)  001115     001                   $ERMAX: .BYTE   1               ;;CONTAINS MAX. ERRORS PER TEST
  (1)  001116  000000                   $ERRPC: .WORD   0               ;;CONTAINS PC OF LAST ERROR INSTRUCTION
  (1)  001120  000000                   $GDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'GOOD' DATA
  (1)  001122  000000                   $BDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'BAD' DATA
  (1)  001124  000000                   $GDDAT: .WORD   0               ;;CONTAINS 'GOOD' DATA
  (1)  001126  000000                   $BDDAT: .WORD   0               ;;CONTAINS 'BAD' DATA
  (1)  001130  000000                           .WORD   0               ;;RESERVED--NOT TO BE USED
  (1)  001132  000000                           .WORD   0
  (1)  001134     000                   $AUTOB: .BYTE   0               ;;AUTOMATIC MODE INDICATOR
  (1)  001135     000                   $INTAG: .BYTE   0               ;;INTERRUPT MODE INDICATOR
  (1)  001136  000000                           .WORD   0
  (1)  001140  177570                   SWR:    .WORD   DSWR            ;;ADDRESS OF SWITCH REGISTER
  (1)  001142  177570                   DISPLAY: .WORD  DDISP           ;;ADDRESS OF DISPLAY REGISTER
  (1)  001144  177560                   $TKS:   177560                  ;;TTY KBD STATUS
  (1)  001146  177562                   $TKB:   177562                  ;;TTY KBD BUFFER
  (1)  001150  177564                   $TPS:   177564                  ;;TTY PRINTER STATUS REG. ADDRESS
  (1)  001152  177566                   $TPB:   177566                  ;;TTY PRINTER BUFFER REG. ADDRESS
  (1)  001154     000                   $NULL:  .BYTE   0               ;;CONTAINS NULL CHARACTER FOR FILLS
  (1)  001155     002                   $FILLS: .BYTE   2
  (1)                                           ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
  (1)  001156     012                   $FILLC: .BYTE   12              ;;INSERT FILL CHARS. AFTER A "LINE FEED"
  (1)  001157     000                   $TPFLG: .BYTE   0               ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
  (1)  001160  000000                   $TIMES: 0                       ;;MAX. NUMBER OF ITERATIONS
  (1)  001162  000000                   $ESCAPE:0                       ;;ESCAPE ON ERROR ADDRESS
  (1)  001164     077                   $QUES:  .ASCII  /?/             ;;QUESTION MARK
  (1)  001165     015                   $CRLF:  .ASCII  <15>            ;;CARRIAGE RETURN
  (1)  001166  000012                   $LF:    .ASCIZ  <12>            ;;LINE FEED
  (2)                                   ;;**********************************************************************
  (2)                                   .SBTTL  APT MAILBOX-ETABLE
  (2)
  (3)                                   ;;**********************************************************************
  (2)                                   .EVEN
  (2)  001170                           $MAIL:                          ;;APT MAILBOX
  (2)  001170  000000                   $MSGTY: .WORD   AMSGTY           ;;MESSAGE TYPE CODE
  (2)  001172  000000                   $FATAL: .WORD   AFATAL           ;;FATAL ERROR NUMBER
  (2)  001174  000000                   $TESTN: .WORD   ATESTN           ;;TEST NUMBER
  (2)  001176  000000                   $PASS:  .WORD   APASS            ;;PASS COUNT
  (2)  001200  000000                   $DEVCT: .WORD   ADEVCT           ;;DEVICE COUNT
  (2)  001202  000000                   $UNIT:  .WORD   AUNIT            ;;I/O UNIT NUMBER
  (2)  001204  000000                   $MSGAD: .WORD   AMSGAD           ;;MESSAGE ADDRESS
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    (2)  001206  000000                $MSGLG: .WORD   AMSGLG  ;;MESSAGE LENGTH
    (2)  001210                        $ETABLE:                ;;APT ENVIRONMENT TABLE
    (2)  001210     000                $ENV:   .BYTE   AENV    ;;ENVIRONMENT BYTE
    (2)  001211     000                $ENVM:  .BYTE   AENVM
    (2)                                ;;ENVIRONMENT MODE BITS
    (2)  001212  000000                $SWREG: .WORD   ASWREG  ;;APT SWITCH REGISTER
    (2)  001214  000000                $USWR:  .WORD   AUSWR   ;;USER SWITCHES
    (2)  001216  000000                $CPUOP: .WORD   ACPUOP  ;;CPU TYPE,OPTIONS
    (2)                                ;*                      BITS 15-11=CPU TYPE
    (2)                                ;*                              11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
    (2)                                ;*                              11/70=06,PDQ=07,Q=10
    (2)                                ;*                      BIT 10=REAL TIME CLOCK
    (2)                                ;*                      BIT  9=FLOATING POINT PROCESSOR
    (2)                                ;*                      BIT  8=MEMORY MANAGEMENT
    (2)  001220     000                $MAMS1: .BYTE   AMAMS1  ;;HIGH ADDRESS,M.S. BYTE
    (2)  001221     000                $MTYP1: .BYTE   AMTYP1  ;;MEM. TYPE,BLK#1
    (2)                                ;*                      MEM.TYPE BYTE   --  (HIGH BYTE)
    (2)                                ;*                              900 NSEC CORE=001
    (2)                                ;*                              300 NSEC BIPOLAR=002
    (2)                                ;*                              500 NSEC MOS=003
    (2)  001222  000000                $MADR1: .WORD   AMADR1  ;;HIGH ADDRESS,BLK#1
    (2)                                ;*                        MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF ''TYPE'' ABOVE
    (2)  001224     000                $MAMS2: .BYTE   AMAMS2  ;;HIGH ADDRESS,M.S. BYTE
    (2)  001225     000                $MTYP2: .BYTE   AMTYP2  ;;MEM.TYPE,BLK#2
    (2)  001226  000000                $MADR2: .WORD   AMADR2  ;;MEM.LAST ADDRESS,BLK#2
    (2)  001230     000                $MAMS3: .BYTE   AMAMS3  ;;HIGH ADDRESS,M.S.BYTE
    (2)  001231     000                $MTYP3: .BYTE   AMTYP3  ;;MEM.TYPE,BLK#3
    (2)  001232  000000                $MADR3: .WORD   AMADR3  ;;MEM.LAST ADDRESS,BLK#3
    (2)  001234     000                $MAMS4: .BYTE   AMAMS4  ;;HIGH ADDRESS,M.S.BYTE
    (2)  001235     000                $MTYP4: .BYTE   AMTYP4  ;;MEM.TYPE,BLK#4
    (2)  001236  000000                $MADR4: .WORD   AMADR4  ;;MEM.LAST ADDRESS,BLK#4
    (2)  001240  000000                $VECT1: .WORD   AVECT1  ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
    (2)  001242  000000                $VECT2: .WORD   AVECT2  ;;INTERRUPT VECTOR#2BUS PRIORITY#2
    (2)  001244  174160                $BASE:  .WORD   ABASE
    (2)                                ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
    (2)  001246  000001                $DEVM:  .WORD   ADEVM   ;;DEVICE MAP
    (2)  001250  000000                $CDW1:  .WORD   ACDW1   ;;CONTROLLER DESCRIPTION WORD#1
    (2)  001252                        $ETEND:
    (2)                                .MEXIT
```

```
   (1)                                  .SBTTL  ERROR POINTER TABLE
   (1)
   (1)                                  ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
   (1)                                  ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
   (1)                                  ;*LOCATION $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
   (1)                                  ;*NOTE1:        IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
   (1)                                  ;*NOTE2:       EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:
   (1)
   (1)                                  ;*      EM              ;;POINTS TO THE ERROR MESSAGE
   (1)                                  ;*      DH              ;;POINTS TO THE DATA HEADER
   (1)                                  ;*      DT              ;;POINTS TO THE DATA
   (1)                                  ;*      DF              ;;POINTS TO THE DATA FORMAT
   (1)
   (1)
   (1)  001252                          $ERRTB:
 5744                                   ;ERROR  1
 5745  001252  016633                          EM1             ;REG TIMEOUT ER
 5746  001254  016765                          DH1             ;ERRPC  TSTNUM  BUSADR  EXPCT   RCVD
 5747  001256  017110                          DT1             ;$ERRPC TSTNUM  $BDADR  $GDDAT  $BDDAT(R5)
 5748  001260  000000                          0
 5749
 5750                                   ;ERROR  2
 5751  001262  016652                          EM2             ;REG READ/WRITE ER
 5752  001264  016765                          DH1             ;ERRPC  TSTNUM  BUSADR  EXPCT   RCVD
 5753  001266  017110                          DT1             ;$ERRPC TSTNUM  $BDADR  $GDDAT  $BDDAT(R5)
 5754  001270  000000                          0
 5755
 5756                                   ;ERROR  3
 5757  001272  016674                          EM3             ;IRR REG ER
 5758  001274  016765                          DH1             ;ERRPC  TSTNUM  BUSADR  EXPCT   RCVD
 5759  001276  017110                          DT1             ;$ERRPC TSTNUM  $BDADR  $GDDAT  $BDDAT(R5)
 5760  001300  000000                          0
 5761
 5762                                   ;ERROR  4
 5763  001302  016707                          EM4             ;ACR REG ER
 5764  001304  016765                          DH1             ;ERRPC  TSTNUM  BUSADR  EXPCT   RCVD
 5765  001306  017110                          DT1             ;$ERRPC TSTNUM  $BDADR  $GDDAT  $BDDAT(R5)
 5766  001310  000000                          0
 5767
 5768                                   ;ERROR  5
 5769  001312  016722                          EM5             ;IMR REG ERROR
 5770  001314  016765                          DH1             ;ERRPC  TSTNUM  BUSADR  EXPCT   RCVD
 5771  001316  017110                          DT1             ;$ERRPC TSTNUM  $BDADR  $GDDAT  $BDDAT(R5)
 5772  001320  000000                          0
 5773
 5774                                   ;ERROR  6
 5775  001322  016735                          EM6             ;ISR REG ERROR
 5776  001324  016765                          DH1             ;ERRPC  TSTNUM  BUSADR  EXPCT   RCVD
 5777  001326  017110                          DT1             ;$ERRPC TSTNUM  $BDADR  $GDDAT  $BDDAT(R5)
 5778  001330  000000                          0
 5779
 5780
 5781                                   ;ERROR  7
 5782  001332  016750                          EM7             ;CHIP STAT ER
 5783  001334  016765                          DH1             ;ERRPC  TSTNUM  BUSADR  EXPCT   RCVD
 5784  001336  017110                          DT1             ;$ERRPC TSTNUM  $BDADR  $GDDAT  $BDDAT(R5)
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 5785  001340  000000                        0
 5786
 5787
 5788                                ; BUS REGISTER ADDRESS POINTERS
 5789
 5790
 5791  001342  174160                DRCSA:  ABASE
 5792  001344  174162                DRDBA:  ABASE+2
 5793  001346  174164                DRCSB:  ABASE+4
 5794  001350  174166                DRDBB:  ABASE+6
 5795  001352  174170                DRCSC:  ABASE+10
 5796  001354  174172                DRDBC:  ABASE+12
 5797  001356  174174                DRCSD:  ABASE+14
 5798  001360  174176                DRDBD:  ABASE+16
 5799
 5800
 5801                                ;COMMON PROGRAM LOCATION(S)
 5802
 5803  001362  000000                TSTNUM: 0               ;CONTAINS TEST NUMBER ON ERROR
 5804  001364  000001                DMAP:   1
 5805  001366  000000                INTFLG: .WORD   0
 5806  001370  000000                XXDP:   .WORD   0
 5807  001372  000000                IMRLOC: .WORD   0
 5808  001374  000000                ISRLOC: .WORD   0
 5809  001376  000000                IRRLOC: .WORD   0
 5810  001400  000000                ACRLOC: .WORD   0
```

```
 5813                                                   .SBTTL  PROGRAM START
 5814  001402                                  START:
  (1)                                           .SBTTL  INITIALIZE THE COMMON TAGS
  (1)                                           ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
  (1)  001402  012706  001100                           MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
  (1)  001406  005026                                   CLR     (R6)+           ;;CLEAR MEMORY LOCATION
  (1)  001410  022706  001140                           CMP     #SWR,R6 ;;DONE?
  (1)  001414  001374                                   BNE     .-6             ;;LOOP BACK IF NO
  (1)  001416  012706  001100                           MOV     #1100,SP                ;;SETUP THE STACK POINTER
  (1)                                           ;;INITIALIZE A FEW VECTORS
  (1)  001422  012737  015216  000020                   MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
  (1)  001430  012737  000300  000022                   MOV     #PR6,@#IOTVEC+2 ;;LEVEL 6
  (1)  001436  012737  014670  000030                   MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
  (1)  001444  012737  000300  000032                   MOV     #PR6,@#EMTVEC+2 ;;LEVEL 6
  (1)                                           ;;BIT02
  (1)  001452  012737  016456  000034                   MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
  (1)  001460  012737  000300  000036                   MOV     #PR6,@#TRAPVEC+2;LEVEL 6
  (1)  001466  012737  016252  000024                   MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
  (1)  001474  012737  000300  000026                   MOV     #PR6,@#PWRVEC+2 ;;LEVEL 6
  (1)  001502  005037  001160                           CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
  (1)  001506  005037  001162                           CLR     $ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
  (1)  001512  112737  000001  001115                   MOVB    #1,$ERMAX       ;;ALLOW ONE ERROR PER TEST
  (1)  001520  012737  001520  001106                   MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
  (1)  001526  012737  001526  001110                   MOV     #.,$LPERR       ;;SETUP THE ERROR LOOP ADDRESS
  (2)                                           ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
  (2)                                           ;;EQUAL TO A "-1", SETUP FOR A SOFTWARE SWITCH REGISTER.
  (2)  001534  013746  000004                           MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
  (2)  001540  012737  001574  000004                   MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
  (2)  001546  012737  177570  001140                   MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
  (2)  001554  012737  177570  001142                   MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
  (2)  001562  022777  177777  177350                   CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
  (2)  001570  001012                                   BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
  (2)                                                                           ;;AND  THE HARDWARE SWR IS NOT = -1
  (2)  001572  000403                                   BR      65$             ;;BRANCH IF NO TIMEOUT
  (2)  001574  012716  001602           64$:    MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
  (2)  001600  000002                           RTI
  (2)  001602  012737  000176  001140   65$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
  (2)  001610  012737  000174  001142           MOV     #DISPREG,DISPLAY
  (2)  001616  012637  000004           66$:    MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR
  (1)
  (2)  001622  005037  001176                           CLR     $PASS           ;;CLEAR PASS COUNT
  (2)  001626  132737  000200  001211                   BITB    #APTSIZE,$ENVM  ;;TEST USER SIZE UNDER APT
  (2)  001634  001403                                   BEQ     67$             ;;YES,USE NON-APT SWITCH
  (2)  001636  012737  001212  001140                   MOV     #$SWREG,SWR     ;;NO,USE APT SWITCH REGISTER
  (2)  001644                           67$:
 5815  001644  005037  001172                           CLR     $FATAL          ;CLEAR ERROR NUMBER
 5816  001650  005037  001170                           CLR     $MSGTYP         ;CLEAR MESSAGE TYPE
 5817  001654  005037  001174                           CLR     $TESTN          ;CLEAR TEST NUMBER
 5818                                           ;;THE FOLLOWING  9 LINES WERE DELETED
 5819                                           ;;IN ORDER TO MAKE THIS DIAGNOSTIC SPECIFIC TO 11/21 PROCESSOR.
 5820                                                   ;CALL   FALCON          ; CHECK FOR FALCON (KXT11)      ;;GPA
 5821                                                   ;BEQ    1000$           ; BR IF NOT KXT11 SYSTEM        ;;GPA
 5822                                                   ;BIC    #40,@#22        ; YES, STRAP IOT...             ;;GPA
 5823                                                   ;BIC    #40,@#32        ;...EMT...                      ;;GPA
 5824                                                   ;BIC    #40,@#36        ;...AND TRAP TO LEVEL 6.        ;;GPA
 5825                                                   ;CMP    $BASE,#ABASE    ; IS $BASE VIRGIN ??            ;;GPA
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                                        ;BNE    1000$           ; BR IF NOT.                                ;;GPA
                                        ;MOV    #174160,$BASE   ; YES, USE ENGINEERING DEFAULT              ;;GPA
                                ;1000$:                                                                     ;;GPA
                                ;CHECK OPERATING ENVIRONMENT
001660  005737  000042                  TST     @#42            ;ARE WE IN ACT/XXDP AUTO MODE?
001664  001410                          BEQ     1$              ;BRANCH IF NO
001666  023737  000042  000046          CMP     @#42,@#46       ;IS IT ACT AUTO MODE?
001674  001410                          BEQ     2$              ;BRANCH IF YES
001676  012737  177777  001370          MOV     #-1,XXDP        ;SET XXDP CHAIN MODE INDICATOR
001704  000404                          BR      2$
001706  123727  001210  000001  1$:     CMPB    $ENV,#1         ;ARE WE IN APT AUTO MODE?
001714  001003                          BNE     3$              ;BRANCH IF NO
001716  112737  000001  001134  2$:     MOVB    #1,$AUTOB       ;SET AUTO MODE INDICATOR

                                ;PRINT TITLE IF NOT IN ACT OR APT AUTO MODE
001724  005227  177777          3$:     INC     #-1             ;FIRST TIME?
001730  001012                          BNE     5$              ;SKIP TITLE IF NO
001732  005737  001134                  TST     $AUTOB          ;ARE WE IN AUTO MODE?
001736  001403                          BEQ     4$              ;BRANCH TO TITLE TYPEOUT IF NOT
001740  005737  001370                  TST     XXDP            ;IS THE AUTO MODE UNDER XXDP?
001744  001404                          BEQ     5$              ;SKIP TITLE IF NOT
001746  104401  016536          4$:     TYPE    ,TITLED         ;PRINT OUT THE TITLE
001752  104401  016604                  TYPE    ,TLCABL         ;PRINT "DRV11J CABLE REQ'D"

                                ;GET THE VALUE IN THE SOFTWARE SWITCH REGISTER
001756  005737  001134          5$:     TST     $AUTOB          ;ARE WE IN AUTOMATIC MODE?
001762  001001                          BNE     START1          ;BRANCH IF YES
001764  104406                          GTSWR                   ;ASK FOR SWR INPUT FROM CONSOLE
001766  005037  001202          START1: CLR     $UNIT           ;CLEAR UNIT NUMBER
001772  013737  001246  001364          MOV     $DEVM,DMAP      ;POSITION OF DRV11-J'S
002000  042737  177760  001364          BIC     #177760,DMAP    ;UP TO 4 DRV11-J'S ONLY
002006  013701  001244                  MOV     $BASE,R1        ;GET BASE ADDRESS
002012  010137  001342                  MOV     R1,DRCSA        ;MAKE BUS REG. POINTER = $BASE
002016  032737  000001  001364          BIT     #1,DMAP         ;IS FIRST DRV11-J SELECTED?
002024  001002                          BNE     NEXPAS          ;YES
002026  000137  012700                  JMP     NXDEV1          ;ADVANCE BASE DRV11-J ADDRESS
002032  012700  001342          NEXPAS: MOV     #DRCSA,R0       ;SET UP REGISTER ADDRESS POINTERS
002036  010120                  NEXPA1: MOV     R1,(R0)+        ;LOAD EM,R1 = DRV11-J CSRA ADDRESS
002040  062701  000002                  ADD     #2,R1           ;DO POINTERS FOR ALL REGS, A THRU D
002044  022700  001362                  CMP     #DRDBD+2,R0     ;ALL DONE?
002050  001372                          BNE     NEXPA1          ;BR IF NOT
002052  012706  001100                  MOV     #STACK,SP       ;ALWAYS RESET STACK
002056  012705  001126                  MOV     #$BDDAT,R5      ;INIT R5 WITH $BDDAT
002062  013737  001202  001200          MOV     $UNIT,$DEVCT    ;LOAD APT COUNTER WITH UNIT NO.
002070  106427  000300                  MTPS    #PR6            ;SET PRIORITY TO 6


                                ;;*******************************************************************
                                ;*TEST 1         TEST THAT ALL  REGISTERS ARE ADDRESSABLE
                                ;;*******************************************************************
002074  000004                  TST1:   SCOPE

002076  005037  001124                  CLR     $GDDAT          ;NO DATA COMPARE
002102  005015                          CLR     (R5)            ;NO DATA COMPARE
002104  012737  002140  000004          MOV     #2$,@#ERRVEC    ;SET UP TIMEOUT RETURN ADDRS
```

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 5878  002112  013700  001342                  MOV     DRCSA,R0        ;SET UP 1ST DRV11 BUS ADRS
 5879  002116  012701  000010                  MOV     #8.,R1          ;SET UP REG COUNT
 5880  002122  010037  001122          1$:     MOV     R0,$BDADR       ;SET UP CURRENT DRV BUS ADRS
 5881  002126  005010                          CLR     (R0)            ;SEE IF THERE
 5882  002130  005720                          TST     (R0)+           ;BUMP TO NEXT
 5883  002132  005301                          DEC     R1              ;COUNT 8 OF THEM
 5884  002134  001403                          BEQ     3$              ;BR IF ALL DONE
 5885  002136  000771                          BR      1$              ;TRY NEXT
 5886  002140  022626                  2$:     CMP     (SP)+,(SP)+     ;FIX STACK SINCE NO RTI
 5887  002142  104001                          ERROR   1               ;BUS ADRS INDICATED DID NOT RESPOND
 5888  002144  012737  000006  000004  3$:     MOV     #ERRVEC+2,@#ERRVEC  ;RESTORE LOC 4
 5889
 5890                                  ;;*******************************************************************
  (3)                                  ;*TEST 2        TEST CSRA W/R DIR BIT,INT. CHIP RESET STATUS
  (3)                                  ;;*******************************************************************
  (2)  002152  000004                  TST2:   SCOPE
  (2)
 5891  002154  013700  001342                  MOV     DRCSA,R0        ;GET CSR ADDRESS
 5892  002160  013701  001352                  MOV     DRCSC,R1        ;STORE CSRC ADDRESS
 5893  002164  005010                          CLR     (R0)            ;INIT CSRA
 5894  002166  005011                          CLR     (R1)            ;INIT CSRC
 5895  002170  010037  001122                  MOV     R0,$BDADR       ;STORE CSR ADDRESS
 5896                                                                   ;SET UP EXPECTED DATA
 5897  002174  012737  100700  001124          MOV     #RDY!DIR!BIT7!BIT6,$GDDAT
 5898  002202  112760  000001  000001          MOVB    #BIT0,1(R0)     ;SET DIRECTION BIT
 5899  002210  011015                          MOV     (R0),(R5)       ;GET CSR DATA
 5900  002212  042715  000007                  BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
 5901  002216  023715  001124                  CMP     $GDDAT,(R5)
 5902  002222  001401                          BEQ     100$
 5903  002224  104002                          ERROR   2               ;CSRA ERROR
 5904  002226  010137  001122          100$:   MOV     R1,$BDADR       ;STORE CSRC ADDRESS
 5905  002232  012737  000200  001124          MOV     #BIT7,$GDDAT    ;STORE EXPECTED
 5906  002240  011115                          MOV     (R1),(R5)       ;STORE CSRC
 5907  002242  042715  000007                  BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
 5908  002246  023715  001124                  CMP     $GDDAT,(R5)
 5909  002252  001401                          BEQ     1$
 5910  002254  104002                          ERROR   2               ;CSRC ERROR
 5911  002256  010037  001122          1$:     MOV     R0,$BDADR       ;CSRA ADDRESS
 5912  002262  012737  100300  001124          MOV     #RDY!BIT7!BIT6,$GDDAT
 5913  002270  105060  000001                  CLRB    1(R0)           ;CLEAR CSRA DIR BIT
 5914  002274  011015                          MOV     (R0),(R5)       ;READ CSR
 5915  002276  042715  000007                  BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
 5916  002302  023715  001124                  CMP     $GDDAT,(R5)
 5917  002306  001401                          BEQ     2$              ;;BR IF EQUAL
 5918  002310  104002                          ERROR   2
 5919  002312  012737  000300  001124  2$:     MOV     #BIT7!BIT6,$GDDAT
 5920  002320  112761  000001  000001          MOVB    #BIT0,1(R1)     ;CSRC TO OUTPUT MODE
 5921  002326  011015                          MOV     (R0),(R5)       ;READ CSRA
 5922  002330  042715  000007                  BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
 5923  002334  023715  001124                  CMP     $GDDAT,(R5)     ;CHECK IF RDY BIT CLEARED
 5924  002340  001401                          BEQ     TST3            ;;BR IF EQUAL
 5925  002342  104002                          ERROR   2               ;CSRA REG ERROR
 5926
 5927                                  ;;*******************************************************************
  (3)                                  ;*TEST 3        TEST CSRA INT. ENABLE BIT
  (3)                                  ;;*******************************************************************
```

```
  (2)  002344  000004                    TST3:   SCOPE
  (2)
5928   002346  004737  013056                    JSR     PC,CLRCSR       ;CLEAR CSR REGISTER
5929   002352  013700  001342                    MOV     DRCSA,R0        ;GET CSRA ADDRESS
5930   002356  013701  001352                    MOV     DRCSC,R1        ;GET CSRC ADDRESS
5931   002362  112761  000001  000001            MOVB    #BIT0,1(R1)     ;SET DIRECTION BIT CSRC
5932   002370  010037  001122                    MOV     R0,$BDADR       ;STORE CSRA ADDRESS
5933   002374  012737  001300  001124            MOV     #BIT9!BIT7!BIT6,$GDDAT
5934   002402  012710  001000                    MOV     #IE,(R0)        ;SET INTERRUPT ENABLE BIT
5935   002406  011015                            MOV     (R0),(R5)
5936   002410  042715  000007                    BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
5937   002414  023715  001124                    CMP     $GDDAT,(R5)
5938   002420  001401                            BEQ     1$
5939   002422  104002                            ERROR   2               ;INT. ENABLE ERROR,CSRA
5940   002424  012737  000300  001124  1$:       MOV     #BIT7!BIT6,$GDDAT
5941   002432  105060  000001                    CLRB    1(R0)           ;CLEAR I/E BIT
5942   002436  011015                            MOV     (R0),(R5)
5943   002440  042715  000007                    BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
5944   002444  023715  001124                    CMP     $GDDAT,(R5)
5945   002450  001401                            BEQ     TST4            ;;BR IF EQUAL
5946   002452  104002                            ERROR   2               ;CSRA ERROR
5947
5948                                  ;;*********************************************************************
  (3)                               ;*TEST 4        TEST CSRA I/E,DIR BIT
  (3)                               ;;*********************************************************************
  (2)  002454  000004                    TST4:   SCOPE
  (2)
5949   002456  004737  013056                    JSR     PC,CLRCSR       ;CLEAR CSR REGISTERS
5950   002462  013700  001342                    MOV     DRCSA,R0        ;GET CSRA ADDRESS
5951   002466  010037  001122                    MOV     R0,$BDADR       ;SAVE CSRA ADDRESS
5952   002472  012737  101700  001124            MOV     #101700,$GDDAT  ;EXPECTED I/E,DIR
5953   002500  112760  000003  000001            MOVB    #BIT1!BIT0,1(R0)
5954                                                                    ;SET I/E AND DIR BIT
5955   002506  011015                            MOV     (R0),(R5)
5956   002510  042715  000007                    BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
5957   002514  023715  001124                    CMP     $GDDAT,(R5)
5958   002520  001401                            BEQ     1$
5959   002522  104002                            ERROR   2               ;CSRA ERROR
5960   002524  012737  100300  001124  1$:       MOV     #RDY!BIT7!BIT6,$GDDAT
5961   002532  005010                            CLR     (R0)
5962   002534  011015                            MOV     (R0),(R5)
5963   002536  042715  000007                    BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
5964   002542  023715  001124                    CMP     $GDDAT,(R5)
5965   002546  001401                            BEQ     TST5            ;;BR IF EQUAL
5966   002550  104002                            ERROR   2               ;CSRA ERROR
5967
5968
5969                                  ;;*********************************************************************
  (3)                               ;*TEST 5        TEST CSRB W/R DIR BIT,INT CHIP RESET STATUS
  (3)                               ;;*********************************************************************
  (2)  002552  000004                    TST5:   SCOPE
  (2)
5970   002554  004737  013056                    JSR     PC,CLRCSR       ;CLEAR CSR REGISTERS
5971   002560  013700  001346                    MOV     DRCSB,R0        ;GET CSR ADDRESS
5972   002564  013701  001356                    MOV     DRCSD,R1        ;GET CSRD ADDRESS
5973   002570  010037  001122                    MOV     R0,$BDADR       ;STORE CSR ADDRESS
```

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 5974  002574  012737  100400  001124          MOV     #RDY!DIR,$GDDAT ;SET UP EXPECTED DATA
 5975  002602  112760  000001  000001          MOVB    #BIT0,1(R0)     ;SET DIRECTION BIT
 5976  002610  011015                          MOV     (R0),(R5)       ;GET CSRB DATA
 5977  002612  023715  001124                  CMP     $GDDAT,(R5)
 5978  002616  001401                          BEQ     100$
 5979  002620  104002                          ERROR   2               ;CSRB ERROR
 5980  002622  010137  001122          100$:   MOV     R1,$BDADR       ;STORE CSRD ADDRESS
 5981  002626  005037  001124                  CLR     $GDDAT          ;STORE EXPECTED
 5982  002632  011115                          MOV     (R1),(R5)       ;READ CSRD
 5983  002634  023715  001124                  CMP     $GDDAT,(R5)
 5984  002640  001401                          BEQ     1$
 5985  002642  104002                          ERROR   2               ;CSRD ERROR
 5986  002644  010037  001122          1$:     MOV     R0,$BDADR       ;STORE CSRB ADDRESS
 5987  002650  012737  100000  001124          MOV     #RDY,$GDDAT     ;STORE EXPECTED
 5988  002656  105060  000001                  CLRB    1(R0)           ;CLEAR CSR DIR BIT
 5989  002662  011015                          MOV     (R0),(R5)       ;READ CSR
 5990  002664  023715  001124                  CMP     $GDDAT,(R5)
 5991  002670  001401                          BEQ     2$              ;;BR IF EQUAL
 5992  002672  104002                          ERROR   2
 5993  002674  005037  001124          2$:     CLR     $GDDAT          ;STORE EXPECTED
 5994  002700  112761  000001  000001          MOVB    #BIT0,1(R1)     ;CSRD TO OUTPUT MODE
 5995  002706  011015                          MOV     (R0),(R5)       ;READ CSRB
 5996  002710  023715  001124                  CMP     $GDDAT,(R5)     ;RDY BIT CLEARED
 5997  002714  001401                          BEQ     TST6            ;;BR IF EQUAL
 5998  002716  104002                          ERROR   2               ;CSRB REG ERROR
 5999
 6000                                  ;;*******************************************************************
  (3)                                  ;*TEST 6        TEST CSRC W/R DIR BIT,INT CHIP RESET STATUS
  (3)                                  ;;*******************************************************************
  (2)  002720  000004                  TST6:   SCOPE
  (2)
 6001  002722  004737  013056                  JSR     PC,CLRCSR       ;CLEAR CSR REGISTERS
 6002  002726  013700  001352                  MOV     DRCSC,R0        ;GET CSR ADDRESS
 6003  002732  013701  001342                  MOV     DRCSA,R1        ;GET CSRA ADDRESS
 6004  002736  010037  001122                  MOV     R0,$BDADR       ;STORE CSR ADDRESS
 6005  002742  012737  100600  001124          MOV     #RDY!DIR!BIT7,$GDDAT
 6006  002750  112760  000001  000001          MOVB    #BIT0,1(R0)     ;SET DIRECTION BIT
 6007  002756  011015                          MOV     (R0),(R5)       ;GET CSR DATA
 6008  002760  042715  000007                  BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
 6009  002764  023715  001124                  CMP     $GDDAT,(R5)
 6010  002770  001401                          BEQ     100$
 6011  002772  104002                          ERROR   2
 6012  002774  010137  001122          100$:   MOV     R1,$BDADR       ;STORE CSR ADDRESS
 6013  003000  012737  000300  001124          MOV     #BIT7!BIT6,$GDDAT
 6014  003006  011115                          MOV     (R1),(R5)       ;READ CSRA
 6015  003010  042715  000007                  BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
 6016  003014  023715  001124                  CMP     $GDDAT,(R5)
 6017  003020  001401                          BEQ     1$              ;CHECK CSRA
 6018  003022  104002                          ERROR   2               ;CSRA ERROR
 6019  003024  010037  001122          1$:     MOV     R0,$BDADR       ;STORE CSR ADDRESS
 6020  003030  012737  100200  001124          MOV     #RDY!BIT7,$GDDAT;STORE EXPECTED DATA
 6021  003036  105060  000001                  CLRB    1(R0)           ;CLEAR CSR DIR BIT
 6022  003042  011015                          MOV     (R0),(R5)       ;READ CSR
 6023  003044  042715  000007                  BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
 6024  003050  023715  001124                  CMP     $GDDAT,(R5)
 6025  003054  001401                          BEQ     2$              ;;BR IF EQUAL
```

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 6026  003056  104002                          ERROR   2
 6027  003060  012737  000200  001124  2$:     MOV     #BIT7,$GDDAT    ;EXPECTED DATA
 6028  003066  112761  000001  000001          MOVB    #BIT0,1(R1)     ;CSRA TO OUTPUT MODE
 6029  003074  011015                          MOV     (R0),(R5)       ;READ CSRC
 6030  003076  042715  000007                  BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
 6031  003102  023715  001124                  CMP     $GDDAT,(R5)     ;RDY BIT CLEARED
 6032  003106  001401                          BEQ     TST7            ;;BR IF EQUAL
 6033  003110  104002                          ERROR   2               ;CSRC REG ERROR
 6034
 6035                                  ;;*******************************************************************
  (3)                                  ;*TEST 7        TEST CSRD W/R DIR BIT,INT CHIP RESET STATUS
  (3)                                  ;;*******************************************************************
  (2)  003112  000004                  TST7:   SCOPE
  (2)
 6036  003114  004737  013056                  JSR     PC,CLRCSR       ;CLEAR CSR REGISTERS
 6037  003120  013700  001356                  MOV     DRCSD,R0        ;GET CSR ADDRESS
 6038  003124  013701  001346                  MOV     DRCSB,R1        ;CSRB ADDRESS
 6039  003130  010037  001122                  MOV     R0,$BDADR       ;STORE CSR ADDRESS
 6040  003134  012737  100400  001124          MOV     #RDY!DIR,$GDDAT ;SET UP EXPECTED DATA
 6041  003142  112760  000001  000001          MOVB    #BIT0,1(R0)     ;SET DIRECTION BIT
 6042  003150  011015                          MOV     (R0),(R5)       ;GET CSR DATA
 6043  003152  023715  001124                  CMP     $GDDAT,(R5)
 6044  003156  001401                          BEQ     100$
 6045  003160  104002                          ERROR   2
 6046  003162  010137  001122          100$:   MOV     R1,$BDADR       ;STORE CSRB ADDRESS
 6047  003166  005037  001124                  CLR     $GDDAT          ;STORE EXPECTED
 6048  003172  011115                          MOV     (R1),(R5)
 6049  003174  023715  001124                  CMP     $GDDAT,(R5)
 6050  003200  001401                          BEQ     1$
 6051  003202  104002                          ERROR   2               ;CSRB ERROR
 6052  003204  010037  001122          1$:     MOV     R0,$BDADR       ;STORE CSRD ADDRESS
 6053  003210  012737  100000  001124          MOV     #RDY,$GDDAT     ;STORE EXPECTED
 6054  003216  105060  000001                  CLRB    1(R0)           ;CLEAR CSR DIR BIT
 6055  003222  011015                          MOV     (R0),(R5)       ;READ CSR
 6056  003224  023715  001124                  CMP     $GDDAT,(R5)
 6057  003230  001401                          BEQ     2$              ;;BR IF EQUAL
 6058  003232  104002                          ERROR   2
 6059  003234  005037  001124          2$:     CLR     $GDDAT          ;EXPECTED
 6060  003240  112761  000001  000001          MOVB    #BIT0,1(R1)     ;CSRD TO OUTPUT MODE
 6061  003246  011015                          MOV     (R0),(R5)       ;READ CSR
 6062  003250  023715  001124                  CMP     $GDDAT,(R5)     ;RDY BIT CLEARED
 6063  003254  001401                          BEQ     TST10           ;;BR IF EQUAL
 6064  003256  104002                          ERROR   2               ;CSRD REG ERROR
 6065
 6066                                  ;;*******************************************************************
  (3)                                  ;*TEST 10       TEST DBRA W/R IN OUTPUT MODE
  (3)                                  ;;*******************************************************************
  (2)  003260  000004                  TST10:  SCOPE
  (2)
 6067  003262  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6068  003266  012703  013164                  MOV     #BEGPAT,R3      ;GET DATA PATTERN TABLE
 6069  003272  012737  003322  001110          MOV     #1$,$LPERR      ;SET UP SCOPE ADDRESS
 6070  003300  013700  001342                  MOV     DRCSA,R0        ;GET CSRA
 6071  003304  013701  001344                  MOV     DRDBA,R1        ;GET DBRA ADDRESS
 6072  003310  010137  001122                  MOV     R1,$BDADR       ;STORE DBRA ADDRESS
 6073  003314  112760  000001  000001          MOVB    #BIT0,1(R0)     ;SET CSRA IN OUTPUT MODE
```

```
 6074  003322  011337  001124          1$:     MOV     (R3),$GDDAT     ;SAVE EXPECTED DATA
 6075  003326  005011                          CLR     (R1)            ;CLEAR DBRA
 6076  003330  051311                          BIS     (R3),(R1)       ;WRITE INTO DBRA
 6077  003332  011115                          MOV     (R1),(R5)       ;READ DBRA
 6078  003334  023715  001124                  CMP     $GDDAT,(R5)     ;CHECK W/R DBRA
 6079  003340  001401                          BEQ     2$              ;NEXT PAT. IF EQUAL
 6080  003342  104002                          ERROR   2               ;DBRA W/R ERROR
 6081  003344  005723                  2$:     TST     (R3)+           ;INC FOR NEXT PATTERN
 6082  003346  020327  013464                  CMP     R3,#ENDDAT      ;CHECK FOR END
 6083  003352  001363                          BNE     1$              ;DO NEXT PATTERN
 6084
 6085                                  ;;*******************************************************************
   (3)                                 ;*TEST 11       TEST DBRB W/R IN OUTPUT MODE
   (3)                                 ;;*******************************************************************
   (2)  003354  000004                  TST11:  SCOPE
   (2)
 6086  003356  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6087  003362  012703  013164                  MOV     #BEGPAT,R3      ;GET DATA PATTERN TABLE
 6088  003366  012737  003416  001110          MOV     #1$,$LPERR      ;SET UP SCOPE ADDRESS
 6089  003374  013700  001346                  MOV     DRCSB,R0        ;GET CSRB
 6090  003400  013701  001350                  MOV     DRDBB,R1        ;GET DBRB ADDRESS
 6091  003404  010137  001122                  MOV     R1,$BDADR       ;STORE DBRB ADDRESS
 6092  003410  112760  000001  000001          MOVB    #BIT0,1(R0)     ;SET CSRB IN OUTPUT MODE
 6093  003416  011337  001124          1$:     MOV     (R3),$GDDAT     ;SAVE EXPECTED DATA
 6094  003422  005011                          CLR     (R1)            ;CLEAR DBRB
 6095  003424  051311                          BIS     (R3),(R1)       ;WRITE INTO DBRB
 6096  003426  011115                          MOV     (R1),(R5)       ;READ DBRB
 6097  003430  023715  001124                  CMP     $GDDAT,(R5)     ;CHECK W/R DBRB
 6098  003434  001401                          BEQ     2$              ;NEXT PAT. IF EQUAL
 6099  003436  104002                          ERROR   2               ;DBRB W/R ERROR
 6100  003440  005723                  2$:     TST     (R3)+           ;INC FOR NEXT PATTERN
 6101  003442  020327  013464                  CMP     R3,#ENDDAT      ;CHECK FOR END
 6102  003446  001363                          BNE     1$              ;DO NEXT PATTERN
 6103
 6104
 6105                                  ;;*******************************************************************
   (3)                                 ;*TEST 12       TEST DBRC W/R IN OUTPUT MODE
   (3)                                 ;;*******************************************************************
   (2)  003450  000004                  TST12:  SCOPE
   (2)
 6106  003452  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6107  003456  012703  013164                  MOV     #BEGPAT,R3      ;GET DATA PATTERN TABLE
 6108  003462  012737  003512  001110          MOV     #1$,$LPERR      ;SET UP SCOPE ADDRESS
 6109  003470  013700  001352                  MOV     DRCSC,R0        ;GET CSRC
 6110  003474  013701  001354                  MOV     DRDBC,R1        ;GET DBRC ADDRESS
 6111  003500  010137  001122                  MOV     R1,$BDADR       ;STORE DBRC ADDRESS
 6112  003504  112760  000001  000001          MOVB    #BIT0,1(R0)     ;SET CSRC IN OUTPUT MODE
 6113  003512  011337  001124          1$:     MOV     (R3),$GDDAT     ;SAVE EXPECTED DATA
 6114  003516  005011                          CLR     (R1)            ;CLEAR DBRC
 6115  003520  051311                          BIS     (R3),(R1)       ;WRITE INTO DBRC
 6116  003522  011115                          MOV     (R1),(R5)       ;READ DBRC
 6117  003524  023715  001124                  CMP     $GDDAT,(R5)     ;CHECK W/R DBRC
 6118  003530  001401                          BEQ     2$              ;NEXT PAT. IF EQUAL
 6119  003532  104002                          ERROR   2               ;DBRC W/R ERROR
 6120  003534  005723                  2$:     TST     (R3)+           ;INC FOR NEXT PATTERN
 6121  003536  020327  013464                  CMP     R3,#ENDDAT      ;CHECK FOR END
```

```
 6122  003542  001363                          BNE     1$              ;DO NEXT PATTERN
 6123
 6124
 6125                                  ;;*************************************************************************
   (3)                                 ;*TEST 13        TEST DBRD W/R IN OUTPUT MODE
   (3)                                 ;;*************************************************************************
   (2)  003544  000004                 TST13:  SCOPE
   (2)
 6126  003546  004737  013056                    JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6127  003552  012703  013164                    MOV     #BEGPAT,R3      ;GET DATA PATTERN TABLE
 6128  003556  012737  003606  001110            MOV     #1$,$LPERR      ;SET UP SCOPE ADDRESS
 6129  003564  013700  001356                    MOV     DRCSD,R0        ;GET CSRD
 6130  003570  013701  001360                    MOV     DRDBD,R1        ;GET DBRD ADDRESS
 6131  003574  010137  001122                    MOV     R1,$BDADR       ;STORE DBRD ADDRESS
 6132  003600  112760  000001  000001            MOVB    #BIT0,1(R0)     ;SET CSRD IN OUTPUT MODE
 6133  003606  011337  001124          1$:       MOV     (R3),$GDDAT     ;SAVE EXPECTED DATA
 6134  003612  005011                            CLR     (R1)            ;CLEAR DBRD
 6135  003614  051311                            BIS     (R3),(R1)       ;WRITE INTO DBRD
 6136  003616  011115                            MOV     (R1),(R5)       ;READ DBRD
 6137  003620  023715  001124                    CMP     $GDDAT,(R5)     ;CHECK W/R DBRD
 6138  003624  001401                            BEQ     2$              ;NEXT PAT. IF EQUAL
 6139  003626  104002                            ERROR   2               ;DBRD W/R ERROR
 6140  003630  005723                  2$:       TST     (R3)+           ;INC FOR NEXT PATTERN
 6141  003632  020327  013464                    CMP     R3,#ENDDAT      ;CHECK FOR END
 6142  003636  001363                            BNE     1$              ;DO NEXT PATTERN
```

```
                                        ;;*******************************************************************
                                        ;*TEST 14       TEST CSR UNIQUENESS,CSRS (A-B),(C-D)
                                        ;;*******************************************************************
003640  000004                  TST14:  SCOPE
003642  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
                                                                ;CSRA = R0
                                                                ;CSRB = R1
                                                                ;CSRC = R2
                                                                ;CSRD = R3
003646  112760  000003  000001          MOVB    #3,1(R0)        ;CSRA OUTPUT MODE,I/E
003654  112763  000001  000001          MOVB    #BIT0,1(R3)     ;CSRD OUTPUT MODE
003662  010037  001122                  MOV     R0,$BDADR
003666  012737  101700  001124          MOV     #101700,$GDDAT  ;EXPECTED DATA
003674  011015                          MOV     (R0),(R5)
003676  042715  000007                  BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
003702  023715  001124                  CMP     $GDDAT,(R5)
003706  001401                          BEQ     1$
003710  104002                          ERROR   2               ;CSRA ERROR
003712  010137  001122          1$:     MOV     R1,$BDADR       ;CHECK CSRB
003716  005037  001124                  CLR     $GDDAT
003722  011115                          MOV     (R1),(R5)
003724  023715  001124                  CMP     $GDDAT,(R5)
003730  001401                          BEQ     2$
003732  104002                          ERROR   2               ;CSRB ERROR
003734  010337  001122          2$:     MOV     R3,$BDADR
003740  012737  100400  001124          MOV     #100400,$GDDAT
003746  011315                          MOV     (R3),(R5)
003750  023715  001124                  CMP     $GDDAT,(R5)
003754  001401                          BEQ     3$
003756  104002                          ERROR   2               ;CSRD ERROR
003760  010237  001122          3$:     MOV     R2,$BDADR       ;CHECK CSRC
003764  012737  000200  001124          MOV     #BIT7,$GDDAT    ;EXPECTED
003772  011215                          MOV     (R2),(R5)
003774  042715  000007                  BIC     #7,(R5)
004000  023715  001124                  CMP     $GDDAT,(R5)
004004  001401                          BEQ     TST15           ;;BR IF EQUAL
004006  104002                          ERROR   2               ;CSRC ERROR

                                        ;;*******************************************************************
                                        ;*TEST 15       TEST CSR UNIQUENESS,CSRS (A-D),(C-B)
                                        ;;*******************************************************************
004010  000004                  TST15:  SCOPE
004012  004737  013056                  JSR     PC,CLRCSR       ;CLR ALL CSRS
                                                                ;CSRA = R0
                                                                ;CSRB = R1
                                                                ;CSRC = R2
                                                                ;CSRD = R3
004016  112760  000003  000001          MOVB    #3,1(R0)        ;CSRA OUTPUT,I/E
004024  112761  000001  000001          MOVB    #BIT0,1(R1)     ;CSRB OUTPUT MODE
004032  010037  001122                  MOV     R0,$BDADR       ;CSRA ADDRESS
004036  012737  101700  001124          MOV     #101700,$GDDAT
004044  011015                          MOV     (R0),(R5)
```

```
 6192  004046  042715  000007                  BIC     #7,(R5)          ;CLEAR UNDEFINED BITS
 6193  004052  023715  001124                  CMP     $GDDAT,(R5)
 6194  004056  001400                          BEQ     1$
 6195  004060  010137  001122          1$:     MOV     R1,$BDADR        ;CHECK CSRB
 6196  004064  012737  100400  001124          MOV     #100400,$GDDAT
 6197  004072  011115                          MOV     (R1),(R5)
 6198  004074  023715  001124                  CMP     $GDDAT,(R5)
 6199  004100  001401                          BEQ     2$
 6200  004102  104002                          ERROR   2                ;CSRB ERROR
 6201  004104  010237  001122          2$:     MOV     R2,$BDADR        ;CHECK CSRC
 6202  004110  012737  000200  001124          MOV     #BIT7,$GDDAT
 6203  004116  011215                          MOV     (R2),(R5)
 6204  004120  042715  000007                  BIC     #7,(R5)
 6205  004124  023715  001124                  CMP     $GDDAT,(R5)
 6206  004130  001401                          BEQ     3$
 6207  004132  104002                          ERROR   2                ;CSRC ERROR
 6208  004134  010337  001122          3$:     MOV     R3,$BDADR
 6209  004140  005037  001124                  CLR     $GDDAT
 6210  004144  011315                          MOV     (R3),(R5)
 6211  004146  023715  001124                  CMP     $GDDAT,(R5)
 6212  004152  001401                          BEQ     TST16            ;;BR IF EQUAL
 6213  004154  104002                          ERROR   2                ;CSRD ERROR
 6214
 6215
 6216                                  ;;*******************************************************************
  (3)                                  ;*TEST 16       TEST PORT A TO PORT C INTERACTION
  (3)                                  ;;*******************************************************************
  (2)  004156  000004                  TST16:  SCOPE
  (2)
 6217  004160  004737  013056                  JSR     PC,CLRCSR        ;CLEAR ALL CSRS
 6218  004164  012703  013164                  MOV     #BEGPAT,R3       ;GET DATA PATTERN TABLE
 6219  004170  012737  004220  001110          MOV     #1$,$LPERR       ;SET UP SCOPE ADDRESS
 6220  004176  013700  001342                  MOV     DRCSA,R0         ;GET PORT A, CSRA ADDRESS
 6221  004202  013701  001352                  MOV     DRCSC,R1         ;GET PORT C, CSRC ADDRESS
 6222  004206  013702  001346                  MOV     DRCSB,R2         ;CSRB ADDRESS
 6223  004212  112762  000001  000001          MOVB    #BIT0,1(R2)      ;CSRB IN OUTPUT MODE
 6224  004220  010037  001122          1$:     MOV     R0,$BDADR        ;STORE CSRA ADDRESS
 6225  004224  005062  000002                  CLR     2(R2)            ;CLEAR DBRB
 6226  004230  105061  000001                  CLRB    1(R1)            ;PORT C,CSRC,INPUT MODE
 6227  004234  112760  000001  000001          MOVB    #BIT0,1(R0)      ;SET CSRA IN OUTPUT MODE
 6228  004242  011360  000002                  MOV     (R3),2(R0)       ;WRITE INTO DBRA
 6229  004246  016104  000002                  MOV     2(R1),R4         ;READ DBRC
 6230  004252  012737  100700  001124          MOV     #RDY!DIR!BIT7!BIT6,$GDDAT
 6231                                                                   ;CSRA DIR SHOULD STAY SET
 6232  004260  011015                          MOV     (R0),(R5)        ;READ CSRA
 6233  004262  042715  000007                  BIC     #7,(R5)          ;CLEAR UNDEFINED BITS
 6234  004266  023715  001124                  CMP     $GDDAT,(R5)
 6235  004272  001401                          BEQ     100$
 6236  004274  104002                          ERROR   2                ;CSRA ERROR
 6237  004276  012737  000200  001124  100$:   MOV     #BIT7,$GDDAT
 6238  004304  010137  001122                  MOV     R1,$BDADR        ;CSRC ADDRESS
 6239  004310  011115                          MOV     (R1),(R5)        ;READ CSRC
 6240  004312  042715  000007                  BIC     #7,(R5)          ;CLEAR UNDEFINED BITS
 6241  004316  023715  001124                  CMP     $GDDAT,(R5)
 6242  004322  001401                          BEQ     101$
 6243  004324  104002                          ERROR   2                ;CSRC ERROR
```

```
004326 013737 001354 001122 101$:  MOV     DRDBC,$BDADR      ;STORE DBRC ADDRESS
004334 011337 001124               MOV     (R3),$GDDAT       ;SAVE EXPECTED
004340 010415                      MOV     R4,(R5)           ;DBRC CONTENTS
004342 023715 001124               CMP     $GDDAT,(R5)       ;CHECK PORT C,DBRC
004346 001401                      BEQ     2$                ;BEQ TO NEXT SUBTEST
004350 104002                      ERROR   2                 ;DBRC REG ERROR
004352 005137 001124        2$:    COM     $GDDAT            ;SET UP TO WRITE COM DATA FROM
                                                             ;PORT C TO PORT A
004356 013737 001344 001122        MOV     DRDBA,$BDADR      ;STORE DBRA ADDRESS
004364 013761 001124 000002 3$:    MOV     $GDDAT,2(R1)      ;WRITE PORT C,INPUT MODE
004372 105060 000001               CLRB    1(R0)             ;MAKE PORT A INPUT MODE
004376 112761 000001 000001        MOVB    #BIT0,1(R1)       ;MAKE PORT C OUTPUT MODE
004404 016015 000002               MOV     2(R0),(R5)        ;READ PORT A,DBRA
004410 023715 001124               CMP     $GDDAT,(R5)       ;PORT A =PORT C?
004414 001401                      BEQ     4$                ;CHECK DBRB FOR NO DATA CHANGE
004416 104002                      ERROR   2                 ;PORT A,DBRA REG ERROR
004420 013737 001350 001122 4$:    MOV     DRDBB,$BDADR      ;STORE DBRB ADDRESS
004426 005037 001124               CLR     $GDDAT            ;CONTENTS SHOULD STAY ZERO
004432 016215 000002               MOV     2(R2),(R5)        ;READ DBRB FOR CLEAR
004436 023715 001124               CMP     $GDDAT,(R5)       ;CHECK FOR DBRB CLEAR
004442 001401                      BEQ     5$                ;YES,CONTINUE
004444 104002                      ERROR   2                 ;DBRB INTERACTION ERROR
004446 005723               5$:    TST     (R3)+             ;INC FOR NEXT PATTERN
004450 020327 013464               CMP     R3,#ENDDAT        ;CHECK FOR END
004454 001261                      BNE     1$                ;DO NEXT PATTERN


                            ;;*****************************************************************
(3)                         ;*TEST 17          TEST PORT B TO PORT D INTERACTION
(3)                         ;;*****************************************************************
(2)  004456 000004          TST17: SCOPE
(2)
004460 004737 013056               JSR     PC,CLRCSR         ;CLEAR ALL CSRS
004464 012703 013164               MOV     #BEGPAT,R3        ;GET DATA PATTERN TABLE
004470 012737 004520 001110        MOV     #1$,$LPERR        ;SET UP SCOPE ADDRESS
004476 013700 001346               MOV     DRCSB,R0          ;GET PORT B, CSRB ADDRESS
004502 013701 001356               MOV     DRCSD,R1          ;GET PORT D, CSRD ADDRESS
004506 013702 001342               MOV     DRCSA,R2          ;STORE CSRA ADDRESS
004512 112762 000001 000001        MOVB    #BIT0,1(R2)       ;CSRA IN OUTPUT MODE
004520 010037 001122        1$:    MOV     R0,$BDADR         ;STORE CSRB ADDRESS
004524 005062 000002               CLR     2(R2)             ;CLEAR DBRA
004530 105061 000001               CLRB    1(R1)             ;PORT D,CSRD,INPUT MODE
004534 112760 000001 000001        MOVB    #BIT0,1(R0)       ;SET CSRB IN OUTPUT MODE
004542 011360 000002               MOV     (R3),2(R0)        ;WRITE INTO DBRB
004546 016104 000002               MOV     2(R1),R4          ;DBRD CONTENTS
004552 012737 100400 001124        MOV     #RDY!DIR,$GDDAT   ;SAVE EXPECTED
004560 011015                      MOV     (R0),(R5)         ;READ CSRB
004562 023715 001124               CMP     $GDDAT,(R5)
004566 001401                      BEQ     100$
004570 104002                      ERROR   2                 ;CSRB ERROR
004572 005037 001124        100$:  CLR     $GDDAT            ;SAVE EXPECTED
004576 010137 001122               MOV     R1,$BDADR         ;SAVE CSRD ADDRESS
004602 011115                      MOV     (R1),(R5)
004604 023715 001124               CMP     $GDDAT,(R5)
004610 001401                      BEQ     101$
004612 104002                      ERROR   2                 ;CSRD ERROR
```

```
 6296   004614   013737   001360   001122   101$:   MOV     DRDBD,$BDADR    ;SAVE DBRD ADDRESS
 6297   004622   011337   001124                    MOV     (R3),$GDDAT     ;SAVE EXPECTED
 6298   004626   010415                             MOV     R4,(R5)         ;DBRD CONTENTS
 6299   004630   023715   001124                    CMP     $GDDAT,(R5)     ;CHECK PORT D,DBRD
 6300   004634   001401                             BEQ     2$              ;BEQ TO NEXT SUBTEST
 6301   004636   104002                             ERROR   2               ;DBRD REG ERROR
 6302   004640   005137   001124            2$:     COM     $GDDAT          ;SET UP TO WRITE COM DATA FROM
 6303                                                                       ;PORT D TO PORT B
 6304   004644   013737   001350   001122           MOV     DRDBB,$BDADR    ;STORE DBRB ADDRESS
 6305   004652   013761   001124   000002   3$:     MOV     $GDDAT,2(R1)    ;WRITE PORT D,INPUT MODE
 6306   004660   105060   000001                    CLRB    1(R0)           ;MAKE PORT B INPUT MODE
 6307   004664   112761   000001   000001           MOVB    #BIT0,1(R1)     ;MAKE PORT D OUTPUT MODE
 6308   004672   016015   000002                    MOV     2(R0),(R5)      ;READ PORT B,DBRB
 6309   004676   023715   001124                    CMP     $GDDAT,(R5)     ;PORT B =PORT D?
 6310   004702   001401                             BEQ     4$              ;CHECK DBRA FOR NO DATA CHANGE
 6311   004704   104002                             ERROR   2               ;PORT B,DBRB REG ERROR
 6312   004706   013737   001344   001122   4$:     MOV     DRDBA,$BDADR    ;STORE DBRA ADDRESS
 6313   004714   005037   001124                    CLR     $GDDAT          ;CONTENTS = 0
 6314   004720   016215   000002                    MOV     2(R2),(R5)      ;READ DBRA FOR CLEAR
 6315   004724   023715   001124                    CMP     $GDDAT,(R5)     ;DBRA CLEAR?
 6316   004730   001401                             BEQ     5$              ;YES,CONTINUE
 6317   004732   104002                             ERROR   2               ;DBRA INTERACTION ERROR
 6318   004734   005723                     5$:     TST     (R3)+           ;INC FOR NEXT PATTERN
 6319   004736   020327   013464                    CMP     R3,#ENDDAT      ;CHECK FOR END
 6320   004742   001266                             BNE     1$              ;DO NEXT PATTERN
 6321
 6322
 6323                                               ;;*************************************************************************
  (3)                                              ;*TEST 20       TEST PORT C TO PORT A INTERACTION
  (3)                                              ;;*************************************************************************
  (2)   004744   000004                    TST20:  SCOPE
  (2)
 6324   004746   004737   013056                    JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6325   004752   012703   013164                    MOV     #BEGPAT,R3      ;GET DATA PATTERN TABLE
 6326   004756   012737   005006   001110           MOV     #1$,$LPERR      ;SET UP SCOPE ADDRESS
 6327   004764   013700   001352                    MOV     DRCSC,R0        ;GET PORT C, CSRC ADDRESS
 6328   004770   013701   001342                    MOV     DRCSA,R1        ;GET PORT A, CSRA ADDRESS
 6329   004774   013702   001356                    MOV     DRCSD,R2        ;STORE CSRD ADDRESS
 6330   005000   112762   000001   000001           MOVB    #BIT0,1(R2)     ;CSRD IN OUTPUT MODE
 6331   005006   010037   001122            1$:     MOV     R0,$BDADR       ;STORE CSRC ADDRESS
 6332   005012   005062   000002                    CLR     2(R2)           ;CLEAR DBRD
 6333   005016   105061   000001                    CLRB    1(R1)           ;PORT A,CSRA,INPUT MODE
 6334   005022   112760   000001   000001           MOVB    #BIT0,1(R0)     ;SET CSRC IN OUTPUT MODE
 6335   005030   011360   000002                    MOV     (R3),2(R0)      ;WRITE INTO DBRC
 6336   005034   016104   000002                    MOV     2(R1),R4        ;READ DBRA
 6337   005040   012737   100600   001124           MOV     #RDY!DIR!BIT7,$GDDAT
 6338                                                                       ;CSRC DIR SHOULD BE SET
 6339   005046   011015                             MOV     (R0),(R5)       ;READ CSRC
 6340   005050   042715   000007                    BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
 6341   005054   023715   001124                    CMP     $GDDAT,(R5)
 6342   005060   001401                             BEQ     100$
 6343   005062   104002                             ERROR   2               ;CSRC ERROR
 6344   005064   012737   000300   001124   100$:   MOV     #BIT7!BIT6,$GDDAT
 6345   005072   010137   001122                    MOV     R1,$BDADR       ;CSRA ADDRESS
 6346   005076   011115                             MOV     (R1),(R5)       ;READ CSRA
 6347   005100   042715   000007                    BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
```

```
 6348  005104  023715  001124                    CMP     $GDDAT,(R5)
 6349  005110  001401                            BEQ     101$
 6350  005112  104002                            ERROR   2                       ;CSRA ERROR
 6351  005114  013737  001344  001122  101$:     MOV     DRDBA,$BDADR            ;STORE DBRA ADDRESS
 6352  005122  011337  001124                    MOV     (R3),$GDDAT             ;SAVE EXPECTED
 6353  005126  010415                            MOV     R4,(R5)                 ;DBRA CONTENTS
 6354  005130  023715  001124                    CMP     $GDDAT,(R5)             ;CHECK PORT A,DBRA
 6355  005134  001401                            BEQ     2$                      ;BEQ TO NEXT SUBTEST
 6356  005136  104002                            ERROR   2                       ;DBRA REG ERROR
 6357  005140  005137  001124            2$:     COM     $GDDAT                  ;SET UP TO WRITE COM DATA FROM
 6358                                                                            ;PORT A TO PORT C
 6359  005144  013737  001354  001122            MOV     DRDBC,$BDADR            ;STORE DBRC ADDRESS
 6360  005152  013761  001124  000002  3$:       MOV     $GDDAT,2(R1)            ;WRITE PORT A,INPUT MODE
 6361  005160  105060  000001                    CLRB    1(R0)                   ;MAKE PORT C INPUT MODE
 6362  005164  112761  000001  000001            MOVB    #BIT0,1(R1)             ;MAKE PORT A OUTPUT MODE
 6363  005172  016015  000002                    MOV     2(R0),(R5)              ;READ PORT C,DBRC
 6364  005176  023715  001124                    CMP     $GDDAT,(R5)             ;PORT C =PORT A?
 6365  005202  001401                            BEQ     4$                      ;CHECK DBRD FOR NO DATA CHANGE
 6366  005204  104002                            ERROR   2                       ;PORT C,DBRC REG ERROR
 6367  005206  013737  001360  001122  4$:       MOV     DRDBD,$BDADR            ;STORE DBRD ADDRESS
 6368  005214  005037  001124                    CLR     $GDDAT                  ;DBRD = 0 EXPECTED
 6369  005220  016215  000002                    MOV     2(R2),(R5)              ;READ DBRD FOR CLEAR
 6370  005224  023715  001124                    CMP     $GDDAT,(R5)             ;IS DBRD CLEAR?
 6371  005230  001401                            BEQ     5$                      ;YES,CONTINUE
 6372  005232  104002                            ERROR   2                       ;DBRD INTERACTION ERROR
 6373  005234  005723                    5$:     TST     (R3)+                   ;INC FOR NEXT PATTERN
 6374  005236  020327  013464                    CMP     R3,#ENDDAT              ;CHECK FOR END
 6375  005242  001261                            BNE     1$                      ;DO NEXT PATTERN
 6376
 6377                                    ;;*****************************************************************
  (3)                                    ;*TEST 21       TEST PORT D TO PORT B INTERACTION
  (3)                                    ;;*****************************************************************
  (2)  005244  000004                    TST21:  SCOPE
  (2)
 6378  005246  004737  013056                    JSR     PC,CLRCSR               ;CLEAR ALL CSRS
 6379  005252  012703  013164                    MOV     #BEGPAT,R3              ;GET DATA PATTERN TABLE
 6380  005256  012737  005306  001110            MOV     #1$,$LPERR              ;SET UP SCOPE ADDRESS
 6381  005264  013700  001356                    MOV     DRCSD,R0                ;GET PORT D, CSRD ADDRESS
 6382  005270  013701  001346                    MOV     DRCSB,R1                ;GET PORT B, CSRB ADDRESS
 6383  005274  013702  001352                    MOV     DRCSC,R2                ;STORE CSRC ADDRESS
 6384  005300  112762  000001  000001            MOVB    #BIT0,1(R2)             ;CSRC IN OUTPUT MODE
 6385  005306  010037  001122            1$:     MOV     R0,$BDADR               ;STORE CSRD ADDRESS
 6386  005312  005062  000002                    CLR     2(R2)                   ;CLEAR DBRC
 6387  005316  105061  000001                    CLRB    1(R1)                   ;PORT B,CSRB,INPUT MODE
 6388  005322  112760  000001  000001            MOVB    #BIT0,1(R0)             ;SET CSRD IN OUTPUT MODE
 6389  005330  011360  000002                    MOV     (R3),2(R0)              ;WRITE INTO DBRD
 6390  005334  016104  000002                    MOV     2(R1),R4                ;READ DBRB
 6391  005340  012737  100400  001124            MOV     #RDY!DIR,$GDDAT         ;SAVE EXPECTED
 6392  005346  011015                            MOV     (R0),(R5)               ;READ CSRD
 6393  005350  023715  001124                    CMP     $GDDAT,(R5)
 6394  005354  001401                            BEQ     100$
 6395  005356  104002                            ERROR   2                       ;CSRD ERROR
 6396  005360  005037  001124            100$:   CLR     $GDDAT                  ;SAVE EXPECTED
 6397  005364  010137  001122                    MOV     R1,$BDADR               ;SAVE CSRB ADDRESS
 6398  005370  011115                            MOV     (R1),(R5)
 6399  005372  023715  001124                    CMP     $GDDAT,(R5)
```

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 6400  005376  001401                          BEQ     101$
 6401  005400  104002                          ERROR   2               ;CSRB ERROR
 6402  005402  013737  001350  001122  101$:   MOV     DRDBB,$BDADR    ;SAVE DBRB ADDRESS
 6403  005410  011337  001124                  MOV     (R3),$GDDAT     ;SAVE EXPECTED
 6404  005414  010415                          MOV     R4,(R5)         ;DBRB CONTENTS
 6405  005416  023715  001124                  CMP     $GDDAT,(R5)     ;CHECK PORT B,DBRB
 6406  005422  001401                          BEQ     2$              ;BEQ TO NEXT SUBTEST
 6407  005424  104002                          ERROR   2               ;DBRB REG ERROR
 6408  005426  005137  001124          2$:     COM     $GDDAT          ;SET UP TO WRITE COM DATA FROM
 6409                                                                  ;PORT B TO PORT D
 6410  005432  013737  001360  001122          MOV     DRDBD,$BDADR    ;STORE  DBRD ADDRESS
 6411  005440  013761  001124  000002  3$:     MOV     $GDDAT,2(R1)    ;WRITE PORT B,INPUT MODE
 6412  005446  105060  000001                  CLRB    1(R0)           ;MAKE PORT D INPUT MODE
 6413  005452  112761  000001  000001          MOVB    #BIT0,1(R1)     ;MAKE PORT B OUTPUT MODE
 6414  005460  016015  000002                  MOV     2(R0),(R5)      ;READ PORT D,DBRD
 6415  005464  023715  001124                  CMP     $GDDAT,(R5)     ;PORT B =PORT D?
 6416  005470  001401                          BEQ     4$              ;CHECK DBRC FOR NO DATA CHANGE
 6417  005472  104002                          ERROR   2               ;PORT D,DBRD REG ERROR
 6418  005474  013737  001354  001122  4$:     MOV     DRDBC,$BDADR    ;STORE DBRC ADDRESS
 6419  005502  005037  001124                  CLR     $GDDAT          ;EXPECT DBRC = 0
 6420  005506  016215  000002                  MOV     2(R2),(R5)      ;READ DBRC
 6421  005512  023715  001124                  CMP     $GDDAT,(R5)     ;IS DBRC = 0
 6422  005516  001401                          BEQ     5$              ;YES,CONTINUE
 6423  005520  104002                          ERROR   2               ;DBRC INTERACTION ERROR
 6424  005522  005723                  5$:     TST     (R3)+           ;INC FOR NEXT PATTERN
 6425  005524  020327  013464                  CMP     R3,#ENDDAT      ;CHECK FOR END
 6426  005530  001266                          BNE     1$              ;DO NEXT PATTERN
 6427
 6428                                  ;;*****************************************************************
  (3)                                  ;*TEST 22       TEST GROUP 1,2 IMR,IRR,ACR WITH CHIP RESET
  (3)                                  ;;*****************************************************************
  (2)  005532  000004                  TST22:  SCOPE
  (2)
 6429  005534  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6430  005540  012702  000002                  MOV     #2,R2           ;TWO GROUPS TO TEST
 6431  005544  013700  001342                  MOV     DRCSA,R0        ;STORE CSRA
 6432  005550  013701  001346                  MOV     DRCSB,R1        ;STORE CSRB
 6433  005554  004737  013126                  JSR     PC,CLRIRR       ;CLEAR IRR REGISTERS
 6434  005560  010137  001122          111$:   MOV     R1,$BDADR       ;STORE ADDRESS
 6435  005564  012737  000377  001124          MOV     #377,$GDDAT     ;STORE EXPECTED DATA
 6436  005572  112710  000244                  MOVB    #MIMR,(R0)      ;LOAD MODE BITS FOR IMR
 6437  005576  111115                          MOVB    (R1),(R5)       ;READ IMR REGISTER
 6438  005600  023715  001124                  CMP     $GDDAT,(R5)
 6439  005604  001401                          BEQ     1$
 6440  005606  104005                          ERROR   5               ;IMR REG ERROR
 6441  005610  005037  001124          1$:     CLR     $GDDAT          ;STORE EXPECTED
 6442  005614  112710  000250                  MOVB    #MIRR,(R0)      ;LOAD MODE BITS FOR IRR
 6443  005620  111115                          MOVB    (R1),(R5)       ;READ IRR REGISTER
 6444  005622  023715  001124                  CMP     $GDDAT,(R5)
 6445  005626  001401                          BEQ     2$
 6446  005630  104003                          ERROR   3               ;IRR REG ERROR
 6447  005632  112710  000254          2$:     MOVB    #MACR,(R0)      ;LOAD MODE BITS FOR ACR
 6448  005636  111115                          MOVB    (R1),(R5)       ;READ ACR REGISTER
 6449  005640  023715  001124                  CMP     $GDDAT,(R5)
 6450  005644  001401                          BEQ     3$
 6451  005646  104004                          ERROR   4               ;ACR REG ERROR
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                                3$:     DEC     R2                      ;FINISHED BOTH GROUPS?
                                        BEQ     TST23                   ;;BR IF EQUAL
                                        MOV     DRCSC,R0
                                        MOV     DRCSD,R1
                                        BR      111$

                                ;;**********************************************************************
                                ;*TEST 23        TEST GROUPS 1 AND 2 ACR UNIQUENESS
                                ;;**********************************************************************
                                TST23:  SCOPE

                                        JSR     PC,CLRCSR               ;CLEAR ALL CSRS
                                        MOV     DRCSA,R0                ;CSRA ADDRESS
                                        MOV     DRCSB,R1                ;CSRB ADDRESS
                                        MOV     #2,R3                   ;COUNTER FOR TESTING TWO GROUPS
                                        JSR     PC,CLRIRR               ;CLEAR IRR REGS WITH CHIP RESET
                                111$:   MOV     R1,$BCADR               ;STORE ADDRESS
                        001124          MOV     #252,$GDDAT             ;STORE EXPECTED
                                        MOVB    #MACR,(R0)              ;LOAD MODE BITS FOR ACR
                                        MOVB    #PACR,(R0)              ;PRESELECT ACR FOR WRITING
                                        MOVB    $GDDAT,(R1)             ;WRITE INTO DATA PORT
                                        MOVB    (R1),(R5)               ;STORE DATA FOR COMPARE
                                        CMP     $GDDAT,(R5)             ;CHECK ACR RESULTS
                                        BEQ     1$                      ;
                                        ERROR   4                       ;ACR ERROR
                                1$:     MOVB    #MIMR,(R0)              ;CHANGE TO IMR REGISTER
                        001124          MOV     #377,$GDDAT             ;STORE EXPECTED
                                        MOVB    (R1),(R5)               ;READ IMR
                                        CMP     $GDDAT,(R5)             ;SHOULD STILL BE ALL 1'S
                                        BEQ     2$
                                        ERROR   5                       ;IMR REG ERROR
                                2$:     MOVB    #MISR,(R0)              ;LOAD MODE BITS FOR ISR
                                        CLR     $GDDAT                  ;STORE EXPECTED
                                        MOVB    (R1),(R5)               ;READ ISR
                                        CMP     $GDDAT,(R5)             ;ISR SHOULD BE CLEARED
                                        BEQ     3$
                                        ERROR   6                       ;ISR REG ERROR
                                3$:     MOVB    #MIRR,(R0)              ;LOAD MODE BITS FOR IRR
                                        MOVB    (R1),(R5)               ;READ IRR
                                        CMP     $GDDAT,(R5)             ;IRR SHOULD BE CLEARED
                                        BEQ     4$
                                        ERROR   3                       ;IRR REG ERROR
                                4$:     CLRB    (R0)                    ;CHIP RESET GROUP 1
                                        MOVB    #MACR,(R0)              ;LOAD MODE BITS FOR ACR
                                        MOVB    (R1),(R5)               ;READ ACR
                                        CMP     $GDDAT,(R5)             ;ACR SHOULD BE CLEARED
                                        BEQ     5$
                                        ERROR   4                       ;ACR REG ERROR
                                5$:     DEC     R3                      ;TEST GROUPS 1 AND 2
                                        BEQ     TST24                   ;;BR IF BOTH GROUPS TESTED
                                        MOV     DRCSC,R0                ;GROUP 2 CONTROL PORT
                                        MOV     DRCSD,R1                ;GROUP 2 DATA PORT
                                        BR      111$                    ;TEST GROUP 2 ACR UNIQUENESS

                                ;;**********************************************************************
                                ;*TEST 24        TEST GROUPS 1 AND 2 IMR UNIQUENESS
```

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  (3)                                   ;;*****************************************************************
  (2)  006076  000004                   TST24:  SCOPE
  (2)
 6503                                   ;;GPA   JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6504  006100  004737  013126                   JSR     PC,CLRIRR       ;; *** VDRCA1 CHANGES THIS ***  ;;GPA
 6505  006104  013700  001342                   MOV     DRCSA,R0        ;CSRA ADDRESS
 6506  006110  013701  001346                   MOV     DRCSB,R1        ;CSRB ADDRESS
 6507  006114  012703  000002                   MOV     #2,R3           ;COUNTER FOR TWO GROUP TESTING
 6508  006120  010137  001122           111$:   MOV     R1,$BDADR       ;STORE ADDRESS
 6509  006124  012737  000252  001124         MOV     #252,$GDDAT     ;STORE EXPECTED
 6510  006132  112710  000244                 MOVB    #MIMR,(R0)      ;LOAD MODE BITS FOR IMR
 6511  006136  112710  000260                 MOVB    #PIMR,(R0)      ;PRESELECT IMR FOR WRITING
 6512  006142  113711  001124                 MOVB    $GDDAT,(R1)     ;WRITE INTO DATA PORT
 6513  006146  111115                         MOVB    (R1),(R5)       ;STORE DATA FOR COMPARE
 6514  006150  023715  001124                 CMP     $GDDAT,(R5)     ;CHECK IMR RESULTS
 6515  006154  001401                         BEQ     1$              ;
 6516  006156  104005                         ERROR   5               ;IMR ERROR
 6517  006160  112710  000254           1$:   MOVB    #MACR,(R0)      ;CHANGE TO ACR REGISTER
 6518  006164  005037  001124                 CLR     $GDDAT          ;STORE EXPECTED
 6519  006170  111115                         MOVB    (R1),(R5)       ;READ ACR
 6520  006172  023715  001124                 CMP     $GDDAT,(R5)     ;SHOULD STILL BE CLEARED
 6521  006176  001401                         BEQ     2$
 6522  006200  104004                         ERROR   4               ;ACR REG ERROR
 6523  006202  112710  000240           2$:   MOVB    #MISR,(R0)      ;LOAD MODE BITS FOR ISR
 6524  006206  111115                         MOVB    (R1),(R5)       ;READ ISR
 6525  006210  023715  001124                 CMP     $GDDAT,(R5)     ;ISR SHOULD BE CLEARED
 6526  006214  001401                         BEQ     3$
 6527  006216  104006                         ERROR   6               ;ISR REG ERROR
 6528  006220  112710  000250           3$:   MOVB    #MIRR,(R0)      ;LOAD MODE BITS FOR IRR
 6529  006224  111115                         MOVB    (R1),(R5)       ;READ IRR
 6530  006226  023715  001124                 CMP     $GDDAT,(R5)     ;IRR SHOULD BE CLEARED
 6531  006232  001401                         BEQ     4$
 6532  006234  104003                         ERROR   3               ;IRR REG ERROR
 6533  006236  105010                   4$:   CLRB    (R0)            ;CHIP RESET GROUP 1
 6534  006240  112710  000244                 MOVB    #MIMR,(R0)      ;LOAD MODE BITS FOR IMR
 6535  006244  012737  000377  001124         MOV     #377,$GDDAT     ;STORE EXPECTED
 6536  006252  111115                         MOVB    (R1),(R5)       ;READ IMR
 6537  006254  023715  001124                 CMP     $GDDAT,(R5)     ;IMR SHOULD BE ALL ONES
 6538  006260  001401                         BEQ     5$              ;DO NEXT GROUP
 6539  006262  104005                         ERROR   5               ;IMR REG ERROR
 6540  006264  005303                   5$:   DEC     R3              ;DO GROUPS 1 AND GROUP 2
 6541  006266  001405                         BEQ     TST25           ;;BR IF BOTH GROUPS TESTED
 6542  006270  013700  001352                 MOV     DRCSC,R0        ;SET UP TO TEST GROUP 2
 6543  006274  013701  001356                 MOV     DRCSD,R1        ;GROUP 2 DATA PORT
 6544  006300  000707                         BR      111$            ;DO GROUP 2 IMR UNIQUENESS
 6545
 6546                                   ;;*****************************************************************
  (3)                                   ;*TEST 25       TEST GROUPS 1 AND 2 IRR UNIQUENESS
  (3)                                   ;;*****************************************************************
  (2)  006302  000004                   TST25:  SCOPE
  (2)
 6547  006304  004737  013056                   JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6548  006310  013700  001342                   MOV     DRCSA,R0        ;CSRA ADDRESS
 6549  006314  013701  001346                   MOV     DRCSB,R1        ;CSRB ADDRESS
 6550  006320  012703  000002                   MOV     #2,R3           ;COUNTER FOR TESTING TWO GROUPS
 6551  006324  004737  013126                   JSR     PC,CLRIRR       ;CLEAR IRR REGS WITH CHIP RESET
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 6552  006330  010137  001122          111$:   MOV     R1,$BDADR       ;STORE ADDRESS
 6553  006334  012737  000200  001124          MOV     #200,$GDDAT     ;STORE EXPECTED
 6554  006342  112710  000250                  MOVB    #MIRR,(R0)      ;LOAD MODE BITS FOR IRR
 6555  006346  112710  000137                  MOVB    #137,(R0)       ;SET SINGLE IRR BIT7
 6556  006352  111115                          MOVB    (R1),(R5)       ;STORE DATA FOR COMPARE
 6557  006354  023715  001124                  CMP     $GDDAT,(R5)     ;CHECK IRR RESULTS
 6558  006360  001401                          BEQ     1$              ;
 6559  006362  104003                          ERROR   3               ;IRR ERROR
 6560  006364  112710  000244          1$:     MOVB    #MIMR,(R0)      ;CHANGE TO IMR REGISTER
 6561  006370  012737  000377  001124          MOV     #377,$GDDAT     ;STORE EXPECTED
 6562  006376  111115                          MOVB    (R1),(R5)       ;READ IMR
 6563  006400  023715  001124                  CMP     $GDDAT,(R5)     ;SHOULD STILL BE ALL 1'S
 6564  006404  001401                          BEQ     2$
 6565  006406  104005                          ERROR   5               ;IMR REG ERROR
 6566  006410  112710  000240          2$:     MOVB    #MISR,(R0)      ;LOAD MODE BITS FOR ISR
 6567  006414  005037  001124                  CLR     $GDDAT          ;STORE EXPECTED
 6568  006420  111115                          MOVB    (R1),(R5)       ;READ ISR
 6569  006422  023715  001124                  CMP     $GDDAT,(R5)     ;ISR SHOULD BE CLEARED
 6570  006426  001401                          BEQ     3$
 6571  006430  104006                          ERROR   6               ;ISR REG ERROR
 6572  006432  112710  000254          3$:     MOVB    #MACR,(R0)      ;LOAD MODE BITS FOR ACR
 6573  006436  111115                          MOVB    (R1),(R5)       ;READ ACR
 6574  006440  023715  001124                  CMP     $GDDAT,(R5)     ;ACR SHOULD BE CLEARED
 6575  006444  001401                          BEQ     4$
 6576  006446  104004                          ERROR   4               ;ACR REG ERROR
 6577  006450  105010          4$:     CLRB    (R0)                    ;CHIP RESET GROUP 1
 6578  006452  112710  000250                  MOVB    #MIRR,(R0)      ;LOAD MODE BITS FOR IRR
 6579  006456  111115                          MOVB    (R1),(R5)       ;READ IRR
 6580  006460  023715  001124                  CMP     $GDDAT,(R5)     ;IRR SHOULD BE CLEARED
 6581  006464  001401                          BEQ     5$
 6582  006466  104003                          ERROR   3               ;IRR REG ERROR
 6583  006470  005303          5$:     DEC     R3                      ;TEST GROUPS 1 AND 2
 6584  006472  001405                          BEQ     TST26           ;;BR IF BOTH GROUPS TESTED
 6585  006474  013700  001352                  MOV     DRCSC,R0        ;GROUP 2 CONTROL PORT
 6586  006500  013701  001356                  MOV     DRCSD,R1        ;GROUP 2 DATA PORT
 6587  006504  000711                          BR      111$            ;TEST GROUP 2 ACR UNIQUENESS
 6588
 6589
 6590                                  ;;*******************************************************************
   (3)                                 ;*TEST 26       TEST GROUPS 1,2 ACR WITH PATTERNS
   (3)                                 ;;*******************************************************************
   (2)  006506  000004                  TST26:  SCOPE
   (2)
 6591  006510  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6592  006514  012702  000002                  MOV     #2,R2           ;TEST TWO GROUPS
 6593  006520  012737  006546  001110          MOV     #1$,$LPERR      ;SET UP LOOP RETURN
 6594  006526  013700  001342                  MOV     DRCSA,R0        ;STORE CSRA ADDRESS
 6595  006532  013701  001346                  MOV     DRCSB,R1        ;STORE CSRB ADDRESS
 6596  006536  012703  013164          111$:   MOV     #BEGPAT,R3      ;SET UP PATTERN TABLE
 6597  006542  010137  001122                  MOV     R1,$BDADR       ;STORE ADDRESS
 6598  006546  112710  000254          1$:     MOVB    #MACR,(R0)      ;LOAD MODE BITS FOR ACR
 6599  006552  112710  000300                  MOVB    #PACR,(R0)      ;PRESELECT ACR FOR WRITING
 6600  006556  111337  001124                  MOVB    (R3),$GDDAT     ;STORE EXPECTED
 6601  006562  111311                          MOVB    (R3),(R1)       ;WRITE INTO ACR
 6602  006564  111115                          MOVB    (R1),(R5)       ;READ OUT OF ACR
 6603  006566  023715  001124                  CMP     $GDDAT,(R5)
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 6604  006572  001401                          BEQ     2$
 6605  006574  104004                          ERROR   4               ;ACR REGISTER ERROR
 6606  006576  005723                  2$:     TST     (R3)+           ;INC FOR NEXT PATTERN
 6607  006600  020327  013464                  CMP     R3,#ENDDAT      ;CHECK FOR TABLE END
 6608  006604  001360                          BNE     1$              ;W/R NEXT PATTERN
 6609  006606  005302                          DEC     R2              ;FINISHED BOTH GROUPS?
 6610  006610  001405                          BEQ     TST27           ;;BR IF EQUAL
 6611  006612  013700  001352                  MOV     DRCSC,R0
 6612  006616  013701  001356                  MOV     DRCSD,R1
 6613  006622  000745                          BR      111$            ;DO NEXT GROUP
 6614
 6615                                  ;;*******************************************************************
   (3)                                 ;*TEST 27       TEST GROUPS 1,2 IMR WITH PATTERNS
   (3)                                 ;;*******************************************************************
   (2)  006624  000004                  TST27:  SCOPE
   (2)
 6616  006626  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6617  006632  012702  000002                  MOV     #2,R2           ;TEST TWO GROUPS
 6618  006636  012737  006664  001110          MOV     #1$,$LPERR      ;SET UP LOOP RETURN
 6619  006644  013700  001342                  MOV     DRCSA,R0        ;STORE CSRA ADDRESS
 6620  006650  013701  001346                  MOV     DRCSB,R1        ;STORE CSRB ADDRESS
 6621  006654  012703  013164          111$:   MOV     #BEGPAT,R3      ;SET UP PATTERN TABLE
 6622  006660  010137  001122                  MOV     R1,$BDADR       ;STORE ADDRESS
 6623  006664  112710  000244          1$:     MOVB    #MIMR,(R0)      ;LOAD MODE BITS FOR IMR
 6624  006670  112710  000260                  MOVB    #PIMR,(R0)      ;PRESELECT IMR FOR WRITING
 6625  006674  111337  001124                  MOVB    (R3),$GDDAT     ;STORE EXPECTED
 6626  006700  111311                          MOVB    (R3),(R1)       ;WRITE INTO IMR
 6627  006702  111115                          MOVB    (R1),(R5)       ;READ OUT OF IMR
 6628  006704  023715  001124                  CMP     $GDDAT,(R5)
 6629  006710  001401                          BEQ     2$
 6630  006712  104005                          ERROR   5               ;IMR REGISTER ERROR
 6631  006714  005723                  2$:     TST     (R3)+           ;INC FOR NEXT PATTERN
 6632  006716  020327  013464                  CMP     R3,#ENDDAT      ;CHECK FOR TABLE END
 6633  006722  001360                          BNE     1$              ;W/R NEXT PATTERN
 6634  006724  005302                          DEC     R2              ;FINISHED BOTH GROUPS?
 6635  006726  001405                          BEQ     TST30           ;;BR IF EQUAL
 6636  006730  013700  001352                  MOV     DRCSC,R0
 6637  006734  013701  001356                  MOV     DRCSD,R1
 6638  006740  000745                          BR      111$            ;DO NEXT GROUP
 6639
 6640                                  ;;*******************************************************************
   (3)                                 ;*TEST 30       TEST GROUP 1,2 CLEAR IMR INSTR.
   (3)                                 ;;*******************************************************************
   (2)  006742  000004                  TST30:  SCOPE
   (2)
 6641  006744  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6642  006750  012704  000002                  MOV     #2,R4           ;COUNTER FOR TWO GROUPS
 6643  006754  013700  001342                  MOV     DRCSA,R0        ;CSRA ADDRESS
 6644  006760  013701  001346                  MOV     DRCSB,R1        ;CSRB ADDRESS
 6645  006764  010137  001122          111$:   MOV     R1,$BDADR       ;STORE ADDRESS
 6646  006770  005037  001124                  CLR     $GDDAT          ;EXPECTED DATA
 6647  006774  112710  000244                  MOVB    #MIMR,(R0)      ;LOAD MODE BITS TO READ IMR
 6648  007000  112710  000040                  MOVB    #CIMR,(R0)      ;CLEAR IMR COMMAND
 6649  007004  111115                          MOVB    (R1),(R5)       ;READ DATA PORT
 6650  007006  023715  001124                  CMP     $GDDAT,(R5)
 6651  007012  001401                          BEQ     1$
```

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 6652  007014  104005                          ERROR   5               ;ERROR ,IMR SHOULD BE CLEARED
 6653  007016  005304                  1$:     DEC     R4              ;FINISHED BOTH GROUPS?
 6654  007020  001405                          BEQ     TST31           ;;BR IF BOTH GROUPS TESTED
 6655  007022  013700  001352                  MOV     DRCSC,R0        ;SETUP FOR GROUP 2
 6656  007026  013701  001356                  MOV     DRCSD,R1
 6657  007032  000754                          BR      111$            ;DO IMR TEST WITH GROUP 2
 6658
 6659                                  ;;*************************************************************************
  (3)                                  ;*TEST 31        TEST GROUP 1,2 SET IMR INSTR.
  (3)                                  ;;*************************************************************************
  (2)  007034  000004                  TST31:  SCOPE
  (2)
 6660  007036  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6661  007042  012704  000002                  MOV     #2,R4           ;COUNTER FOR TWO GROUPS
 6662  007046  013700  001342                  MOV     DRCSA,R0        ;CSRA ADDRESS
 6663  007052  013701  001346                  MOV     DRCSB,R1        ;CSRB ADDRESS
 6664  007056  010137  001122          111$:   MOV     R1,$BDADR       ;STORE ADDRESS
 6665  007062  012737  000377  001124          MOV     #377,$GDDAT     ;EXPECTED DATA
 6666  007070  112710  000244                  MOVB    #MIMR,(R0)      ;LOAD MODE BITS TO READ IMR
 6667  007074  112710  000040                  MOVB    #CIMR,(R0)      ;CLEAR IMR
 6668  007100  112710  000060                  MOVB    #SIMR,(R0)      ;SET IMR COMMAND
 6669  007104  111115                          MOVB    (R1),(R5)       ;READ DATA PORT
 6670  007106  023715  001124                  CMP     $GDDAT,(R5)
 6671  007112  001401                          BEQ     1$
 6672  007114  104005                          ERROR   5               ;ERROR ,IMR SHOULD BE SET
 6673  007116  005304                  1$:     DEC     R4              ;FINISHED BOTH GROUPS?
 6674  007120  001405                          BEQ     TST32           ;;BR IF BOTH GROUPS TESTED
 6675  007122  013700  001352                  MOV     DRCSC,R0        ;SETUP FOR GROUP 2
 6676  007126  013701  001356                  MOV     DRCSD,R1
 6677  007132  000751                          BR      111$            ;DO IMR TEST WITH GROUP 2
 6678
 6679                                  ;;*************************************************************************
  (3)                                  ;*TEST 32        TEST GROUP 1,2  CLEAR SINGLE IMR BIT INSTR.
  (3)                                  ;;*************************************************************************
  (2)  007134  000004                  TST32:  SCOPE
  (2)
 6680  007136  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6681  007142  012704  000002                  MOV     #2,R4           ;GROUP COUNTER
 6682  007146  012737  007204  001110          MOV     #1$,$LPERR      ;SCOPE RETURN ADDRESS
 6683  007154  013700  001342                  MOV     DRCSA,R0        ;CSRA ADDRESS
 6684  007160  013701  001346                  MOV     DRCSB,R1        ;CSRB ADDRESS
 6685  007164  010137  001122          111$:   MOV     R1,$BDADR       ;STORE ADDRESS
 6686  007170  012703  013330                  MOV     #BGCHP4,R3      ;GOOD DATA PATTERN TABLE
 6687  007174  112710  000244                  MOVB    #MIMR,(R0)      ;LOAD MODE BITS FOR IMR
 6688  007200  012702  000050                  MOV     #CSIMR,R2       ;CLEAR SINGLE IMR BIT VALUE
 6689  007204  111337  001124          1$:     MOVB    (R3),$GDDAT     ;STORE EXPECTED
 6690  007210  112710  000060                  MOVB    #SIMR,(R0)      ;SET ALL IMR BITS
 6691  007214  110210                          MOVB    R2,(R0)         ;CLEAR SINGLE IMR BIT
 6692  007216  111115                          MOVB    (R1),(R5)       ;READ DATA PORT
 6693  007220  023715  001124                  CMP     $GDDAT,(R5)
 6694  007224  001401                          BEQ     2$
 6695  007226  104005                          ERROR   5               ;IMR REG ERROR
 6696  007230  005723                  2$:     TST     (R3)+           ;INC EXPECTED DATA TABLE
 6697  007232  020327  013350                  CMP     R3,#EDCHP4      ;CHECK FOR END
 6698  007236  001402                          BEQ     3$
 6699  007240  005202                          INC     R2              ;SET UP TO CLEAR NEXT IMR BIT
```

```
 6700  007242  000760                          BR      1$              ;CLEAR NEXT IMR BIT
 6701  007244  005304                  3$:     DEC     R4              ;DO GROUPS 1 AND 2
 6702  007246  001405                          BEQ     TST33           ;;BR IF BOTH GROUPS TESTED
 6703  007250  013700  001352                  MOV     DRCSC,R0        ;CSRC ADDRESS
 6704  007254  013701  001356                  MOV     DRCSD,R1        ;CSRD ADDRESS
 6705  007260  000741                          BR      111$            ;DO GROUP 2
 6706
 6707
 6708                                  ;;*******************************************************************
   (3)                                 ;*TEST 33       TEST GROUP 1,2  SET SINGLE IMR BIT INSTR.
   (3)                                 ;;*******************************************************************
   (2)  007262  000004                  TST33:  SCOPE
   (2)
 6709  007264  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6710  007270  012704  000002                  MOV     #2,R4           ;GROUP COUNTER
 6711  007274  012737  007332  001110          MOV     #1$,$LPERR      ;SCOPE RETURN ADDRESS
 6712  007302  013700  001342                  MOV     DRCSA,R0        ;CSRA ADDRESS
 6713  007306  013701  001346                  MOV     DRCSB,R1        ;CSRB ADDRESS
 6714  007312  010137  001122          111$:   MOV     R1,$BDADR       ;STORE ADDRESS
 6715  007316  012703  013266                  MOV     #BGCHP3,R3      ;GOOD DATA PATTERN TABLE
 6716  007322  112710  000244                  MOVB    #MIMR,(R0)      ;LOAD MODE BITS FOR IMR
 6717  007326  012702  000070                  MOV     #SSIMR,R2       ;SET SINGLE IMR BIT VALUE
 6718  007332  111337  001124          1$:     MOVB    (R3),$GDDAT     ;STORE EXPECTED
 6719  007336  112710  000040                  MOVB    #CIMR,(R0)      ;CLEAR ALL IMR BITS
 6720  007342  110210                          MOVB    R2,(R0)         ;SET SINGLE IMR BIT
 6721  007344  111115                          MOVB    (R1),(R5)       ;READ DATA PORT
 6722  007346  023715  001124                  CMP     $GDDAT,(R5)
 6723  007352  001401                          BEQ     2$
 6724  007354  104005                          ERROR   5               ;IMR REG ERROR
 6725  007356  005723                  2$:     TST     (R3)+           ;INC EXPECTED DATA TABLE
 6726  007360  020327  013306                  CMP     R3,#EDCHP3      ;CHECK FOR END
 6727  007364  001402                          BEQ     3$
 6728  007366  005202                          INC     R2              ;SET UP TO SET NEXT IMR BIT
 6729  007370  000760                          BR      1$              ;SET NEXT IMR BIT
 6730  007372  005304                  3$:     DEC     R4              ;DO GROUPS 1 AND 2
 6731  007374  001405                          BEQ     TST34           ;;BR IF BOTH GROUPS TESTED
 6732  007376  013700  001352                  MOV     DRCSC,R0        ;CSRC ADDRESS
 6733  007402  013701  001356                  MOV     DRCSD,R1        ;CSRD ADDRESS
 6734  007406  000741                          BR      111$            ;DO GROUP 2
 6735
 6736                                  ;;*******************************************************************
   (3)                                 ;*TEST 34       TEST GROUP 1,2 SET IRR INSTR.
   (3)                                 ;;*******************************************************************
   (2)  007410  000004                  TST34:  SCOPE
   (2)
 6737  007412  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6738  007416  012704  000002                  MOV     #2,R4           ;COUNTER FOR TWO GROUPS
 6739  007422  013700  001342                  MOV     DRCSA,R0        ;CSRA ADDRESS
 6740  007426  013701  001346                  MOV     DRCSB,R1        ;CSRB ADDRESS
 6741  007432  004737  013126                  JSR     PC,CLRIRR       ;CLEAR IRR REGS WITH CHIP RESET
 6742  007436  010137  001122          111$:   MOV     R1,$BDADR       ;STORE ADDRESS
 6743  007442  012737  000377  001124          MOV     #377,$GDDAT     ;EXPECTED DATA
 6744  007450  112710  000250                  MOVB    #MIRR,(R0)      ;LOAD MODE BITS TO READ IRR
 6745  007454  112710  000120                  MOVB    #SIRR,(R0)      ;SET IRR COMMAND
 6746  007460  111115                          MOVB    (R1),(R5)       ;READ DATA PORT
 6747  007462  023715  001124                  CMP     $GDDAT,(R5)
```

```
 6748  007466  001401                          BEQ     1$
 6749  007470  104003                          ERROR   3               ;ERROR ,IRR SHOULD BE SET
 6750  007472  005304                  1$:     DEC     R4              ;FINISHED BOTH GROUPS?
 6751  007474  001405                          BEQ     TST35           ;;BR IF BOTH GROUPS TESTED
 6752  007476  013700  001352                  MOV     DRCSC,R0        ;SETUP FOR GROUP 2
 6753  007502  013701  001356                  MOV     DRCSD,R1
 6754  007506  000753                          BR      111$            ;DO IRR TEST WITH GROUP 2
 6755
 6756
 6757                                  ;;*********************************************************************
  (3)                                  ;*TEST 35       TEST GROUP 1,2 CLEAR IRR INSTR.
  (3)                                  ;;*********************************************************************
  (2)  007510  000004                  TST35:  SCOPE
  (2)
 6758  007512  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6759  007516  012704  000002                  MOV     #2,R4           ;COUNTER FOR TWO GROUPS
 6760  007522  013700  001342                  MOV     DRCSA,R0        ;CSRA ADDRESS
 6761  007526  013701  001346                  MOV     DRCSB,R1        ;CSRB ADDRESS
 6762  007532  004737  013126                  JSR     PC,CLRIRR       ;CLEAR IRR REGS WITH CHIP RESET
 6763  007536  010137  001122          111$:   MOV     R1,$BDADR       ;STORE ADDRESS
 6764  007542  005037  001124                  CLR     $GDDAT          ;EXPECTED DATA
 6765  007546  112710  000250                  MOVB    #MIRR,(R0)      ;LOAD MODE BITS TO READ IRR
 6766  007552  112710  000120                  MOVB    #SIRR,(R0)      ;SET IRR BITS
 6767  007556  112710  000100                  MOVB    #CIRR,(R0)      ;CLEAR IRR COMMAND
 6768  007562  111115                          MOVB    (R1),(R5)       ;READ DATA PORT
 6769  007564  023715  001124                  CMP     $GDDAT,(R5)
 6770  007570  001401                          BEQ     1$
 6771  007572  104003                          ERROR   3               ;ERROR ,IRR SHOULD BE CLEARED
 6772  007574  005304                  1$:     DEC     R4              ;FINISHED BOTH GROUPS?
 6773  007576  001405                          BEQ     TST36           ;;BR IF BOTH GROUPS TESTED
 6774  007600  013700  001352                  MOV     DRCSC,R0        ;SETUP FOR GROUP 2
 6775  007604  013701  001356                  MOV     DRCSD,R1
 6776  007610  000752                          BR      111$            ;DO IRR TEST WITH GROUP 2
 6777
 6778                                  ;;*********************************************************************
  (3)                                  ;*TEST 36       TEST GROUP 1,2  CLEAR SINGLE IRR BIT INSTR.
  (3)                                  ;;*********************************************************************
  (2)  007612  000004                  TST36:  SCOPE
  (2)
 6779  007614  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6780  007620  012704  000002                  MOV     #2,R4           ;GROUP COUNTER
 6781  007624  012737  007666  001110          MOV     #1$,$LPERR      ;SCOPE RETURN ADDRESS
 6782  007632  013700  001342                  MOV     DRCSA,R0        ;CSRA ADDRESS
 6783  007636  013701  001346                  MOV     DRCSB,R1        ;CSRB ADDRESS
 6784  007642  004737  013126                  JSR     PC,CLRIRR       ;CLEAR IRR REGS WITH CHIP RESET
 6785  007646  010137  001122          111$:   MOV     R1,$BDADR       ;STORE ADDRESS
 6786  007652  012703  013330                  MOV     #BGCHP4,R3      ;GOOD DATA PATTERN TABLE
 6787  007656  112710  000250                  MOVB    #MIRR,(R0)      ;LOAD MODE BITS FOR IRR
 6788  007662  012702  000110                  MOV     #CSIRR,R2       ;CLEAR SINGLE IRR BIT VALUE
 6789  007666  111337  001124          1$:     MOVB    (R3),$GDDAT     ;STORE EXPECTED
 6790  007672  112710  000120                  MOVB    #SIRR,(R0)      ;SET ALL IRR BITS
 6791  007676  110210                          MOVB    R2,(R0)         ;CLEAR SINGLE IRR BIT
 6792  007700  111115                          MOVB    (R1),(R5)       ;READ DATA PORT
 6793  007702  023715  001124                  CMP     $GDDAT,(R5)
 6794  007706  001401                          BEQ     2$
 6795  007710  104003                          ERROR   3               ;IRR REG ERROR
```

```
 6796  007712  005723                  2$:     TST     (R3)+           ;INC EXPECTED DATA TABLE
 6797  007714  020327  013350                  CMP     R3,#EDCHP4      ;CHECK FOR END
 6798  007720  001402                          BEQ     3$
 6799  007722  005202                          INC     R2              ;SET UP TO CLEAR NEXT IRR BIT
 6800  007724  000760                          BR      1$              ;CLEAR NEXT IRR BIT
 6801  007726  005304                  3$:     DEC     R4              ;DO GROUPS 1 AND 2
 6802  007730  001405                          BEQ     TST37           ;;BR IF BOTH GROUPS TESTED
 6803  007732  013700  001352                  MOV     DRCSC,R0        ;CSRC ADDRESS
 6804  007736  013701  001356                  MOV     DRCSD,R1        ;CSRD ADDRESS
 6805  007742  000741                          BR      111$            ;DO GROUP 2
 6806
 6807                                  ;;******************************************************************
   (3)                                 ;*TEST 37       TEST GROUP 1,2  SET SINGLE IRR BIT INSTR.
   (3)                                 ;;******************************************************************
   (2)  007744  000004                  TST37:  SCOPE
   (2)
 6808  007746  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6809  007752  012704  000002                  MOV     #2,R4           ;GROUP COUNTER
 6810  007756  012737  010020  001110          MOV     #1$,$LPERR      ;SCOPE RETURN ADDRESS
 6811  007764  013700  001342                  MOV     DRCSA,R0        ;CSRA ADDRESS
 6812  007770  013701  001346                  MOV     DRCSB,R1        ;CSRB ADDRESS
 6813  007774  004737  013126                  JSR     PC,CLRIRR       ;CLEAR IRR REGS WITH CHIP RESET
 6814  010000  010137  001122          111$:   MOV     R1,$BDADR       ;STORE ADDRESS
 6815  010004  012703  013266                  MOV     #BGCHP3,R3      ;GOOD DATA PATTERN TABLE
 6816  010010  112710  000250                  MOVB    #MIRR,(R0)      ;LOAD MODE BITS FOR IRR
 6817  010014  012702  000130                  MOV     #SSIRR,R2       ;SET SINGLE IRR BIT VALUE
 6818  010020  111337  001124          1$:     MOVB    (R3),$GDDAT     ;STORE EXPECTED
 6819  010024  112710  000100                  MOVB    #CIRR,(R0)      ;CLEAR ALL IRR BITS
 6820  010030  110210                          MOVB    R2,(R0)         ;SET SINGLE IRR BIT
 6821  010032  111115                          MOVB    (R1),(R5)       ;READ DATA PORT
 6822  010034  023715  001124                  CMP     $GDDAT,(R5)
 6823  010040  001401                          BEQ     2$
 6824  010042  104003                          ERROR   3               ;IRR REG ERROR
 6825  010044  005723                  2$:     TST     (R3)+           ;INC EXPECTED DATA TABLE
 6826  010046  020327  013306                  CMP     R3,#EDCHP3      ;CHECK FOR END
 6827  010052  001402                          BEQ     3$
 6828  010054  005202                          INC     R2              ;SET UP TO SET NEXT IRR BIT
 6829  010056  000760                          BR      1$              ;SET NEXT IRR BIT
 6830  010060  005304                  3$:     DEC     R4              ;DO GROUPS 1 AND 2
 6831  010062  001405                          BEQ     TST40           ;;BR IF BOTH GROUPS TESTED
 6832  010064  013700  001352                  MOV     DRCSC,R0        ;CSRC ADDRESS
 6833  010070  013701  001356                  MOV     DRCSD,R1        ;CSRD ADDRESS
 6834  010074  000741                          BR      111$            ;DO GROUP 2
 6835
 6836                                  ;;******************************************************************
   (3)                                 ;*TEST 40       TEST GROUP 1,2 CLEAR IRR+IMR INSTR.
   (3)                                 ;;******************************************************************
   (2)  010076  000004                  TST40:  SCOPE
   (2)
 6837  010100  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6838  010104  012704  000002                  MOV     #2,R4           ;COUNTER FOR TWO GROUPS
 6839  010110  013700  001342                  MOV     DRCSA,R0        ;CSRA ADDRESS
 6840  010114  013701  001346                  MOV     DRCSB,R1        ;CSRB ADDRESS
 6841  010120  004737  013126                  JSR     PC,CLRIRR       ;CLEAR IRR REGS WITH CHIP RESET
 6842  010124  010137  001122          111$:   MOV     R1,$BDADR       ;STORE ADDRESS
 6843  010130  005037  001124                  CLR     $GDDAT          ;EXPECTED DATA
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 6844  010134  112710  000250                  MOVB    #MIRR,(R0)      ;LOAD MODE BITS TO READ IRR
 6845  010140  112710  000120                  MOVB    #SIRR,(R0)      ;SET IRR BITS
 6846  010144  112710  000060                  MOVB    #SIMR,(R0)      ;SET IMR BITS
 6847  010150  112710  000020                  MOVB    #CIRMR,(R0)     ;CLEAR IRR+IMR COMMAND
 6848  010154  111115                          MOVB    (R1),(R5)       ;READ DATA PORT FOR IRR
 6849  010156  023715  001124                  CMP     $GDDAT,(R5)
 6850  010162  001401                          BEQ     1$
 6851  010164  104003                          ERROR   3               ;ERROR ,IRR SHOULD BE CLEARED
 6852  010166  112710  000244          1$:     MOVB    #MIMR,(R0)      ;LOAD MODE BITS TO READ IMR
 6853  010172  111115                          MOVB    (R1),(R5)       ;READ IMR REG
 6854  010174  023715  001124                  CMP     $GDDAT,(R5)
 6855  010200  001401                          BEQ     2$
 6856  010202  104005                          ERROR   5               ;IRR+IMR COMMAND DID NOT CLEAR IMR
 6857  010204  005304          2$:     DEC     R4                      ;FINISHED BOTH GROUPS?
 6858  010206  001405                          BEQ     TST41           ;;BR IF BOTH GROUPS TESTED
 6859  010210  013700  001352                  MOV     DRCSC,R0        ;SETUP FOR GROUP 2
 6860  010214  013701  001356                  MOV     DRCSD,R1
 6861  010220  000741                          BR      111$            ;DO IRR+IMR TEST WITH GROUP 2
 6862
 6863                                  ;;*******************************************************************
   (3)                                ;*TEST 41       TEST GROUP 1,2  CLEAR SINGLE IRR+IMR BIT INSTR.
   (3)                                ;;*******************************************************************
   (2)  010222  000004                  TST41:  SCOPE
   (2)
 6864  010224  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6865  010230  012704  000002                  MOV     #2,R4           ;GROUP COUNTER
 6866  010234  012737  010272  001110          MOV     #1$,$LPERR      ;SCOPE RETURN ADDRESS
 6867  010242  013700  001342                  MOV     DRCSA,R0        ;CSRA ADDRESS
 6868  010246  013701  001346                  MOV     DRCSB,R1        ;CSRB ADDRESS
 6869  010252  004737  013126                  JSR     PC,CLRIRR       ;CLEAR IRR REGS WITH CHIP RESET
 6870  010256  010137  001122          111$:   MOV     R1,$BDADR       ;STORE ADDRESS
 6871  010262  012703  013330                  MOV     #BGCHP4,R3      ;GOOD DATA PATTERN TABLE
 6872  010266  012702  000030                  MOV     #CSIRMR,R2      ;CLEAR SINGLE IRR+IMR BIT VALUE
 6873  010272  111337  001124          1$:     MOVB    (R3),$GDDAT     ;STORE EXPECTED
 6874  010276  112710  000250                  MOVB    #MIRR,(R0)      ;LOAD MODE BITS TO READ IRR
 6875  010302  112710  000120                  MOVB    #SIRR,(R0)      ;SET ALL IRR BITS
 6876  010306  112710  000060                  MOVB    #SIMR,(R0)      ;SET ALL IMR BITS
 6877  010312  110210                          MOVB    R2,(R0)         ;CLEAR SINGLE IRR+IMR BIT
 6878  010314  111115                          MOVB    (R1),(R5)       ;READ DATA PORT FOR IRR
 6879  010316  023715  001124                  CMP     $GDDAT,(R5)
 6880  010322  001401                          BEQ     2$
 6881  010324  104003                          ERROR   3               ;IRR REG ERROR
 6882  010326  112710  000244          2$:     MOVB    #MIMR,(R0)      ;SET UP TO READ IMR
 6883  010332  111115                          MOVB    (R1),(R5)       ;READ IMR REGISTER
 6884  010334  023715  001124                  CMP     $GDDAT,(R5)
 6885  010340  001401                          BEQ     3$
 6886  010342  104005                          ERROR   5               ;IMR REG ERROR
 6887  010344  005723          3$:     TST     (R3)+                   ;INC EXPECTED DATA TABLE
 6888  010346  020327  013350                  CMP     R3,#EDCHP4      ;CHECK FOR END
 6889  010352  001402                          BEQ     4$
 6890  010354  005202                          INC     R2              ;SET UP TO CLEAR NEXT IRR+IMR BIT
 6891  010356  000745                          BR      1$              ;CLEAR NEXT IRR+IMR BIT
 6892  010360  005304          4$:     DEC     R4                      ;DO GROUPS 1 AND 2
 6893  010362  001405                          BEQ     TST42           ;;BR IF BOTH GROUPS TESTED
 6894  010364  013700  001352                  MOV     DRCSC,R0        ;CSRC ADDRESS
 6895  010370  013701  001356                  MOV     DRCSD,R1        ;CSRD ADDRESS
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 6896  010374  000730                        BR      111$            ;DO GROUP 2
 6897
 6898                                ;;*****************************************************************
  (3)                                ;*TEST 42       TEST GROUPS 1,2 FOR GROUP UNIQUENESS
  (3)                                ;;*****************************************************************
  (2)  010376  000004                TST42:  SCOPE
  (2)
 6899  010400  004737  013056                JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6900                                                                ;CSRA = R0
 6901                                                                ;CSRB = R1
 6902                                                                ;CSRC = R2
 6903                                                                ;CSRD = R3
 6904  010404  012704  000002                MOV     #2,R4           ;COUNTER FOR TESTING TWO GROUPS
 6905  010410  004737  013126                JSR     PC,CLRIRR       ;CLEAR IRR REGS WITH CHIP RESET
 6906  010414  010337  001122        111$:   MOV     R3,$BDADR       ;STORE ADDRESS
 6907  010420  112710  000300                MOVB    #PACR,(R0)      ;PRESELECT ACR FOR WRITING
 6908  010424  112711  000377                MOVB    #377,(R1)       ;WRITE INTO DATA PORT FOR ACR
 6909  010430  112710  000120                MOVB    #SIRR,(R0)      ;SET IRR TO ALL 1'S
 6910  010434  112710  000040                MOVB    #CIMR,(R0)      ;CLEAR IMR
 6911  010440  112712  000254                MOVB    #MACR,(R2)      ;LOAD MODE TO READ ACR
 6912  010444  005037  001124                CLR     $GDDAT          ;EXPECTED
 6913  010450  111315                        MOVB    (R3),(R5)       ;STORE DATA FOR COMPARE
 6914  010452  023715  001124                CMP     $GDDAT,(R5)     ;CHECK ACR RESULTS
 6915  010456  001401                        BEQ     1$              ;
 6916  010460  104004                        ERROR   4               ;ERROR,OTHER GROUP ACR SHOULD BE CLEARED
 6917  010462  112712  000244        1$:     MOVB    #MIMR,(R2)      ;CHANGE TO IMR REGISTER
 6918  010466  012737  000377  001124        MOV     #377,$GDDAT     ;STORE EXPECTED
 6919  010474  111315                        MOVB    (R3),(R5)       ;READ IMR
 6920  010476  023715  001124                CMP     $GDDAT,(R5)     ;SHOULD  BE ALL 1'S
 6921  010502  001401                        BEQ     2$
 6922  010504  104005                        ERROR   5               ;ERROR,OTHER GROUP IMR SHOULD BE SET
 6923  010506  112712  000240        2$:     MOVB    #MISR,(R2)      ;LOAD MODE BITS FOR ISR
 6924  010512  005037  001124                CLR     $GDDAT          ;STORE EXPECTED
 6925  010516  111315                        MOVB    (R3),(R5)       ;READ ISR
 6926  010520  023715  001124                CMP     $GDDAT,(R5)     ;ISR SHOULD BE CLEARED
 6927  010524  001401                        BEQ     3$
 6928  010526  104006                        ERROR   6               ;ISR REG ERROR
 6929  010530  112712  000250        3$:     MOVB    #MIRR,(R2)      ;LOAD MODE BITS FOR IRR
 6930  010534  111315                        MOVB    (R3),(R5)       ;READ IRR
 6931  010536  023715  001124                CMP     $GDDAT,(R5)     ;IRR SHOULD BE CLEARED
 6932  010542  001401                        BEQ     4$
 6933  010544  104003                        ERROR   3               ;ERROR,OTHER GROUP IRR SHOULD BE CLEARED
 6934  010546  005304                4$:     DEC     R4              ;TEST GROUPS 1 AND 2
 6935  010550  001415                        BEQ     TST43           ;;BR IF BOTH GROUPS TESTED
 6936  010552  004737  013056                JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6937  010556  013700  001352                MOV     DRCSC,R0        ;GROUP 2 CONTROL PORT
 6938  010562  013701  001356                MOV     DRCSD,R1        ;GROUP 2 DATA PORT
 6939  010566  013702  001342                MOV     DRCSA,R2        ;GROUP 1 CONTROL PORT
 6940  010572  013703  001346                MOV     DRCSB,R3        ;GROUP 1 DATA PORT
 6941  010576  004737  013126                JSR     PC,CLRIRR       ;CLEAR IRR REGS WITH CHIP RESET
 6942  010602  000704                        BR      111$            ;TEST GROUP 2 ACR UNIQUENESS
 6943
 6944                                ;;*****************************************************************
  (3)                                ;*TEST 43       TEST STATUS BITS GINT,S2,S1,S0,GP1,2
  (3)                                ;;*****************************************************************
  (2)  010604  000004                TST43:  SCOPE
```

```
  (2)
 6945  010606  004737  013056                    JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 6946  010612  013700  001342                    MOV     DRCSA,R0
 6947  010616  013701  001346                    MOV     DRCSB,R1
 6948  010622  012703  000002                    MOV     #2,R3           ;DO TWO GROUPS
 6949  010626  012704  000120            111$:   MOV     #120,R4         ;EXPECTED STATUS BITS
 6950  010632  005077  170504                    CLR     @DRCSA          ;INIT CSRA
 6951  010636  005077  170510                    CLR     @DRCSC          ;INIT CSRC
 6952  010642  012702  013166                    MOV     #BGPAT1,R2      ;EXPECTED IRR PATTERN
 6953  010646  112760  000001  000001            MOVB    #BIT0,1(R0)     ;CSR TO OUTPUT MODE
 6954  010654  112777  000204  170460            MOVB    #204,@DRCSA     ;POLLED MODE FOR CSRA,GROUP 1
 6955  010662  112777  000204  170462            MOVB    #204,@DRCSC     ;POLLED MODE FOR CSRC,GROUP 2
 6956  010670  112710  000020                    MOVB    #CIRMR,(R0)     ;CLEAR IMR + IRR
 6957  010674  012737  000070  001372            MOV     #SSIMR,IMRLOC   ;STORE CODE FOR SINGLE IMR
 6958  010702  012737  000130  001376            MOV     #SSIRR,IRRLOC   ;STORE CODE FOR SINGLE IRR
 6959  010710  010037  001122            112$:   MOV     R0,$BDADR       ;CSR CHIP COMMAND  ADDRESS
 6960  010714  010437  001124                    MOV     R4,$GDDAT       ;EXPECTED DATA
 6961  010720  113710  001376                    MOVB    IRRLOC,(R0)     ;SET SINGLE IRR BIT
 6962  010724  111015                            MOVB    (R0),(R5)       ;CHECK STATUS
 6963  010726  042715  000007                    BIC     #7,(R5)         ;; *** VDRCA1 ADDS THIS ***     ;;GPA
 6964  010732  023715  001124                    CMP     $GDDAT,(R5)
 6965  010736  001401                            BEQ     1$
 6966  010740  104007                            ERROR   7               ;CHIP STATUS ERROR
 6967  010742  005037  001124            1$:     CLR     $GDDAT
 6968  010746  010137  001122                    MOV     R1,$BDADR       ;CSR CHIP DATA ADDRESS
 6969  010752  111237  001124                    MOVB    (R2),$GDDAT
 6970  010756  112710  000250                    MOVB    #MIRR,(R0)      ;READ IRR
 6971  010762  111115                            MOVB    (R1),(R5)
 6972  010764  023715  001124                    CMP     $GDDAT,(R5)     ;CHECK IRR
 6973  010770  001401                            BEQ     2$
 6974  010772  104003                            ERROR   3               ;IRR ERROR
 6975  010774  010037  001122            2$:     MOV     R0,$BDADR
 6976  011000  113710  001372                    MOVB    IMRLOC,(R0)     ;SET IMR BIT
 6977  011004  012737  000320  001124            MOV     #320,$GDDAT     ;CSR EXPECTED DATA
 6978  011012  111015                            MOVB    (R0),(R5)
 6979  011014  042715  000007                    BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
 6980  011020  023715  001124                    CMP     $GDDAT,(R5)
 6981  011024  001401                            BEQ     3$
 6982  011026  104007                            ERROR   7               ;CHIP STATUS ERROR
 6983  011030  010137  001122            3$:     MOV     R1,$BDADR
 6984  011034  011237  001124                    MOV     (R2),$GDDAT     ;EXPECTED DATA
 6985  011040  112710  000244                    MOVB    #MIMR,(R0)      ;READ IMR BITS
 6986  011044  111115                            MOVB    (R1),(R5)       ;SAVE IMR READ
 6987  011046  023715  001124                    CMP     $GDDAT,(R5)
 6988  011052  001401                            BEQ     4$
 6989  011054  104005                            ERROR   5               ;IMR ERROR
 6990  011056  005722                    4$:     TST     (R2)+           ;NEXT EXPECTED FOR IMR + IRR
 6991  011060  020227  013206                    CMP     R2,#EDCHP1      ;CHECK FOR END
 6992  011064  001407                            BEQ     5$
 6993  011066  005237  001376                    INC     IRRLOC          ;NEXT IRR BIT
 6994  011072  005237  001372                    INC     IMRLOC          ;NEXT IMR BIT
 6995                                    ;;GPA   INC     R4              ;INDEX EXPECTED STATUS
 6996  011076  000240                            NOP                     ;; *** VDRCA1 DELETES INC R4 *** ;;GPA
 6997  011100  000137  010710                    JMP     112$            ;DO NEXT STATUS CHECK
 699C  011104  005303                    5$:     DEC     R3              ;FINISHED BOTH GROUPS?
 6999  011106  001406                            BEQ     TST44           ;;BR IF EQUAL
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 7000  011110  013700  001352                MOV     DRCSC,R0
 7001  011114  013701  001356                MOV     DRCSD,R1
 7002  011120  000137  010626                JMP     111$                ;DO NEXT GROUP
 7003
 7004
 7005                                  ;;*****************************************************************
  (3)                                  ;*TEST 44       TEST POLLED MODE;CSRS A,B=OUT C,D=IN,ACTIVE LOW
  (3)                                  ;;*****************************************************************
  (2)  011124  000004                  TST44:  SCOPE
  (2)
 7006  011126  004737  013056                JSR     PC,CLRCSR           ;CLEAR ALL CSRS
 7007                                                                     ;R0 = CSRA-GROUP 1 CONTROL
 7008                                                                     ;R1 = CSRB-GROUP 1 DATA
 7009                                                                     ;R2 = CSRC-GROUP 2 CONTROL
 7010                                                                     ;R3 = CSRD-GROUP 2 DATA
 7011  011132  012737  011174  001110        MOV     #1$,$LPERR          ;SET FOR SCOPE RETURN
 7012  011140  012704  013164                MOV     #BEGPAT,R4          ;START OF PATTERN TABLE
 7013  011144  112760  000001  000001        MOVB    #BIT0,1(R0)         ;SET CSRA TO OUTPUT MODE
 7014  011152  112761  000001  000001        MOVB    #BIT0,1(R1)         ;SET CSRB TO OUTPUT MODE
 7015
 7016  011160  105010                        CLRB    (R0)                ;CHIP RESET GROUP 1 CSRA
 7017  011162  105012                        CLRB    (R2)                ;CHIP RESET GROUP 2 CSRC
 7018  011164  112710  000204                MOVB    #204,(R0)           ;LOAD MODE BITS FOR POLLED MODE,GR 1
 7019  011170  112712  000204                MOVB    #204,(R2)           ;LOAD MODE BITS FOR POLLED MODE,GR2
 7020  011174  011460  000002        1$:     MOV     (R4),2(R0)          ;SET PATTERN DBRA FROM H TO L
 7021  011200  112710  000020                MOVB    #CIRMR,(R0)         ;CLEAR IMR+IRR GROUP 1
 7022  011204  112712  000020                MOVB    #CIRMR,(R2)         ;CLEAR IMR+IRR GROUP 2
 7023  011210  005060  000002                CLR     2(R0)               ;CLEAR DBRA,ACTIVE LOW WILL SET RPLY C
 7024  011214  010137  001122        2$:     MOV     R1,$BDADR           ; GROUP 1 DATA PORT
 7025  011220  112710  000250                MOVB    #MIRR,(R0)          ;LOAD BITS TO READ IRR
 7026  011224  111437  001124                MOVB    (R4),$GDDAT
 7027  011230  111115                        MOVB    (R1),(R5)           ;READ IRR,GROUP 1
 7028  011232  023715  001124                CMP     $GDDAT,(R5)
 7029  011236  001401                        BEQ     3$
 7030  011240  104003                        ERROR   3                   ;IRR ERROR,GROUP 1
 7031  011242  010337  001122        3$:     MOV     R3,$BDADR           ;GROUP 2 DATA PORT
 7032  011246  112712  000250                MOVB    #MIRR,(R2)          ;LOAD MODE BITS TO READ IRR GROUP2
 7033  011252  116437  000001  001124        MOVB    1(R4),$GDDAT        ;BUILD EXPECTED DATA
 7034  011260  042737  000360  001124        BIC     #360,$GDDAT         ;SAVE BITS 0-3
 7035  011266  052737  000100  001124        BIS     #100,$GDDAT         ;EXPECTED 0-3,URPLY 6(C)
 7036  011274  111315                        MOVB    (R3),(R5)           ;READ IRR BITS,GROUP 2
 7037  011276  023715  001124                CMP     $GDDAT,(R5)
 7038  011302  001401                        BEQ     4$
 7039  011304  104003                        ERROR   3                   ;IRR ERROR,GROUP 2
 7040  011306  005762  000002        4$:     TST     2(R2)               ;READ DBRC FOR RPLY 4(A)
 7041  011312  052737  000020  001124        BIS     #20,$GDDAT          ;STORE EXPECTED
 7042  011320  111315                        MOVB    (R3),(R5)           ;READ IRR BITS,GROUP 2
 7043  011322  023715  001124                CMP     $GDDAT,(R5)
 7044  011326  001401                        BEQ     5$
 7045  011330  104003                        ERROR   3                   ;IRR ERROR,GROUP 2
 7046  011332  005061  000002        5$:     CLR     2(R1)               ;CLEAR DBRB FOR RPY 7(D)
 7047  011336  052737  000200  001124        BIS     #200,$GDDAT         ;EXPECTED
 7048  011344  111315                        MOVB    (R3),(R5)           ;READ IRR BITS GROUP 2
 7049  011346  023715  001124                CMP     $GDDAT,(R5)
 7050  011352  001401                        BEQ     6$
 7051  011354  104003                        ERROR   3                   ;IRR ERROR,GROUP 2
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 7052  011356  005763  000002          6$:     TST     2(R3)           ;READ DBRD FOR RPLY 5(B)
 7053  011362  052737  000040  001124          BIS     #40,$GDDAT
 7054  011370  111315                          MOVB    (R3),(R5)       ;READ IRR BITS GROUP2
 7055  011372  023715  001124                  CMP     $GDDAT,(R5)
 7056  011376  001401                          BEQ     7$              ;GET NEXT PATTERN
 7057  011400  104003                          ERROR   3               ;IRR ERROR,GROUP 2
 7058  011402  005724                  7$:     TST     (R4)+           ;INDEX DATA TABLE
 7059  011404  020427  013464                  CMP     R4,#ENDDAT      ;CHECK FOR END
 7060  011410  001271                          BNE     1$              ;DO NEXT PATTERN
 7061
 7062
 7063                                  ;;*************************************************************************
   (3)                                 ;*TEST 45       TEST GROUPS 1,2 IN POLLED MODE,NO REPLY
   (3)                                 ;;*************************************************************************
   (2)  011412  000004                  TST45:  SCOPE
   (2)
 7064  011414  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 7065                                                                  ;R0 = CSRA-GROUP 1 CONTROL
 7066                                                                  ;R1 = CSRB-GROUP 1 DATA
 7067                                                                  ;R2 = CSRC-GROUP 2 CONTROL
 7068                                                                  ;R3 = CSRD-GROUP 2 DATA
 7069  011420  012704  000002                  MOV     #2,R4           ;TWO PASSES
 7070                                                                  ;FIRST PASS CSRA,CSRB = OUTPUT
 7071                                                                  ;           CSRC,CSRD = INPUT
 7072                                                                  ;SEC PASS   CSRC,CSRD = OUTPUT
 7073                                                                  ;           CSRA,CSRB = INPUT
 7074  011424  112760  000001  000001 111$:   MOVB    #BIT0,1(R0)     ;SET CSR TO OUTPUT MODE
 7075  011432  112761  000001  000001        MOVB    #BIT0,1(R1)     ;SET CSR TO OUTPUT MODE
 7076  011440  012760  177777  000002        MOV     #-1,2(R0)       ;SET ALL ONES DBR FOR H TO L
 7077  011446  105010                          CLRB    (R0)            ;CHIP RESET GROUP  CSR
 7078  011450  105012                          CLRB    (R2)            ;CHIP RESET GROUP  CSR
 7079  011452  112710  000204                  MOVB    #204,(R0)       ;LOAD MODE BITS FOR POLLED MODE
 7080  011456  112712  000204                  MOVB    #204,(R2)       ;LOAD MODE BITS FOR POLLED MODE
 7081  011462  112710  000020                  MOVB    #CIRMR,(R0)     ;CLEAR IMR+IRR
 7082  011466  112712  000020                  MOVB    #CIRMR,(R2)     ;CLEAR IMR+IRR
 7083  011472  005760  000002                  TST     2(R0)           ;READ DBR IN OUTPUT MODE,NO REPLY
 7084  011476  012737  000320  001124          MOV     #320,$GDDAT     ;STORE EXPECTED
 7085  011504  010037  001122                  MOV     R0,$BDADR       ;STORE ADDRESS
 7086  011510  111015                          MOVB    (R0),(R5)       ;READ STATUS
 7087  011512  042715  000007                  BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
 7088  011516  023715  001124                  CMP     $GDDAT,(R5)     ;CHECK STATUS
 7089  011522  001401                          BEQ     1$
 7090  011524  104007                          ERROR   7               ;CHIP STATUS ERROR
 7091  011526  010237  001122          1$:     MOV     R2,$BDADR       ;STORE ADDRESS
 7092  011532  111215                          MOVB    (R2),(R5)       ;READ STATUS
 7093  011534  042715  000007                  BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
 7094  011540  023715  001124                  CMP     $GDDAT,(R5)
 7095  011544  001401                          BEQ     2$
 7096  011546  104007                          ERROR   7               ; CHIP STATUS ERROR
 7097  011550  012762  000000  000002  2$:     MOV     #0,2(R2)        ;WRITE ONLY,DBR INPUT MODE FOR NO REPLY
 7098  011556  005761  000002                  TST     2(R1)           ;READ DBR OUTPUT MODE,NO REPLY
 7099  011562  012763  000000  000002          MOV     #0,2(R3)        ;WRITE ONLY, DBR INPUT MODE,NO REPLY
 7100  011570  010137  001122                  MOV     R1,$BDADR       ; CHIP DATA PORT
 7101  011574  112710  000250                  MOVB    #MIRR,(R0)      ;LOAD BITS TO READ IRR
 7102  011600  005037  001124                  CLR     $GDDAT          ;IRR SHOULD BE ZERO
 7103  011604  111115                          MOVB    (R1),(R5)       ;READ IRR
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 7104  011606  023715  001124                  CMP     $GDDAT,(R5)
 7105  011612  001412                          BEQ     3$
 7106  011614  005737  017214                  TST     KXTFLAG         ; ON KXT11, READ-BEFORE-WRITE...;;GPA
 7107  011620  001406                          BEQ     100$            ;...AT 2$ UPSETS EXPECTED IRR.  ;;GPA
 7108  011622  012737  000300  001124          MOV     #300,$GDDAT     ; TRY THE ALTERNATE VALUE.      ;;GPA
 7109  011630  023715  001124                  CMP     $GDDAT,(R5)                                     ;;GPA
 7110  011634  001401                          BEQ     3$                                              ;;GPA
 7111  011636  104003                  100$:   ERROR   3               ;IRR ERROR                      ;;GPA
 7112  011640  005037  001124          3$:     CLR     $GDDAT                                          ;;GPA
 7113  011644  010337  001122                  MOV     R3,$BDADR       ;CHIP DATA PORT
 7114  011650  112712  000250                  MOVB    #MIRR,(R2)      ;LOAD MODE BITS TO READ IRR
 7115  011654  111315                          MOVB    (R3),(R5)       ;READ IRR BITS
 7116  011656  023715  001124                  CMP     $GDDAT,(R5)
 7117  011662  001412                          BEQ     4$
 7118  011664  005737  017214                  TST     KXTFLAG         ; ON KXT11, DITTO.              ;;GPA
 7119  011670  001406                          BEQ     101$                                            ;;GPA
 7120  011672  012737  000060  001124          MOV     #60,$GDDAT      ; TRY THE ALTERNATE VALUE.      ;;GPA
 7121  011700  023715  001124                  CMP     $GDDAT,(R5)                                     ;;GPA
 7122  011704  001401                          BEQ     4$                                              ;;GPA
 7123  011706  104003                  101$:   ERROR   3               ;IRR ERROR                      ;;GPA
 7124  011710  005304                  4$:     DEC     R4              ;FINISHED TWO PASSES
 7125  011712  001413                          BEQ     TST46           ;;BR IF EQUAL
 7126  011714  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 7127  011720  013700  001352                  MOV     DRCSC,R0        ;SET UP FOR NEXT PASS
 7128  011724  013701  001356                  MOV     DRCSD,R1
 7129  011730  013702  001342                  MOV     DRCSA,R2
 7130  011734  013703  001346                  MOV     DRCSB,R3
 7131  011740  000631                          BR      111$            ;DO NEXT PASS
 7132
 7133                                  ;;*******************************************************************
  (3)                                  ;*TEST 46       TEST POLLED MODE;CSRS C,D=OUT A,B=IN,ACTIVE LOW
  (3)                                  ;;*******************************************************************
  (2)  011742  000004                  TST46:  SCOPE
  (2)
 7134  011744  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 7135                                                                  ;R0 = CSRA-GROUP 1 CONTROL
 7136                                                                  ;R1 = CSRB-GROUP 1 DATA
 7137                                                                  ;R2 = CSRC-GROUP 2 CONTROL
 7138                                                                  ;R3 = CSRD-GROUP 2 DATA
 7139  011750  012737  012012  001110          MOV     #1$,$LPERR      ;SCOPE LOOP RETURN
 7140  011756  012704  013164                  MOV     #BEGPAT,R4      ;PATTERN TABLE
 7141  011762  112762  000001  000001          MOVB    #BIT0,1(R2)     ;SET CSRC TO OUTPUT MODE
 7142  011770  112763  000001  000001          MOVB    #BIT0,1(R3)     ;SET CSRD TO OUTPUT MODE
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 7144  011776  105010                          CLRB    (R0)            ;CHIP RESET GROUP 1 CSRA
 7145  012000  105012                          CLRB    (R2)            ;CHIP RESET GROUP 2 CSRC
 7146  012002  112710  000204                  MOVB    #204,(R0)       ;LOAD MODE BITS FOR POLLED MODE,GR 1
 7147  012006  112712  000204                  MOVB    #204,(R2)       ;LOAD MODE BITS FOR POLLED MODE,GR2
 7148  012012  011462  000002        1$:       MOV     (R4),2(R2)      ;SET PATTERN DBRC FOR H TO L
 7149  012016  112710  000020                  MOVB    #CIRMR,(R0)     ;CLEAR IMR+IRR GROUP 1
 7150  012022  112712  000020                  MOVB    #CIRMR,(R2)     ;CLEAR IMR+IRR GROUP 2
 7151  012026  005062  000002                  CLR     2(R2)           ;CLEAR DBRC,ACTIVE LOW WILL SET RPLY A
 7152  012032  010137  001122        2$:       MOV     R1,$BDADR       ; GROUP 1 DATA PORT
 7153  012036  112710  000250                  MOVB    #MIRR,(R0)      ;LOAD BITS TO READ IRR
 7154  012042  111437  001124                  MOVB    (R4),$GDDAT
 7155  012046  111115                          MOVB    (R1),(R5)       ;READ IRR,GROUP 1
 7156  012050  023715  001124                  CMP     $GDDAT,(R5)
 7157  012054  001401                          BEQ     3$
 7158  012056  104003                          ERROR   3               ;IRR ERROR,GROUP 1
 7159  012060  010337  001122        3$:       MOV     R3,$BDADR       ;GROUP 2 DATA PORT
 7160  012064  112712  000250                  MOVB    #MIRR,(R2)      ;LOAD MODE BITS TO READ IRR GROUP2
 7161  012070  116437  000001  001124          MOVB    1(R4),$GDDAT
 7162  012076  042737  000360  001124          BIC     #360,$GDDAT     ;SAVE BITS 0-3
 7163  012104  052737  000020  001124          BIS     #20,$GDDAT      ;EXPECTED 0-3,URPLY 4(A)
 7164  012112  111315                          MOVB    (R3),(R5)       ;READ IRR BITS,GROUP 2
 7165  012114  023715  001124                  CMP     $GDDAT,(R5)
 7166  012120  001401                          BEQ     4$
 7167  012122  104003                          ERROR   3               ;IRR ERROR,GROUP 2
 7168  012124  005760  000002        4$:       TST     2(R0)           ;READ DBRA FOR RPLY 6(C)
 7169  012130  052737  000100  001124          BIS     #100,$GDDAT     ;STORE EXPECTED
 7170  012136  111315                          MOVB    (R3),(R5)       ;READ IRR BITS,GROUP 2
 7171  012140  023715  001124                  CMP     $GDDAT,(R5)
 7172  012144  001401                          BEQ     5$
 7173  012146  104003                          ERROR   3               ;IRR ERROR,GROUP 2
 7174  012150  005063  000002        5$:       CLR     2(R3)           ;CLEAR DBRD FOR RPY 5(B)
 7175  012154  052737  000040  001124          BIS     #40,$GDDAT      ;EXPECTED
 7176  012162  111315                          MOVB    (R3),(R5)       ;READ IRR BITS GROUP 2
 7177  012164  023715  001124                  CMP     $GDDAT,(R5)
 7178  012170  001401                          BEQ     6$
 7179  012172  104003                          ERROR   3               ;IRR ERROR,GROUP 2
 7180  012174  005761  000002        6$:       TST     2(R1)           ;READ DBRB FOR RPLY 7(D)
 7181  012200  052737  000200  001124          BIS     #200,$GDDAT
 7182  012206  111315                          MOVB    (R3),(R5)       ;READ IRR BITS GROUP2
 7183  012210  023715  001124                  CMP     $GDDAT,(R5)
 7184  012214  001401                          BEQ     7$
 7185  012216  104003                          ERROR   3               ;IRR ERROR,GROUP 2
 7186  012220  005724                  7$:     TST     (R4)+           ;INDEX DATA TABLE
 7187  012222  020427  013464                  CMP     R4,#ENDDAT      ;CHECK FOR END
 7188  012226  001271                          BNE     1$              ;DO NEXT PATTERN
 7189
 7190
 7191
 7192                                  ;;*******************************************************************
  (3)                                  ;*TEST 47       TEST IRR BITS WITH DATA PAT.,POLLED MODE,ACT. HIGH
  (3)                                  ;;*******************************************************************
  (2)  012230  000004                  TST47:  SCOPE
  (2)
 7193  012232  004737  013056                  JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 7194  012236  012703  013164                  MOV     #BEGPAT,R3      ;GET DATA PATTERN TABLE
 7195  012242  012737  000001  001110          MOV     #1,$LPERR       ;SET UP SCOPE ADDRESS
```

```
 7196  012250  013700  001342                    MOV     DRCSA,R0
 7197  012254  013701  001346                    MOV     DRCSB,R1
 7198  012260  013702  001356                    MOV     DRCSD,R2
 7199  012264  112760  000001  000001            MOVB    #BIT0,1(R0)     ;CSRA OUTPUT MODE
 7200  012272  112761  000001  000001            MOVB    #BIT0,1(R1)     ;CSRB OUTPUT MODE
 7201  012300  112710  000224                    MOVB    #224,(R0)       ;LOAD MODE BITS FOR POLLED MODE,GP1
 7202  012304  112760  000224  000010            MOVB    #224,10(R0)     ;LOAD MODE BITS FOR POLLED MODE,GP2
 7203  012312  005060  000002          1$:       CLR     2(R0)           ;CLEAR DBRA
 7204  012316  112710  000020                    MOVB    #CIRMR,(R0)     ;CLEAR IMR +IRR GROUP 1
 7205  012322  112760  000020  000010            MOVB    #CIRMR,10(R0)   ;CLEAR IMR + IRR GROUP 2
 7206  012330  011360  000002                    MOV     (R3),2(R0)      ;STORE PATTERN INTO DBRA
 7207  012334  010137  001122                    MOV     R1,$BDADR       ;CSRB ADDRESS
 7208  012340  112710  000250                    MOVB    #MIRR,(R0)      ;LOAD BITS TO READ IRR1
 7209  012344  111337  001124                    MOVB    (R3),$GDDAT
 7210  012350  111115                            MOVB    (R1),(R5)       ;READ IRR,GP1
 7211  012352  023715  001124                    CMP     $GDDAT,(R5)
 7212  012356  001401                            BEQ     2$
 7213  012360  104003                            ERROR   3               ;IRR ERROR,GP1
 7214  012362  010237  001122          2$:       MOV     R2,$BDADR       ;CSRD ADDRESS
 7215  012366  112760  000250  000010            MOVB    #MIRR,10(R0)    ;SET MODE TO READ IRR BITS GROUP 2
 7216  012374  116337  000001  001124            MOVB    1(R3),$GDDAT    ;BUILD EXPECTED DATA
 7217  012402  042737  000360  001124            BIC     #360,$GDDAT     ;BITS 0-3 EXPECTED
 7218  012410  052737  000100  001124            BIS     #100,$GDDAT     ;"A" REPLY EXPECTED
 7219  012416  111215                            MOVB    (R2),(R5)       ;READ IRR2
 7220  012420  023715  001124                    CMP     $GDDAT,(R5)
 7221  012424  001401                            BEQ     3$
 7222  012426  104003                            ERROR   3               ;IRR GROUP 2
 7223  012430  005723          3$:       TST     (R3)+           ;INDEX DATA TABLE
 7224  012432  020327  013464                    CMP     R3,#ENDDAT      ;CHECK FOR PATTERN END
 7225  012436  001325                            BNE     1$              ;DO NEXT PATTERN
 7226
 7227
 7228                                    ;;*****************************************************************
  (3)                                    ;*TEST 50       TEST CSRA AND CSRB WITH RESET
  (3)                                    ;;*****************************************************************
  (2)  012440  000004                    TST50:  SCOPE
  (2)
  (1)  012442  012737  000001  001160            MOV     #1,$TIMES       ;;DO 1 ITERATION
 7229  012450  004737  013056                    JSR     PC,CLRCSR       ;CLEAR ALL CSRS
 7230  012454  013700  001342                    MOV     DRCSA,R0
 7231  012460  013701  001346                    MOV     DRCSB,R1
 7232  012464  112760  001001  000001            MOVB    #IE!BIT0,1(R0)  ;CSRA TO OUTPUT MODE
 7233  012472  112761  000001  000001            MOVB    #BIT0,1(R1)     ;SET CSRB TO OUTPUT MODE
 7234  012500  010037  001122                    MOV     R0,$BDADR       ;STORE CSRA ADDRESS
 7235  012504  012737  100300  001124            MOV     #100300,$GDDAT  ;RDY + CHIP STATUS EXP'D
 7236  012512  000005                            RESET                   ;INITIALIZE
 7237  012514  011015                            MOV     (R0),(R5)       ;STORE REC'D
 7238  012516  042715  000007                    BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
 7239  012522  023715  001124                    CMP     $GDDAT,(R5)     ;MAKE COMPARE
 7240  012526  001401                            BEQ     1$
 7241  012530  104002                            ERROR   2               ;CSRA ERROR ON RESET
 7242  012532  012737  100000  001124  1$:       MOV     #100000,$GDDAT  ;STORE EXPECTED
 7243  012540  010137  001122                    MOV     R1,$BDADR       ;CHECK CSRB
 7244  012544  011115                            MOV     (R1),(R5)       ;STORE IN $BDDAT
 7245  012546  023715  001124                    CMP     $GDDAT,(R5)     ;MAKE COMPARE
 7246  012552  001401                            BEQ     TST51           ;;BR IF EQUAL
```

```
  7247  012554  104002                          ERROR   2               ;CSRB ERROR WITH RESET
  7248
  7249
  7250                                  ;;*************************************************************************
   (3)                                  ;*TEST 51       TEST CSRC AND CSRD WITH RESET
   (3)                                  ;;*************************************************************************
   (2)  012556  000004                  TST51:  SCOPE
   (2)
   (1)  012560  012737  000001  001160          MOV     #1,$TIMES       ;;DO 1 ITERATION
  7251  012566  004737  013056                  JSR     PC,CLRCSR
  7252  012572  013702  001352                  MOV     DRCSC,R2
  7253  012576  013703  001356                  MOV     DRCSD,R3
  7254  012602  112762  000001  000001         MOVB    #BIT0,1(R2)     ;SET CSRC TO OUTPUT MODE
  7255  012610  112763  000001  000001         MOVB    #BIT0,1(R3)     ;SET CSRD TO OUTPUT MODE
  7256  012616  010237  001122                  MOV     R2,$BDADR       ;STORE ADDRESS
  7257  012622  012737  100200  001124          MOV     #100200,$GDDAT  ;RDY + CHIP STATUS
  7258  012630  000005                          RESET                   ;INITIALIZE
  7259  012632  011215                          MOV     (R2),(R5)       ;STORE CSRC
  7260  012634  042715  000007                  BIC     #7,(R5)         ;CLEAR UNDEFINED BITS
  7261  012640  023715  001124                  CMP     $GDDAT,(R5)     ;MAKE COMPARE
  7262  012644  001401                          BEQ     1$
  7263  012646  104002                          ERROR   2               ;CSRC ERROR WITH RESET
  7264  012650  010337  001122          1$:     MOV     R3,$BDADR       ;CHECK CSRD
  7265  012654  012737  100000  001124          MOV     #100000,$GDDAT  ;STORE EXPECTED
  7266  012662  011315                          MOV     (R3),(R5)       ;READ CSRD
  7267  012664  023715  001124                  CMP     $GDDAT,(R5)     ;MAKE COMPARE
  7268  012670  001401                          BEQ     2$
  7269  012672  104002                          ERROR   2               ;CSRD ERROR ON RESET
  7270  012674                          2$:
  7271
```

```
                                                ;DON'T REPORT "EOP" UNTIL ALL SELECTED DRV11-J'S HAVE BEEN TESTED.
012674  013701  001342                  NXDEV:  MOV     DRCSA,R1        ;INIT TO SETUP NEXT DRV11J ADDRESSES
012700  000241                          NXDEV1: CLC                     ;CLEAR CARRY FOR DEVICE MAP
012702  006037  001364                          ROR     DMAP            ;LOOK FOR NEXT DRV11J
012706  001412                                  BEQ     $EOP            ;BR IF ALL TESTED
012710  162701  000020                          SUB     #20,R1          ;NEXT DRV11-J STARTS -20
012714  005237  001202                          INC     $UNIT           ;UPDATE UNIT NUMBER
012720  032737  000001  001364                  BIT     #1,DMAP         ;IS UNIT SELECTED?
012726  001764                                  BEQ     NXDEV1          ;NEXT,IF NOT SELECTED
012730  000137  002032                          JMP     NEXPAS          ;TEST NEXT DRV11-J
                                        .SBTTL  END OF PASS ROUTINE
                                        ;;*****************************************************************
                                        ;*INCREMENT THE PASS NUMBER ($PASS)
                                        ;*TYPE "END PASS #XXXXX" (WHERE XXXXX IS A DECIMAL NUMBER)
                                        ;*IF THERES A MONITOR GO TO IT
                                        ;*IF THERE ISN'T JUMP TO START1
012734                                  $EOP:
012734  000240                                  NOP
012736  005037  001102                          CLR     $TSTNM          ;;ZERO THE TEST NUMBER
012742  005037  001160                          CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
012746  005237  001176                          INC     $PASS           ;;INCREMENT THE PASS NUMBER
012752  042737  100000  001176                  BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
012760  005327                                  DEC     (PC)+           ;;LOOP?
012762  000001                          $EOPCT: .WORD   1
012764  003022                                  BGT     $DOAGN          ;;YES
012766  012737                                  MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
012770  000001                          $ENDCT: .WORD   1
012772  012762                                  $EOPCT
012774  104401  013041                          TYPE    ,$ENDMG         ;;TYPE "END PASS #"
013000  013746  001176                          MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
013004  104405                                  TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
013006  104401  013036                          TYPE    ,$ENULL         ;;TYPE A NULL CHARACTER
013012  013700  000042                  $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
013016  001405                                  BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
013020  000005                                  RESET                   ;;CLEAR THE WORLD
013022  004710                          $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
013024  000240                                  NOP                     ;;SAVE ROOM
013026  000240                                  NOP                     ;;FOR
013030  000240                                  NOP                     ;;ACT11
013032                                  $DOAGN:
013032  000137                                  JMP     @(PC)+          ;;RETURN
013034  001766                          $RTNAD: .WORD   START1

013036     377     377     000          $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
013041     015  042412  042116          $ENDMG: .ASCIZ  <15><12>/END PASS #/
013046  050040  051501  020123
013054  000043
```

```
                                .SBTTL  PROGRAM SUBROUTINES


                                ;;*****************************************************************
                                ;CLEAR ALL CONTROL/STATUS REGISTERS
                                ;INIT REGISTERS R0-R4 WITH CSRA-CSRD
                                ;AND STORE $BDDAT INTO R5.
                                ;;*****************************************************************
013056  012705  001126          CLRCSR: MOV     #$BDDAT,R5      ;BAD DATA STORAGE IN R5
013062  013700  001342                  MOV     DRCSA,R0        ;CSRA ADDRESS TO R0
013066  013701  001346                  MOV     DRCSB,R1        ;CSRB ADDRESS TO R1
013072  013702  001352                  MOV     DRCSC,R2        ;CSRC ADDRESS TO R2
013076  013703  001356                  MOV     DRCSD,R3        ;CSRD ADDRESS TO R3
013102  005037  001124                  CLR     $GDDAT          ;CLEAR EXPECTED
013106  005015                          CLR     (R5)            ;CLEAR REC'D
013110  005010                          CLR     (R0)            ;CLEAR CSRA;CHIP RESET GROUP 1
013112  105061  000001                  CLRB    1(R1)           ;CLEAR HIGH BYTE CSRB
013116  005012                          CLR     (R2)            ;CLEAR CSRC;CHIP RESET GROUP 2
013120  105063  000001                  CLRB    1(R3)           ;CLEAR HIGH BYTE CSRD
013124  000207                          RTS     PC


                                ;CLEAR IRR REGISTERS,GROUP 1,GROUP 2 WITH CHIP RESET
013126  010046                  CLRIRR: MOV     R0,-(SP)
013130  013700  001342                  MOV     DRCSA,R0        ;START OF CSR ADDRESS
013134  105060  000011                  CLRB    11(R0)          ;CSRC TO INPUT MODE
013140  112760  000001  000001          MOVB    #BIT0,1(R0)     ;CSRA TO OUTPUT MODE
013146  005060  000002                  CLR     2(R0)           ;CLEAR DBRA
013152  105010                          CLRB    (R0)            ;CHIP RESET OF GROUP1
013154  105060  000010                  CLRB    10(R0)          ;CHIP RESET OF GROUP 2
013160  012600                          MOV     (SP)+,R0        ;RESTORE REGISTER
013162  000207                          RTS     PC              ;EXIT
```

```
                        .SBTTL  PATTERNS FOR REGISTER R/W
                        ;
                        ;PATTERNS USED FOR LOADING/READING REGISTERS

013164  000000          BEGPAT: 0                       ;GROWING 1
013166  000001          BGPAT1: 1
013170  000003                  3
013172  000007                  7
013174  000017                  17
013176  000037                  37
013200  000077                  77
013202  000177                  177
013204  000377                  377
013206  000777          EDCHP1: 777
013210  001777                  1777
013212  003777                  3777
013214  007777                  7777
013216  017777                  17777
013220  037777                  37777
013222  077777                  77777
013224  177777                  177777
013226  177776          BGCHP2: 177776                  ;GROWING 0
013230  177774                  177774
013232  177770                  177770
013234  177760                  177760
013236  177740                  177740
013240  177700                  177700
013242  177600                  177600
013244  177400          EDCHP2: 177400
013246  177000                  177000
013250  176000                  176000
013252  174000                  174000
013254  170000                  170000
013256  160000                  160000
013260  140000                  140000
013262  100000                  100000

013264  000000                  000000
013266  000001          BGCHP3: 1                       ;WALKING 1
013270  000002                  2
013272  000004                  4
013274  000010                  10
013276  000020                  20
013300  000040                  40
013302  000100                  100
013304  000200                  200
013306  000400          EDCHP3: 400
013310  001000                  1000
013312  002000                  2000
013314  004000                  4000
013316  010000                  10000
013320  020000                  20000
013322  040000                  40000
013324  100000                  100000
013326  177777                  177777                  ;WALKING 0
```

```
 7378  013330  177776                 BGCHP4: 177776
 7379  013332  177775                         177775
 7380  013334  177773                         177773
 7381  013336  177767                         177767
 7382  013340  177757                         177757
 7383  013342  177737                         177737
 7384  013344  177677                         177677
 7385  013346  177577                         177577
 7386  013350  177377                 EDCHP4: 177377
 7387  013352  176777                         176777
 7388  013354  175777                         175777
 7389  013356  173777                         173777
 7390  013360  167777                         167777
 7391  013362  157777                         157777
 7392  013364  137777                         137777
 7393  013366  077777                         077777
 7394  013370  177777                         177777
 7395  013372  000000                 ENDPAT: 000000
 7396
 7397                                 ;DATA  PATTERNS
 7398  013374  155555                 PATDAT: 155555
 7399  013376  133333                         133333
 7400  013400  066666                         066666
 7401  013402  125252                         125252
 7402  013404  052525                         052525
 7403  013406  177777                         177777
 7404  013410  000000                         000000
 7405  013412  107070                         107070
 7406  013414  070707                         070707
 7407  013416  144444                         144444
 7408  013420  033333                         033333
 7409  013422  011111                         011111
 7410  013424  022222                         022222
 7411  013426  044444                         044444
 7412  013430  111111                         111111
 7413  013432  166666                         166666
 7414  013434  010421                         010421
 7415  013436  021042                         021042
 7416  013440  031463                         031463
 7417  013442  042104                         042104
 7418  013444  063146                         063146
 7419  013446  073567                         073567
 7420  013450  104210                         104210
 7421  013452  114631                         114631
 7422  013454  135673                         135673
 7423  013456  146314                         146314
 7424  013460  156735                         156735
 7425  013462  167356                         167356
 7426  013464  000000                 ENDDAT: 000000
 7427
```

```
 7429                                           .SBTTL  SYSMAC ROUTINES
 7430
 7431                                   .SBTTL  TYPE ROUTINE
  (1)
  (2)                                   ;;**********************************************************************
  (1)                                   ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
  (1)                                   ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
  (1)                                   ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
  (1)                                   ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
  (1)                                   ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
  (1)                                   ;*
  (1)                                   ;*CALL:
  (1)                                   ;*1) USING A TRAP INSTRUCTION
  (1)                                   ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
  (1)                                   ;*OR
  (1)                                   ;*      TYPE
  (1)                                   ;*      MESADR
  (1)                                   ;*
  (1)
  (1)  013466  105737  001157           $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
  (1)  013472  100002                           BPL     1$              ;;BR IF YES
  (1)  013474  000000                           HALT                    ;;HALT HERE IF NO TERMINAL
  (1)  013476  000430                           BR      3$              ;;LEAVE
  (1)  013500  010046                   1$:     MOV     R0,-(SP)        ;;SAVE R0
  (1)  013502  017600  000002                   MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
  (1)  013506  122737  000001  001210           CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
  (1)  013514  001011                           BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
  (1)  013516  132737  000100  001211           BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
  (1)  013524  001405                           BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
  (1)  013526  010037  013536                   MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
  (1)  013532  004737  013756                   JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
  (1)  013536  000000                   61$:    .WORD   0               ;;MESSAGE ADDRESS
  (1)  013540  132737  000040  001211   62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
  (1)  013546  001003                           BNE     60$             ;;YES,SKIP TYPE OUT
  (1)  013550  112046                   2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
  (1)  013552  001005                           BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
  (1)  013554  005726                           TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
  (1)  013556  012600                   60$:    MOV     (SP)+,R0        ;;RESTORE R0
  (1)  013560  062716  000002           3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
  (1)  013564  000002                           RTI                     ;;RETURN
  (1)  013566  122716  000011           4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
  (1)  013572  001430                           BEQ     8$
  (1)  013574  122716  000200                   CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
  (1)  013600  001006                           BNE     5$
  (1)  013602  005726                           TST     (SP)+           ;;POP  <CR><LF> EQUIV
  (1)  013604  104401                           TYPE                    ;;TYPE A CR AND LF
  (1)  013606  001165                           $CRLF
  (1)  013610  105037  013744                   CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
  (1)  013614  000755                           BR      2$              ;;GET NEXT CHARACTER
  (1)  013616  004737  013700           5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
  (1)  013622  123726  001156           6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
  (1)  013626  001350                           BNE     2$              ;;IF NO GO GET NEXT CHAR.
  (1)  013630  013746  001154                   MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
  (1)                                           ;;AND THE NULL CHAR.
  (1)  013634  105366  000001           7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
  (1)  013640  002770                           BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
```

```
    (1)  013642  004737  013700                    JSR     PC,$TYPEC       ;;GO TYPE A NULL
    (1)  013646  105337  013744                    DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
    (1)  013652  000770                            BR      7$              ;;LOOP
    (1)
    (1)                                 ;HORIZONTAL TAB PROCESSOR
    (1)
    (1)  013654  112716  000040            8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
    (1)  013660  004737  013700            9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
    (1)  013664  132737  000007  013744            BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
    (1)  013672  001372                            BNE     9$              ;;TAB STOP
    (1)  013674  005726                            TST     (SP)+           ;;POP SPACE OFF STACK
    (1)  013676  000724                            BR      2$              ;;GET NEXT CHARACTER
    (1)  013700  105777  165244            $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
    (1)  013704  100375                            BPL     $TYPEC
    (1)  013706  116677  000002  165236            MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
    (1)
    (1)  013714  122766  000015  000002    CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
    (1)  013722  001003                            BNE     1$              ;;BRANCH IF NO
    (1)  013724  105037  013744                    CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
    (1)  013730  000406                            BR      $TYPEX          ;;EXIT
    (1)  013732  122766  000012  000002    1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
    (1)  013740  001402                            BEQ     $TYPEX          ;;BRANCH IF YES
    (1)  013742  105227                            INCB    (PC)+           ;;COUNT THE CHARACTER
    (1)  013744  000000                    $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
    (1)  013746  000207                    $TYPEX: RTS     PC
    (1)
    (1)
    (1)
  7432                                  .SBTTL  APT COMMUNICATIONS ROUTINE
    (1)
    (2)                                 ;;**************************************************************************
    (1)  013750  112737  000001  014214  $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
    (1)  013756  112737  000001  014212  $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
    (1)  013764  000403                            BR      $ATYC
    (1)  013766  112737  000001  014214  $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
    (1)  013774                          $ATYC:
    (3)  013774  010046                            MOV     R0,-(SP)        ;;PUSH R0 ON STACK
    (3)  013776  010146                            MOV     R1,-(SP)        ;;PUSH R1 ON STACK
    (1)  014000  105737  014212                    TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
    (1)  014004  001450                            BEQ     5$              ;;IF NOT:  BR
    (1)  014006  122737  000001  001210            CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
    (1)  014014  001031                            BNE     3$              ;;IF NOT:  BR
    (1)  014016  132737  000100  001211            BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
    (1)  014024  001425                            BEQ     3$              ;;IF NOT:  BR
    (1)  014026  017600  000004                    MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
    (1)  014032  062766  000002  000004            ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
    (1)  014040  005737  001170            1$:     TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
    (1)  014044  001375                            BNE     1$              ;;IF NOT:  WAIT
    (1)  014046  010037  001204                    MOV     R0,$MSGAD
    (1)                                 ;;PUT ADDR IN MAILBOX
    (1)  014052  105720                    2$:     TSTB    (R0)+           ;;FIND END OF MESSAGE
    (1)  014054  001376                            BNE     2$
    (1)  014056  163700  001204                    SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
    (1)  014062  006200                            ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
    (1)  014064  010037  001206                    MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
    (1)  014070  012737  000004  001170            MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
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(1)  014076  000413                          BR      5$
(1)  014100  017637  000004  014124  3$:     MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
(1)  014106  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
(3)  014114  013746  177776                  MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
(1)  014120  004737  013466                  JSR     PC,$TYPE        ;;CALL TYPE MACRO
(1)  014124  000000                  4$:     .WORD   0
(1)  014126                          5$:
(1)  014126  105737  014214          10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
(1)  014132  001416                          BEQ     12$             ;;IF NOT:  BR
(1)  014134  005737  001210                  TST     $ENV            ;;RUNNING UNDER APT?
(1)  014140  001413                          BEQ     12$             ;;IF NOT:  BR
(1)  014142  005737  001170          11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
(1)  014146  001375                          BNE     11$             ;;IF NOT:  WAIT
(1)  014150  017637  000004  001172          MOV     @4(SP),$FATAL   ;;GET ERROR #
(1)  014156  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
(1)  014164  005237  001170                  INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
(1)  014170  105037  014214          12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
(1)  014174  105037  014213                  CLRB    $LFLG           ;;CLEAR LOG FLAG
(1)  014200  105037  014212                  CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
(3)  014204  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
(3)  014206  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
(1)  014210  000207                          RTS     PC              ;;RETURN
(1)  014212     000                  $MFLG:  .BYTE   0               ;;MESSG. FLAG
(1)  014213     000                  $LFLG:  .BYTE   0
(1)                                          ;;LOG FLAG
(1)  014214     000                  $FFLG:  .BYTE   0               ;;FATAL FLAG
(1)          014216                          .EVEN
(1)          000200                  APTSIZE=200
(1)          000001                  APTENV=001
(1)          000100                  APTSPOOL=100
(1)          000040                  APTCSUP=040
7433                                 .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
(1)
(2)                                  ;;**********************************************************************
(1)                                  ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
(1)                                  ;*OCTAL (ASCII) NUMBER AND TYPE IT.
(1)                                  ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
(1)                                  ;*CALL:
(1)                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
(1)                                  ;*      TYPOS                   ;;CALL FOR TYPEOUT
(1)                                  ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
(1)                                  ;*      .BYTE   M               ;;M=1 OR 0
(1)                                  ;*                                      ;;1=TYPE LEADING ZEROS
(1)                                  ;*                                      ;;0=SUPPRESS LEADING ZEROS
(1)                                  ;*
(1)                                  ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
(1)                                  ;*$TYPOS OR $TYPOC
(1)                                  ;*CALL:
(1)                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
(1)                                  ;*      TYPON                   ;;CALL FOR TYPEOUT
(1)                                  ;*
(1)                                  ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
(1)                                  ;*CALL:
(1)                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
(1)                                  ;*      TYPOC                   ;;CALL FOR TYPEOUT
(1)
```

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   (1)  014216  017646  000000          $TYPOS: MOV     @(SP),-(SP)       ;;PICKUP THE MODE
   (1)  014222  116637  000001  014441          MOVB    1(SP),$OFILL      ;;LOAD ZERO FILL SWITCH
   (1)  014230  112637  014443                  MOVB    (SP)+,$OMODE+1    ;;NUMBER OF DIGITS TO TYPE
   (1)  014234  062716  000002                  ADD     #2,(SP)           ;;ADJUST RETURN ADDRESS
   (1)  014240  000406                          BR      $TYPON
   (1)  014242  112737  000001  014441  $TYPOC: MOVB    #1,$OFILL         ;;SET THE ZERO FILL SWITCH
   (1)  014250  112737  000006  014443          MOVB    #6,$OMODE+1       ;;SET FOR SIX(6) DIGITS
   (1)  014256  112737  000005  014440  $TYPON: MOVB    #5,$OCNT          ;;SET THE ITERATION COUNT
   (1)  014264  010346                          MOV     R3,-(SP)          ;;SAVE R3
   (1)  014266  010446                          MOV     R4,-(SP)          ;;SAVE R4
   (1)  014270  010546                          MOV     R5,-(SP)          ;;SAVE R5
   (1)  014272  113704  014443                  MOVB    $OMODE+1,R4       ;;GET THE NUMBER OF DIGITS TO TYPE
   (1)  014276  005404                          NEG     R4
   (1)  014300  062704  000006                  ADD     #6,R4             ;;SUBTRACT IT FOR MAX. ALLOWED
   (1)  014304  110437  014442                  MOVB    R4,$OMODE         ;;SAVE IT FOR USE
   (1)  014310  113704  014441                  MOVB    $OFILL,R4         ;;GET THE ZERO FILL SWITCH
   (1)  014314  016605  000012                  MOV     12(SP),R5         ;;PICKUP THE INPUT NUMBER
   (1)  014320  005003                          CLR     R3                ;;CLEAR THE OUTPUT WORD
   (1)  014322  006105                  1$:     ROL     R5                ;;ROTATE MSB INTO "C"
   (1)  014324  000404                          BR      3$                ;;GO DO MSB
   (1)  014326  006105                  2$:     ROL     R5                ;;FORM THIS DIGIT
   (1)  014330  006105                          ROL     R5
   (1)  014332  006105                          ROL     R5
   (1)  014334  010503                          MOV     R5,R3
   (1)  014336  006103                  3$:     ROL     R3                ;;GET LSB OF THIS DIGIT
   (1)  014340  105337  014442                  DECB    $OMODE            ;;TYPE THIS DIGIT?
   (1)  014344  100016                          BPL     7$                ;;BR IF NO
   (1)  014346  042703  177770                  BIC     #177770,R3        ;;GET RID OF JUNK
   (1)  014352  001002                          BNE     4$                ;;TEST FOR 0
   (1)  014354  005704                          TST     R4                ;;SUPPRESS THIS 0?
   (1)  014356  001403                          BEQ     5$                ;;BR IF YES
   (1)  014360  005204                  4$:     INC     R4                ;;DON'T SUPPRESS ANYMORE 0'S
   (1)  014362  052703  000060                  BIS     #'0,R3            ;;MAKE THIS DIGIT ASCII
   (1)  014366  052703  000040          5$:     BIS     #' ,R3            ;;MAKE ASCII IF NOT ALREADY
   (1)  014372  110337  014436                  MOVB    R3,8$             ;;SAVE FOR TYPING
   (1)  014376  104401  014436                  TYPE    ,8$               ;;GO TYPE THIS DIGIT
   (1)  014402  105337  014440          7$:     DECB    $OCNT             ;;COUNT BY 1
   (1)  014406  003347                          BGT     2$                ;;BR IF MORE TO DO
   (1)  014410  002402                          BLT     6$                ;;BR IF DONE
   (1)  014412  005204                          INC     R4                ;;INSURE LAST DIGIT ISN'T A BLANK
   (1)  014414  000744                          BR      2$                ;;GO DO THE LAST DIGIT
   (1)  014416  012605                  6$:     MOV     (SP)+,R5          ;;RESTORE R5
   (1)  014420  012604                          MOV     (SP)+,R4          ;;RESTORE R4
   (1)  014422  012603                          MOV     (SP)+,R3          ;;RESTORE R3
   (1)  014424  016666  000002  000004          MOV     2(SP),4(SP)       ;;SET THE STACK FOR RETURNING
   (1)  014432  012616                          MOV     (SP)+,(SP)
   (1)  014434  000002                          RTI                       ;;RETURN
   (1)  014436     000                  8$:     .BYTE   0                 ;;STORAGE FOR ASCII DIGIT
   (1)  014437     000                          .BYTE   0                 ;;TERMINATOR FOR TYPE ROUTINE
   (1)  014440     000          $OCNT:  .BYTE   0                 ;;OCTAL DIGIT COUNTER
   (1)  014441     000          $OFILL: .BYTE   0                 ;;ZERO FILL SWITCH
   (1)  014442  000000          $OMODE: .WORD   0                 ;;NUMBER OF DIGITS TO TYPE
7434                                    .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
   (1)
   (2)                                  ;;**********************************************************************
   (1)                                  ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
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(1)                                 ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT  DEPENDING ON WHETHER THE
(1)                                 ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
(1)                                 ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
(1)                                 ;*REPLACED WITH SPACES.
(1)                                 ;*CALL:
(1)                                 ;*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
(1)                                 ;*      TYPDS                   ;;GO TO THE ROUTINE
(1)
(1)   014444                        $TYPDS:
(3)   014444  010046                        MOV     R0,-(SP)        ;;PUSH R0 ON STACK
(3)   014446  010146                        MOV     R1,-(SP)        ;;PUSH R1 ON STACK
(3)   014450  010246                        MOV     R2,-(SP)        ;;PUSH R2 ON STACK
(3)   014452  010346                        MOV     R3,-(SP)        ;;PUSH R3 ON STACK
(3)   014454  010546                        MOV     R5,-(SP)        ;;PUSH R5 ON STACK
(1)   014456  012746  020200                MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
(1)   014462  016605  000020                MOV     20(SP),R5       ;;GET THE INPUT NUMBER
(1)   014466  100004                        BPL     1$              ;;BR IF INPUT IS POS.
(1)   014470  005405                        NEG     R5              ;;MAKE THE BINARY NUMBER POS.
(1)   014472  112766  000055  000001        MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
(1)   014500  005000                1$:     CLR     R0              ;;ZERO THE CONSTANTS INDEX
(1)   014502  012703  014660                MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
(1)   014506  112723  000040                MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
(1)   014512  005002                2$:     CLR     R2              ;;CLEAR THE BCD NUMBER
(1)   014514  016001  014650                MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
(1)   014520  160105                3$:     SUB     R1,R5           ;;FORM THIS BCD DIGIT
(1)   014522  002402                        BLT     4$              ;;BR IF DONE
(1)   014524  005202                        INC     R2              ;;INCREASE THE BCD DIGIT BY 1
(1)   014526  000774                        BR      3$
(1)   014530  060105                4$:     ADD     R1,R5           ;;ADD BACK THE CONSTANT
(1)   014532  005702                        TST     R2              ;;CHECK IF BCD DIGIT=0
(1)   014534  001002                        BNE     5$              ;;FALL THROUGH IF 0
(1)   014536  105716                        TSTB    (SP)            ;;STILL DOING LEADING 0'S?
(1)   014540  100407                        BMI     7$              ;;BR IF YES
(1)   014542  106316                5$:     ASLB    (SP)            ;;MSD?
(1)   014544  103003                        BCC     6$              ;;BR IF NO
(1)   014546  116663  000001  177777        MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
(1)   014554  052702  000060          6$:   BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
(1)   014560  052702  000040          7$:   BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
(1)   014564  110223                        MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
(1)   014566  005720                        TST     (R0)+           ;;JUST INCREMENTING
(1)   014570  020027  000010                CMP     R0,#10          ;;CHECK THE TABLE INDEX
(1)   014574  002746                        BLT     2$              ;;GO DO THE NEXT DIGIT
(1)   014576  003002                        BGT     8$              ;;GO TO EXIT
(1)   014600  010502                        MOV     R5,R2           ;;GET THE LSD
(1)   014602  000764                        BR      6$              ;;GO CHANGE TO ASCII
(1)   014604  105726                8$:     TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
(1)   014606  100003                        BPL     9$              ;;BR IF NO
(1)   014610  116663  177777  177776        MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
(1)   014616  105013                9$:     CLRB    (R3)            ;;SET THE TERMINATOR
(3)   014620  012605                        MOV     (SP)+,R5        ;;POP STACK INTO R5
(3)   014622  012603                        MOV     (SP)+,R3        ;;POP STACK INTO R3
(3)   014624  012602                        MOV     (SP)+,R2        ;;POP STACK INTO R2
(3)   014626  012601                        MOV     (SP)+,R1        ;;POP STACK INTO R1
(3)   014630  012600                        MOV     (SP)+,R0        ;;POP STACK INTO R0
(1)   014632  104401  014660                TYPE    ,$DBLK          ;;NOW TYPE THE NUMBER
(1)   014636  016666  000002  000004        MOV     2(SP),4(SP)     ;;ADJUST THE STACK
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   (1)  014644  012616                          MOV     (SP)+,(SP)
   (1)  014646  000002                          RTI                             ;;RETURN TO USER
   (1)  014650  023420                  $DTBL:  10000.
   (1)  014652  001750                          1000.
   (1)  014654  000144                          100.
   (1)  014656  000012                          10.
   (1)  014660  000004                  $DBLK:  .BLKW   4
  7435                                  .SBTTL  ERROR HANDLER ROUTINE
   (1)
   (2)                                  ;;**********************************************************************
   (1)                                  ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
   (1)                                  ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
   (1)                                  ;*AND GO TO SWRCK ON ERROR
   (1)                                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
   (1)                                  ;*SW15=1        HALT ON ERROR
   (1)                                  ;*SW13=1        INHIBIT ERROR TYPEOUTS
   (1)                                  ;*SW09=1        LOOP ON ERROR
   (1)                                  ;*CALL
   (1)                                  ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
   (1)
   (1)  014670                          $ERROR:
   (1)  014670  104407                          CKSWR                           ;;TEST FOR CHANGE IN SOFT-SWR
   (2)  014672  104407                          CKSWR                   ;GO LOOK FOR SWR CHANGE
   (1)  014674  105237  001103          7$:     INCB    $ERFLG                  ;;SET THE ERROR FLAG
   (1)  014700  001775                          BEQ     7$                      ;;DON'T LET THE FLAG GO TO ZERO
   (1)  014702  013777  001102  164232          MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
   (1)  014710  005237  001112                  INC     $ERTTL                  ;;INC THE ERROR COUNT
   (1)  014714  011637  001116                  MOV     (SP),$ERRPC             ;;GET ADDRESS OF ERROR INSTRUCTION
   (1)  014720  162737  000002  001116          SUB     #2,$ERRPC
   (1)  014726  117737  164164  001114          MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
   (1)  014734  032777  020000  164176          BIT     #BIT13,@SWR             ;;SKIP TYPEOUT IF SET
   (1)  014742  001004                          BNE     20$                     ;;SKIP TYPEOUTS
   (1)  014744  004737  015044                  JSR     PC,SWRCK                ;;GO TO USER ERROR ROUTINE
   (1)  014750  104401  001165                  TYPE    ,$CRLF
   (1)  014754                          20$:
   (1)  014754  122737  000001  001210          CMPB    #APTENV,$ENV            ;;RUNNING IN APT MODE
   (1)  014762  001007                          BNE     2$                      ;;NO,SKIP APT ERROR REPORT
   (1)  014764  113737  001114  014776          MOVB    $ITEMB,21$              ;;SET ITEM NUMBER AS ERROR NUMBER
   (1)  014772  004737  013766                  JSR     PC,$ATY4                ;;REPORT FATAL ERROR TO APT
   (1)  014776     000                  21$:    .BYTE   0
   (1)  014777     000                          .BYTE   0
   (1)  015000  000777                  22$:    BR      22$                     ;;APT ERROR LOOP
   (1)  015002  005777  164132          2$:     TST     @SWR                    ;;HALT ON ERROR
   (1)  015006  100002                          BPL     3$                      ;;SKIP IF CONTINUE
   (1)  015010  000000                          HALT                            ;;HALT ON ERROR!
   (1)  015012  104407                          CKSWR                           ;;TEST FOR CHANGE IN SOFT-SWR
   (1)  015014  032777  001000  164116  3$:     BIT     #BIT09,@SWR             ;;LOOP ON ERROR SWITCH SET?
   (1)  015022  001402                          BEQ     4$                      ;;BR IF NO
   (1)  015024  013716  001110                  MOV     $LPERR,(SP)             ;;FUDGE RETURN FOR LOOPING
   (1)  015030  005737  001162          4$:     TST     $ESCAPE                 ;;CHECK FOR AN ESCAPE ADDRESS
   (1)  015034  001402                          BEQ     5$                      ;;BR IF NONE
   (1)  015036  013716  001162                  MOV     $ESCAPE,(SP)    ;;FUDGE RETURN ADDRESS FOR ESCAPE
   (1)  015042                          5$:
   (1)  015042  000002                          RTI                             ;;RETURN
  7436                                  ;;**********************************************************************
  7437                                  ;GO TYPE ERROR
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 7438                                   ;GO UPDATE SOFTWARE SWR IF 'CNTRL/G'
 7439                                   ;;*****************************************************************
 7440  015044  113737  001102  001362  SWRCK:  MOVB    $TSTNM,TSTNUM   ;SET UP TEST # ON ER
 7441  015052  004737  015062          JSR     PC,$ERRTYP      ;GO TYPE ERROR
 7442  015056  104407                  CKSWR                   ;GO LOOK FOR SWR CHANGE
 7443  015060  000207                  RTS     PC              ;RETURN TO ERROR HANDLER
 7444                                  .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE
  (1)                                   
  (2)                                   ;;*****************************************************************
  (1)                                   ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
  (1)                                   ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE "ERROR TABLE" ($ERRTB),
  (1)                                   ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.
  (1)                                   
  (1)  015062                           $ERRTYP:
  (1)  015062  104401  001165                   TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
  (1)  015066  010046                           MOV     R0,-(SP)        ;;SAVE R0
  (1)  015070  005000                           CLR     R0              ;;PICKUP THE ITEM INDEX
  (1)  015072  153700  001114                   BISB    @#$ITEMB,R0
  (1)  015076  001004                           BNE     1$              ;;IF ITEM NUMBER IS ZERO, JUST
  (1)                                                                   ;;TYPE THE PC OF THE ERROR
  (2)  015100  013746  001116                   MOV     $ERRPC,-(SP)    ;;SAVE $ERRPC FOR TYPEOUT
  (2)                                                                   ;;ERROR ADDRESS
  (2)  015104  104402                           TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
  (1)  015106  000426                           BR      6$              ;;GET OUT
  (1)  015110  005300                   1$:     DEC     R0              ;;ADJUST THE INDEX SO THAT IT WILL
  (1)  015112  006300                           ASL     R0              ;;      WORK FOR THE ERROR TABLE
  (1)  015114  006300                           ASL     R0
  (1)  015116  006300                           ASL     R0
  (1)  015120  062700  001252                   ADD     #$ERRTB,R0      ;;FORM TABLE POINTER
  (1)  015124  012037  015134                   MOV     (R0)+,2$        ;;PICKUP "ERROR MESSAGE" POINTER
  (1)  015130  001404                           BEQ     3$              ;;SKIP TYPEOUT IF NO POINTER
  (1)  015132  104401                           TYPE                    ;;TYPE THE "ERROR MESSAGE"
  (1)  015134  000000                   2$:     .WORD   0               ;;"ERROR MESSAGE" POINTER GOES HERE
  (1)  015136  104401  001165                   TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
  (1)  015142  012037  015152           3$:     MOV     (R0)+,4$        ;;PICKUP "DATA HEADER" POINTER
  (1)  015146  001404                           BEQ     5$              ;;SKIP TYPEOUT IF 0
  (1)  015150  104401                           TYPE                    ;;TYPE THE "DATA HEADER"
  (1)  015152  000000                   4$:     .WORD   0               ;;"DATA HEADER" POINTER GOES HERE
  (1)  015154  104401  001165                   TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
  (1)  015160  011000                   5$:     MOV     (R0),R0         ;;PICKUP "DATA TABLE" POINTER
  (1)  015162  001004                           BNE     7$              ;;GO TYPE THE DATA
  (1)  015164  012600                   6$:     MOV     (SP)+,R0        ;;RESTORE R0
  (1)                                   
  (1)  015166  104401  001165                   TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
  (1)  015172  000207                           RTS     PC              ;;RETURN
  (1)  015174                           7$:
  (2)  015174  013046                           MOV     @(R0)+,-(SP)    ;;SAVE @(R0)+ FOR TYPEOUT
  (2)  015176  104402                           TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
  (1)  015200  005710                           TST     (R0)            ;;IS THERE ANOTHER NUMBER?
  (1)  015202  001770                           BEQ     6$              ;;BR IF NO
  (1)  015204  104401  015212                   TYPE    ,8$             ;;TYPE TWO(2) SPACES
  (1)  015210  000771                           BR      7$              ;;LOOP
  (1)  015212  020040      000          8$:     .ASCIZ  /  /            ;;TWO(2) SPACES
  (1)          015216                           .EVEN
 7445                                   .SBTTL  SCOPE HANDLER ROUTINESTARS
  (1)                                   ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
```

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(1)                                     ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
(1)                                     ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
(1)                                     ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
(1)                                     ;*SW14=1        LOOP ON TEST
(1)                                     ;*SW11=1        INHIBIT ITERATIONS
(1)                                     ;*SW09=1        LOOP ON ERROR
(1)                                     ;*SW08=1        LOOP ON TEST IN SWR<7:0>
(1)                                     ;*CALL
(1)                                     ;*      SCOPE           ;;SCOPE=IOT
(1)
(1)  015216                             $SCOPE:
(1)  015216  104407                             CKSWR                           ;;TEST  FOR CHANGE IN SOFT-SWR
(1)  015220  032777  040000  163712     1$:     BIT     #BIT14,@SWR             ;;LOOP ON PRESENT TEST?
(1)  015226  001114                             BNE     $OVER                   ;;YES IF SW14=1
(1)                                     ;#####START OF CODE FOR THE XOR TESTER#####
(1)  015230  000416                     $XTSTR: BR      6$                      ;;IF RUNNING ON THE "XOR" TESTER CHANGE
(1)                                                                             ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
(1)  015232  013746  000004                     MOV     @#ERRVEC,-(SP)          ;;SAVE THE CONTENTS OF THE ERROR VECTOR
(1)  015236  012737  015256  000004             MOV     #5$,@#ERRVEC            ;;SET FOR TIMEOUT
(1)  015244  005737  177060                     TST     @#177060                ;;TIME OUT ON XOR?
(1)  015250  012637  000004                     MOV     (SP)+,@#ERRVEC          ;;RESTORE THE ERROR VECTOR
(1)  015254  000463                             BR      $SVLAD                  ;;GO TO THE NEXT TEST
(1)  015256  022626                     5$:     CMP     (SP)+,(SP)+             ;;CLEAR THE STACK AFTER A TIME OUT
(1)  015260  012637  000004                     MOV     (SP)+,@#ERRVEC          ;;RESTORE THE ERROR VECTOR
(1)  015264  000423                             BR      7$                      ;;LOOP ON THE PRESENT TEST
(1)  015266                             6$:;#####END OF CODE FOR THE XOR TESTER#####
(1)  015266  032777  000400  163644             BIT     #BIT08,@SWR             ;;LOOP ON SPEC. TEST?
(1)  015274  001404                             BEQ     2$                      ;;BR IF NO
(1)  015276  127737  163636  001102             CMPB    @SWR,$TSTNM             ;;ON THE RIGHT TEST?    SWR<7:0>
(1)  015304  001465                             BEQ     $OVER                   ;;BR IF YES
(1)  015306  105737  001103             2$:     TSTB    $ERFLG                  ;;HAS AN ERROR OCCURRED?
(1)  015312  001421                             BEQ     3$                      ;;BR IF NO
(1)  015314  123737  001115  001103             CMPB    $ERMAX,$ERFLG           ;;MAX. ERRORS FOR THIS TEST OCCURRED?
(1)  015322  101015                             BHI     3$                      ;;BR IF NO
(1)  015324  032777  001000  163606             BIT     #BIT09,@SWR             ;;LOOP ON ERROR?
(1)  015332  001404                             BEQ     4$                      ;;BR IF NO
(1)  015334  013737  001110  001106     7$:     MOV     $LPERR,$LPADR           ;;SET LOOP ADDRESS TO LAST SCOPE
(1)  015342  000446                             BR      $OVER
(1)  015344  105037  001103             4$:     CLRB    $ERFLG                  ;;ZERO THE ERROR FLAG
(1)  015350  005037  001160                     CLR     $TIMES                  ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
(1)  015354  000415                             BR      1$                      ;;ESCAPE TO THE NEXT TEST
(1)  015356  032777  004000  163554     3$:     BIT     #BIT11,@SWR             ;;INHIBIT ITERATIONS?
(1)  015364  001011                             BNE     1$                      ;;BR IF YES
(1)  015366  005737  001176                     TST     $PASS                   ;;IF FIRST PASS OF PROGRAM
(1)  015372  001406                             BEQ     1$                      ;;      INHIBIT ITERATIONS
(1)  015374  005237  001104                     INC     $ICNT                   ;;INCREMENT ITERATION COUNT
(1)  015400  023737  001160  001104             CMP     $TIMES,$ICNT            ;;CHECK THE NUMBER OF ITERATIONS MADE
(1)  015406  002024                             BGE     $OVER                   ;;BR IF MORE ITERATION REQUIRED
(1)  015410  012737  000001  001104     1$:     MOV     #1,$ICNT                ;;REINITIALIZE THE ITERATION COUNTER
(1)  015416  013737  015474  001160             MOV     $MXCNT,$TIMES           ;;SET NUMBER OF ITERATIONS TO DO
(1)  015424  105237  001102             $SVLAD: INCB    $TSTNM                  ;;COUNT TEST NUMBERS
(1)  015430  113737  001102  001174             MOVB    $TSTNM,$TESTN           ;;SET TEST NUMBER IN APT MAILBOX
(1)  015436  011637  001106                     MOV     (SP),$LPADR             ;;SAVE SCOPE LOOP ADDRESS
(1)  015442  011637  001110                     MOV     (SP),$LPERR             ;;SAVE ERROR LOOP ADDRESS
(1)  015446  005037  001162                     CLR     $ESCAPE                 ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
(1)  015452  112737  000001  001115             MOVB    #1,$ERMAX               ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
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   (1)  015460  013777  001102  163454  $OVER:  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
   (1)  015466  013716  001106                  MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
   (1)  015472  000002                          RTI                     ;;FIXES PS
   (1)  015474  000062                  $MXCNT: 50.                     ;;MAX. NUMBER OF ITERATIONS
  7446                                  .SBTTL  TTY INPUT ROUTINE
   (1)
   (2)                                  ;;**************************************************************************
   (1)
   (1)
   (1)                                  .ENABL  LSB
   (1)
   (2)                                  ;;**************************************************************************
   (1)                                  ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
   (1)                                  ;*ROUTINE IS ENTERED FROM THE TRAP HANDLER, AND WILL
   (1)                                  ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP CALL
   (1)                                  ;*WHEN OPERATING IN TTY FLAG MODE.
   (1)  015476  022737  000176  001140  $CKSWR: CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED?
   (1)  015504  001074                          BNE     15$             ;;BRANCH IF NO
   (1)  015506  105777  163432                  TSTB    @$TKS           ;;CHAR THERE?
   (1)  015512  100071                          BPL     15$             ;;IF NO, DON'T WAIT AROUND
   (1)  015514  117746  163426                  MOVB    @$TKB,-(SP)     ;;SAVE THE CHAR
   (1)  015520  042716  177600                  BIC     #^C177,(SP)     ;;STRIP-OFF THE ASCII
   (1)  015524  022726  000007                  CMP     #7,(SP)+        ;;IS IT A CONTROL G?
   (1)  015530  001062                          BNE     15$             ;;NO, RETURN TO USER
   (1)  015532  123727  001134  000001          CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
   (1)  015540  001456                          BEQ     15$             ;;BRANCH IF YES
   (1)
   (1)  015542  104401  016223                  TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (^G)
   (1)  015546  104401  016230          $GTSWR: TYPE    ,$MSWR          ;;TYPE CURRENT CONTENTS
   (2)  015552  013746  000176                  MOV     SWREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
   (2)  015556  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
   (1)  015560  104401  016241                  TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
   (1)  015564  005046                  19$:    CLR     -(SP)           ;;CLEAR COUNTER
   (1)  015566  005046                          CLR     -(SP)
   (1)                                          ;;THE NEW SWR
   (1)  015570  105777  163350          7$:     TSTB    @$TKS           ;;CHAR THERE?
   (1)  015574  100375                          BPL     7$              ;;IF NOT TRY AGAIN
   (1)
   (1)  015576  117746  163344                  MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
   (1)  015602  042716  177600                  BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
   (1)
   (1)
   (1)
   (1)  015606  021627  000025          9$:     CMP     (SP),#25        ;;IS IT A CONTROL-U?
   (1)  015612  001005                          BNE     10$             ;;BRANCH IF NOT
   (1)  015614  104401  016216                  TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (^U)
   (1)  015620  062706  000006          20$:    ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
   (1)  015624  000757                          BR      19$             ;;LET'S TRY IT AGAIN
   (1)
   (1)
   (1)  015626  021627  000015          10$:    CMP     (SP),#15        ;;IS IT A <CR>?
   (1)  015632  001022                          BNE     16$             ;;BRANCH IF NO
   (1)  015634  005766  000004                  TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
   (1)  015640  001403                          BEQ     11$             ;;BRANCH IF YES
   (1)  015642  016677  000002  163270          MOV     2(SP),@SWR      ;;SAVE NEW SWR
   (1)  015650  062706  000006          11$:    ADD     #6,SP           ;;CLEAR UP STACK
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(1)  015654  104401  001165            14$:    TYPE    ,$CRLF          ;;ECHO <CR> AND <LF>
(1)  015660  123727  001135  000001              CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
(1)  015666  001003                              BNE     15$             ;;BRANCH IF NOT
(1)  015670  012777  000100  163246              MOV     #100,@$TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
(1)  015676  000002                      15$:    RTI                     ;;RETURN
(1)  015700  004737  013700              16$:    JSR     PC,$TYPEC       ;;ECHO CHAR
(1)  015704  021627  000060                      CMP     (SP),#60        ;;CHAR < 0?
(1)  015710  002420                              BLT     18$             ;;BRANCH IF YES
(1)  015712  021627  000067                      CMP     (SP),#67        ;;CHAR > 7?
(1)  015716  003015                              BGT     18$             ;;BRANCH IF YES
(1)  015720  042726  000060                      BIC     #60,(SP)+       ;;STRIP-OFF ASCII
(1)  015724  005766  000002                      TST     2(SP)           ;;IS THIS THE FIRST CHAR
(1)  015730  001403                              BEQ     17$             ;;BRANCH IF YES
(1)  015732  006316                              ASL     (SP)            ;;NO, SHIFT PRESENT
(1)  015734  006316                              ASL     (SP)            ;;    CHAR OVER TO MAKE
(1)  015736  006316                              ASL     (SP)            ;;    ROOM FOR NEW ONE.
(1)  015740  005266  000002              17$:    INC     2(SP)           ;;KEEP COUNT OF CHAR
(1)  015744  056616  177776                      BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
(1)  015750  000707                              BR      7$              ;;GET THE NEXT ONE
(1)  015752  104401  001164              18$:    TYPE    ,$QUES          ;;TYPE ?<CR><LF>
(1)  015756  000720                              BR      20$             ;;SIMULATE CONTROL-U
(1)                                       .DSABL  LSB
(1)
(1)
(2)                                       ;;**********************************************************************
(1)                                       ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
(1)                                       ;*CALL:
(1)                                       ;*      RDCHR                   ;;INPUT A SINGLE CHARACTER FROM THE TTY
(1)                                       ;*      RETURN HERE             ;;CHARACTER IS ON THE STACK
(1)                                       ;*                              ;;WITH PARITY BIT STRIPPED OFF
(1)                                       ;
(1)
(1)  015760  011646              $RDCHR: MOV     (SP),-(SP)      ;;PUSH DOWN THE PC
(1)  015762  016666  000004  000002      MOV     4(SP),2(SP)     ;;SAVE THE PS
(1)  015770  105777  163150      1$:     TSTB    @$TKS           ;;WAIT FOR
(1)  015774  100375                      BPL     1$              ;;A CHARACTER
(1)  015776  117766  163144  000004      MOVB    @$TKB,4(SP)     ;;READ THE TTY
(1)  016004  042766  177600  000004      BIC     #^C<177>,4(SP)  ;;GET RID OF JUNK IF ANY
(1)  016012  026627  000004  000023      CMP     4(SP),#23       ;;IS IT A CONTROL-S?
(1)  016020  001013                      BNE     3$              ;;BRANCH IF NO
(1)  016022  105777  163116      2$:     TSTB    @$TKS           ;;WAIT FOR A CHARACTER
(1)  016026  100375                      BPL     2$              ;;LOOP UNTIL ITS THERE
(1)  016030  117746  163112              MOVB    @$TKB,-(SP)     ;;GET CHARACTER
(1)  016034  042716  177600              BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
(1)  016040  022627  000021              CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
(1)  016044  001366                      BNE     2$              ;;IF NOT DISCARD IT
(1)  016046  000750                      BR      1$              ;;YES, RESUME
(1)  016050  026627  000004  000140  3$:  CMP     4(SP),#140      ;;IS IT UPPER CASE?
(1)  016056  002407                      BLT     4$              ;;BRANCH IF YES
(1)  016060  026627  000004  000175      CMP     4(SP),#175      ;;IS IT A SPECIAL CHAR?
(1)  016066  003003                      BGT     4$              ;;BRANCH IF YES
(1)  016070  042766  000040  000004      BIC     #40,4(SP)       ;;MAKE IT UPPER CASE
(1)  016076  000002              4$:     RTI                     ;;GO BACK TO USER
(2)                                       ;;**********************************************************************
(1)                                       ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
(1)                                       ;*CALL:
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   (1)                                  ;*      RDLIN                   ;;INPUT A STRING FROM THE TTY
   (1)                                  ;*      RETURN HERE             ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
   (1)                                  ;*                              ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
   (1)
   (1)  016100  010346                  $RDLIN: MOV     R3,-(SP)        ;;SAVE R3
   (1)  016102  012703  016206          1$:     MOV     #$TTYIN,R3      ;;GET ADDRESS
   (1)  016106  022703  016216          2$:     CMP     #$TTYIN+8.,R3   ;;BUFFER FULL?
   (1)  016112  101405                          BLOS    4$              ;;BR IF YES
   (1)  016114  104410                          RDCHR                   ;;GO READ ONE CHARACTER FROM THE TTY
   (1)  016116  112613                          MOVB    (SP)+,(R3)      ;;GET CHARACTER
   (1)  016120  122713  000177          10$:    CMPB    #177,(R3)       ;;IS IT A RUBOUT
   (1)  016124  001003                          BNE     3$              ;;SKIP IF NOT
   (1)  016126  104401  001164          4$:     TYPE    ,$QUES          ;;TYPE A '?'
   (1)  016132  000763                          BR      1$              ;;CLEAR THE BUFFER AND LOOP
   (1)  016134  111337  016204          3$:     MOVB    (R3),9$         ;;ECHO THE CHARACTER
   (1)  016140  104401  016204                  TYPE    ,9$
   (1)  016144  122723  000015                  CMPB    #15,(R3)+       ;;CHECK FOR RETURN
   (1)  016150  001356                          BNE     2$              ;;LOOP IF NOT RETURN
   (1)  016152  105063  177777                  CLRB    -1(R3)          ;;CLEAR RETURN (THE 15)
   (1)  016156  104401  001166                  TYPE    ,$LF            ;;TYPE A LINE FEED
   (1)  016162  012603                          MOV     (SP)+,R3        ;;RESTORE R3
   (1)  016164  011646                          MOV     (SP),-(SP)      ;;ADJUST THE STACK AND PUT ADDRESS OF THE
   (1)  016166  016666  000004  000002          MOV     4(SP),2(SP)     ;;      FIRST ASCII CHARACTER ON IT
   (1)  016174  012766  016206  000004          MOV     #$TTYIN,4(SP)
   (1)  016202  000002                          RTI                     ;;RETURN
   (1)  016204     000          9$:     .BYTE   0                       ;;STORAGE FOR ASCII CHAR. TO TYPE
   (1)  016205     000                  .BYTE   0                       ;;TERMINATOR
   (1)  016206  000010          $TTYIN: .BLKB   8.                      ;;RESERVE 8 BYTES FOR TTY INPUT
   (1)  016216  052536  005015     000  $CNTLU: .ASCIZ  /^U/<15><12>    ;;CONTROL "U"
   (1)  016223     136  006507  000012  $CNTLG: .ASCIZ  /^G/<15><12>    ;;CONTROL "G"
   (1)  016230  005015  053523  020122  $MSWR:  .ASCIZ  <15><12>/SWR = /
   (1)  016236  020075     000
   (1)  016241     040  047040  053505  $MNEW:  .ASCIZ  /  NEW = /
   (1)  016246  036440  000040
7447                                    .SBTTL  POWER DOWN AND UP ROUTINES
   (1)
   (2)                                  ;;*****************************************************************
   (1)                                  ;POWER DOWN ROUTINE
   (1)  016252  012737  016416  000024  $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
   (1)  016260  012737  000300  000026          MOV     #PR6,@#PWRVEC+2 ;;PRIO:6
   (3)  016266  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
   (3)  016270  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
   (3)  016272  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
   (3)  016274  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
   (3)  016276  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
   (3)  016300  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
   (3)  016302  017746  162632                  MOV     @SWR,-(SP)      ;;PUSH @SWR ON STACK
   (1)  016306  010637  016422                  MOV     SP,$SAVR6       ;;SAVE SP
   (1)  016312  012737  016324  000024          MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
   (1)  016320  000000                          HALT
   (1)  016322  000776                          BR      .-2             ;;HANG UP
   (1)
   (2)                                  ;;*****************************************************************
   (1)                                  ;POWER UP ROUTINE
   (1)  016324  012737  016416  000024  $PWRUP: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST DOWN
   (1)  016332  013706  016422                  MOV     $SAVR6,SP       ;;GET SP
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   (1)  016336  005037  016422                 CLR     $SAVR6           ;;WAIT LOOP FOR THE TTY
   (1)  016342  005237  016422          1$:    INC     $SAVR6           ;;WAIT FOR THE INC
   (1)  016346  001375                         BNE     1$               ;;CF  WORD
   (3)  016350  012677  162564                 MOV     (SP)+,@SWR       ;;POP STACK INTO @SWR
   (3)  016354  012605                         MOV     (SP)+,R5         ;;POP STACK INTO R5
   (3)  016356  012604                         MOV     (SP)+,R4         ;;POP STACK INTO R4
   (3)  016360  012603                         MOV     (SP)+,R3         ;;POP STACK INTO R3
   (3)  016362  012602                         MOV     (SP)+,R2         ;;POP STACK INTO R2
   (3)  016364  012601                         MOV     (SP)+,R1         ;;POP STACK INTO R1
   (3)  016366  012600                         MOV     (SP)+,R0         ;;POP STACK INTO R0
   (1)  016370  012737  016252  000024         MOV     #$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
   (1)  016376  012737  000300  000026         MOV     #PR6,@#PWRVEC+2  ;;PRIO:6
   (1)  016404  104401                         TYPE                     ;;REPORT THE POWER FAILURE
   (1)  016406  016424                $PWRMG:  .WORD   PWRMSG           ;;POWER FAIL MESSAGE POINTER
   (1)  016410  012716                         MOV     (PC)+,(SP)       ;;RESTART AT START1
   (1)  016412  001766                $PWRAD:  .WORD   START1           ;;RESTART ADDRESS
   (1)  016414  000002                         RTI
   (1)  016416  000000                $ILLUP:  HALT                     ;;THE POWER UP SEQUENCE WAS STARTED
   (1)  016420  000776                         BR      .-2              ;; BEFORE THE POWER DOWN WAS COMPLETE
   (1)  016422  000000                $SAVR6:  0                        ;;PUT THE SP HERE
 7448   016424  005015  042522  052123 PWRMSG:  .ASCIZ  <15><12>/RESTARTED FROM PWR FAIL/
        016432  051101  042524  020104
        016440  051106  046517  050040
        016446  051127  043040  044501
        016454  000114
 7449                               .EVEN
 7450                               .SBTTL  TRAP DECODER
   (1)
   (2)                              ;;**************************************************************************
   (1)                              ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
   (1)                              ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
   (1)                              ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
   (1)                              ;*GO TO THAT ROUTINE.
   (1)
   (1)  016456  010046              $TRAP:  MOV     R0,-(SP)          ;;SAVE R0
   (1)  016460  016600  000002              MOV     2(SP),R0          ;;GET TRAP ADDRESS
   (1)  016464  005740                      TST     -(R0)             ;;BACKUP BY 2
   (1)  016466  111000                      MOVB    (R0),R0           ;;GET RIGHT BYTE OF TRAP
   (1)  016470  006300                      ASL     R0                ;;POSITION FOR INDEXING
   (1)  016472  016000  016512              MOV     $TRPAD(R0),R0     ;;INDEX TO TABLE
   (1)  016476  000200                      RTS     R0                ;;GO TO ROUTINE
   (1)
   (1)
   (1)                              ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
   (1)
   (1)  016500  011646              $TRAP2: MOV     (SP),-(SP)        ;;MOVE THE PC DOWN
   (1)  016502  016666  000004  000002      MOV     4(SP),2(SP)       ;;MOVE THE PSW DOWN
   (1)  016510  000002                      RTI                       ;;RESTORE THE PSW
   (1)
   (3)                              .SBTTL  TRAP TABLE
   (3)
   (3)                              ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
   (3)                              ;*BY THE "TRAP" INSTRUCTION.
   (3)
   (3)                              ;       ROUTINE
   (3)                              ;       -------
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   (3)  016512  016500                  $TRPAD: .WORD   $TRAP2
   (3)  016514  013466                          $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
   (3)  016516  014242                          $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
   (3)  016520  014216                          $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
   (3)  016522  014256                          $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
   (3)  016524  014444                          $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)
   (1)
   (3)  016526  015546                          $GTSWR  ;;CALL=GTSWR    TRAP+6(104406)  GET SOFT-SWR SETTING
   (1)
   (3)  016530  015476                          $CKSWR  ;;CALL=CKSWR    TRAP+7(104407)  TEST FOR CHANGE IN SOFT-SWR
   (3)  016532  015760                          $RDCHR  ;;CALL=RDCHR    TRAP+10(104410) TTY TYPEIN CHARACTER ROUTINE
   (3)  016534  016100                          $RDLIN  ;;CALL=RDLIN    TRAP+11(104411) TTY TYPEIN STRING ROUTINE
 7451
 7452                                  .SBTTL  ASCII MESSAGES
 7453                                  ;;GPA TITLED:   .ASCIZ  <15><12>/CNDRCA  DRV11J DIAG TEST PART 1  /<15><12>
 7454  016536  005015  047103  051104  TITLED: .ASCIZ  <15><12>/CNDRCA  DRV11J DIAG TEST PART 1  /<15><12> ;;GPA
       016544  040503  020040  051104
       016552  030526  045061  042040
       016560  040511  020107  042524
       016566  052123  050040  051101
       016574  020124  020061  006440
       016602  000012
 7455  016604  005015  051104  030526  TLCABL: .ASCIZ  <15><12>/DRV11J CABLE REQ'D/<15><12>
       016612  045061  041440  041101
       016620  042514  051040  050505
       016626  042047  005015     000
 7456
 7457  016633     122  043505  052040  EM1:    .ASCIZ  /REG TIMEOUT ER/
       016640  046511  047505  052125
       016646  042440  000122
 7458  016652  042522  020107  042522  EM2:    .ASCIZ  'REG READ/WRITE ER'
       016660  042101  053457  044522
       016666  042524  042440  000122
 7459  016674  051111  020122  042522  EM3:    .ASCIZ  /IRR REG ER/
       016702  020107  051105     000
 7460  016707     101  051103  051040  EM4:    .ASCIZ  /ACR REG ER/
       016714  043505  042440  000122
 7461  016722  046511  020122  042522  EM5:    .ASCIZ  /IMR REG ER/
       016730  020107  051105     000
 7462  016735     111  051123  051040  EM6:    .ASCIZ  /ISR REG ER/
       016742  043505  042440  000122
 7463  016750  044103  050111  051440  EM7:    .ASCIZ  /CHIP STAT ER/
       016756  040524  020124  051105
       016764     000
 7464  016765     105  051122  041520  DH1:    .ASCIZ  /ERRPC   TSTNUM  BUSADR  EXPCT   RCVD/
       016772  020040  052040  052123
       017000  052516  020115  041040
       017006  051525  042101  020122
       017014  042440  050130  052103
       017022  020040  051040  053103
       017030  000104
 7465  017032  051105  050122  020103  DH2:    .ASCIZ  /ERRPC   TSTNUM  BUSADR  ADRS    EXPCT   RCVD/
       017040  020040  051524  047124
       017046  046525  020040  052502
       017054  040523  051104  020040
       017062  042101  051522  020040
```

```
        017070  020040  054105  041520
        017076  020124  020040  041522
        017104  042126     000
 7466
 7467           017110                          .EVEN
 7468   017110  001116  001362  001122  DT1:    $ERRPC,TSTNUM,$BDADR,$GDDAT,$BDDAT,0
        017116  001124  001126  000000
 7469   017124  001116  001362  001122  DT2:    $ERRPC,TSTNUM,$BDADR,$GDADR,$GDDAT,$BDDAT,0
        017132  001120  001124  001126
        017140  000000
```

```
7558                                    ;THE FOLLOWING .INIT CALL WAS ADDED TO INITIALIZE ODT
7559                                    ;VECTOR AND LKVEC.
7560           017142                   POINT=.                 ;SAVE POINTER
 (1)           000100                   .=100
 (1)  000100   017142                   $CLKVEC                 ;LKVEC  HANDLER
 (1)  000102   000300                   300                     ;INTERRUPT HANDLER PRI
 (1)           000140                   .=140                   ;BRKVEC
 (1)  000140   170000                   170000                  ;ODT START ADDRESS
 (1)  000142   000300                   300                     ;PRIORITY
 (1)           017142                   .=POINT                 ;RESTORE POINTER
 (1)  017142   104401  017150           $CLKVEC:       TYPE,CLKMES
 (1)  017146   000000                                  HALT
 (1)  017150   005015  045514  042526   CLKMES:  .ASCIZ <15><12>/LKVEC INTERRUPT - DISCONNECT LTC /
 (1)  017156   020103  047111  042524
 (1)  017164   051122  050125  020124
 (1)  017172   020055  044504  041523
 (1)  017200   047117  042516  052103
 (1)  017206   046040  041524  000040
7561                                    ;THE FOLLOWING FLAG WAS ADDED TO INDICATE IT IS FALCON
7562  017214   000001                   KXTFLAG:1
7563           000001                          .END
```

```
ABASE = 174160           5694#   5743    5791    5792    5793    5794    5795    5796    5797    5798
ACDW1 = 000000           5743
ACDW2 = 000000           5743
ACPUOP= 000000           5743
ACRLOC  001400           5810#
ADDW0 = 000000           5743
ADDW1 = 000000           5743
ADDW10= 000000           5743
ADDW11= 000000           5743
ADDW12= 000000           5743
ADDW13= 000000           5743
ADDW14= 000000           5743
ADDW15= 000000           5743
ADDW2 = 000000           5743
ADDW3 = 000000           5743
ADDW4 = 000000           5743
ADDW5 = 000000           5743
ADDW6 = 000000           5743
ADDW7 = 000000           5743
ADDW8 = 000000           5743
ADDW9 = 000000           5743
ADEVCT= 000000           5743
ADEVM = 000001           5695#   5743
AENV  = 000000           5743
AENVM = 000000           5743
AFATAL= 000000           5743
AMADR1= 000000           5743
AMADR2= 000000           5743
AMADR3= 000000           5743
AMADR4= 000000           5743
AMAMS1= 000000           5743
AMAMS2= 000000           5743
AMAMS3= 000000           5743
AMAMS4= 000000           5743
AMSGAD= 000000           5743
AMSGLG= 000000           5743
AMSGTY= 000000           5743
AMTYP1= 000000           5743
AMTYP2= 000000           5743
AMTYP3= 000000           5743
AMTYP4= 000000           5743
APASS = 000000           5743
APRIOR= 000000           5743
APTCSU= 000040           7431    7432#
APTENV= 000001           7431    7432#   7435
APTSIZ= 000200           5814    7432#
APTSPO= 000100           7431    7432#
ASWREG= 000000           5743
ATESTN= 000000           5743
AUNIT = 000000           5743
AUSWR = 000000           5743
AVECT1= 000000           5743
AVECT2= 000000           5743
BEGPAT  013164           6068    6087    6107    6127    6218    6273    6325    6379    6596    6621    7012    7140    7194
                         7327#
BGCHP2  013226           7344#
```

```
BGCHP3  013266           6715    6815    7361#
BGCHP4  013330           6686    6786    6871    7378#
BGPAT1  013166           6952    7328#
BIT0  = 000001           5693#   5898    5920    5931    5953    5975    5994    6006    6028    6041    6060    6073    6092
                         6112    6132    6153    6188    6223    6227    6255    6278    6282    6307    6330    6334    6362
                         6384    6388    6413    6953    7013    7014    7074    7075    7141    7142    7199    7200    7232
                         7233    7254    7255    7314
BIT00 = 000001           5693#
BIT01 = 000002           5693#
BIT02 = 000004           5693#
BIT03 = 000010           5693#
BIT04 = 000020           5693#
BIT05 = 000040           5693#
BIT06 = 000100           5693#
BIT07 = 000200           5693#
BIT08 = 000400           5693#   7445
BIT09 = 001000           5693#   7435    7445
BIT1  = 000002           5693#   5953
BIT10 = 002000           5693#
BIT11 = 004000           5693#   7445
BIT12 = 010000           5693#
BIT13 = 020000           5693#   7435
BIT14 = 040000           5693#   7445
BIT15 = 100000           5693#   5696
BIT2  = 000004           5693#
BIT3  = 000010           5693#
BIT4  = 000020           5693#
BIT5  = 000040           5693#
BIT6  = 000100           5693#   5897    5912    5919    5933    5940    5960    6013    6230    6344
BIT7  = 000200           5693#   5897    5905    5912    5919    5933    5940    5960    6005    6013    6020    6027    6174
                         6202    6230    6237    6337    6344
BIT8  = 000400           5693#   5697
BIT9  = 001000           5693#   5698    5933
BPTVEC= 000014           5693#
BRKVEC= 000140           5693#
CHPISR= 000140           5714#
CIMR  = 000040           5704#   6648    6667    6719    6910
CIRMR = 000020           5701#   6847    6956    7021    7022    7081    7082    7149    7150    7204    7205
CIRR  = 000100           5709#   6767    6819
CISR  = 000160           5715#
CKSWR = 104407           7435    7442    7445    7450#
CLKMES  017150           7560#
CLRCSR  013056           5928    5949    5970    6001    6036    6067    6086    6106    6126    6147    6182    6217    6272
                         6324    6378    6429    6459    6547    6591    6616    6641    6660    6680    6709    6737    6758
                         6779    6808    6837    6864    6899    6936    6945    7006    7064    7126    7134    7193    7229
                         7251    7296#
CLRIRR  013126           6433    6463    6504    6551    6741    6762    6784    6813    6841    6869    6905    6941    7311#
CR    = 000015           5693#   7431
CRLF  = 000200           5693#   7431
CSIMR = 000050           5705#   6688
CSIRMR= 000030           5702#   6872
CSIRR = 000110           5710#   6788
CSISR = 000170           5716#
DDISP = 177570           5693#   5743    5814
DH1     016765           5746    5752    5758    5764    5770    5776    5783    7464#
DH2     017032           7465#
```

```
DIR    = 000400            5697#   5897    5974    6005    6040    6230    6285    6337    6391
DISPLA  001142             5743#   5814*   7435*   7445*
DISPRE  000174             5732#   5814
DMAP    001364             5804#   5855*   5856*   5859    7279*   7283
DRCSA   001342             5791#   5858*   5862    5878    5891    5929    5950    6003    6070    6220    6277    6328    6431
                           6460    6505    6548    6594    6619    6643    6662    6683    6712    6739    6760    6782    6811
                           6839    6867    6939    6946    6950*   6954*   7129    7196    7230    7277    7297    7312
DRCSB   001346             5793#   5971    6038    6089    6222    6275    6382    6432    6461    6506    6549    6595    6620
                           6644    6663    6684    6713    6740    6761    6783    6812    6840    6868    6940    6947    7130
                           7197    7231    7298
DRCSC   001352             5795#   5892    5930    6002    6109    6221    6327    6383    6454    6498    6542    6585    6611
                           6636    6655    6675    6703    6732    6752    6774    6803    6832    6859    6894    6937    6951*
                           6955*   7000    7127    7252    7299
DRCSD   001356             5797#   5972    6037    6129    6276    6329    6381    6455    6499    6543    6586    6612    6637
                           6656    6676    6704    6733    6753    6775    6804    6833    6860    6895    6938    7001    7128
                           7198    7253    7300
DRDBA   001344             5792#   6071    6252    6312    6351
DRDBB   001350             5794#   6090    6260    6304    6402
DRDBC   001354             5796#   6110    6244    6359    6418
DRDBD   001360             5798#   5865    6130    6296    6367    6410
DSWR   = 177570            5693#   5743    5814
DT1     017110             5747    5753    5759    5765    5771    5777    5784    7468#
DT2     017124             7469#
EDCHP1  013206             6991    7336#
EDCHP2  013244             7351#
EDCHP3  013306             6726    6826    7369#
EDCHP4  013350             6697    6797    6888    7386#
EMTVEC= 000030             5693#   5814*
EM1     016633             5745    7457#
EM2     016652             5751    7458#
EM3     016674             5757    7459#
EM4     016707             5763    7460#
EM5     016722             5769    7461#
EM6     016735             5775    7462#
EM7     016750             5782    7463#
ENDDAT  013464             6082    6101    6121    6141    6267    6319    6374    6425    6607    6632    7059    7187    7224
                           7426#
ENDPAT  013372             7395#
ERRVEC= 000004             5693#   5814*   5877*   5888*   7445*
GNS    = ****** U          5732    7450
GTSWR  = 104406            5853    7450#
HT     = 000011            5693#   7431
IE     = 001000            5698#   5934    7232
IMRLOC  001372             5807#   6957*   6976    6994*
INTFLG  001366             5805#
IOTVEC= 000020             5693#   5814*
IRRLOC  001376             5809#   6958*   6961    6993*
ISRLOC  001374             5808#
KXTFLA  017214             7106    7118    7562#
LF     = 000012            5693#   7431
LKVEC  = 000100            5693#
LMD04  = 000200            5718#
LMD57  = 000240            5719#
MACR   = 000254            5725#   6447    6466    6491    6517    6572    6598    6911
MIMR   = 000244            5723#   6436    6473    6510    6534    6560    6623    6647    6666    6687    6716    6852    6882
                           6917    6985
```

```
MIRR   = 000250        5724#   6442    6485    6528    6554    6578    6744    6765    6787    6816    6844    6874    6929
                       6970    7025    7032    7101    7114    7153    7160    7208    7215
MISR   = 000240        5722#   6479    6523    6566    6923
NEXPAS   002032        5860    5862#   7285
NEXPA1   002036        5863#   5866
NXDEV    012674        7277#
NXDEV1   012700        5861    7278#   7284
ODTST  = 170000        5693#
PACR   = 000300        5728#   6467    6599    6907
PATDAT   013374        7398#
PIMR   = 000260        5729#   6511    6624
PIRQ   = 177772        5693#
PIRQVE= 000240         5693#
POINT  = 017142        7560#
PR0    = 000000        5693#
PR1    = 000040        5693#
PR2    = 000100        5693#
PR3    = 000140        5693#
PR4    = 000200        5693#
PR5    = 000240        5693#
PR6    = 000300        5693#   5814    5870*   7447
PR7    = 000340        5693#
PS     = 177776        5693#
PSW    = 177776        5693#
PVMA   = 000340        5730#
PWRMSG   016424        7447    7448#
PWRVEC= 000024         5693#   5814*   7447*
RDCHR  = 104410        7446    7450#
RDLIN  = 104411        7450#
RDY    = 100000        5696#   5897    5912    5960    5974    5987    6005    6020    6040    6053    6230    6285    6337
                       6391
RESVEC= 000010         5693#
SIMR   = 000060        5706#   6668    6690    6846    6876
SIRR   = 000120        5711#   6745    6766    6790    6845    6875    6909
SSIMR  = 000070        5707#   6717    6957
SSIRR  = 000130        5712#   6817    6958
STACK  = 001100        5693#   5867
START    001402        5732    5814#
START1   001766        5852    5854#   7286    7447
STKLMT= 177774         5693#
SWR      001140        5743#   5814*   7435    7445    7446*   7447*
SWRCK    015044        7435    7440#
SWREG    000176        5732#   5814    7446
SW0    = 000001        5693#
SW00   = 000001        5693#
SW01   = 000002        5693#
SW02   = 000004        5693#
SW03   = 000010        5693#
SW04   = 000020        5693#
SW05   = 000040        5693#
SW06   = 000100        5693#
SW07   = 000200        5693#
SW08   = 000400        5693#
SW09   = 001000        5693#
SW1    = 000002        5693#
SW10   = 002000        5693#
```

```
SW11   = 004000            5693#
SW12   = 010000            5693#
SW13   = 020000            5693#
SW14   = 040000            5693#
SW15   = 100000            5693#
SW2    = 000004            5693#
SW3    = 000010            5693#
SW4    = 000020            5693#
SW5    = 000040            5693#
SW6    = 000100            5693#
SW7    = 000200            5693#
SW8    = 000400            5693#
SW9    = 001000            5693#
TBITVE= 000014             5693#
TITLED  016536             5847    7454#
TKVEC  = 000060            5693#
TLCABL  016604             5848    7455#
TPVEC  = 000064            5693#
TRAPVE= 000034             5693#   5814*
TRTVEC= 000014             5693#
TSTNUM  001362             5803#   7440*   7468    7469
TST1    002074             5874#
TST10   003260             6063    6066#
TST11   003354             6085#
TST12   003450             6105#
TST13   003544             6125#
TST14   003640             6146#
TST15   004010             6178    6181#
TST16   004156             6212    6216#
TST17   004456             6271#
TST2    002152             5890#
TST20   004744             6323#
TST21   005244             6377#
TST22   005532             6428#
TST23   005666             6453    6458#
TST24   006076             6497    6502#
TST25   006302             6541    6546#
TST26   006506             6584    6590#
TST27   006624             6610    6615#
TST3    002344             5924    5927#
TST30   006742             6635    6640#
TST31   007034             6654    6659#
TST32   007134             6674    6679#
TST33   007262             6702    6708#
TST34   007410             6731    6736#
TST35   007510             6751    6757#
TST36   007612             6773    6778#
TST37   007744             6802    6807#
TST4    002454             5945    5948#
TST40   010076             6831    6836#
TST41   010222             6858    6863#
TST42   010376             6893    6898#
TST43   010604             6935    6944#
TST44   011124             6999    7005#
TST45   011412             7063#
TST46   011742             7125    7133#
```

```
TST47   012230            7192#
TST5    002552            5965    5969#
TST50   012440            7228#
TST51   012556            7246    7250#
TST6    002720            5997    6000#
TST7    003112            6032    6035#
TYPDS = 104405            7286    7450#
TYPE  = 104401            5847    5848    7286    7431    7433    7434    7435    7444    7446    7447    7450#   7560
TYPOC = 104402            7444    7446    7450#
TYPON = 104404            7450#
TYPOS = 104403            7450#
XXDP    001370            5806#   5834*   5845
$APTHD  001000            5742#
$ASTAT= ****** U          7432
$ATYC   013774            7432#
$ATY1   013750            7432#
$ATY3   013756            7431    7432#
$ATY4   013766            7432#   7435
$AUTOB  001134            5743#   5838*   5843    5851    7446
$BASE   001244            5743#   5857
$BDADR  001122            5743#   5880*   5895*   5904*   5911*   5932*   5951*   5973*   5980*   5986*   6004*   6012*   6019*
                          6039*   6046*   6052*   6072*   6091*   6111*   6131*   6154*   6161*   6167*   6173*   6189*   6195*
                          6201*   6208*   6224*   6238*   6244*   6252*   6260*   6279*   6291*   6296*   6304*   6312*   6331*
                          6345*   6351*   6359*   6367*   6385*   6397*   6402*   6410*   6418*   6434*   6464*   6508*   6552*
                          6597*   6622*   6645*   6664*   6685*   6714*   6742*   6763*   6785*   6814*   6842*   6870*   6906*
                          6959*   6968*   6975*   6983*   7024*   7031*   7085*   7091*   7100*   7113*   7152*   7159*   7207*
                          7214*   7234*   7243*   7256*   7264*   7468    7469
$BDDAT  001126            5743#   5868    7296    7468    7469
$CDW1   001250            5743#
$CHARC  013744            7431#*
$CKSWR  015476            7446#   7450
$CLKVE  017142            7560#
$CMTAG  001100            5743#   5814
$CM3  = 000000            5743#
$CNTLG  016223            7446#
$CNTLU  016216            7446#
$CPUOP  001216            5743#
$CRLF   001165            5743#   7431    7435    7444    7446
$DBLK   014660            7434#
$DEVCT  001200            5743#   5869*
$DEVM   001246            5743#   5855
$DOAGN  013032            7286#
$DTBL   014650            7434#
$ENDAD  013022            5737    7286#
$ENDCT  012770            7286#
$ENDMG  013041            7286#
$ENULL  013036            7286#
$ENV    001210            5743#   5836    7431    7432    7435
$ENVM   001211            5743#   5814    7431    7432
$EOP    012734            7280    7286#
$EOPCT  012762            7286#
$ERFLG  001103            5743#   7435*   7445*
$ERMAX  001115            5743#   5814*   7445*
$ERROR  014670            5814    7435#
$ERRPC  001116            5743#   7435*   7444    7468    7469
$ERRTB  001252            5743#   7444
```

```
$ERRTY  015062            7441    7444#
$ERTTL  001112            5743#   7435*
$ESCAP  001162            5743#   5814*   7435    7445*
$ETABL  001210            5743#
$ETEND  001252            5742    5743#
$FATAL  001172            5743#   5815*   7432*
$FFLG   014214            7432#*
$FILLC  001156            5743#   7431
$FILLS  001155            5743#   7431
$GDADR  001120            5743#   7469
$GDDAT  001124            5743#   5875*   5897*   5901    5905*   5908    5912*   5916    5919*   5923    5933*   5937    5940*
                          5944    5952*   5957    5960*   5964    5974*   5977    5981*   5983    5987*   5990    5993*   5996
                          6005*   6009    6013*   6016    6020*   6024    6027*   6031    6040*   6043    6047*   6049    6053*
                          6056    6059*   6062    6074*   6078    6093*   6097    6113*   6117    6133*   6137    6155*   6158
                          6162*   6164    6168*   6170    6174*   6177    6190*   6193    6196*   6198    6202*   6205    6209*
                          6211    6230*   6234    6237*   6241    6245*   6247    6250*   6253    6257    6261*   6263    6285*
                          6287    6290*   6293    6297*   6299    6302*   6305    6309    6313*   6315    6337*   6341    6344*
                          6348    6352*   6354    6357*   6360    6364    6368*   6370    6391*   6393    6396*   6399    6403*
                          6405    6408*   6411    6415    6419*   6421    6435*   6438    6441*   6444    6449    6465*   6468
                          6470    6474*   6476    6480*   6482    6487    6493    6509*   6512    6514    6518*   6520    6525
                          6530    6535*   6537    6553*   6557    6561*   6563    6567*   6569    6574    6580    6600*   6603
                          6625*   6628    6646*   6650    6665*   6670    6689*   6693    6718*   6722    6743*   6747    6764*
                          6769    6789*   6793    6818*   6822    6843*   6849    6854    6873*   6879    6884    6912*   6914
                          6918*   6920    6924*   6926    6931    6960*   6964    6967*   6969*   6972    6977*   6980    6984*
                          6987    7026*   7028    7033*   7034*   7035*   7037    7041*   7043    7047*   7049    7053*   7055
                          7084*   7088    7094    7102*   7104    7108*   7109    7112*   7116    7120*   7121    7154*   7156
                          7161*   7162*   7163*   7165    7169*   7171    7175*   7177    7181*   7183    7209*   7211    7216*
                          7217*   7218*   7220    7235*   7239    7242*   7245    7257*   7261    7265*   7267    7301*   7468
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$HIBTS  001000            5742#
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$ILLUP  016416            7447#
$INTAG  001135            5743#   7446
$ITEMB  001114            5743#   7435*   7444
$LF     001166            5743#   7431    7435    7446
$LFLG   014213            7432#*
$LPADR  001106            5743#   5814*   7445*
$LPERR  001110            5743#   5814*   6069*   6088*   6108*   6128*   6219*   6274*   6326*   6380*   6593*   6618*   6682*
                          6711*   6781*   6810*   6866*   7011*   7139*   7195*   7435    7445*
$MADR1  001222            5743#
$MADR2  001226            5743#
$MADR3  001232            5743#
$MADR4  001236            5743#
$MAIL   001170            5742    5743#   5814    7431    7435    7445
$MAMS1  001220            5743#
$MAMS2  001224            5743#
$MAMS3  001230            5743#
$MAMS4  001234            5743#
$MBADR  001002            5742#
$MFLG   014212            7432#*
$MNEW   016241            7446#
$MSGAD  001204            5743#   7432*
$MSGLG  001206            5743#   7432*
```

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$MSWR   016230            7446#
$MTYP1  001221            5743#
$MTYP2  001225            5743#
$MTYP3  001231            5743#
$MTYP4  001235            5743#
$MXCNT  015474            7445#
$NULL   001154            5743#   7431
$NWTST= 000001            5874#   5890#   5927#   5948#   5969#   6000#   6035#   6066#   6085#   6105#   6125#   6146#   6181#
                          6216#   6271#   6323#   6377#   6428#   6458#   6502#   6546#   6590#   6615#   6640#   6659#   6679#
                          6708#   6736#   6757#   6778#   6807#   6836#   6863#   6898#   6944#   7005#   7063#   7133#   7192#
                          7228#   7250#
$OCNT   014440            7433#*
$OMODE  014442            7433#*
$OVER   015460            7445#
$PASS   001176            5743#   5814*   7286*   7445
$PASTM  001006            5742#
$PWRAD  016412            7447#
$PWRDN  016252            5814    7447#
$PWRMG  016406            7447#
$PWRUP  016324            7447#
$QUES   001164            5743#   7431    7435    7446
$RDCHR  015760            7446#   7450
$RDDEC= ****** U          7450
$RDLIN  016100            7446#   7450
$RDOCT= ****** U          7450
$RDSZ = 000010            7446#
$RTNAD  013034            7286#
$R2A  = ****** U          7450
$SAVRE= ****** U          7450
$SAVR6  016422            7447#*
$SCOPE  015216            5814    7445#
$SETUP= 000117            5812#   5814    7286    7435    7445    7446
$STUP = 177777            5812#
$SVLAD  015424            7445#
$SVPC = 000106            5737#
$SWR  = 165400            5686#   5690#   5692    5743    5814    5874    5890    5927    5948    5969    6000    6035    6066
                          6085    6105    6125    6146    6181    6216    6271    6323    6377    6428    6458    6502    6546
                          6590    6615    6640    6659    6679    6708    6736    6757    6778    6807    6836    6863    6898
                          6944    7005    7063    7133    7192    7228    7250    7286    7435    7445    7447
$SWREG  001212            5743#   5814
$SWRMK= 000000            5692    7445
$TESTN  001174            5743#   5817*   7445*
$TIMES  001160            5743#   5814*   7228*   7250*   7286*   7445*
$TKB    001146            5743#   7446
$TKS    001144            5743#   7446*
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                          6035#   6063    6066#   6085#   6105#   6125#   6146#   6178    6181#   6212    6216#   6271#   6323#
                          6377#   6428#   6453    6458#   6497    6502#   6541    6546#   6584    6590#   6610    6615#   6635
                          6640#   6654    6659#   6674    6679#   6702    6708#   6731    6736#   6751    6757#   6773    6778#
                          6802    6807#   6831    6836#   6858    6863#   6893    6898#   6935    6944#   6999    7005#   7063#
                          7125    7133#   7192#   7228#   7246    7250#
$TPB    001152            5743#   7431*
$TPFLG  001157            5743#   7431
$TPS    001150            5743#   7431
$TRAP   016456            5814    7450#
```

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$TRP   = 000012          7450#
$TRPAD  016512           7450#
$TSTM   001004           5742#
$TSTNM  001102           5743#   7286*   7435    7440    7445*
$TTYIN  016206           7446#
$TYPBN= ****** U         7450
$TYPDS  014444           7434#   7450
$TYPE   013466           7431#   7432    7450
$TYPEC  013700           7431#   7446
$TYPEX  013746           7431#
$TYPOC  014242           7433#   7450
$TYPON  014256           7433#   7450
$TYPOS  014216           7433#   7450
$UNIT   001202           5743#   5854*   5869    7282*
$UNITM  001010           5742#
$USWR   001214           5743#
$VECT1  001240           5743#
$VECT2  001242           5743#
$XTSTR  015230           7445#
$$GET4= 000000           7286#
$OFILL  014441           7433#*
$40CAT= ****** U         7435    7445
.      = 017216          5732#   5733#   5737#   5738#   5742#   5743#   5814    7286    7431    7432#   7434#   7435    7444#
                         7445    7446#   7447    7467#   7560#
.$ASTA= ****** U         7432
.$X    = 001000          5742#
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```
COMMEN  1566#  5693#
ENDCOM  1578#  5693#
ERROR   5693#  5887  5903  5910  5918  5925  5939  5946  5959  5966  5979  5985  5992  5998  6011
        6018   6026  6033  6045  6051  6058  6064  6080  6099  6119  6139  6160  6166  6172  6179
        6200   6207  6213  6236  6243  6249  6259  6265  6289  6295  6301  6311  6317  6343  6350
        6356   6366  6372  6395  6401  6407  6417  6423  6440  6446  6451  6472  6478  6484  6489
        6495   6516  6522  6527  6532  6539  6559  6565  6571  6576  6582  6605  6630  6652  6672
        6695   6724  6749  6771  6795  6824  6851  6856  6881  6886  6916  6922  6928  6933  6966
        6974   6982  6989  7030  7039  7045  7051  7057  7090  7096  7111  7123  7158  7167  7173
        7179   7185  7213  7222  7241  7247  7263  7269
ESCAPE  1698#  5693#
GETPRI  1312#  5693#
GETSWR  1771#  5693#
MULT    4484#  5693#
NEWTST  1626#  5693#  5874  5890  5927  5948  5969  6000  6035  6066  6085  6105  6125  6146  6181
        6216   6271  6323  6377  6428  6458  6502  6546  6590  6615  6640  6659  6679  6708  6736
        6757   6778  6807  6836  6863  6898  6944  7005  7063  7133  7192  7228  7250
POP     2153#  5693#  7432  7434  7447
PUSH    2145#  5693#  7432  7434  7447
REPORT  5463#  5693#
SCOPE   5693#  5874  5890  5927  5948  5969  6000  6035  6066  6085  6105  6125  6146  6181  6216
        6271   6323  6377  6428  6458  6502  6546  6590  6615  6640  6659  6679  6708  6736  6757
        6778   6807  6836  6863  6898  6944  7005  7063  7133  7192  7228  7250
SETPRI  1279#  5693#
SETTRA  7450#
SETUP   1337#  5693#  5814
SKIP    1733#  5693#  5917  5924  5945  5965  5991  5997  6025  6032  6057  6063  6178  6212  6453
        6497   6541  6584  6610  6635  6654  6674  6702  6731  6751  6773  6802  6831  6858  6893
        6935   6999  7125  7246
SLASH   1517#  5693#
SPACE   5693#
STARS   1485#  5693#  5737  5742  5743  5874  5890  5927  5948  5969  6000  6035  6066  6085  6105
        6125   6146  6181  6216  6271  6323  6377  6428  6458  6502  6546  6590  6615  6640  6659
        6679   6708  6736  6757  6778  6807  6836  6863  6898  6944  7005  7063  7133  7192  7228
        7250   7286  7291  7295  7431  7432  7433  7434  7435  7436  7439  7444  7446  7447  7450
SWRSU   1453#  5693#  5814#
TRMTRP  7450#
TYPBIN  2088#  5693#
TYPDEC  2058#  5693#  7286
TYPNAM  1826#  5693#
TYPNUM  2025#  5693#
TYPOCS  1978#  5681#  5693#
TYPOCT  1941#  5693#  7444  7446
TYPTXT  1894#  5693#
$$CMRE  5743#
$$CMTM  5743#
$$ESCA  1711#  5693#
$$NEWT  1662#  5693#  5874  5890  5927  5948  5969  6000  6035  6066  6085  6105  6125  6146  6181
        6216   6271  6323  6377  6428  6458  6502  6546  6590  6615  6640  6659  6679  6708  6736
        6757   6778  6807  6836  6863  6898  6944  7005  7063  7133  7192  7228  7250
$$SET   7450#
$$SETM  5814#
$$SKIP  1746#  5693#  5924  5945  5965  5997  6032  6063  6178  6212  6453  6497  6541  6584  6610
        6635   6654  6674  6702  6731  6751  6773  6802  6831  6858  6893  6935  6999  7125  7246
.EQUAT   189#  5681#  5693
.HEADE    61#  5680#  5686
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.SETUP   1213#   5680#   5812
.SWRHI    104#   5681#   5692
.SWRLO   5692#
.$ACT1   5064#   5683#   5737
.$APTB   5109#   5683#   5743#
.$APTH   5370#   5683#   5742
.$APTY   5547#   5683#   7432
.$ASTA   5417#
.$CATC    932#   5681#   5732
.$CMTA   1047#   5681#   5743
.$DB2D   4686#
.$DB2O   4812#
.$DIV    4587#
.$EOP    2214#   5682#   7286
.$ERRO   2700#   5682#   7435
.$ERRT   2896#   5682#   7444
.$MULT   4523#
.$POWE   4229#   5681#   7447
.$RAND   4307#
.$RDDE   3891#
.$RDOC   3797#   5680#
.$READ   3395#   5682#   7446
.$R2AZ   4958#
.$SAVE   3969#
.$SB2D   4771#
.$SB2O   4874#
.$SCOP   2454#   5682#   7445
.$SIZE   4361#
.$SUPR   4913#
.$TRAP   4073#   5680#   7450
.$TYPB   3287#
.$TYPD   3209#   5682#   7434
.$TYPE   2985#   5682#   7431
.$TYPO   3112#   5681#   7433
.$40CA    972#


. ABS.  017216     000

 ERRORS DETECTED:  0

 CNDRCA,CNDRCA/CR/NL:TOC=CNMAC2.SML,CNDRCA.P11
 RUN-TIME: 14 15 1 SECONDS
 RUN-TIME RATIO: 68/30=2.2
 CORE USED:  33K  (66 PAGES)
```