CB11

TEST PROGRAM
MD-11-DZCBH-B

EP-DZCBH-B-DL-A

FICHE 1 OF 1

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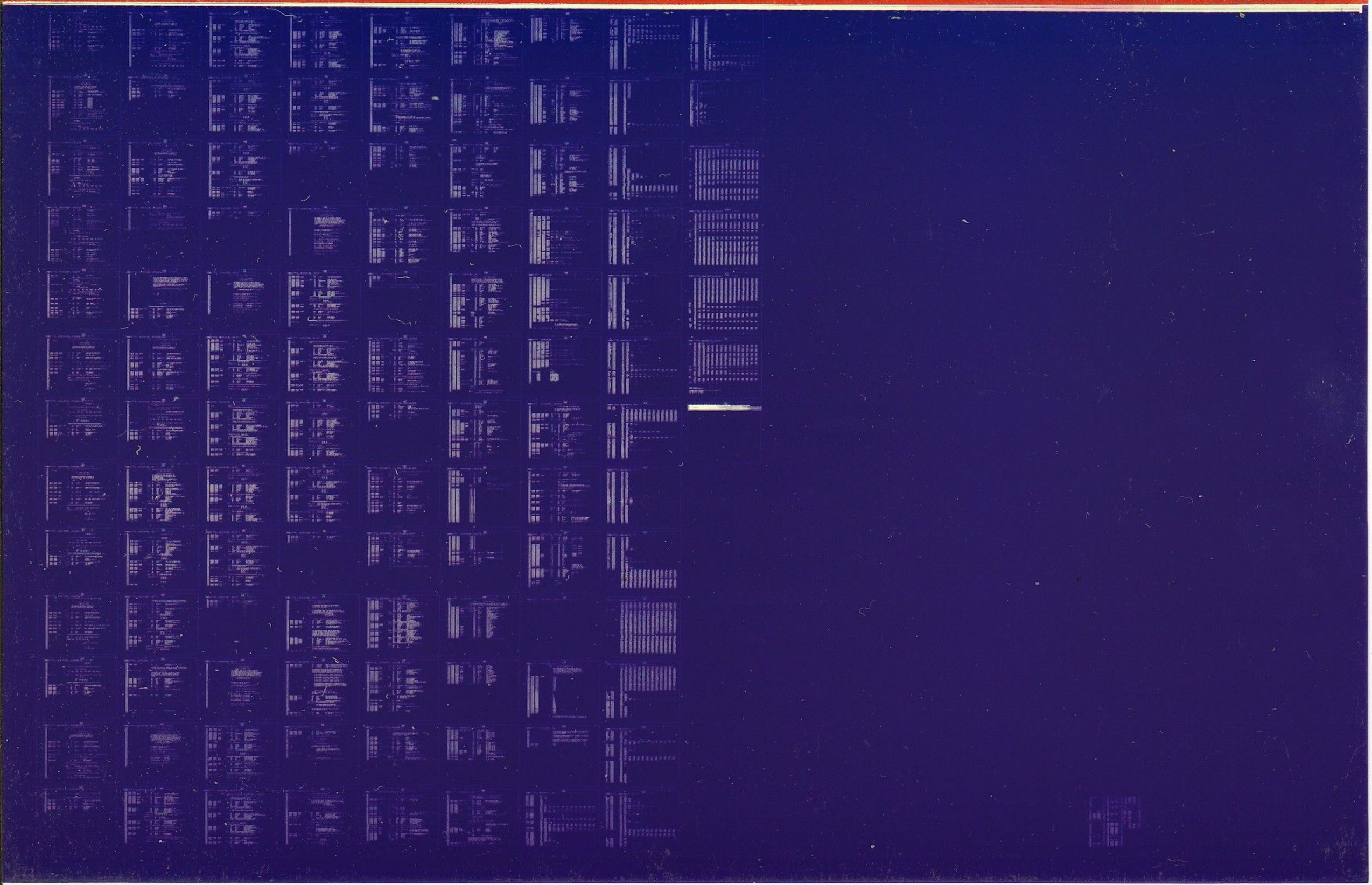
MADE IN USA



```
                                ;*****************************************************************
                                ;
                                ;       INIT ERROR
                                ;       (TER)  WORD#6
                                ;
                                ;PROBABLE FAULT LOGIC: M7291 (D6-B2) E24
                                ;
002524  004737  013374                  JSR     PC,HTST$                ;OUTPUT TEST # 1
                                ;
                                ;       (TER)  WORD#6
                                ;                       DISPLAY SIGNIFICANCE
                                ;
                                ;  (PC)  (PS)    (SP)    TEST   DEV#   DEVADD   WAS  SHOULD BE
                                ;  (R7)  (PSW)   (R6)    (R0)    (R1)   (R2)    (R3)    (R4)
002530  104004                 ERY1:  HLT+4   ;DEVICE ADDRESS (R2) FAILED TO INITIALIZE BY RESET
                                ;
                                ;       SYNC ON SELECT 6
002532  032737  000400  177570          BIT     #BIT8,SWR       ;TEST LOCK ON ERROR SELECTED
002540  001257                        BNE     TST1            ;(YES)BRANCHES
                                ;
002542  005012                 LPC1:  CLR     (R2)            ;VERIFY (WRITE)
002544  005512                        ADC     (R2)            ;VERIFY (READ/WRITE)
                                ;
                                ;
002546  006201                         ASR     R1              ;ADVANCE TO NEXT DEVICE
002550  005201                         INC     R1              ;INDEX
                                ;
002552  000137  002334                 JMP     TS1
                                ;
002556  123700  177570         END1:  CMPB    SWR,R0          ;TEST LOCK ON SUBTEST SELECTED
002562  001002                        BNE     OUT1            ;(NO)BRANCHES
                                ;
002564  000137  002300                 JMP     TST1            ;(YES)JUMPS
                                ;
002570  104400                 OUT1:  SCOPE                   ;TEST SCOPE SELECTION
```

```
                                .SBTTL  TST2: TEST DEVICE REGISTER DATOB RESPONSE TEST

                                ;               ***   BASIC LOGIC TEST   ***
                                ;                   DATOB RESPONSE TEST
                                ;       THE PURPOSE OF THIS TEST IS TO VERIFY THAT
                                ;       THE DEVICE(S) WILL NOT RESPOND TO "DATOB".
                                ;       SSYN WILL OCCURE BUT NO DATA "D LINES" TO
                                ;       DEVICE REGISTER(S) WILL TAKE PLACE.
                                ;
002572  004737  013072          TST2:   JSR     PC,INITQ        ;CLEAR ALL REGISTERS
002576  012700  000002                  MOV     #2,RD           ;MOVE TEST # TO DISPLAY REGISTER>D
002602  006301                  TS2:    ASL     R1              ;FORM WORD OFFSET

002604  016102  016262          LOP2:   MOV     CADCSR(R1),R2   ;CURRENT DEVICE ADDRESS>R2
002610  001515                          BEQ     END2            ;BRANCH IF ALL DEVICES TESTED
002612  012703  177777                  MOV     #ONES,R3
002616  005004                          CLR     R4
                                                                ;DATOB CSR
002620  110312                          MOVB    R3,(R2)         ;EVEN BYTE
002622  110362  000001                  MOVB    R3,1(R2)        ;ODD BYTE
                                                                ;DATOB DDR
002626  110462  000002                  MOVB    R4,2(R2)        ;EVEN BYTE
002632  110462  000003                  MOVB    R4,3(R2)        ;ODD BYTE
                                                                ;DATOB TSR
002636  110362  000004                  MOVB    R3,4(R2)        ;EVEN BYTE
002642  110362  000005                  MOVB    R3,5(R2)        ;ODD BYTE
                                                                ;DATOB TER
002646  110362  000006                  MOVB    R3,6(R2)        ;EVEN BYTE
002652  110362  000007                  MOVB    R3,7(R2)        ;ODD BYTE

                                ;
002656  011203                          MOV     (R2),R3         ;FETCH CURRENT CONTENTS OF CSR>R3
                                ;
002660  016104  016612                  MOV     CVT.CB(R1),R4   ; CSR   SET ADDRESS (VECTOR) BITS 08-02

002664  020304                          CMP     R3,R4           ;VERIFY RESULTS

002666  001405                          BEQ     T$2             ;TEST IF CSR INITIALIZED RESET

                                ;*****************************************************************
                                ;
                                ;       INIT ERROR
                                ;       CSR  WORD#0
                                ;
                                ;PROBABLE FAULT LOGIC: M7291 (D6-B2) E24
                                ;
                                ;       (CSR)  WORD#0
                                ;                DISPLAY SIGNIFICANCE
                                ;
                                ;  (PC)  (PS)    (SP)    TEST   DEV#   DEVADD   WAS  SHOULD BE
                                ;  (R7)  (PSW)   (R6)    (R0)    (R1)   (R2)    (R3)    (R4)
                                ;
```

```
1488
1489  002670  104004                  ERA2:   HLT+4   ;DEVICE ADDRESS (R2) RESPONDING TO DATOB
1490                                  ;
1491                                  ;       PROBABLE FAULT LOGIC:  M7291 (D2 C2) E35
1492                                  ;                                    (D2 C4,C3) E21, E23
1493                                  ;
1494                                  ;       SYNC ON SELECT 0
1495                                  ;
1496                                  ;*****************************************************************
1497                                  ;
1498  002672  032737  000400  177570          BIT     #BIT8,SWR       ;TEST FOR LOCK ON ERROR SELECTED
1499  002700  001334                          BNE     TST2            ;(YES) BRANCHES
1500                                  ;
1501                                  ;
1502                                  ;*****************************************************************
1503                                  ;       (CSR)  WORD#0)
1504  002702  005712                  TST2:   TST     (R2)            ;VERIFY (READ)
1505  002704  005012                          CLR     (R2)            ;VERIFY (WRITE)
1506  002706  005512                          ADC     (R2)            ;VERIFY (READ/WRITE)
1507                                  ;
1508  002710  005722                          TST     (R2)+           ;ADVANCE TO
1509                                  ;       (DDR)  WORD#2)
1510                                  ;
1511  002712  005712                          TST     (R2)            ;VERIFY (READ
1512  002714  004737  011614                  JSR     PC,DLYGMS       ;DELAY 7 MILLISECONDS
1513                                  ;
1514  002720  011203                          MOV     (R2),R3         ;FETCH CONTENTS DDR>R3
1515  002722  012704  177777                  MOV     #177777,R4      ;SHOULD INITIALIZE TO ALL ONES>R4
1516                                  ;
1517  002726  020304                          CMP     R3,R4           ;TEST RESULTS
1518                                  ;
1519  002730  001405                          BEQ     LPA2            ;(OK) BRANCHES
1520
1521                                  ;*****************************************************************
1522                                  ;
1523                                  ;       INIT ERROR
1524                                  ;       (DDR)  WORD#2
1525                                  ;
1526                                  ;PROBABLE FAULT LOGIC: M7291 (D6-B2) E24
1527                                  ;
1528                                  ;
1529                                  ;       (DDR)  WORD#2
1530                                  ;                DISPLAY SIGNIFICANCE
1531                                  ;
1532                                  ;  (PC)  (PS)    (SP)    TEST   DEV#   DEVADD   WAS  SHOULD BE
1533                                  ;  (R7)  (PSW)   (R6)    (R0)    (R1)   (R2)    (R3)    (R4)
1534                                  ;
1535
1536  002732  104004                  ERB2:   HLT+4   ;DEVICE ADDRESS (R2) RESPONDING TO DATOB
1537                                  ;
1538                                  ;       PROBABLE FAULT LOGIC:  M7291 (D2 C2) E35
1539                                  ;                                    (D2 C4,C3) E21, E23
1540                                  ;
1541                                  ;
1542                                  ;       SYNC ON SELECT 2
1543                                  ;
```

```
1544  002734  032737  000400  177570          BIT     #BIT8,SWR       ;TEST LOCK ON ERROR SELECTED
1545  002742  001313                          BNE     TST2            ;(YES)BRANCHES
1546                                  ;
1547                                  ;
1548  002744  005012                  LPA2:   CLR     (R2)            ;VERIFY (WRITE)
1549                                  ;
1550  002746  005512                          ADC     (R2)            ;VERIFY (READ/WRITE
1551                                  ;
1552  002750  005722                          TST     (R2)+           ;ADVANCE TO
1553                                  ;
1554                                  ;       (TSR)  WORD#4)
1555  002752  011203                          MOV     (R2),R3         ;FETCH CONTENTS TSR>R3
1556
1557  002754  005004                          CLR     R4              ;SHOULD INITIALIZE TO ALL ZEROS>R4
1558                                  ;
1559  002756  005703                          TST     R3              ;TEST RESULTS
1560
1561  002760  001405                          BEQ     LPB2            ;(OK) BRANCHES
1562
1563                                  ;
1564                                  ;*****************************************************************
1565                                  ;
1566                                  ;       INIT ERROR
1567                                  ;       (TSR)  WORD#4
1568                                  ;
1569                                  ;PROBABLE FAULT LOGIC: M7291 (D6-B2) E24
1570                                  ;
1571
1572                                  ;       (TSR)  WORD#4
1573                                  ;              DISPLAY SIGNIFICANCE
1574                                  ;
1575                                  ;  (PC)  (PS)    (SP)    TEST   DEV#   DEVADD   WAS  SHOULD BE
1576                                  ;  (R7)  (PSW)   (R6)    (R0)    (R1)   (R2)    (R3)    (R4)
1577                                  ;
1578
1579  002762  104004                  ERC24:  HLT+4   ;DEVICE ADDRESS (R2) RESPONDING TO DATOB
1580                                  ;
1581                                  ;       PROBABLE FAULT LOGIC:  M7291 (D2 C2) E35
1582                                  ;                                    (D2 C4,C3) E21, E23
1583                                  ;
1584                                  ;
1585                                  ;       SYNC ON SELECT 4
1586                                  ;
1587  002764  032737  000400  177570          BIT     #BIT8,SWR       ;TEST LOCK ON ERROR SELECTED
1588  002772  001277                          BNE     TST2            ;(YES)BRANCHES
1589                                  ;
1590  002774  005012                  LPB2:   CLR     (R2)            ;VERIFY (WRITE)
1591                                  ;
1592  002776  005512                          ADC     (R2)            ;VERIFY (READ/WRITE)
1593
1594  003000  005722                          TST     (R2)+           ;ADVANCE TO
1595                                  ;       (TER)  WORD#6)
1596
1597  003002  011203                          MOV     (R2),R3         ;FETCH CONTENTS TSR>R3
1598
1599  003004  005004                          CLR     R4              ;SHOULD INITIALIZE TO ALL ZEROES>R4
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```
1600
1601  003006  005703                    TST     R3              ;TEST RESULTS
1602
1603  003010  001407                    BEQ     LPC2
1604                                ;*****************************************************************
1605                                ;
1606                                ;       INIT ERROR
1607                                ;       (TER)  WORD#6
1608                                ;
1609                                ;PROBABLE FAULT LOGIC: M7291 (D6-B2) E24
1610                                ;
1611  003012  004737  013374                JSR     PC,HTST$                ;OUTPUT TEST # 2
1612
1613                                ;       (TER)  WORD#6
1614                                ;              DISPLAY SIGNIFICANCE
1615                                ;
1616                                ;  (PC)  (PS)    (SP)    TEST   DEV#   DEVADD   WAS  SHOULD BE
1617                                ;  (R7)  (PSW)   (R6)    (R0)    (R1)   (R2)    (R3)    (R4)
1618
1619  003016  104004                ERR2:   HLT+4   ;DEVICE ADDRESS (R2) RESPONDING TO DATOB
1620                                ;
1621                                ;       PROBABLE FAULT LOGIC:  M7291 (D2 C2) E35
1622                                ;                              (D2 C4,C3) E21, E23
1623                                ;
1624                                ;
1625                                ;       SYNC ON SELECT 6
1626  003020  032737  000400  177570        BIT     #BIT8,SWR       ;TEST LOCK ON ERROR SELECTED
1627  003026  001261                       BNE     TST2            ;(YES)BRANCHES
1628                                ;
1629
1630
1631  003030  005012                LPC2:   CLR     (R2)            ;VERIFY (WRITE)
1632  003032  005512                        ADC     (R2)            ;VERIFY (READ/WRITE)
1633
1634                                ;
1635                                ;
1636  003034  006201                        ASR     R1              ;ADVANCE TO NEXT DEVICE
1637  003036  005201                        INC     R1              ;INDEX
1638                                ;
1639  003040  000137  002602                JMP     TS2
1640                                ;
1641  003044  123700  177570        END2:   CMPB    SWR,R0          ;TEST LOCK ON SUBTEST SELECTED
1642  003050  001002                        BNE     OUT2            ;(NO)BRANCHES
1643                                ;
1644  003052  000137  002572                JMP     TST2            ;(YES)JUMPS
1645                                ;
1646  003056  104400                OUT2:   SCOPE                   ;TEST SCOPE SELECTION
1647
```

```
                                .SBTTL  TST3: TEST DEVICE CNTL+STATUS CSR  RESPONSE SET TO ONE

                        000004          N=N+1

                                ;               ***   STATIC LOGIC TESTS   ***

                                ;                   CSR SET TO ONE  #BIT13

                                ;       THE PURPOSE OF THIS TEST IS TO VERIFY THE
                                ;       BASIC LOGIC RESPONSE (SET TO ONES/CLR TO
                                ;       ZEROES) FOR EACH CB11-HA REGISTER ADDRESS.


003060  004737  013072  TST3:   JSR     PC,INITQ        ;CLEAR WORK REGISTERS R0-R4
003064  012700  000003          MOV     #3,R0           ;MOVE TEST# 3 TO DISPLAY R0

003070  006301          LOP3:   ASL     R1              ;FORM WORD OFFSET

003072  016102  016262  RA3:    MOV     CADCSR(R1),R2   ;CURRENT DEVICE CSR ADDRESS > R2
003076  001421          BEQ     END3            ;BRANCH IF ALL DEVICES TESTED


003100  012704  020000          MOV     #BIT13,R4               ;#BIT13 > SHOULD BE  > R4


003104  012712  020000          MOV     #BIT13,(R2)     ;OUTPUT TO #BIT13 > I.E. (WRITE #BIT13 TO CSR)

003110  056104  016612          BIS     CVT.CB(R1),R4   ;CSR    MASK IN VECTOR ADDRESS RESPONSE
003114  011203                  MOV     (R2),R3         ;INPUT RESULTS (CSR ) >R3


003116  020304                  CMP     R3,R4           ;VERIFY RESULTS
003120  001405                  BEQ     RB3             ;(OK) BRANCHES

                        ;*************************************************************
                        ;
                        ;ERR3           DEVICE CSR (R2)  FAILED TO RESPOND CORRECTLY
                        ;
                        ;PROBABLE FAULT LOGIC: M7291 (D6-2B) E24
                        ;                                       CSR
                        ;                                   #BIT13 = ONE FAILURE
                        ;                                   (D6 D2) E16
                        ;                                       OR
                        ;                                   VECTOR PRESENTATION
```

```
1704                                    ;                               (D5 D2,D6) E1, E2
1705                                    ;                               (D4 A6) E34
1706
1707                                    ;
1708                                    ;*****************************************************************
1709
1710                                    ;
1711                                    ;               DISPLAY SIGNIFICANCE
1712                                    ;
1713                                    ;  (PC)  (PS)    (SP)    TEST    DEV#  DEVADD   WAS  SHOULD BE
1714                                    ;  (R7)  (PSW)   (R6)    (R0)    (R1)   (R2)    (R3)    (R4)
1715                                    ;
1716
1717  003122  104004                    ERR3:   HLT+4   ;DEVICE CSR (R2) #BIT13 FAILED TO RESPOND CORRECTLY
1718                                    ;                ON
1719                                    ;                       SET TO ONE
1720
1721                                    ;                CHECK:
1722                                    ;               CSR     BITS 15 THRU 13
1723                                    ;               CSR     BITS 08 THRU 02
1724                                    ;
1725                                    ;*****************************************************************
1726                                    ; TEST 3 = SWITCH SETTINGS D2A6 E32 CHECK D3-D4-D5 E25-E23 SET TO ONE
1727                                    ;
1728  003124  032737  000400  177570            BIT     #BIT8,SWR       ;TEST FOR LOCK ON ERROR SELECTED
1729  003132  001357                            BNE     RA3             ;(YES) LOOP ON CURRENT DATA ERROR
1730
1731  003134  006201                    RB3:    ASR     R1              ;ADVANCE
1732  003136  005201                            INC     R1              ;DEVICE CSR ADDRESS
1733  003140  000753                            BR      LOP3            ;CONTINUE
1734
1735  003142  123700  177570            END3:   CMPB    SWR,R0  ;TEST LOCK ON SUBTEST SELECTED
1736  003146  001002                            BNE     OUT3            ;(NO) BRANCHES
1737  003150  000137  003060                    JMP     TST3            ;YES JUMPS
1738  003154  104400                    OUT3:   SCOPE                   ;SCOPE LOOP
1739
1740
1741
```

```
1742                                    .SBTTL  TST4: TEST DEVICE CNTL+STATUS CSR  RESPONSE SET TO ONE
1743
1744            000005                          N=N+1
1745
1746                                    ;               ***   STATIC LOGIC TESTS   ***
1747
1748                                    ;                   CSR SET TO ONE  #BIT14
1749
1750                                    ;       THE PURPOSE OF THIS TEST IS TO VERIFY THE
1751                                    ;       BASIC LOGIC RESPONSE (SET TO ONES/CLR TO
1752                                    ;       ZEROES) FOR EACH CB11-HA REGISTER ADDRESS.
1753
1754
1755
1756
1757    003156  004737  013072         TST4:  JSR     PC,INITQ        ;CLEAR WORK REGISTERS R0-R4
1758    003162  012700  000004                 MOV     #4,R0           ;MOVE TEST# 4 TO DISPLAY R0
1759
1760    003166  006301                 LOP4:  ASL     R1              ;FORM WORD OFFSET
1761
1762    003170  016102  016262         RA4:   MOV     CADCSR(R1),R2   ;CURRENT DEVICE CSR ADDRESS > R2
1763    003174  001421                        BEQ     END4            ;BRANCH IF ALL DEVICES TESTED
1764
1765
1766
1767    003176  012704  040000                 MOV     #BIT14,R4               ;#BIT14 > SHOULD BE > R4
1768
1769
1770
1771    003202  012712  040000                 MOV     #BIT14,(R2)     ;OUTPUT TO #BIT14 > I.E. (WRITE #BIT14 TO CSR)
1772
1773
1774    003206  056104  016612                 BIS     CVT.CB(R1),R4   ;CSR    MASK IN VECTOR ADDRESS RESPONSE
1775    003212  011203                         MOV     (R2),R3         ;INPUT RESULTS (CSR ) >R3
1776
1777
1778    003214  020304                         CMP     R3,R4           ;VERIFY RESULTS
1779    003216  001405                         BEQ     RB4             ;(OK) BRANCHES
1780
1781                                    ;*************************************************************
1782                                    ;
1783                                    ;
1784                                    ;ERR4           DEVICE CSR (R2)  FAILED TO RESPOND CORRECTLY
1785                                    ;
1786                                    ;PROBABLE FAULT LOGIC: M7291 (D6-B2) E24
1787                                    ;
1788                                    ;                                       CSR
1789
1790                                    ;                                  #BIT14 = ONE FAILURE
1791                                    ;                                  (D6 D2) E16
1792
1793
1794                                    ;                                       OR
1795
1796                                    ;                                  VECTOR PRESENTATION
1797
```

```
1798                                    ;                                   (D5 D2,D6) E1, E2
1799                                    ;                                   (D4 A6) E34
1800
1801                                    ;
1802                                    ;*****************************************************************
1803
1804                                    ;
1805                                    ;                   DISPLAY SIGNIFICANCE
1806                                    ;
1807                                    ;  (PC)  (PS)    (SP)    TEST    DEV#  DEVADD   WAS  SHOULD BE
1808                                    ;  (R7)  (PSW)   (R6)    (R0)    (R1)   (R2)    (R3)    (R4)
1809                                    ;
1810
1811  003220  104004                    ERR4:   HLT+4   ;DEVICE CSR (R2) #BIT14 FAILED TO RESPOND CORRECTLY
1812                                    ;                ON
1813                                    ;                       SET TO ONE
1814
1815                                    ;                CHECK:
1816                                    ;                CSR     BITS 15 THRU 13
1817                                    ;                CSR     BITS 08 THRU 02
1818                                    ;
1819                                    ;*****************************************************************
1820                                    ; TEST 4 = SWITCH SETTINGS D2A6 E32 CHECK D3-D4-D5 E25-E23 SET TO ONE
1821                                    ;
1822  003222  032737  000400  177570            BIT     #BIT8,SWR       ;TEST FOR LOCK ON ERROR SELECTED
1823  003230  001357                           BNE     RA4             ;(YES) LOOP ON CURRENT DATA ERROR
1824
1825  003232  006201                    RB4:    ASR     R1              ;ADVANCE
1826  003234  005201                            INC     R1              ;DEVICE CSR ADDRESS
1827  003236  000753                            BR      LOP4            ;CONTINUE
1828
1829  003240  123700  177570            END4:   CMPB    SWR,R0  ;TEST LOCK ON SUBTEST SELECTED
1830  003244  001002                            BNE     OUT4            ;(NO) BRANCHES
1831  003246  000137  003156                    JMP     TST4            ;YES JUMPS
1832  003252  104400                    OUT4:   SCOPE                   ;SCOPE LOOP
1833
1834
1835
```

```
                                .SBTTL  TST5: TEST DEVICE CNTL+STATUS CSR  RESPONSE READ ONLY

                 000006                 N=N+1

                                ;               ***   STATIC LOGIC TESTS   ***
                                ;                   CSR READ ONLY  #BIT15
                                ;       THE PURPOSE OF THIS TEST IS TO VERIFY THE
                                ;       BASIC LOGIC RESPONSE (SET TO ONES/CLR TO
                                ;       ZEROES) FOR EACH CB11-HA REGISTER ADDRESS.


 003254  004737  013072        TST5:   JSR     PC,INITQ        ;CLEAR WORK REGISTERS R0-R4
 003260  012700  000005                MOV     #5,R0           ;MOVE TEST# 5 TO DISPLAY R0

 003264  006301                LOP5:   ASL     R1              ;FORM WORD OFFSET

 003266  016102  016262        RA5:    MOV     CADCSR(R1),R2   ;CURRENT DEVICE CSR ADDRESS > R2
 003272  001421                        BEQ     END5            ;BRANCH IF ALL DEVICES TESTED


 003274  013704  013220                MOV     ZERO,R4         ;ZERO > SHOULD BE  > R4


 003300  012712  100000                MOV     #BIT15,(R2)     ;OUTPUT TO #BIT15 > I.E. (WRITE #BIT15 TO CSR)

 003304  056104  016612                BIS     CVT.CB(R1),R4   ;CSR    MASK IN VECTOR ADDRESS RESPONSE
 003310  011203                        MOV     (R2),R3         ;INPUT RESULTS (CSR ) >R3


 003312  020304                        CMP     R3,R4           ;VERIFY RESULTS
 003314  001405                        BEQ     RB5             ;(OK) BRANCHES

                                ;***************************************************************
                                ;
                                ;ERR5            DEVICE CSR (R2)  FAILED TO RESPOND CORRECTLY
                                ;
                                ;PROBABLE FAULT LOGIC: M7291 (D6-B2) E24
                                ;                                       CSR
                                ;                                  #BIT15 = READ ONLY FAILURE
                                ;                          (D4 C5) E7
                                ;                                       OR
                                ;                                  VECTOR PRESENTATION
```

```
1892                                    ;                                   (D5 D2,D6) E1, E2
1893                                    ;                                   (D4 A6) E34
1894
1895                                    ;
1896                                    ;*****************************************************************
1897
1898                                    ;
1899                                    ;               DISPLAY SIGNIFICANCE
1900                                    ;
1901                                    ;  (PC)  (PS)    (SP)    TEST    DEV#  DEVADD   WAS  SHOULD BE
1902                                    ;  (R7)  (PSW)   (R6)    (R0)    (R1)   (R2)    (R3)    (R4)
1903                                    ;
1904
1905  003316  104004                    ERR5:   HLT+4   ;DEVICE CSR (R2) #BIT15 FAILED TO RESPOND CORRECTLY
1906                                    ;                ON
1907                                    ;                       READ ONLY
1908
1909                                    ;                CHECK:
1910                                    ;                CSR     BITS 15 THRU 13
1911                                    ;                CSR     BITS 08 THRU 02
1912                                    ;
1913                                    ;*****************************************************************
1914                                    ; TEST 5 =   READ ONLY
1915                                    ;
1916  003320  032737  000400  177570            BIT     #BIT8,SWR       ;TEST FOR LOCK ON ERROR SELECTED
1917  003326  001357                           BNE     RA5             ;(YES) LOOP ON CURRENT DATA ERROR
1918
1919  003330  006201                    RB5:    ASR     R1              ;ADVANCE
1920  003332  005201                            INC     R1              ;DEVICE CSR ADDRESS
1921  003334  000753                            BR      LOP5            ;CONTINUE
1922
1923  003336  123700  177570            END5:   CMPB    SWR,R0  ;TEST LOCK ON SUBTEST SELECTED
1924  003342  001002                            BNE     OUT5            ;(NO) BRANCHES
1925  003344  000137  003254                    JMP     TST5            ;YES JUMPS
1926  003350  104400                    OUT5:   SCOPE                   ;SCOPE LOOP
1927
1928
1929
```

```
                                .SBTTL  TST6: TEST DEVICE TRN ENB REG TER  RESPONSE ENABLE TO ONE

                000007                  N=N+1

                                ;               ***   STATIC LOGIC TESTS   ***
                                ;                   TER ENABLE TO ONE  #ONES
                                ;       THE PURPOSE OF THIS TEST IS TO VERIFY THE
                                ;       BASIC LOGIC RESPONSE (SET TO ONES/CLR TO
                                ;       ZEROES) FOR EACH CB11-HA REGISTER ADDRESS.


003352  004737  013072  TST6:   JSR     PC,INITQ        ;CLEAR WORK REGISTERS R0-R4
003356  012700  000006          MOV     #6,R0           ;MOVE TEST# 6 TO DISPLAY R0

003362  006301          LOP6:   ASL     R1              ;FORM WORD OFFSET

003364  016102  016524  RA6:    MOV     CADTER(R1),R2   ;CURRENT DEVICE TER ADDRESS > R2
003370  001417          BEQ     END6            ;BRANCH IF ALL DEVICES TESTED


003372  012704  177777          MOV     #ONES,R4                ;#ONES > SHOULD BE  > R4


003376  012712  177777          MOV     #ONES,(R2)      ;OUTPUT TO #ONES > I.E. (WRITE #ONES TO TER)

003402  011203                  MOV     (R2),R3         ;INPUT RESULTS (TER ) >R3

003404  020304                  CMP     R3,R4           ;VERIFY RESULTS
003406  001405                  BEQ     RB6             ;(OK) BRANCHES

                        ;*************************************************************
                        ;
                        ;       DATA ERROR
                        ;
                        ;ERR6           DEVICE TER (R2)  FAILED TO RESPOND CORRECTLY
                        ;
                        ;PROBABLE FAULT LOGIC: M7291 (D6-B2) E24
                        ;                                       (D7)    ALL
                        ;                                       (D2 C2) E35,E36
                        ;
                        ;*************************************************************

                        ;
                        ;               DISPLAY SIGNIFICANCE
                        ;
                        ;  (PC)  (PS)    (SP)    TEST    DEV#  DEVADD   WAS  SHOULD BE
                        ;  (R7)  (PSW)   (R6)    (R0)    (R1)   (R2)    (R3)    (R4)
```

```
1986                                    ;
1987
1988  003410  104004                    ERR6:   HLT+4   ;DEVICE TER (R2) #ONES FAILED TO RESPOND CORRECTLY
1989                                    ;                ON
1990                                    ;                       ENABLE TO ONE
1991
1992                                    ;*****************************************************************
1993                                    ; TEST 6 =   ENABLE TO ONE
1994                                    ;
1995  003412  032737  000400  177570            BIT     #BIT8,SWR       ;TEST FOR LOCK ON ERROR SELECTED
1996  003420  001361                           BNE     RA6             ;(YES) LOOP ON CURRENT DATA ERROR
1997
1998  003422  006201                    RB6:    ASR     R1              ;ADVANCE
1999  003424  005201                            INC     R1              ;DEVICE TER ADDRESS
2000  003426  000755                           BR      LOP6            ;CONTINUE
2001
2002  003430  123700  177570            END6:   CMPB    SWR,R0  ;TEST LOCK ON SUBTEST SELECTED
2003  003434  001002                           BNE     OUT6            ;(NO) BRANCHES
2004  003436  000137  003352                   JMP     TST6            ;YES JUMPS
2005  003442  104400                    OUT6:   SCOPE                   ;SCOPE LOOP
2006
2007
2008
```

```
                                .SBTTL  TST7: TEST DEVICE TRN ENB REG TER  RESPONSE CLEAR TO ZERO

000010                          N=N+1

                        ;               ***   STATIC LOGIC TESTS   ***
                        ;                   TER CLEAR TO ZERO  ZERO
                        ;       THE PURPOSE OF THIS TEST IS TO VERIFY THE
                        ;       BASIC LOGIC RESPONSE (SET TO ONES/CLR TO
                        ;       ZEROES) FOR EACH CB11-HA REGISTER ADDRESS.

003444  004737  013072  TST7:  JSR     PC,INITQ        ;CLEAR WORK REGISTERS R0-R4
003450  012700  000007          MOV     #7,R0           ;MOVE TEST# 7 TO DISPLAY R0

003454  006301          LOP7:  ASL     R1              ;FORM WORD OFFSET

003456  016102  016524  RA7:   MOV     CADTER(R1),R2   ;CURRENT DEVICE TER ADDRESS > R2
003462  001417                  BEQ     END7            ;BRANCH IF ALL DEVICES TESTED

003464  013704  013220          MOV     ZERO,R4         ;ZERO > SHOULD BE  > R4

003470  013712  013220          MOV     ZERO,(R2)       ;OUTPUT TO ZERO > I.E. (WRITE ZERO TO TER)

003474  011203                  MOV     (R2),R3         ;INPUT RESULTS (TER ) >R3

003476  020304                  CMP     R3,R4           ;VERIFY RESULTS
003500  001405                  BEQ     RB7             ;(OK) BRANCHES

                        ;*****************************************************************
                        ;
                        ;       DATA ERROR
                        ;
                        ;ERR7           DEVICE TER (R2)  FAILED TO RESPOND CORRECTLY
                        ;
                        ;PROBABLE FAULT LOGIC: M7291 (D6-B2) E24
                        ;                                   (D7)     ALL
                        ;                                   (D2 C2) E35,E36
                        ;
                        ;*****************************************************************

                        ;               DISPLAY SIGNIFICANCE
                        ;
                        ;  (PC)  (PS)    (SP)    TEST    DEV#  DEVADD   WAS  SHOULD BE
                        ;  (R7)  (PSW)   (R6)    (R0)    (R1)   (R2)    (R3)    (R4)
```

```
2065                                    ;
2066
2067   003502  104004                   ERR7:   HLT+4   ;DEVICE TER (R2) ZERO FAILED TO RESPOND CORRECTLY
2068                                    ;                ON
2069                                    ;                       CLEAR TO ZERO
2070
2071                                    ;*****************************************************************
2072                                    ; TEST 7 = SWITCH SETTINGS D2A6 E32 CHECK D3-D4-D5 E25-E23 CLEAR TO ZERO
2073                                    ;
2074   003504  032737  000400  177570             BIT     #BIT8,SWR       ;TEST FOR LOCK ON ERROR SELECTED
2075   003512  001361                           BNE     RA7             ;(YES) LOOP ON CURRENT DATA ERROR
2076
2077   003514  006201                   RB7:    ASR     R1              ;ADVANCE
2078   003516  005201                           INC     R1              ;DEVICE TER ADDRESS
2079   003520  000755                           BR      LOP7            ;CONTINUE
2080
2081   003522  123700  177570           END7:   CMPB    SWR,R0  ;TEST LOCK ON SUBTEST SELECTED
2082   003526  001002                           BNE     OUT7            ;(NO) BRANCHES
2083   003530  000137  003444                   JMP     TST7            ;YES JUMPS
2084   003534  104400                   OUT7:   SCOPE                   ;SCOPE LOOP
2085
2086
2087
```

```
                                .SBTTL  TST10: TEST DEVICE TRANSITION TSR  RESPONSE SET TO ONE

                        000011          N=N+1

                                ;               ***   STATIC LOGIC TESTS   ***

                                ;                   TSR SET TO ONE  #ONES

                                ;       THE PURPOSE OF THIS TEST IS TO VERIFY THE
                                ;       BASIC LOGIC RESPONSE (SET TO ONES/CLR TO
                                ;       ZEROES) FOR EACH CB11-HA REGISTER ADDRESS.


003536  004737  013072          TST10:  JSR     PC,INITQ        ;CLEAR WORK REGISTERS R0-R4
003542  012700  000010                  MOV     #10,R0          ;MOVE TEST# 10 TO DISPLAY R0

003546  006301                  LOP10:  ASL     R1              ;FORM WORD OFFSET

003550  016102  016436          RA10:   MOV     CADTSR(R1),R2   ;CURRENT DEVICE TSR ADDRESS > R2
003554  001442                          BEQ     END10           ;BRANCH IF ALL DEVICES TESTED


003556  016102  016524                  MOV     CADTER(R1),R2   ;TRANSITION ENABLE TER ADDRESS > R2
003562  012704  177777                  MOV     #ONES,R4                ;#ONES TO SHOULD BE
003566  010412                          MOV     R4,(R2)         ;#ONES TO TER
003570  011203                          MOV     (R2),R3 ;FETCH RESULTS
003572  020304                          CMP     R3,R4           ;VERIFY RESULTS
003574  001401                          BEQ     RAA10           ;(OK) BRANCHES

003576  104004                  ETR10:  HLT+4   ;TER (R2) RESPONSE FAILURE
                                ;               FAILURE TO ENABLE TO #ONES

003600  016102  016262          RAA10:  MOV     CADCSR(R1),R2   ;TOGGIE CONTROL AND STATUS REGISTER
003604  052712  020000                  BIS     #20000,(R2)     ;MAINTENANCE BIT 13 SET
003610  004737  011614                  JSR     PC,DLYGMS       ;DELAY
003614  042712  020000                  BIC     #20000,(R2)     ;MAINTENANCE BIT 13 CLEAR
003620  004737  011614                  JSR     PC,DLYGMS       ;DELAY

003624  016102  016436                  MOV     CADTSR(R1),R2


003630  012704  177777                  MOV     #ONES,R4                ;#ONES > SHOULD BE  > R4


003634  011203                          MOV     (R2),R3         ;INPUT RESULTS (TSR ) >R3

003636  020304                          CMP     R3,R4           ;VERIFY RESULTS
003640  001405                          BEQ     RB10            ;(OK) BRANCHES

                                ;*****************************************************************
```

```
                                ;
                                ;       DATA ERROR
                                ;
                                ;ERR10          DEVICE TSR (R2)  FAILED TO RESPOND CORRECTLY
                                ;
                                ;PROBABLE FAULT LOGIC: M7291 (D6-B2) E24
                                ;                                   (D8 B4)E25, (D2 C2)E35,(D6 C2)E38
                                ;                                   (D4 OR D5 OR D6 OR D8 OR D9) ALL
                                ;
                                ;*****************************************************************
                                ;
                                ;               DISPLAY SIGNIFICANCE
                                ;
                                ;  (PC)  (PS)    (SP)    TEST    DEV#  DEVADD   WAS  SHOULD BE
                                ;  (R7)  (PSW)   (R6)    (R0)    (R1)   (R2)    (R3)    (R4)
                                ;
003642  104004                  ERR10:  HLT+4   ;DEVICE TSR (R2) #ONES FAILED TO RESPOND CORRECTLY
                                ;                 ON
                                ;                       SET TO ONE
```

```
2167
2168                                    ;NOTE:
2169                                    ;-----
2170                                    ;       AN ALL ZERO ERROR RESPONSE MAY SIGNIFY THAT THE DELAY INTERVAL
2171                                    ;       CALCULATED USING THE REALTIME CLOCK IS INCORRECT, I.E. THAT THE
2172                                    ;       INTERVAL IS MUCH TO FAST. THIS MAY BE VERIFIED BY CONFIGURING A
2173                                    ;       SINGLE CB11-HA MODULE FOR TEST, SELECTING TEST 10 IN THE LOWER
2174                                    ;       8 BITS OF THE SWITCH REGISTER, AND INHIBITING ERROR PRINTOUTS
2175                                    ;       BY SETTING SWITCH 13 OF THE SWITCH REGISTER.
2176                                    ;
2177                                    ;       VERIFY SOFTWARE TIMING BY DISPLAYING BIT 13 OF THE DEVICE "CSR"
2178                                    ;       REGISTER (MAINTAINENCE). THIS WILL REQUIRE THE USE OF AN
2179                                    ;       OSCILLOSCOPE. SYNC POSITIVE AND DISPLAY (MAINT H) AT
2180                                    ;       D6-B2-E24 PIN 7.
2181                                    ;
2182                                    ;       THE FOLLOWING TIMING RELATIONSHIP DISPLAYED BELOW SHOULD EXIST:
2183                                    ;
2184                                    ;
2185                                    ;                  ----------          ----------
2186                                    ;                 I          I        I          I
2187                                    ;                 I          I        I          I
2188                                    ;       MAINT-H   I          I        I          I
2189                                    ;                 I          I        I          I
2190                                    ;                 I          I--------I          I
2191                                    ;                 I          I        I          I
2192                                    ;                 I          I        I          I
2193                                    ;                 I          I        I          I
2194                                    ;                 I          I        I          I
2195                                    ;                 I  TIME    I        I          I
2196                                    ;                 I          I        I          I
2197                                    ;                 I          I        I          I
2198                                    ;                  7.3 MILLISECONDS +- 10%
2199                                    ;
2200
2201                                    ;*****************************************************************
2202                                    ; TEST 10 = 10  SET TO ONE
2203                                    ;
2204  003644  032737  000400  177570            BIT     #BIT8,SWR       ;TEST FOR LOCK ON ERROR SELECTED
2205  003652  001336                           BNE     RA10            ;(YES) LOOP ON CURRENT DATA ERROR
2206
2207  003654  006201                    RB10:   ASR     R1              ;ADVANCE
2208  003656  005201                            INC     R1              ;DEVICE TSR ADDRESS
2209  003660  000732                           BR      LOP10           ;CONTINUE
2210
2211  003662  123700  177570            END10:  CMPB    SWR,R0  ;TEST LOCK ON SUBTEST SELECTED
2212  003666  001002                           BNE     OUT10           ;(NO) BRANCHES
2213  003670  000137  003536                   JMP     TST10           ;YES JUMPS
2214  003674  104400                    OUT10:  SCOPE                   ;SCOPE LOOP
2215
2216
2217
```

```
                                .SBTTL  TST11: TEST DEVICE TRANSITION TSR  RESPONSE READ ONCE

                 000012                 N=N+1

                                ;               ***   STATIC LOGIC TESTS   ***
                                ;                   TSR READ ONCE  #ONES
                                ;       THE PURPOSE OF THIS TEST IS TO VERIFY THE
                                ;       BASIC LOGIC RESPONSE (SET TO ONES/CLR TO
                                ;       ZEROES) FOR EACH CB11-HA REGISTER ADDRESS.

003676  004737  013072  TST11:  JSR     PC,INITQ        ;CLEAR WORK REGISTERS R0-R4
003702  012700  000011          MOV     #11,R0          ;MOVE TEST# 11 TO DISPLAY R0

003706  006301          LOP11:  ASL     R1              ;FORM WORD OFFSET

003710  016102  016436  RA11:   MOV     CADTSR(R1),R2   ;CURRENT DEVICE TSR ADDRESS > R2
003714  001443                  BEQ     END11           ;BRANCH IF ALL DEVICES TESTED


003716  016102  016524          MOV     CADTER(R1),R2   ;TRANSITION ENABLE TER ADDRESS > R2
003722  012704  177777          MOV     #ONES,R4                ;#ONES TO SHOULD BE
003726  010412                  MOV     R4,(R2)         ;#ONES TO TER
003730  011203                  MOV     (R2),R3 ;FETCH RESULTS
003732  020304                  CMP     R3,R4           ;VERIFY RESULTS
003734  001401                  BEQ     RAA11           ;(OK) BRANCHES

003736  104004          ETR11:  HLT+4   ;TER (R2) RESPONSE FAILURE
                        ;               FAILURE TO ENABLE TO #ONES

003740  016102  016262  RAA11:  MOV     CADCSR(R1),R2   ;TOGGIE CONTROL AND STATUS REGISTER
003744  052712  020000          BIS     #20000,(R2)     ;MAINTENANCE BIT 13 SET
003750  004737  011614          JSR     PC,DLYGMS       ;DELAY
003754  042712  020000          BIC     #20000,(R2)     ;MAINTENANCE BIT 13 CLEAR
003760  004737  011614          JSR     PC,DLYGMS       ;DELAY

003764  016102  016436          MOV     CADTSR(R1),R2


003770  013704  013220          MOV     ZERO,R4         ;ZERO > SHOULD BE  > R4


003774  011203                  MOV     (R2),R3         ;INPUT RESULTS (TSR ) >R3

003776  011203          CLR11:  MOV     (R2),R3         ;INPUT RESULTS (TSR) >R3(DUAL READ)

004000  020304                  CMP     R3,R4           ;VERIFY RESULTS
004002  001405                  BEQ     RB11            ;(OK) BRANCHES
```

```
2274                            ;*************************************************************
2275                            ;
2276                            ;       DATA ERROR
2277                            ;
2278                            ;ERR11          DEVICE TSR (R2)  FAILED TO RESPOND CORRECTLY
2279                            ;
2280                            ;PROBABLE FAULT LOGIC: M7291 (D5-2A) E24
2281                            ;
2282                            ;                                       (D8 B4)E25, (D2 C2)E35,(D6 C2)E38
2283                            ;                                       (D4 OR D5 OR D6 OR D8 OR D9) ALL
2284                            ;
2285                            ;*************************************************************
2286
2287                            ;
2288                            ;               DISPLAY SIGNIFICANCE
2289                            ;
2290                            ;  (PC)  (PS)    (SP)    TEST    DEV#  DEVADD   WAS  SHOULD BE
2291                            ;  (R7)  (PSW)   (R6)    (R0)    (R1)   (R2)    (R3)    (R4)
2292                            ;
2293
2294  004004  104004            ERR11:  HLT+4   ;DEVICE TSR (R2) #ONES FAILED TO RESPOND CORRECTLY
2295                            ;                 ON
2296                            ;       CLR11: (ABOVE) FAILURE
2297                            ;                 (ZERO) SECOND READ
2298
2299                            ;*************************************************************
2300                            ; TEST 11 = SWITCH SETTINGS D2A6 E32 CHECK D3-D4-D5 E25-E23 READ ONCE
2301                            ;
2302  004006  032737  000400  177570        BIT     #BIT8,SWR       ;TEST FOR LOCK ON ERROR SELECTED
2303  004014  001335                        BNE     RA11            ;(YES) LOOP ON CURRENT DATA ERROR
2304
2305  004016  006201            RB11:       ASR     R1              ;ADVANCE
2306  004020  005201                        INC     R1              ;DEVICE TSR ADDRESS
2307  004022  000731                        BR      LOP11           ;CONTINUE
2308
2309  004024  123700  177570    END11:      CMPB    SWR,R0  ;TEST LOCK ON SUBTEST SELECTED
2310  004030  001002                        BNE     OUT11           ;(NO) BRANCHES
2311  004032  000137  003676                JMP     TST11           ;YES JUMPS
2312  004036  104400            OUT11:      SCOPE                   ;SCOPE LOOP
2313
2314
```

```
                                        .SBTTL  TST12: TEST DEVICE CONTROL AND DATA
                000013                          N=N+1
                                        ;               ***   STATIC LOGIC TESTS   ***
                                        ;
                                        ;               CONTROL AND DATA VARIATIONS
                                        ;
                                        ;       THE PURPOSE OF THIS TEST IS TO VERIFY THE
                                        ;       CB11-HA(S) ABILITY TO PROCESS DATA PATTERNS.
                                        ;       ALL PROCESSING IS STATIC (FLAGMODE) THAT IS
                                        ;       NON-INTERRUPT DRIVEN.
                                        ;       ACTIVITY IS UNDER CONTROL OF THE CB11-HA(S)
                                        ;       CSR BIT 13 MAINT/TRANS, NO DISTRIBUTE MODULE
                                        ;       PROCESSING IS DONE IN THIS TEST.
                                        ;
004040  004737  013072          TST12:  JSR     PC,INITQ        ;CLEAR WORK REGISTERS

004044  012700  000012                  MOV     #12,R0          ;MOVE TEST #12 TO DISPLAY R0
004050  012705  017152          RX12:   MOV     #CNTL,R5        ;FETCH DATA TABLE ADDRESS BASE>R5
004054  006301                  LOP12:  ASL     R1              ;FORM WORD OFFSET

004056  016102  016262          RA12:   MOV     CADCSR(R1),R2   ;CURRENT CSR ADDRESS>R2
004062  001002                          BNE     LNK0            ;BRANCH IF ALL DEVICES NOT TESTED
004064  000137  004474                  JMP     END12           ;JUMP IF ALL DEVICES TESTED
004070  005062  000006          LNK0:   CLR     6(R2)           ;CLEAR TER
004074  005762  000004                  TST     4(R2)           ;CLEAR TSR
004100  005012                          CLR     (R2)            ;CLEAR CSR
004102  062702  000006                  ADD     #6,R2           ;SET R2=TER ADDRESS
004106  011504                          MOV     (R5),R4         ;CURRENT DATA CONFIGURATION>R4

004110  010412          RB12:   MOV     R4,(R2)         ;SET TER (TRANSITION ENABLE REGISTER)
004112  011203                  MOV     (R2),R3         ;FETCH RESULTS
004114  020304                  CMP     R3,R4           ;VERIFY
004116  001405                  BEQ     LNK1            ;OK BRANCHES
                                ;                               SYNC ON SELECT 6
004120  104004          SETER1: HLT+4   ;TER REGISTER RESPONSE ERROR
                                ;                               SET SWR BIT 8 TO LOOP

                                ;PROBABLE FAULT LOGIC:  (D2 C2) E36, (D7) ALL
                                ;                       (D5 A4) E62
                                ;                       (D5 C2,D2) E1
                                ;                       (D5 C6,D6) E2

004122  032737  000400  177570           BIT     #BIT8,SWR       ;TEST LOCK ON ERROR SELECTED
004130  001367                           BNE     RB12            ;(YES) LOOP ON CURRENT ERROR
004132  016102  016262          LNK1:    MOV     CADCSR(R1),R2   ;SET DEVICE BASE CSR ADDDRESS >R2
004136  012704  020000                   MOV     #20000,R4       ;SET BIT 13>R4
004142  010412                           MOV     R4,(R2)         ;ENABLE MAINTENANCE BIT 13>CSR
                                                                 ;TOGGLE DATA REGISTER NEGATIVE [ZERO]
004144  004737  011614                   JSR     PC,DLYGMS       ;DELAY
004150  056104  016612                   BIS     CVT.CB(R1),R4   ;SET VECTOR RESPONSE
004154  011203                           MOV     (R2),R3         ;FETCH RESULTS
004156  042703  100000                   BIC     #BIT15,R3       ;INT/RDY (DON'T CARE)
004162  020304                           CMP     R3,R4           ;VERIFY
004164  001405                           BEQ     RC12            ;OK BRANCHES
                                ;                               SYNC ON SELECT 0
004166  104004          SECSR1: HLT+4   ;CSR REGISTER RESPONSE ERROR
```

```
2371                                    ;                       SET SWR BIT 8 TO LOOP
2372
2373
2374                                    ;PROBABLE FAULT LOGIC:  (D6 B2) E24
2375                                    ;                       (D5 D3,D6) E1, E2
2376                                    ;                       (D5 B4) E62
2377
2378  004170  032737  000400  177570          BIT     #BIT8,SWR       ;TEST LOCK ON ERROR SELECTED
2379  004176  001355                          BNE     LNK1            ;(YES) LOOP ON CURRENT ERROR
2380
2381  004200  005004                  RC12:   CLR     R4              ;RESET BIT 13>R4
2382  004202  005012                          CLR     (R2)            ;DISABLE MAINTENANCE BIT13>CSR
2383                                                                  ;TOGGLE DATA RESPONSE POSITIVE [ONES]
2384  004204  004737  011614                  JSR     PC,DLYGMS       ;DELAY
2385  004210  056104  016612                  BIS     CVT.CB(R1),R4   ;SET VECTOR RESPONSE
2386  004214  005715                          TST     (R5)            ;TEST TER DEVICE ACTIVITY
2387  004216  001402                          BEQ     1$              ;(NONE) BRANCHES
2388  004220  052704  100000                  BIS     #BIT15,R4       ;(ACTIVE) INT/RDY SHOULD BE = 1
2389  004224  011203                  1$:     MOV     (R2),R3         ;FETCH RESULTS
2390  004226  020304                          CMP     R3,R4           ;VERIFY
2391  004230  001405                          BEQ     LNK3            ;OK BRANCHES
2392                                  ;                       SYNC ON SELECT 0
2393  004232  104004                  SECSR2: HLT+4   ;CSR REGISTER RESPONSE ERROR
2394                                  ;                       ;SET SWR BIT 8 TO LOOP
2395
2396                                  ;PROBABLE FAULT LOGIC:  (D6 B2) E24
2397                                  ;                       (D5 D3,D6) E1, E2
2398                                  ;                       (D5 B4) E62
2399
2400  004234  032737  000400  177570          BIT     #BIT8,SWR       ;TEST LOCK ON ERROR SELECTED
2401  004242  001356                          BNE     RC12            ;(YES) LOOP ON CURRENT ERROR
2402
2403  004244  012704  140000          LNK3:   MOV     #140000,R4      ;SET BITS 15,14>R4
2404  004250  012712  040000                  MOV     #40000,(R2)     ;ENABLE INTERRUPT ENABLE BIT14>CSR
2405  004254  056104  016612                  BIS     CVT.CB(R1),R4   ;SET VECTOR RESPONSE
2406
2407  004260  005715                          TST     (R5)            ;TEST DATA CONFIGURATION ZERO
2408  004262  001002                          BNE     1$              ;(NO) BRANCHES
2409  004264  042704  100000                  BIC     #100000,R4      ;ZERO CLEAR INTERRUPT READY BIT15>R4
2410
2411  004270  011203                  1$:     MOV     (R2),R3         ;FETCH RESULTS
2412  004272  020304                          CMP     R3,R4           ;VERIFY
2413  004274  001411                          BEQ     LNK4
2414                                  ;                       SYNC ON (4TH) SELECT 0
2415  004276  104004                  ERERDY: HLT+4   ;CSR REGISTER RESPONSE ERROR
2416
2417                                  ;PROBABLE FAULT LOGIC:  (D6 B2) E24
2418                                  ;                       (D5 D3,D6) E1, E2
2419                                  ;                       (D5 B4) E62
2420
2421
2422                                  ;                       (D4 D6) E7
2423                                  ;                       (D6 D2) E38
2424
2425  004300  005703                          TST     R3
2426  004302  100004                          BPL     1$
```

```
2427                                    ;
2428                                    ;       A FAILURE OF BIT15 OF THE CURRENT CSR TO SET IS UNRECOVERABLE
2429                                    ;       CONTINUATION WILL RESULT IN MISLEADING RESULTS IN DYNAMIC TESTING
2430                                    ;       THIS FAILURE MUST BE CORRECTED BEFORE THE PROGRAM WILL CONTINUE
2431                                    ;
2432  004304  032737  000400  177570            BIT     #BIT8,SWR       ;TEST LOCK ON ERROR SELECTED
2433  004312  001402                            BEQ     LNK4            ;(NO)BRANCHES
2434
2435  004314  000137  004056          1$:       JMP     RA12    ;NO GO LOOP
2436
2437  004320  011504                  LNK4:     MOV     (R5),R4         ;CURRENT DATA TEST CONFIGURATION>R4
2438  004322  062702  000004                    ADD     #4,R2           ;SET TSR ADDRESS>R2
2439
2440  004326  011203                            MOV     (R2),R3         ;FETCH RESULTS
2441  004330  020304                            CMP     R3,R4           ;VERIFY
2442  004332  001407                            BEQ     LNK5            ;OK BRANCHES
2443                                  ;                               SYNC ON  SELECT 4
2444  004334  104004                  SETSR:    HLT+4   ;TSR REGISTER RESPONSE ERROR DATA
2445                                  ;                               SET SWR BIT 8 TO LOOP
2446
2447                                  ;PROBABLE FAULT LOGIC:  (D4 OR D5) ALL
2448                                  ;                               (D2 C2) E35
2449
2450  004336  032737  000400  177570            BIT     #BIT8,SWR       ;TEST LOCK ON ERROR SELECTED
2451  004344  001402                            BEQ     LNK5            ;(NO) BRANCHES
2452  004346  000137  004056                    JMP     RA12            ;(YES) LOOP ON CURRENT ERROR
2453
2454  004352  005004                  LNK5:     CLR     R4              ;CLEAR (R4) SHOULD BE
2455  004354  011203                            MOV     (R2),R3         ;FETCH CONTENTS OF TSR
2456  004356  020304                            CMP     R3,R4           ;VERIFY RESULTS
2457  004360  001407                            BEQ     LNK6            ;(OK) BRANCHES
2458                                  ;                               SYNC ON  SELECT 4
2459  004362  104004                  CLRTSR:   HLT+4   ;TSR REGISTER RESPONSE ERROR [FAILURE TO CLEAR]
2460                                  ;                               SET SWR BIT 8 TO LOOP
2461
2462                                  ;PROBABLE FAULT LOGIC:  (D2 B1,C1) E16, E38
2463                                  ;                               (D7) ALL
2464                                  ;                               (D8) ALL
2465                                  ;                               (D4 OR D5) E7, E8, E1, E2
2466
2467  004364  032737  000400  177570            BIT     #BIT8,SWR       ;TEST LOCK ON ERROR SELECTED
2468  004372  001402                            BEQ     LNK6            ;(NO)BRANCHES
2469  004374  000137  004056                    JMP     RA12            ;(YES) LOOP ON CURRENT ERROR
2470                                  ;
2471  004400  012704  040000          LNK6:     MOV     #40000,R4       ;SET BIT 14>R4
2472  004404  056104  016612                    BIS     CVT.CB(R1),R4   ;SET VECTOR RESPONSE
2473  004410  016102  016262                    MOV     CADCSR(R1),R2   ;SET CSR ADDRESS>R2
2474  004414  011203                            MOV     (R2),R3         ;FETCH RESULTS
2475  004416  020304                            CMP     R3,R4           ;VERIFY
2476  004420  001413                            BEQ     LNK7            ;(OK)BRANCHES
2477                                  ;                               SYNC ON  SELECT 4
2478  004422  104004                  ERIRDY:   HLT+4                   ;CSR REGISTER RESPONSE ERROR
2479                                  ;                               SET SWR BIT 8 TO LOOP
2480
2481                                  ;PROBABLE FAULT LOGIC:  (D6 D3) E68, E38
2482                                  ;                               (D4 C6,C7) E7, E37
```

```
2483
2484  004424  005703                          TST     R3              ;TEST IF BIT 15 FAILURE TO CLEAR
2485  004426  100002                          BPL     L1$             ;(NO)BRANCHES
2486                                  ;
2487                                  ;       A FAILURE OF BIT 15 OF THE CURRENT CSR TO CLEAR IS UNRECOVERABLE
2488                                  ;       CONTINUATION WOULD RESULT IN MISLEADING RESULTS IN DYNAMIC TESTING
2489                                  ;       THIS FAILURE MUST BE CORRECTED BEFORE THE PROGRAM WILL CONTINUE
2490                                  ;
2491  004430  000137  004056                  JMP     RA12    ;NO GO LOOP
2492                                  ;NOTE:
2493                                  ;       INTERMITTENT TYPE FAILURE WILL NOT HANG THE PROGRAM
2494                                  ;       ONLY HARD FAILURE.  THIS TEST SEQUENCE CAN BE LOCKED
2495                                  ;       ON VIA THE USE OF SWR BIT'S 07 THRU 00 SET TO THE
2496                                  ;       CURRENT TEST #12 FOR TROUBLE SHOOTING INTERMITTENT
2497                                  ;       FAILURES.
2498
2499  004434  032737  000400  177570  L1$:    BIT     #BIT8,SWR       ;TEST LOCK ON ERROR SELECTED
2500  004442  001402                          BEQ     LNK7            ;(NO)BRANCHES
2501  004444  000137  004056                  JMP     RA12            ;(YES)JUMPS
2502  004450  005725                  LNK7:   TST     (R5)+           ;ADVANCE TO NEXT DATA CONFIGURATION
2503  004452  005765  177776                  TST     -2(R5)          ;TEST FOR END OF DATA SCAN
2504  004456  001402                          BEQ     LNK8            ;(YES) BRANCHES
2505  004460  000137  004056                  JMP     RA12            ;(NO) JUMPS
2506
2507  004464  006201                  LNK8:   ASR     R1              ;ADVANCE
2508  004466  005201                          INC     R1              ;TO NEXT DEVICE INDEX
2509  004470  000137  004050                  JMP     RX12            ;CONTINUE
2510
2511  004474  123700  177570          END12:  CMPB    SWR,R0          ;TEST LOCK ON SUBTEST SELECTED
2512
2513
2514
2515
2516
2517  004500  001002                          BNE     OUT12           ;(NO) BRANCHES
2518  004502  000137  004040                  JMP     TST12           ;(YES) JUMPS
2519
2520
2521
2522
2523
2524
2525
2526
2527
2528
2529
2530
2531
2532
2533
2534  004506  104400                  OUT12:  SCOPE                   ;TEST SCOPE SELECTION
2535
2536          000014                          N=N+1
```

```
                        .SBTTL  TST13: TEST DEVICE INTERRUPT CONTROL ENB


                        ;               ***   STATIC LOGIC TESTS   ***
                        ;
                        ;                  DEVICE INTERRUPT CONTROL
                        ;
                        ;       THE PURPOSE OF THIS TEST IS TO VERIFY (STATICALLY)
                        ;       THE INTERRUPT CONTROL LOGIC OF THE CB11-HA(S) IN
                        ;       NON-INTERRUPT MODE. DEVICE ACTIVITY IS UNDER THE CONTROL
                        ;       OF THE MAINT/TRANS BIT 13 OF THE DEVICE CSR REGISTER FOR
                        ;       NORMAL OPERATION AND CAN BE UNDER THE JOINT CONTROL OF
                        ;       A DISTRIBUTE MODULE INPUT WHEN DISTRIBUTE TIED TO THE
                        ;       INTERRUPT MODULE MODE OF TESTING IS SELECTED BY THE USER.
                        ;       NOTE:
                        ;               NO DISTRIBUTE MODE OF TESTING IS ALLOWED IN
                        ;               MONITOR MODE OF EXECUTION.
                        ;
                        ;
                        ;       TEST ABILITY TO SET BIT 15 INT/RDY
                        ;       OF CURRENT CSR REGCTER WORD 0
                        ;
                        ;       THE FOLLOWING SEQUENCE OF COMMANDS ARE ISSUED
                        ;
                        ;       SET CSR BIT 14 VERIFY RESULTS
                        ;
                        ;       MOV #ONES INTO TER REGISTER     VERIFY RESULTS
                        ;
                        ;       SET BIT13 OF CSR        VERIFY RESULTS  MAINT/TRANS
                        ;
                        ;       DELAY APPROMIMATELY 7 MILLISECONDS
                        ;       CLR BIT13 OF CSR        VERIFY RESULTS  MAINT/TRANS
                        ;
                        ;       DELAY APPROXIMATELY 7 MILLISECONDS
                        ;
                        ;       TEST BIT 15 OF CSR INT/RDY VERIFY SET TO ONE
                        ;
                        ;       TEST TSR WORD 4 NON-ZERO
```

```
2580  004510  000240                    TST13:  NOP
2581  004512  004737  013072                    JSR     PC,INITQ        ;CLEAR WORK REGISTERS R0-R4
2582  004516  012700  000013                    MOV     #13,R0          ;MOVE TEST#13 TO DISPLAY R0
2583
2584  004522  006301                    LOP13:  ASL     R1              ;FORM WORD OFFSET
2585  004524  013737  012430  005216    RA13:   MOV     ERRORS,RERR13   ;RECORD ERROR COUNT ON ENTRY
2586  004532  016102  016262                    MOV     CADCSR(R1),R2   ;CURRENT DEVICE CSR ADDRESS>R2
2587  004536  001002                            BNE     1$              ;BRANCH IF ACTIVE
2588  004540  000137  005204                    JMP     END13           ;JUMP ON END OF SCAN
2589  004544  005012                    1$:     CLR     (R2)            ;INIT CONTROL AND STATUS
2590  004546  005062  000006                    CLR     6(R2)           ;TER
2591  004552  012704  040000                    MOV     #BIT14,R4       ;#BIT14 TO SHOULD BE R4
2592  004556  052704  020000                    BIS     #BIT13,R4       ;SET MAINT/TRANS BIT13 OF CSR = 1
2593                                                                    ;FIRST TOGGLE
2594                                    ;
2595                                    ;       SET MAINT/TRANS BIT 13 OF CSR = 1
2596                                    ;
2597  004562  010412                            MOV     R4,(R2)         ;#BIT14, #BIT13 TO CSR
2598  004564  011203                            MOV     (R2),R3         ;FETCH RESULTS
2599  004566  056104  016612                    BIS     CVT.CB(R1),R4   ;MASK IN VECTOR ADDRESS RESPONSE
2600  004572  020304                            CMP     R3,R4           ;VERIFY RESULTS
2601  004574  001401                            BEQ     RB13            ;(OK) BRANCHES
2602                                    ;*******************************************************************
2603                                    ;               (CSR) SHOULD BE #BIT14
2604  004576  104004                    ECSR13: HLT+4   ;DEVICE CSR (R2) FAILED TO RESPOND CORRECTLY
2605
2606                                    ;PROBABLE FAULT LOGIC:  (D2 C2) E36
2607                                    ;                       (D6 B2) E24
2608                                    ;                       (D4 D7,D6) E42, E7
2609
2610                                    ;*******************************************************************
2611  004600  013702  002176    RB13:   MOV     DSTADR,R2       ;FETCH DISTRIBUTE ADDRESS
2612  004604  001002                            BNE     1$              ;ACTIVE BRANCHES
2613  004606  000137  004730                    JMP     RE13            ;(NOT DISTB/MODE) JUMPS
2614  004612  004737  011614    1$:     JSR     PC,DLYGMS       ;DELAY 7 MILLISECONDS
2615
2616                                    ;       DISTRIBUTE TIED TO INTERRUPT MODE PROCESSING
2617
2618  004616  016102  016524                    MOV     CADTER(R1),R2   ;CURRENT DEVICE TER ADDRESS>R2
2619  004622  012704  177777                    MOV     #ONES,R4
2620  004626  010412                            MOV     R4,(R2)         ;ONES TO TER REGISTER
2621
2622                                    ;       ALL ONES ENABLE TER REGISTER
2623
2624  004630  011203                            MOV     (R2),R3         ;FETCH RESULTS
2625  004632  020304                            CMP     R3,R4           ;VERIFY RESULTS
2626  004634  001401                            BEQ     RBC13           ;(OK) BRANCHES
2627
2628                                    ;*******************************************************************
2629
2630  004636  104004                    ETER13:HLT+4    ;DEVICE TER (R2) FAILED TO RESPOND CORRECTLY
2631
2632
2633                                    ;PROBABLE FAULT LOGIC:  (D4 C2,D6) E8, E7
2634                                    ;                       (D2 C2) E36
2635                                    ;                       (D7) ALL
```

```
                                ;*****************************************************************************
004640                          RBC13:
                                ;*****************************************************************************
                                ;
                                ;       DISTRIBUTE TIED TO INTERRUPT TESTING
                                ;       DELAY FOR PREVIOUS BIT 13 OF CSR = 1
                                ;       TOGGLE DISTRIBUTE MODULE TO #ONES VERIFY RESULTS
                                ;
004640  013702  002176                  MOV     DSTADR,R2       ;DISTRIBUTE MODULE DEVICE ADDRESS
004644  012704  177777                  MOV     #ONES,R4        ;DATA (TEST) BITS TO R4
004650  010412                          MOV     R4,(R2)         ;SET DISTB MODULE BITS
004652  011203                          MOV     (R2),R3         ;FETCH
004654  020304                          CMP     R3,R4           ;VERIFY
004656  001401                          BEQ     RDA13           ;(OK) BRANCHES
                                ;       DISTRIBUTE MODULE RESPONSE FAILURE
004660  104004                  EDST13: HLT+4   ;ERROR DISTRIBUTE MODULE RESPONSE
                                ;
                                ;       SUGGEST YOU RUN DISTRIBUTE MODULE DIAGNOSTICS
                                ;       OR REMOVE CB11-HA MODULE FROM CRUTCH CARD
                                ;
004662  004737  011606          RDA13:  JSR     PC,DDLYMS       ;DELAY 7.3 (X2) MILLISECONDS
004666  016102  016350                  MOV     CADDDR(R1),R2   ;*** NOTE IF NOT DISTB/MODE CSR BIT 13 = 0
004672  011203                          MOV     (R2),R3         ;FETCH CONTENTS OF INTR/HA DATA REGISTER
004674  020304                          CMP     R3,R4           ;COMPARE RESULTS
004676  001401                          BEQ     RDB13           ;(OK) BRANCHES
                                ;       INTERRUPT MODULE DATA REGISTER RESPONSE FAILURE
004700  104004                  EDDR13: HLT+4   ;DATA REGISTER (R2) RESPONSE FAILURE
                                ;       BITS "IN" R3 SHOULD HAVE SET ACCORDING TO BITS "OUT" R4
                                ;
                                ;PROBABLE FAULT LOGIC:  (D8 B4) E25
                                ;                       (D8 OR D9) ALL
                                ; IF EDST13: ERROR ABOVE
                                ;       SUGGEST YOU RUN DISTRIBUTE MODULE DIAGNOSTICS
004702  005004                  RDB13:  CLR     R4              ;CLEAR SHOULD BE
004704  013702  002176                  MOV     DSTADR,R2       ;SET DISTRIBUTE ADDRESS
004710  005012                          CLR     (R2)            ;CLEAR DISTB MODULE REGISTER
004712  011203                          MOV     (R2),R3         ;FETCH RESULTS
004714  001401                          BEQ     RX13            ;VERIFY (OK) BRANCHES
                                ;       DISTRIBUTE REGISTER (R2) RESPONSE FAILURE
004716  104004                  EDDZ13: HLT+4   ;DEVICE DISTRIBUTE REGISTER (R2) FAILED TO CLEAR
                                ;       DISTRIBUTE TIED TO INTERRUPT MODE OF TESTING
                                ;
                                ;       SUGGEST YOU RUN DISTRIBUTE MODULE DIAGNOSTICS
                                ;
004720  004737  011606          RX13:   JSR     PC,DDLYMS       ;DELAY 7.3 (X2) MILLISECONDS
004724  000137  005042                  JMP     EXD13           ;VERIFY RESULTS
                                ;
                                ;       NON DISTRIBUTE MODE PROCESSING
                                ;
004730  016102  016524          RE13:   MOV     CADTER(R1),R2   ;FETCH TER ADDRESS
004734  012704  177777                  MOV     #ONES,R4        ;#ONES TEST DATA TO SHOULD BE
004740  010412                          MOV     R4,(R2)         ;TO TER REGISTER
```

```
2692  004742  011203                  MOV     (R2),R3         ;FETCH RESULTS IN CSR
2693  004744  020304                  CMP     R3,R4           ;VERIFY
2694  004746  001401                  BEQ     RF13            ;(OK) BRANCHES
2695
2696                          ;*************************************************************************
2697
2698  004750  104004          EBXX13: HLT+4   ;DEVICE TER (R2) FAILED TO RESPOND CORRECTLY
2699
2700
2701                          ;PROBABLE FAULT LOGIC:  (D4 D6,C2) E7, E8
2702                          ;                       (D2 C2) E36
2703                          ;                       (D7) ALL
2704
2705
2706                          ;*************************************************************************
2707
2708  004752  004737  011614  RF13:   JSR     PC,DLYGMS       ;DELAY 7 MILLISECONDS
2709  004756  016102  016262          MOV     CADCSR(R1),R2   ;FETCH CSR ADDRESS
2710  004762  012704  040000          MOV     #BIT14,R4       ;#BIT14 TO SHOULD BE
2711  004766  052704  020000          BIS     #BIT13,R4       ;FIRST TOGGLE MAINT/TRANS =1
2712  004772  056104  016612          BIS     CVT.C8(R1),R4   ;MASK IN VECTOR RESPONSE
2713  004776  011203                  MOV     (R2),R3         ;FETCH RESPONSE
2714  005000  042703  100000          BIC     #BIT15,R3       ;FIRST TOGGLE BIT 15 DON'T CARE
2715  005004  020304                  CMP     R3,R4           ;VERIFY RESULTS
2716  005006  001401                  BEQ     RG13            ;(OK) BRANCHES
2717
2718  005010  104004          ERF13:  HLT+4   ;DEVICE CSR (R2) RESPONSE FAILURE
2719
2720  005012  042712  020000  RG13:   BIC     #BIT13,(R2)     ;RESET BIT 13 MAINT/TRANS CSR = 0
2721                                                          ;SECOND TOGGLE
2722  005016  011203                  MOV     (R2),R3         ;FETCH RESULTS
2723  005020  042703  100000          BIC     #BIT15,R3       ;DON'T CARE
2724  005024  042704  020000          BIC     #BIT13,R4
2725  005030  020304                  CMP     R3,R4           ;VERIFY RESULTS
2726  005032  001401                  BEQ     RH13            ;(OK) BRANCHES
2727
2728  005034  104004          ERH13:  HLT+4   ;DEVICE CSR (R2) RESPONSE ERROR
2729
2730
2731                          ;PROBABLE FAULT LOGIC:  (D2 C2) E36
2732                          ;                       (D6 C2) E24
2733                          ;                       (D4 D6,D7) E7, E42
2734
2735  005036  004737  011614  RH13:   JSR     PC,DLYGMS       ;DELAY 7 MILLISECONDS
2736
2737                          ;       ACTIVITY VERIFICATION
2738
2739  005042  016102  016262  EXD13:  MOV     CADCSR(R1),R2   ;FETCH CURRENT CSR ADDRESS
2740
2741  005046  012704  040000          MOV     #BIT14,R4       ;#BIT14 TO SHOULD BE
2742  005052  005737  002176          TST     DSTADR          ;TEST DISTB/MODE
2743  005056  001402                  BEQ     1$              ;(NO) BRANCHES
2744  005060  052704  020000          BIS     #BIT13,R4       ;(YES) MAINT/TRANS BIT 13 = 1
2745  005064  005727  177777  1$:     TST     #ONES           ;TEST TRANS/ENB  ARGUMENT #ONES
2746  005070  001402                  BEQ     2$              ;(NOT ACTIVE) BRANCHES
2747  005072  052704  100000          BIS     #BIT15,R4       ;ACTIVE SET INT/RDY BIT 15 SHOULD BE
```

```
2748  005076  056104  016612          2$:     BIS     CVT.CB(R1),R4   ;MASK IN VECTOR RESPONSE
2749  005102  011203                          MOV     (R2),R3         ;FETCH RESULTS
2750  005104  020304                          CMP     R3,R4           ;VERIFY
2751  005106  001401                          BEQ     RI13            ;(OK) BRANCHES
2752                                  ;
2753  005110  104004                  ERJ13:  HLT+4   ;DEVICE CSR (R2) RESPONSE FAILURE
2754
2755                                  ;PROBABLE FAULT LOGIC:  (D2 C2) E36
2756                                  ;                       (D6 C2) E24
2757                                  ;                       (D4 D6,D7) E7, E42
2758
2759                                  ;
2760  005112  016102  016436          RI13:   MOV     CADTSR(R1),R2   ;SET DEVICE TSR REGISTER > R2
2761  005116  011203                          MOV     (R2),R3         ;(FIRST READ) CHANGE OF STATE REGISTER TSR
2762  005120  012704  177777                  MOV     #ONES,R4        ;APPROPERIATE BITS TO SHOULD BE
2763  005124  020304                          CMP     R3,R4           ;VERIFY RESULTS
2764  005126  001401                          BEQ     RJ13            ;(OK) BRANCHES
2765                                  ;       TRANSITION STATE REGISTER RESPONSE FAILURE
2766  005130  104004                  ETSR13: HLT+4   ;DEVICE TSR (R2) RESPONSE FAILURE
2767                                  ;       BITS "IN" R3 SHOULD HAVE SET ACCORDING TO BITS "OUT" R4
2768
2769                                  ;PROBABLE FAULT LOGIC:  (D4 OR D5) ALL
2770                                  ;                       (D6) ALL
2771                                  ;                       (D7) ALL
2772                                  ;                       (D8 OR D9) ALL
2773
2774
2775  005132  016102  016436          RJ13:   MOV     CADTSR(R1),R2   ;SET DEVICE TSR ADDRESS>R2
2776  005136  005004                          CLR     R4              ;CLR SHOULD BE
2777  005140  011203                          MOV     (R2),R3         ;FETCH CONTENTS OF TSR
2778  005142  020304                          CMP     R3,R4           ;VERIFY RESULTS
2779  005144  001401                          BEQ     RK13            ;(OK) BRANCHES
2780
2781                                  ;*************************************************************************
2782                                  ;       TSR (R2) RESPONSE FAILURE
2783
2784  005146  104004                  ERK13:  HLT+4   ;DEVICE TSR (R2) FAILED TO RESPOND CORRECTLY
2785                                                  ;SHOULD HAVE CLEARED BY FIRST READ ABOVE (RI13)
2786                                  ;PROBABLE FAULT LOGIC:  (D4 OR D5) ALL
2787                                  ;                       (D6) ALL
2788                                  ;                       (D7) ALL
2789                                  ;                       (D8 OR D9) ALL
2790
2791                                  ;*************************************************************************
2792
2793  005150  023737  012430  005216  RK13:   CMP     ERRORS,RERR13   ;TEST ANY ERRORS RECORED
2794                                                                  ;(NO) BRANCHES
2795  005156  001004                          BNE     RL13            ;(YES) BRANCHES
2796
2797  005160  006201                  LOPX13: ASR     R1              ;ADVANCE TO
2798  005162  005201                          INC     R1              ;NEXT DEVICE
2799  005164  000137  004522                  JMP     LOP13           ;CONTINUE
2800
2801  005170  032737  000400  177570  RL13:   BIT     #BIT8,SWR       ;TEST LOCK ON ERROR SELECTED
2802  005176  001770                          BEQ     LOPX13          ;(NO) BRANCHES
2803  005200  000137  004524                  JMP     RA13            ;(YES) JUMPS
```

```
2804
2805  005204  123700  177570        END13:  CMPB    SWR,R0          ;TEST LOCK ON SUBTEST SELECTED
2806  005210  001003                        BNE     OUT13           ;(NO) BRANCHES
2807  005212  000137  004510                JMP     TST13           ;(YES)JUMPS
2808
2809  005216  000000                RERR13:0                        ;RECORD ERROR COUNT ENTRY
2810
2811  005220  104400                OUT13:  SCOPE
2812
2813          000015                        N=N+1
```

```
                        .SBTTL  TST14: TEST DEVICE INTERRUPT CONTROL DSB


                ;               ***   STATIC LOGIC TESTS   ***
                ;
                ;                  DEVICE INTERRUPT CONTROL
                ;
                ;       THE PURPOSE OF THIS TEST IS TO VERIFY (STATICALLY)
                ;       THE INTERRUPT CONTROL LOGIC OF THE CB11-HA(S) IN
                ;       NON-INTERRUPT MODE. DEVICE ACTIVITY IS UNDER THE CONTROL
                ;       OF THE MAINT/TRANS BIT 13 OF THE DEVICE CSR REGISTER FOR
                ;       NORMAL OPERATION AND CAN BE UNDER THE JOINT CONTROL OF
                ;       A DISTRIBUTE MODULE INPUT WHEN DISTRIBUTE TIED TO THE
                ;       INTERRUPT MODULE MODE OF TESTING IS SELECTED BY THE USER.
                ;       NOTE:
                ;               NO DISTRIBUTE MODE OF TESTING IS ALLOWED IN
                ;               MONITOR MODE OF EXECUTION.
                ;
                ;
                ;       TEST ABILITY TO INHIBIT SETTING BIT 15 INT/RDY
                ;       OF CURRENT CSR REGISTER WORD 0
                ;
                ;       THE FOLLOWING SEQUENCE OF COMMANDS ARE ISSUED
                ;
                ;       SET CSR BIT 14 VERIFY RESULTS
                ;
                ;       MOV ZERO INTO TER REGISTER      VERIFY RESULTS
                ;
                ;       SET BIT13 OF CSR        VERIFY RESULTS  MAINT/TRANS
                ;
                ;       DELAY APPROMIMATELY 7 MILLISECONDS
                ;       CLR BIT13 OF CSR        VERIFY RESULTS  MAINT/TRANS
                ;
                ;       DELAY APPROXIMATELY 7 MILLISECONDS
                ;
                ;       TEST BIT 15 OF CSR INT/RDY VERIFY SET TO ZERO
                ;
                ;       TEST TSR WORD 4 ZERO
                ;
```

```
2857  005222  000240                    TST14:  NOP
2858  005224  004737  013072                    JSR     PC,INITQ        ;CLEAR WORK REGISTERS R0-R4
2859  005230  012700  000014                    MOV     #14,R0          ;MOVE TEST#14 TO DISPLAY R0
2860
2861  005234  006301                    LOP14:  ASL     R1              ;FORM WORD OFFSET
2862  005236  013737  012430  005730    RA14:   MOV     ERRORS,RERR14   ;RECORD ERROR COUNT ON ENTRY
2863  005244  016102  016262                    MOV     CADCSR(R1),R2   ;CURRENT DEVICE CSR ADDRESS>R2
2864  005250  001002                            BNE     1$              ;BRANCH IF ACTIVE
2865  005252  000137  005716                    JMP     END14           ;JUMP ON END OF SCAN
2866  005256  005012                    1$:     CLR     (R2)            ;INIT CONTROL AND STATUS
2867  005260  005062  000006                    CLR     6(R2)           ;TER
2868  005264  012704  040000                    MOV     #BIT14,R4       ;#BIT14 TO SHOULD BE R4
2869  005270  052704  020000                    BIS     #BIT13,R4       ;SET MAINT/TRANS BIT13 OF CSR = 1
2870                                                                    ;FIRST TOGGLE
2871                                      ;
2872                                      ;       SET MAINT/TRANS BIT 13 OF CSR = 1
2873                                      ;
2874  005274  010412                            MOV     R4,(R2)         ;#BIT14, #BIT13 TO CSR
2875  005276  011203                            MOV     (R2),R3         ;FETCH RESULTS
2876  005300  056104  016612                    BIS     CVT.CB(R1),R4   ;MASK IN VECTOR ADDRESS RESPONSE
2877  005304  020304                            CMP     R3,R4           ;VERIFY RESULTS
2878  005306  001401                            BEQ     RB14            ;(OK) BRANCHES
2879                                    ;*****************************************************************************
2880                                    ;               (CSR) SHOULD BE #BIT14
2881  005310  104004                    ECSR14: HLT+4   ;DEVICE CSR (R2) FAILED TO RESPOND CORRECTLY
2882
2883                                    ;PROBABLE FAULT LOGIC:  (D2 C2) E36
2884                                    ;                       (D6 B2) E24
2885                                    ;                       (D4 D7,D6) E42, E7
2886
2887                                    ;*****************************************************************************
2888  005312  013702  002176    RB14:   MOV     DSTADR,R2       ;FETCH DISTRIBUTE ADDRESS
2889  005316  001002                            BNE     1$              ;ACTIVE BRANCHES
2890  005320  000137  005442                    JMP     RE14            ;(NOT DISTB/MODE) JUMPS
2891  005324  004737  011614    1$:     JSR     PC,DLYGMS       ;DELAY 7 MILLISECONDS
2892
2893                                    ;       DISTRIBUTE TIED TO INTERRUPT MODE PROCESSING
2894
2895  005330  016102  016524                    MOV     CADTER(R1),R2   ;CURRENT DEVICE TER ADDRESS>R2
2896  005334  012704  177777                    MOV     #ONES,R4
2897  005340  010412                            MOV     R4,(R2)         ;ONES TO TER REGISTER
2898
2899                                    ;       ALL ONES ENABLE TER REGISTER
2900
2901  005342  011203                            MOV     (R2),R3         ;FETCH RESULTS
2902  005344  020304                            CMP     R3,R4           ;VERIFY RESULTS
2903  005346  001401                            BEQ     RBC14           ;(OK) BRANCHES
2904
2905                                    ;*****************************************************************************
2906
2907  005350  104004                    ETER14:HLT+4    ;DEVICE TER (R2) FAILED TO RESPOND CORRECTLY
2908
2909
2910                                    ;PROBABLE FAULT LOGIC:  (D4 C2,D6) E8, E7
2911                                    ;                       (D2 C2) E36
2912                                    ;                       (D7) ALL
```

```
                                ;*****************************************************************
005352                          RBC14:
                                ;*****************************************************************
                                ;
                                ;       DISTRIBUTE TIED TO INTERRUPT TESTING
                                ;       DELAY FOR PREVIOUS BIT 13 OF CSR = 1
                                ;       TOGGLE DISTRIBUTE MODULE TO ZERO VERIFY RESULTS
005352  013702  002176                  MOV     DSTADR,R2       ;DISTRIBUTE MODULE DEVICE ADDRESS
005356  013704  013220                  MOV     ZERO,R4 ;DATA (TEST) BITS TO R4
005362  010412                          MOV     R4,(R2)         ;SET DISTB MODULE BITS
005364  011203                          MOV     (R2),R3         ;FETCH
005366  020304                          CMP     R3,R4           ;VERIFY
005370  001401                          BEQ     RDA14           ;(OK) BRANCHES
                                ;       DISTRIBUTE MODULE RESPONSE FAILURE
005372  104004                  EDST14: HLT+4   ;ERROR DISTRIBUTE MODULE RESPONSE
                                ;       SUGGEST YOU RUN DISTRIBUTE MODULE DIAGNOSTICS
                                ;       OR REMOVE CB11-HA MODULE FROM CRUTCH CARD
005374  004737  011606          RDA14:  JSR     PC,DDLYMS       ;DELAY 7.3 (X2) MILLISECONDS
005400  016102  016350                  MOV     CADDDR(R1),R2   ;*** NOTE IF NOT DISTB/MODE CSR BIT 13 = 0
005404  011203                          MOV     (R2),R3         ;FETCH CONTENTS OF INTR/HA DATA REGISTER
005406  020304                          CMP     R3,R4           ;COMPARE RESULTS
005410  001401                          BEQ     RDB14           ;(OK) BRANCHES
                                ;       INTERRUPT MODULE DATA REGISTER RESPONSE FAILURE
005412  104004                  EDDR14: HLT+4   ;DATA REGISTER (R2) RESPONSE FAILURE
                                ;       BITS "IN" R3 SHOULD HAVE SET ACCORDING TO BITS "OUT" R4

                                ;PROBABLE FAULT LOGIC:  (D8 B4) E25
                                ;                       (D8 OR D9) ALL
                                ; IF EDST14: ERROR ABOVE
                                ;       SUGGEST YOU RUN DISTRIBUTE MODULE DIAGNOSTICS
005414  005004                  RDB14:  CLR     R4              ;CLEAR SHOULD BE
005416  013702  002176                  MOV     DSTADR,R2       ;SET DISTRIBUTE ADDRESS
005422  005012                          CLR     (R2)            ;CLEAR DISTB MODULE REGISTER
005424  011203                          MOV     (R2),R3         ;FETCH RESULTS
005426  001401                          BEQ     RX14            ;VERIFY (OK) BRANCHES
                                ;       DISTRIBUTE REGISTER (R2) RESPONSE FAILURE
005430  104004                  EDDZ14: HLT+4   ;DEVICE DISTRIBUTE REGISTER (R2) FAILED TO CLEAR
                                ;       DISTRIBUTE TIED TO INTERRUPT MODE OF TESTING

                                ;       SUGGEST YOU RUN DISTRIBUTE MODULE DIAGNOSTICS

005432  004737  011606          RX14:   JSR     PC,DDLYMS       ;DELAY 7.3 (X2) MILLISECONDS
005436  000137  005554                  JMP     EXD14           ;VERIFY RESULTS

                                ;       NON DISTRIBUTE MODE PROCESSING

005442  016102  016524          RE14:   MOV     CADTER(R1),R2   ;FETCH TER ADDRESS
005446  013704  013220                  MOV     ZERO,R4 ;ZERO TEST DATA TO SHOULD BE
005452  010412                          MOV     R4,(R2)         ;TO TER REGISTER
```

```
2969  005454  011203                          MOV     (R2),R3         ;FETCH RESULTS IN CSR
2970  005456  020304                          CMP     R3,R4           ;VERIFY
2971  005460  001401                          BEQ     RF14            ;(OK) BRANCHES
2972
2973                                  ;*************************************************************************
2974
2975  005462  104004                  EBXX14: HLT+4   ;DEVICE TER (R2) FAILED TO RESPOND CORRECTLY
2976
2977
2978                                  ;PROBABLE FAULT LOGIC:  (D4 D6,C2) E7, E8
2979                                  ;                       (D2 C2) E36
2980                                  ;                       (D7) ALL
2981
2982
2983                                  ;*************************************************************************
2984
2985  005464  004737  011614          RF14:   JSR     PC,DLYGMS       ;DELAY 7 MILLISECONDS
2986  005470  016102  016262                  MOV     CADCSR(R1),R2   ;FETCH CSR ADDRESS
2987  005474  012704  040000                  MOV     #BIT14,R4       ;#BIT14 TO SHOULD BE
2988  005500  052704  020000                  BIS     #BIT13,R4       ;FIRST TOGGLE MAINT/TRANS =1
2989  005504  056104  016612                  BIS     CVT.CB(R1),R4   ;MASK IN VECTOR RESPONSE
2990  005510  011203                          MOV     (R2),R3         ;FETCH RESPONSE
2991  005512  042703  100000                  BIC     #BIT15,R3       ;FIRST TOGGLE BIT 15 DON'T CARE
2992  005516  020304                          CMP     R3,R4           ;VERIFY RESULTS
2993  005520  001401                          BEQ     RG14            ;(OK) BRANCHES
2994                                  ;
2995  005522  104004                  ERF14:  HLT+4   ;DEVICE CSR (R2) RESPONSE FAILURE
2996                                  ;
2997  005524  042712  020000          RG14:   BIC     #BIT13,(R2)     ;RESET BIT 13 MAINT/TRANS CSR = 0
2998                                                                  ;SECOND TOGGLE
2999  005530  011203                          MOV     (R2),R3         ;FETCH RESULTS
3000  005532  042703  100000                  BIC     #BIT15,R3       ;DON'T CARE
3001  005536  042704  020000                  BIC     #BIT13,R4
3002  005542  020304                          CMP     R3,R4           ;VERIFY RESULTS
3003  005544  001401                          BEQ     RH14            ;(OK) BRANCHES
3004                                  ;
3005  005546  104004                  ERH14:  HLT+4   ;DEVICE CSR (R2) RESPONSE ERROR
3006                                  ;
3007
3008                                  ;PROBABLE FAULT LOGIC:  (D2 C2) E36
3009                                  ;                       (D6 C2) E24
3010                                  ;                       (D4 D6,D7) E7, E42
3011
3012  005550  004737  011614          RH14:   JSR     PC,DLYGMS       ;DELAY 7 MILLISECONDS
3013                                  ;
3014                                  ;       ACTIVITY VERIFICATION
3015
3016  005554  016102  016262          EXDI4:  MOV     CADCSR(R1),R2   ;FETCH CURRENT CSR ADDRESS
3017
3018  005560  012704  040000                  MOV     #BIT14,R4       ;#BIT14 TO SHOULD BE
3019  005564  005737  002176                  TST     DSTADR          ;TEST DISTB/MODE
3020  005570  001402                          BEQ     1$              ;(NO) BRANCHES
3021  005572  052704  020000                  BIS     #BIT13,R4       ;(YES) MAINT/TRANS BIT 13 = 1
3022  005576  005737  013220          1$:     TST     ZERO            ;TEST TRANS/ENB  ARGUMENT ZERO
3023  005602  001402                          BEQ     2$              ;(NOT ACTIVE) BRANCHES
3024  005604  052704  100000                  BIS     #BIT15,R4       ;ACTIVE SET INT/RDY BIT 15 SHOULD BE
```

```
3025  005610  056104  016612          2$:     BIS     CVT.CB(R1),R4   ;MASK IN VECTOR RESPONSE
3026  005614  011203                          MOV     (R2),R3         ;FETCH RESULTS
3027  005616  020304                          CMP     R3,R4           ;VERIFY
3028  005620  001401                          BEQ     RI14            ;(OK) BRANCHES
3029                                  ;
3030  005622  104004                  ERJ14:  HLT+4   ;DEVICE CSR (R2) RESPONSE FAILURE
3031
3032                                  ;PROBABLE FAULT LOGIC:  (D2 C2) E36
3033                                  ;                       (D6 C2) E24
3034                                  ;                       (D4 D6,D7) E7, E42
3035
3036                                  ;
3037  005624  016102  016436          RI14:   MOV     CADTSR(R1),R2   ;SET DEVICE TSR REGISTER > R2
3038  005630  011203                          MOV     (R2),R3         ;(FIRST READ) CHANGE OF STATE REGISTER TSR
3039  005632  013704  013220                  MOV     ZERO,R4 ;APPROPERIATE BITS TO SHOULD BE
3040  005636  020304                          CMP     R3,R4           ;VERIFY RESULTS
3041  005640  001401                          BEQ     RJ14            ;(OK) BRANCHES
3042                                  ;       TRANSITION STATE REGISTER RESPONSE FAILURE
3043  005642  104004                  ETSR14: HLT+4   ;DEVICE TSR (R2) RESPONSE FAILURE
3044                                  ;       BITS "IN" R3 SHOULD HAVE SET ACCORDING TO BITS "OUT" R4
3045
3046                                  ;PROBABLE FAULT LOGIC:  (D4 OR D5) ALL
3047                                  ;                       (D6) ALL
3048                                  ;                       (D7) ALL
3049                                  ;                       (D8 OR D9) ALL
3050
3051
3052  005644  016102  016436          RJ14:   MOV     CADTSR(R1),R2   ;SET DEVICE TSR ADDRESS>R2
3053  005650  005004                          CLR     R4              ;CLR SHOULD BE
3054  005652  011203                          MOV     (R2),R3         ;FETCH CONTENTS OF TSR
3055  005654  020304                          CMP     R3,R4           ;VERIFY RESULTS
3056  005656  001401                          BEQ     RK14            ;(OK) BRANCHES
3057
3058                                  ;*************************************************************************
3059                                  ;       TSR (R2) RESPONSE FAILURE
3060
3061  005660  104004                  ERK14:  HLT+4   ;DEVICE TSR (R2) FAILED TO RESPOND CORRECTLY
3062                                                  ;SHOULD HAVE CLEARED BY FIRST READ ABOVE (RI14)
3063                                  ;PROBABLE FAULT LOGIC:  (D4 OR D5) ALL
3064                                  ;                       (D6) ALL
3065                                  ;                       (D7) ALL
3066                                  ;                       (D8 OR D9) ALL
3067
3068                                  ;*************************************************************************
3069
3070  005662  023737  012430  005730  RK14:   CMP     ERRORS,RERR14   ;TEST ANY ERRORS RECORDED
3071                                                                  ;(NO) BRANCHES
3072  005670  001004                          BNE     RL14            ;(YES) BRANCHES
3073
3074  005672  006201                  LOPX14: ASR     R1              ;ADVANCE TO
3075  005674  005201                          INC     R1              ;NEXT DEVICE
3076  005676  000137  005234                  JMP     LOP14           ;CONTINUE
3077
3078  005702  032737  000400  177570  RL14:   BIT     #BIT8,SWR       ;TEST LOCK ON ERROR SELECTED
3079  005710  001770                          BEQ     LOPX14          ;(NO) BRANCHES
3080  005712  000137  005236                  JMP     RA14            ;(YES) JUMPS
```

```
3081
3082  005716  123700  177570          END14:  CMPB    SWR,R0          ;TEST LOCK ON SUBTEST SELECTED
3083  005722  001003                          BNE     OUT14           ;(NO) BRANCHES
3084  005724  000137  005222                  JMP     TST14           ;(YES)JUMPS
3085
3086  005730  000000                  RERR14:0                        ;RECORD ERROR COUNT ENTRY
3087
3088  005732  104400                  OUT14:  SCOPE
3089
3090          000016                          N=N+1
```

```
                        .SBTTL  TST15: TEST DEVICE INTERRUPT CONTROL ENB


                        ;               ***   STATIC LOGIC TESTS   ***
                        ;
                        ;                 DEVICE INTERRUPT CONTROL
                        ;
                        ;       THE PURPOSE OF THIS TEST IS TO VERIFY (STATICALLY)
                        ;       THE INTERRUPT CONTROL LOGIC OF THE CB11-HA(S) IN
                        ;       NON-INTERRUPT MODE. DEVICE ACTIVITY IS UNDER THE CONTROL
                        ;       OF THE MAINT/TRANS BIT 13 OF THE DEVICE CSR REGISTER FOR
                        ;       NORMAL OPERATION AND CAN BE UNDER THE JOINT CONTROL OF
                        ;       A DISTRIBUTE MODULE INPUT WHEN DISTRIBUTE TIED TO THE
                        ;       INTERRUPT MODULE MODE OF TESTING IS SELECTED BY THE USER.
                        ;       NOTE:
                        ;               NO DISTRIBUTE MODE OF TESTING IS ALLOWED IN
                        ;               MONITOR MODE OF EXECUTION.
                        ;
                        ;
                        ;       TEST ABILITY TO SET BIT 15 INT/RDY
                        ;       OF CURRENT CSR REGCTER WORD 0
                        ;
                        ;       THE FOLLOWING SEQUENCE OF COMMANDS ARE ISSUED
                        ;
                        ;       SET CSR BIT 14 VERIFY RESULTS
                        ;
                        ;       MOV     #ONES INTO TER REGISTER VERIFY RESULTS
                        ;
                        ;       MOV     #ONES INTO DIST/MODULE VERIFY RESULTS
                        ;
                        ;       SET BIT13 OF CSR        VERIFY RESULTS  MAINT/TRANS
                        ;
                        ;       DELAY APPROMIMATELY 7 MILLISECONDS
                        ;       DELAY AN ADDITIONAL 7 MILLISECONDS
                        ;
                        ;       CLR     DSTADR  DIST/MODULE VERIFY RESULTS
                        ;
                        ;       DELAY APPROXIMATELY 7 MILLISECONDS
                        ;       DELAY AN ADDITIONAL 7 MILLISECONDS
                        ;
                        ;       TEST BIT 15 OF CSR INT/RDY VERIFY SET TO ONE
                        ;
                        ;       TEST TSR WORD 4 NON-ZERO
```

```
3140  005734  000240                    TST15:  NOP
3141  005736  004737  013072                    JSR     PC,INITQ        ;CLEAR WORK REGISTERS R0-R4
3142  005742  012700  000015                    MOV     #15,R0          ;MOVE TEST#15 TO DISPLAY R0
3143
3144  005746  006301                    LOP15:  ASL     R1              ;FORM WORD OFFSET
3145  005750  013737  012430  006442    RA15:   MOV     ERRORS,RERR15   ;RECORD ERROR COUNT ON ENTRY
3146  005756  016102  016262                    MOV     CADCSR(R1),R2   ;CURRENT DEVICE CSR ADDRESS>R2
3147  005762  001002                            BNE     1$              ;BRANCH IF ACTIVE
3148  005764  000137  006430                    JMP     END15           ;JUMP ON END OF SCAN
3149  005770  005012                    1$:     CLR     (R2)            ;INIT CONTROL AND STATUS
3150  005772  005062  000006                    CLR     6(R2)           ;TER
3151  005776  012704  040000                    MOV     #BIT14,R4       ;#BIT14 TO SHOULD BE R4
3152  006002  052704  020000                    BIS     #BIT13,R4       ;SET MAINT/TRANS BIT13 OF CSR = 1
3153                                                                    ;FIRST TOGGLE
3154                                      ;
3155                                      ;       SET MAINT/TRANS BIT 13 OF CSR = 1
3156                                      ;
3157  006006  010412                            MOV     R4,(R2)         ;#BIT14, #BIT13 TO CSR
3158  006010  011203                            MOV     (R2),R3         ;FETCH RESULTS
3159  006012  056104  016612                    BIS     CVT.CB(R1),R4   ;MASK IN VECTOR ADDRESS RESPONSE
3160  006016  020304                            CMP     R3,R4           ;VERIFY RESULTS
3161  006020  001401                            BEQ     RB15            ;(OK) BRANCHES
3162                                    ;*****************************************************************
3163                                    ;                               (CSR) SHOULD BE #BIT14
3164  006022  104004                    ECSR15: HLT+4   ;DEVICE CSR (R2) FAILED TO RESPOND CORRECTLY
3165
3166                                    ;PROBABLE FAULT LOGIC:  (D2 C2) E36
3167                                    ;                       (D6 B2) E24
3168                                    ;                       (D4 D7,D6) E42, E7
3169
3170                                    ;*****************************************************************
3171  006024  013702  002176    RB15:   MOV     DSTADR,R2       ;FETCH DISTRIBUTE ADDRESS
3172  006030  001002                            BNE     1$              ;ACTIVE BRANCHES
3173  006032  000137  006154                    JMP     RE15            ;(NOT DISTB/MODE) JUMPS
3174  006036  004737  011614    1$:     JSR     PC,DLYGMS       ;DELAY 7 MILLISECONDS
3175
3176                                    ;       DISTRIBUTE TIED TO INTERRUPT MODE PROCESSING
3177
3178  006042  016102  016524                    MOV     CADTER(R1),R2   ;CURRENT DEVICE TER ADDRESS>R2
3179  006046  012704  177777                    MOV     #ONES,R4
3180  006052  010412                            MOV     R4,(R2)         ;ONES TO TER REGISTER
3181
3182                                    ;       ALL ONES ENABLE TER REGISTER
3183
3184  006054  011203                            MOV     (R2),R3         ;FETCH RESULTS
3185  006056  020304                            CMP     R3,R4           ;VERIFY RESULTS
3186  006060  001401                            BEQ     RBC15           ;(OK) BRANCHES
3187
3188                                    ;*****************************************************************
3189
3190  006062  104004                    ETER15:HLT+4    ;DEVICE TER (R2) FAILED TO RESPOND CORRECTLY
3191
3192
3193                                    ;PROBABLE FAULT LOGIC:  (D4 C2,D6) E8, E7
3194                                    ;                       (D2 C2) E36
3195                                    ;                       (D7) ALL
```

```
3196
3197                                    ;*****************************************************************
3198  006064                            RBC15:
3199                                    ;*****************************************************************
3200
3201                                    ;       DISTRIBUTE TIED TO INTERRUPT TESTING
3202                                    ;       DELAY FOR PREVIOUS BIT 13 OF CSR = 1
3203                                    ;       TOGGLE DISTRIBUTE MODULE TO #ONES VERIFY RESULTS
3204
3205  006064  013702  002176                   MOV     DSTADR,R2       ;DISTRIBUTE MODULE DEVICE ADDRESS
3206  006070  012704  177777                   MOV     #ONES,R4        ;DATA (TEST) BITS TO R4
3207  006074  010412                            MOV     R4,(R2)         ;SET DISTB MODULE BITS
3208  006076  011203                            MOV     (R2),R3         ;FETCH
3209  006100  020304                            CMP     R3,R4           ;VERIFY
3210  006102  001401                            BEQ     RDA15           ;(OK) BRANCHES
3211                                    ;       DISTRIBUTE MODULE RESPONSE FAILURE
3212  006104  104004                   EDST15: HLT+4   ;ERROR DISTRIBUTE MODULE RESPONSE
3213
3214                                    ;       SUGGEST YOU RUN DISTRIBUTE MODULE DIAGNOSTICS
3215                                    ;       OR REMOVE CB11-HA MODULE FROM CRUTCH CARD
3216
3217
3218  006106  004737  011606           RDA15:  JSR     PC,DDLYMS       ;DELAY 7.3 (X2) MILLISECONDS
3219  006112  016102  016350                   MOV     CADDDR(R1),R2   ;*** NOTE IF NOT DISTB/MODE CSR BIT 13 = 0
3220  006116  011203                            MOV     (R2),R3         ;FETCH CONTENTS OF INTR/HA DATA REGISTER
3221  006120  020304                            CMP     R3,R4           ;COMPARE RESULTS
3222  006122  001401                            BEQ     RDB15           ;(OK) BRANCHES
3223                                    ;       INTERRUPT MODULE DATA REGISTER RESPONSE FAILURE
3224  006124  104004                   EDDR15: HLT+4   ;DATA REGISTER (R2) RESPONSE FAILURE
3225                                    ;       BITS "IN" R3 SHOULD HAVE SET ACCORDING TO BITS "OUT" R4
3226
3227
3228                                    ;PROBABLE FAULT LOGIC:  (D8 B4) E25
3229                                    ;                       (D8 OR D9) ALL
3230                                    ; IF EDST15: ERROR ABOVE
3231                                    ;       SUGGEST YOU RUN DISTRIBUTE MODULE DIAGNOSTICS
3232  006126  005004                   RDB15:  CLR     R4              ;CLEAR SHOULD BE
3233  006130  013702  002176                   MOV     DSTADR,R2       ;SET DISTRIBUTE ADDRESS
3234  006134  005012                            CLR     (R2)            ;CLEAR DISTB MODULE REGISTER
3235  006136  011203                            MOV     (R2),R3         ;FETCH RESULTS
3236  006140  001401                            BEQ     RX15            ;VERIFY (OK) BRANCHES
3237                                    ;       DISTRIBUTE REGISTER (R2) RESPONSE FAILURE
3238  006142  104004                   EDDZ15: HLT+4   ;DEVICE DISTRIBUTE REGISTER (R2) FAILED TO CLEAR
3239                                    ;       DISTRIBUTE TIED TO INTERRUPT MODE OF TESTING
3240
3241                                    ;       SUGGEST YOU RUN DISTRIBUTE MODULE DIAGNOSTICS
3242
3243
3244  006144  004737  011606           RX15:   JSR     PC,DDLYMS       ;DELAY 7.3 (X2) MILLISECONDS
3245  006150  000137  006266                   JMP     EXD15           ;VERIFY RESULTS
3246
3247                                    ;       NON DISTRIBUTE MODE PROCESSING
3248
3249  006154  016102  016524           RE15:   MOV     CADTER(R1),R2   ;FETCH TER ADDRESS
3250  006160  012704  177777                   MOV     #ONES,R4        ;#ONES TEST DATA TO SHOULD BE
3251  006164  010412                            MOV     R4,(R2)         ;TO TER REGISTER
```

```
3252  006166  011203                        MOV     (R2),R3         ;FETCH RESULTS IN CSR
3253  006170  020304                        CMP     R3,R4           ;VERIFY
3254  006172  001401                        BEQ     RF15            ;(OK) BRANCHES
3255
3256                                  ;*****************************************************************************
3257
3258  006174  104004                 EBXX15: HLT+4   ;DEVICE TER (R2) FAILED TO RESPOND CORRECTLY
3259
3260
3261                                  ;PROBABLE FAULT LOGIC:  (D4 D6,C2) E7, E8
3262                                  ;                       (D2 C2) E36
3263                                  ;                       (D7) ALL
3264
3265
3266                                  ;*****************************************************************************
3267
3268  006176  004737  011614         RF15:   JSR     PC,DLYGMS       ;DELAY 7 MILLISECONDS
3269  006202  016102  016262                 MOV     CADCSR(R1),R2   ;FETCH CSR ADDRESS
3270  006206  012704  040000                 MOV     #BIT14,R4       ;#BIT14 TO SHOULD BE
3271  006212  052704  020000                 BIS     #BIT13,R4       ;FIRST TOGGLE MAINT/TRANS =1
3272  006216  056104  016612                 BIS     CVT.C8(R1),R4   ;MASK IN VECTOR RESPONSE
3273  006222  011203                        MOV     (R2),R3         ;FETCH RESPONSE
3274  006224  042703  100000                BIC     #BIT15,R3       ;FIRST TOGGLE BIT 15 DON'T CARE
3275  006230  020304                        CMP     R3,R4           ;VERIFY RESULTS
3276  006232  001401                        BEQ     RG15            ;(OK) BRANCHES
3277                                  ;
3278  006234  104004                 ERF15:  HLT+4   ;DEVICE CSR (R2) RESPONSE FAILURE
3279                                  ;
3280  006236  042712  020000         RG15:   BIC     #BIT13,(R2)     ;RESET BIT 13 MAINT/TRANS CSR = 0
3281                                                                  ;SECOND TOGGLE
3282  006242  011203                        MOV     (R2),R3         ;FETCH RESULTS
3283  006244  042703  100000                BIC     #BIT15,R3       ;DON'T CARE
3284  006250  042704  020000                BIC     #BIT13,R4
3285  006254  020304                        CMP     R3,R4           ;VERIFY RESULTS
3286  006256  001401                        BEQ     RH15            ;(OK) BRANCHES
3287                                  ;
3288  006260  104004                 ERH15:  HLT+4   ;DEVICE CSR (R2) RESPONSE ERROR
3289                                  ;
3290
3291                                  ;PROBABLE FAULT LOGIC:  (D2 C2) E36
3292                                  ;                       (D6 C2) E24
3293                                  ;                       (D4 D6,D7) E7, E42
3294
3295  006262  004737  011614         RH15:   JSR     PC,DLYGMS       ;DELAY 7 MILLISECONDS
3296                                  ;
3297                                  ;       ACTIVITY VERIFICATION
3298
3299  006266  016102  016262         EXD15:  MOV     CADCSR(R1),R2   ;FETCH CURRENT CSR ADDRESS
3300
3301  006272  012704  040000                 MOV     #BIT14,R4       ;#BIT14 TO SHOULD BE
3302  006276  005737  002176                 TST     DSTADR          ;TEST DISTB/MODE
3303  006302  001402                        BEQ     1$              ;(NO) BRANCHES
3304  006304  052704  020000                BIS     #BIT13,R4       ;(YES) MAINT/TRANS BIT 13 = 1
3305  006310  005727  177777         1$:     TST     #ONES           ;TEST TRANS/ENB  ARGUMENT #ONES
3306  006314  001402                        BEQ     2$              ;(NOT ACTIVE) BRANCHES
3307  006316  052704  100000                BIS     #BIT15,R4       ;ACTIVE SET INT/RDY BIT 15 SHOULD BE
```

```
3308  006322  056104  016612          2$:     BIS     CVT.CB(R1),R4   ;MASK IN VECTOR RESPONSE
3309  006326  011203                          MOV     (R2),R3         ;FETCH RESULTS
3310  006330  020304                          CMP     R3,R4           ;VERIFY
3311  006332  001401                          BEQ     RI15            ;(OK) BRANCHES
3312                                  ;
3313  006334  104004                  ERJ15:  HLT+4   ;DEVICE CSR (R2) RESPONSE FAILURE
3314
3315                                  ;PROBABLE FAULT LOGIC:  (D2 C2) E36
3316                                  ;                       (D6 C2) E24
3317                                  ;                       (D4 D6,D7) E7, E42
3318
3319                                  ;
3320  006336  016102  016436          RI15:   MOV     CADTSR(R1),R2   ;SET DEVICE TSR REGISTER > R2
3321  006342  011203                          MOV     (R2),R3         ;(FIRST READ) CHANGE OF STATE REGISTER TSR
3322  006344  012704  177777                  MOV     #ONES,R4        ;APPROPERIATE BITS TO SHOULD BE
3323  006350  020304                          CMP     R3,R4           ;VERIFY RESULTS
3324  006352  001401                          BEQ     RJ15            ;(OK) BRANCHES
3325                                  ;       TRANSITION STATE REGISTER RESPONSE FAILURE
3326  006354  104004                  ETSR15: HLT+4   ;DEVICE TSR (R2) RESPONSE FAILURE
3327                                  ;       BITS "IN" R3 SHOULD HAVE SET ACCORDING TO BITS "OUT" R4
3328
3329                                  ;PROBABLE FAULT LOGIC:  (D4 OR D5) ALL
3330                                  ;                       (D6) ALL
3331                                  ;                       (D7) ALL
3332                                  ;                       (D8 OR D9) ALL
3333
3334
3335  006356  016102  016436          RJ15:   MOV     CADTSR(R1),R2   ;SET DEVICE TSR ADDRESS>R2
3336  006362  005004                          CLR     R4              ;CLR SHOULD BE
3337  006364  011203                          MOV     (R2),R3         ;FETCH CONTENTS OF TSR
3338  006366  020304                          CMP     R3,R4           ;VERIFY RESULTS
3339  006370  001401                          BEQ     RK15            ;(OK) BRANCHES
3340
3341                                  ;*************************************************************************
3342                                  ;       TSR (R2) RESPONSE FAILURE
3343
3344  006372  104004                  ERK15:  HLT+4   ;DEVICE TSR (R2) FAILED TO RESPOND CORRECTLY
3345                                                  ;SHOULD HAVE CLEARED BY FIRST READ ABOVE (RI15)
3346                                  ;PROBABLE FAULT LOGIC:  (D4 OR D5) ALL
3347                                  ;                       (D6) ALL
3348                                  ;                       (D7) ALL
3349                                  ;                       (D8 OR D9) ALL
3350
3351                                  ;*************************************************************************
3352
3353  006374  023737  012430  006442  RK15:   CMP     ERRORS,RERR15   ;TEST ANY ERRORS RECORED
3354                                                                  ;(NO) BRANCHES
3355  006402  001004                          BNE     RL15            ;(YES) BRANCHES
3356
3357  006404  006201                  LOPX15: ASR     R1              ;ADVANCE TO
3358  006406  005201                          INC     R1              ;NEXT DEVICE
3359  006410  000137  005746                  JMP     LOP15           ;CONTINUE
3360
3361  006414  032737  000400  177570  RL15:   BIT     #BIT8,SWR       ;TEST LOCK ON ERROR SELECTED
3362  006422  001770                          BEQ     LOPX15          ;(NO) BRANCHES
3363  006424  000137  005750                  JMP     RA15            ;(YES) JUMPS
```

```
3364
3365  006430  123700  177570          END15:  CMPB    SWR,R0          ;TEST LOCK ON SUBTEST SELECTED
3366  006434  001003                          BNE     OUT15           ;(NO) BRANCHES
3367  006436  000137  005734                  JMP     TST15           ;(YES)JUMPS
3368
3369  006442  000000                  RERR15: 0                       ;RECORD ERROR COUNT ENTRY
3370
3371  006444  104400                  OUT15:  SCOPE
3372
3373          000017                          N=N+1
```

```
                        .SBTTL  TST16: TEST DEVICE INTERRUPT CONTROL DSB


                        ;               ***   STATIC LOGIC TESTS   ***
                        ;
                        ;                  DEVICE INTERRUPT CONTROL
                        ;
                        ;       THE PURPOSE OF THIS TEST IS TO VERIFY (STATICALLY)
                        ;       THE INTERRUPT CONTROL LOGIC OF THE CB11-HA(S) IN
                        ;       NON-INTERRUPT MODE. DEVICE ACTIVITY IS UNDER THE CONTROL
                        ;       OF THE MAINT/TRANS BIT 13 OF THE DEVICE CSR REGISTER FOR
                        ;       NORMAL OPERATION AND CAN BE UNDER THE JOINT CONTROL OF
                        ;       A DISTRIBUTE MODULE INPUT WHEN DISTRIBUTE TIED TO THE
                        ;       INTERRUPT MODULE MODE OF TESTING IS SELECTED BY THE USER.
                        ;       NOTE:
                        ;               NO DISTRIBUTE MODE OF TESTING IS ALLOWED IN
                        ;               MONITOR MODE OF EXECUTION.
                        ;
                        ;
                        ;       TEST ABILITY TO INHIBIT SETTING BIT 15 INT/RDY
                        ;       OF CURRENT CSR REGISTER WORD 0
                        ;
                        ;       THE FOLLOWING SEQUENCE OF COMMANDS ARE ISSUED
                        ;
                        ;       SET CSR BIT 14 VERIFY RESULTS
                        ;
                        ;       MOV     #ONES INTO TER REGISTER VERIFY RESULTS
                        ;
                        ;       MOV     ZERO INTO DIST/MODULE VERIFY RESULTS
                        ;
                        ;       SET BIT13 OF CSR        VERIFY RESULTS  MAINT/TRANS
                        ;
                        ;       DELAY APPROMIMATELY 7 MILLISECONDS
                        ;       DELAY AN ADDITIONAL 7 MILLISECONDS
                        ;
                        ;       CLR     DSTADR  DIST/MODULE VERIFY RESULTS
                        ;
                        ;       DELAY APPROXIMATELY 7 MILLISECONDS
                        ;       DELAY AN ADDITIONAL 7 MILLISECONDS
                        ;
                        ;       TEST BIT 15 OF CSR INT/RDY VERIFY SET TO ZERO
                        ;
                        ;       TEST TSR WORD 4 ZERO
```

```
 3423  006446  000240                    TST16:  NOP
 3424  006450  004737  013072                    JSR     PC,INITQ        ;CLEAR WORK REGISTERS R0-R4
 3425  006454  012700  000016                    MOV     #16,R0          ;MOVE TEST#16 TO DISPLAY R0
 3426
 3427  006460  006301                    LOP16:  ASL     R1              ;FORM WORD OFFSET
 3428  006462  013737  012430  007154    RA16:   MOV     ERRORS,RERR16   ;RECORD ERROR COUNT ON ENTRY
 3429  006470  016102  016262                    MOV     CADCSR(R1),R2   ;CURRENT DEVICE CSR ADDRESS>R2
 3430  006474  001002                            BNE     1$              ;BRANCH IF ACTIVE
 3431  006476  000137  007142                    JMP     END16           ;JUMP ON END OF SCAN
 3432  006502  005012                    1$:     CLR     (R2)            ;INIT CONTROL AND STATUS
 3433  006504  005062  000006                    CLR     6(R2)           ;TER
 3434  006510  012704  040000                    MOV     #BIT14,R4       ;#BIT14 TO SHOULD BE R4
 3435  006514  052704  020000                    BIS     #BIT13,R4       ;SET MAINT/TRANS BIT13 OF CSR = 1
 3436                                                                    ;FIRST TOGGLE
 3437                                    ;
 3438                                    ;       SET MAINT/TRANS BIT 13 OF CSR = 1
 3439                                    ;
 3440  006520  010412                            MOV     R4,(R2)         ;#BIT14, #BIT13 TO CSR
 3441  006522  011203                            MOV     (R2),R3         ;FETCH RESULTS
 3442  006524  056104  016612                    BIS     CVT.CB(R1),R4   ;MASK IN VECTOR ADDRESS RESPONSE
 3443  006530  020304                            CMP     R3,R4           ;VERIFY RESULTS
 3444  006532  001401                            BEQ     RB16            ;(OK) BRANCHES
 3445                                    ;*************************************************************************
 3446                                    ;               (CSR) SHOULD BE #BIT14
 3447  006534  104004                    ECSR16: HLT+4   ;DEVICE CSR (R2) FAILED TO RESPOND CORRECTLY
 3448
 3449                                    ;PROBABLE FAULT LOGIC:  (D2 C2) E36
 3450                                    ;                       (D6 B2) E24
 3451                                    ;                       (D4 D7,D6) E42, E7
 3452
 3453                                    ;*************************************************************************
 3454  006536  013702  002176    RB16:   MOV     DSTADR,R2       ;FETCH DISTRIBUTE ADDRESS
 3455  006542  001002                            BNE     1$              ;ACTIVE BRANCHES
 3456  006544  000137  006666                    JMP     RE16            ;(NOT DISTB/MODE) JUMPS
 3457  006550  004737  011614    1$:     JSR     PC,DLYGMS       ;DELAY 7 MILLISECONDS
 3458
 3459                                    ;       DISTRIBUTE TIED TO INTERRUPT MODE PROCESSING
 3460
 3461  006554  016102  016524                    MOV     CADTER(R1),R2   ;CURRENT DEVICE TER ADDRESS>R2
 3462  006560  012704  177777                    MOV     #ONES,R4
 3463  006564  010412                            MOV     R4,(R2)         ;ONES TO TER REGISTER
 3464
 3465                                    ;       ALL ONES ENABLE TER REGISTER
 3466
 3467  006566  011203                            MOV     (R2),R3         ;FETCH RESULTS
 3468  006570  020304                            CMP     R3,R4           ;VERIFY RESULTS
 3469  006572  001401                            BEQ     RBC16           ;(OK) BRANCHES
 3470
 3471                                    ;*************************************************************************
 3472
 3473  006574  104004                    ETER16:HLT+4    ;DEVICE TER (R2) FAILED TO RESPOND CORRECTLY
 3474
 3475
 3476                                    ;PROBABLE FAULT LOGIC:  (D4 C2,D6) E8, E7
 3477                                    ;                       (D2 C2) E36
 3478                                    ;                       (D7) ALL
```

```
3479
3480                                    ;*****************************************************************************
3481  006576                            RBC16:
3482                                    ;*****************************************************************************
3483
3484                                    ;       DISTRIBUTE TIED TO INTERRUPT TESTING
3485                                    ;       DELAY FOR PREVIOUS BIT 13 OF CSR = 1
3486                                    ;       TOGGLE DISTRIBUTE MODULE TO ZERO VERIFY RESULTS
3487
3488  006576  013702  002176                   MOV     DSTADR,R2       ;DISTRIBUTE MODULE DEVICE ADDRESS
3489  006602  013704  013220                   MOV     ZERO,R4 ;DATA (TEST) BITS TO R4
3490  006606  010412                           MOV     R4,(R2)         ;SET DISTB MODULE BITS
3491  006610  011203                           MOV     (R2),R3         ;FETCH
3492  006612  020304                           CMP     R3,R4           ;VERIFY
3493  006614  001401                           BEQ     RDA16           ;(OK) BRANCHES
3494                                    ;       DISTRIBUTE MODULE RESPONSE FAILURE
3495  006616  104004                    EDST16: HLT+4   ;ERROR DISTRIBUTE MODULE RESPONSE
3496
3497                                    ;       SUGGEST YOU RUN DISTRIBUTE MODULE DIAGNOSTICS
3498                                    ;       OR REMOVE CB11-HA MODULE FROM CRUTCH CARD
3499
3500
3501  006620  004737  011606            RDA16:  JSR     PC,DDLYMS       ;DELAY 7.3 (X2) MILLISECONDS
3502  006624  016102  016350                    MOV     CADDDR(R1),R2   ;*** NOTE IF NOT DISTB/MODE CSR BIT 13 = 0
3503  006630  011203                           MOV     (R2),R3         ;FETCH CONTENTS OF INTR/HA DATA REGISTER
3504  006632  020304                           CMP     R3,R4           ;COMPARE RESULTS
3505  006634  001401                           BEQ     RDB16           ;(OK) BRANCHES
3506                                    ;       INTERRUPT MODULE DATA REGISTER RESPONSE FAILURE
3507  006636  104004                    EDDR16: HLT+4   ;DATA REGISTER (R2) RESPONSE FAILURE
3508                                    ;       BITS "IN" R3 SHOULD HAVE SET ACCORDING TO BITS "OUT" R4
3509
3510
3511                                    ;PROBABLE FAULT LOGIC:  (D8 B4) E25
3512                                    ;                       (D8 OR D9) ALL
3513                                    ; IF EDST16: ERROR ABOVE
3514                                    ;       SUGGEST YOU RUN DISTRIBUTE MODULE DIAGNOSTICS
3515  006640  005004                    RDB16:  CLR     R4              ;CLEAR SHOULD BE
3516  006642  013702  002176                   MOV     DSTADR,R2       ;SET DISTRIBUTE ADDRESS
3517  006646  005012                           CLR     (R2)            ;CLEAR DISTB MODULE REGISTER
3518  006650  011203                           MOV     (R2),R3         ;FETCH RESULTS
3519  006652  001401                           BEQ     RX16            ;VERIFY (OK) BRANCHES
3520                                    ;       DISTRIBUTE REGISTER (R2) RESPONSE FAILURE
3521  006654  104004                    EDDZ16: HLT+4   ;DEVICE DISTRIBUTE REGISTER (R2) FAILED TO CLEAR
3522                                    ;       DISTRIBUTE TIED TO INTERRUPT MODE OF TESTING
3523
3524                                    ;       SUGGEST YOU RUN DISTRIBUTE MODULE DIAGNOSTICS
3525
3526
3527  006656  004737  011606            RX16:   JSR     PC,DDLYMS       ;DELAY 7.3 (X2) MILLISECONDS
3528  006662  000137  007000                    JMP     EXD16           ;VERIFY RESULTS
3529
3530                                    ;       NON DISTRIBUTE MODE PROCESSING
3531
3532  006666  016102  016524            RE16:   MOV     CADTER(R1),R2   ;FETCH TER ADDRESS
3533  006672  013704  013220                   MOV     ZERO,R4 ;ZERO TEST DATA TO SHOULD BE
3534  006676  010412                           MOV     R4,(R2)         ;TO TER REGISTER
```

```
3535  006700  011203                          MOV     (R2),R3         ;FETCH RESULTS IN CSR
3536  006702  020304                          CMP     R3,R4           ;VERIFY
3537  006704  001401                          BEQ     RF16            ;(OK) BRANCHES
3538
3539                                  ;*************************************************************************
3540
3541  006706  104004                EBXX16: HLT+4   ;DEVICE TER (R2) FAILED TO RESPOND CORRECTLY
3542
3543
3544                                  ;PROBABLE FAULT LOGIC:  (D4 D6,C2) E7, E8
3545                                  ;                       (D2 C2) E36
3546                                  ;                       (D7) ALL
3547
3548
3549                                  ;*************************************************************************
3550
3551  006710  004737  011614         RF16:   JSR     PC,DLYGMS       ;DELAY 7 MILLISECONDS
3552  006714  016102  016262                 MOV     CADCSR(R1),R2   ;FETCH CSR ADDRESS
3553  006720  012704  040000                 MOV     #BIT14,R4       ;#BIT14 TO SHOULD BE
3554  006724  052704  020000                 BIS     #BIT13,R4       ;FIRST TOGGLE MAINT/TRANS =1
3555  006730  056104  016612                 BIS     CVT.CB(R1),R4   ;MASK IN VECTOR RESPONSE
3556  006734  011203                         MOV     (R2),R3         ;FETCH RESPONSE
3557  006736  042703  100000                 BIC     #BIT15,R3       ;FIRST TOGGLE BIT 15 DON'T CARE
3558  006742  020304                         CMP     R3,R4           ;VERIFY RESULTS
3559  006744  001401                         BEQ     RG16            ;(OK) BRANCHES
3560                                  ;
3561  006746  104004                ERF16:  HLT+4   ;DEVICE CSR (R2) RESPONSE FAILURE
3562                                  ;
3563  006750  042712  020000        RG16:   BIC     #BIT13,(R2)     ;RESET BIT 13 MAINT/TRANS CSR = 0
3564                                                                  ;SECOND TOGGLE
3565  006754  011203                         MOV     (R2),R3         ;FETCH RESULTS
3566  006756  042703  100000                 BIC     #BIT15,R3       ;DON'T CARE
3567  006762  042704  020000                 BIC     #BIT13,R4
3568  006766  020304                         CMP     R3,R4           ;VERIFY RESULTS
3569  006770  001401                         BEQ     RH16            ;(OK) BRANCHES
3570                                  ;
3571  006772  104004                ERH16:  HLT+4   ;DEVICE CSR (R2) RESPONSE ERROR
3572                                  ;
3573
3574                                  ;PROBABLE FAULT LOGIC:  (D2 C2) E36
3575                                  ;                       (D6 C2) E24
3576                                  ;                       (D4 D6,D7) E7, E42
3577
3578  006774  004737  011614         RH16:   JSR     PC,DLYGMS       ;DELAY 7 MILLISECONDS
3579                                  ;
3580                                  ;       ACTIVITY VERIFICATION
3581
3582  007000  016102  016262         EXD16:  MOV     CADCSR(R1),R2   ;FETCH CURRENT CSR ADDRESS
3583
3584  007004  012704  040000                 MOV     #BIT14,R4       ;#BIT14 TO SHOULD BE
3585  007010  005737  002176                 TST     DSTADR          ;TEST DISTB/MODE
3586  007014  001402                         BEQ     1$              ;(NO) BRANCHES
3587  007016  052704  020000                 BIS     #BIT13,R4       ;(YES) MAINT/TRANS BIT 13 = 1
3588  007022  005737  013220         1$:     TST     ZERO            ;TEST TRANS/ENB  ARGUMENT ZERO
3589  007026  001402                         BEQ     2$              ;(NOT ACTIVE) BRANCHES
3590  007030  052704  100000                 BIS     #BIT15,R4       ;ACTIVE SET INT/RDY BIT 15 SHOULD BE
```

```
3591  007034  056104  016612          2$:     BIS     CVT.CB(R1),R4   ;MASK IN VECTOR RESPONSE
3592  007040  011203                          MOV     (R2),R3         ;FETCH RESULTS
3593  007042  020304                          CMP     R3,R4           ;VERIFY
3594  007044  001401                          BEQ     RI16            ;(OK) BRANCHES
3595                                          ;
3596  007046  104004                  ERJ16:  HLT+4   ;DEVICE CSR (R2) RESPONSE FAILURE
3597
3598                                  ;PROBABLE FAULT LOGIC:  (D2 C2) E36
3599                                  ;                       (D6 C2) E24
3600                                  ;                       (D4 D6,D7) E7, E42
3601
3602                                  ;
3603  007050  016102  016436          RI16:   MOV     CADTSR(R1),R2   ;SET DEVICE TSR REGISTER > R2
3604  007054  011203                          MOV     (R2),R3         ;(FIRST READ) CHANGE OF STATE REGISTER TSR
3605  007056  013704  013220                  MOV     ZERO,R4 ;APPROPERIATE BITS TO SHOULD BE
3606  007062  020304                          CMP     R3,R4           ;VERIFY RESULTS
3607  007064  001401                          BEQ     RJ16            ;(OK) BRANCHES
3608                                  ;       TRANSITION STATE REGISTER RESPONSE FAILURE
3609  007066  104004                  ETSR16: HLT+4   ;DEVICE TSR (R2) RESPONSE FAILURE
3610                                  ;       BITS "IN" R3 SHOULD HAVE SET ACCORDING TO BITS "OUT" R4
3611
3612                                  ;PROBABLE FAULT LOGIC:  (D4 OR D5) ALL
3613                                  ;                       (D6) ALL
3614                                  ;                       (D7) ALL
3615                                  ;                       (D8 OR D9) ALL
3616
3617
3618  007070  016102  016436          RJ16:   MOV     CADTSR(R1),R2   ;SET DEVICE TSR ADDRESS>R2
3619  007074  005004                          CLR     R4              ;CLR SHOULD BE
3620  007076  011203                          MOV     (R2),R3         ;FETCH CONTENTS OF TSR
3621  007100  020304                          CMP     R3,R4           ;VERIFY RESULTS
3622  007102  001401                          BEQ     RK16            ;(OK) BRANCHES
3623
3624                                  ;*************************************************************************
3625                                  ;       TSR (R2) RESPONSE FAILURE
3626
3627  007104  104004                  ERK16:  HLT+4   ;DEVICE TSR (R2) FAILED TO RESPOND CORRECTLY
3628                                                  ;SHOULD HAVE CLEARED BY FIRST READ ABOVE (RI16)
3629                                  ;PROBABLE FAULT LOGIC:  (D4 OR D5) ALL
3630                                  ;                       (D6) ALL
3631                                  ;                       (D7) ALL
3632                                  ;                       (D8 OR D9) ALL
3633
3634                                  ;*************************************************************************
3635
3636  007106  023737  012430  007154  RK16:   CMP     ERRORS,RERR16   ;TEST ANY ERRORS RECORED
3637                                                                  ;(NO) BRANCHES
3638  007114  001004                          BNE     RL16            ;(YES) BRANCHES
3639
3640  007116  006201                  LOPX16: ASR     R1              ;ADVANCE TO
3641  007120  005201                          INC     R1              ;NEXT DEVICE
3642  007122  000137  006460                  JMP     LOP16           ;CONTINUE
3643
3644  007126  032737  000400  177570  RL16:   BIT     #BIT8,SWR       ;TEST LOCK ON ERROR SELECTED
3645  007134  001770                          BEQ     LOPX16          ;(NO) BRANCHES
3646  007136  000137  006462                  JMP     RA16            ;(YES) JUMPS
```

```
3647
3648  007142  123700  177570          END16:  CMPB    SWR,R0          ;TEST LOCK ON SUBTEST SELECTED
3649  007146  001003                          BNE     OUT16           ;(NO) BRANCHES
3650  007150  000137  006446                  JMP     TST16           ;(YES)JUMPS
3651
3652  007154  000000                  RERR16:0                        ;RECORD ERROR COUNT ENTRY
3653
3654  007156  104400                  OUT16:  SCOPE
3655
```

```
                    000020                  N=N+1
                                            .SBTTL  TST17:  DEVICE DYNAMIC INTERRUPT TEST

                                            ;  ***   DYNAMIC INTERRUPT TESTS   ***

                                            ;       THIS TEST VERIFIES THE ABILITY OF THE CB11-HA(S)
                                            ;       TO INTERRUPT AT THE PROPER LEVEL AND THE PROPER
                                            ;       VECTOR ADDRESS. ALL CONTROL IS UNDER THE MAINT/TRANS
                                            ;       BIT 13 OF THE CSR REGISTER.

                                            ;NOTE:
                                            ;       IF THE PROCESSOR "HANGS" (CONTINUES TO RUN WITH THE
                                            ;       HALT ENABLE SWITCH SET), THIS INDICATES THAT THE INTERRUPT
                                            ;       REQUEST HAS BEEN GRANTED BUT THE DEVICE FAILED TO CLEAR BBSY
                                            ;       TO RELEASE THE BUS TO THE PROCESSOR.
                                            ;PROBABLE FAULT LOGIC:  M7291 (D3 B2) E12, E15
                                            ;                              (D3 C7) E05, E09, E11
                                            ;                              (D3 D5,D6) E09, E11, E19


                                            ;         ALSO CHECK:  M9000 GRANT CONTINUITY MODULE(S)

007160  004737  013114          TST17:  JSR     PC,INITR        ;INITIALIZE ALSO AUTO ASSIGN PRIORITY ENTRY
007164  012700  000017                  MOV     #17,R0          ;TEST # TO DISPLAY R0
007170  013737  012430  007764          MOV     ERRORS,RERR17   ;RECORD ERROR COUNT ON ENTRY
007176  012703  000340          LOP17:  MOV     #340,R3         ;INITIALIZE FOR INHIBIT(LEVEL#7)TEST
007202  006301                  ASL     R1              ;FORM WORD OFFSET

007204  016102  016262          RA17:   MOV     CADCSR(R1),R2   ;FETCH CURRENT CSR ADDRESS> R2
007210  001002                  BNE     TEST17          ;SCAN ACTIVITY BRANCHES
007212  000137  007752                  JMP     END17           ;ALL DEVICES TESTED END OF SCAN JUMP

                                            ;NOTE:
                                            ;       WITH THE EXCEPTION OF UNIBUS TIME OUT ERROR TRAPS
                                            ;       NO ATTEMPT IS MADE TO VERIFY DEVICE REGISTER RESPONSE
                                            ;       (FAILURES) IN ORDER TO MINIMIZE COMPLEXITY OF CODE.
                                            ;       THEREFORE THE INABILITY OR ABILITY OF A DEVICE TO
                                            ;       INTERRUPT AT A GIVEN LEVEL COULD BE DUE TO A
                                            ;       FAILURE MODE WHICH EXISTED AND WAS REPORTED
                                            ;       EARLIER IN THE STATIC TEST PORTION OF THE PROGRAM.

007216  005012          TEST17: CLR     (R2)            ;(PREVIOUS PROCESS) BIT 14 CLR
007220  016105  016612          MOV     CVT.CB(R1),R5   ;FETCH DEVICE ASSOCIATED VECTOR ADDRESS
007224  010537  013216          MOV     R5,$VEC         ;RECORD
007230  012725  007322          MOV     #ERINH,(R5)+    ;SET INTERRUPT INHIBIT FAILURE ERROR LINK
007234  012715  000340          MOV     #340,(R5)       ;SET DEVICE PRIORITY (VECTOR ENTRY) TO LEVEL#7
007240  012703  000340          MOV     #340,R3         ;SET PSW PRIORITY DISPLAY >R3
007244  010337  177776          MOV     R3,PSW          ;SET PSW PRIORITY=7
007250  010304                  MOV     R3,R4           ;SET DEVICE PRIORITY(VECTOR ENTRY)DISPLAY>R4

                                            ;       DEVICE INTERRUPT GENERATION CODE
                                            ;NOTE:
                                            ;       THIS CODE IS EXECUTED ONCE FOR EACH ACTIVE DEVICE
                                            ;       IN ORDER TO CONDITION THAT DEVICE FOR INTERRUPTING.

007252  012762  177777  000006          MOV     #177777,6(R2)   ;ARM TRANSITION ENABLE REGISTER (ALL BITS)
```

```
3712  007260  012712  060000                  MOV     #60000,(R2)     ;ENABLE CONTROL AND STATUS REGISTER (BITS 14,13)
3713  007264  004737  011614                  JSR     PC,DLYGMS       ;DELAY 7 MILLISECONDS FOR MAINT (BIT13)=1
3714  007270  012712  040000                  MOV     #40000,(R2)     ;DISABLE CONTROL AND STATUS REGISTER (BIT 13)
3715  007274  004737  011614                  JSR     PC,DLYGMS       ;DELAY 7 MILLISECONDS FOR MAINT (BIT13)=0
3716
3717                                  ;       THE TOGGLEING OF BIT 13 OF THE CSR (I.E. MAINT)ASSURES
3718                                  ;       THAT BOTH NEGATIVE AND POSITIVE STRAPPED CHANGE OF STATE
3719                                  ;       TRANSITIONS WILL HAVE BEEN PRODUCED.  THE DEVICE IS NOW
3720                                  ;       ARMED AND SHOULD INTERRUPT WHEN THE PRIORITY IN THE PSW
3721                                  ;       (PROCESSOR STATUS WORD)IS LOWERED BELOW THE DEVICE LEVEL.
3722                                  ;NOTE:
3723                                  ;       1)  AN ERROR REPORT AT LOCATION "ERRINH" SIGINIFIES THAT THE
3724                                  ;           DEVICE INTERRUPTED WHEN IT SHOULD HAVE BEEN INHIBITED.
3725                                  ;
3726                                  ;       2)  AN ERROR REPORT AT LOCATION "ERRENB" SIGNIFIES THAT THE
3727                                  ;           DEVICE DID NOT INTERRUPT WHEN IT SHOULD HAVE.
3728                                  ;
3729                                  ;       3)  AN ERROR REPORT AT LOCATION "ERBENB" SIGNIFIES THAT THE
3730                                  ;           DEVICE DID NOT INTERRUPT AT PRIORITY LEVEL ZERO.
3731                                  ;
3732                                  ;       4)  AN ERROR REPORT AT LOCATION "ERMINT" SIGNIFIES THAT THE
3733                                  ;           DEVICE CONTINIOUSLY INTERRUPTED. I.E. DURING DEVICE SERVICE
3734                                  ;           THE PROCESSOR STATUS WORD (DEVICE INTERRUPT VECTOR ADDRESS+2)
3735                                  ;           PROCESSOR PRIORITY FIELD BITS 07 THRU 05 FAILED TO INHIBIT
3736                                  ;           INTERRUPTS AT IT'S CURRENT LEVEL.
3737                                  ;
3738
3739                                  ;
3740                                  ;               INTERRUPT PRIORITY INHIBIT TESTING
3741                                  ;
3742                                  ;       CONTINUE TO LOWER PRIORITY OF THE CPU (PSW)
3743                                  ;       UNTIL EQUAL TO THAT OF THE DEVICE.  NO INTERRUPTS
3744                                  ;       ARE EXPECTED.
3745
3746  007300  120361  016701          1$:     CMPB    R3,CLV.CB+1(R1) ;SCAN LEVEL UNDER TEST
3747  007304  101432                          BLOS    RB17            ;LOWER OR SAME BRANCHES
3748  007306  162703  000040                  SUB     #40,R3          ;LOWER PROCESSOR PRIORITY DISPLAY>R3
3749  007312  010337  177776                  MOV     R3,PSW          ;LOWER PROCESSOR PRIORITY>PSW
3750  007316  001443                          BEQ     ERRENB-8.
3751  007320  000767                          BR      1$              ;(OK)CONTINUE TO ENABLE TEST
3752                                  ;*******************************************************************
3753                                  ;               DEVICE INTERRUPTED WHEN INHIBITED
3754                                  ;SIGNIFICANCE
3755                                  ;               (R2) DEVICE ADDRESS (CSR) UNDER TEST
3756                                  ;               (R3) PROCESSOR PRIORITY DISPLAY (PSW)
3757                                  ;               (R4) DEVICE PRIORITY DISPLAY (VECTOR ADDRESS +2)
3758
3759                                  ;NOTE:
3760                                  ;       THE FOLLOWING CODE IS FOR AUTO PRIORITY ASSIGNMENT
3761                                  ;       MONITOR MODE EXECUTION ONLY.
3762
3763
3764  007322  005737  000230          ERINH:  TST     FLGPTY          ;TEST AUTO PRIORITY MODE EXECUTION
3765  007326  001415                          BEQ     ERRINH          ;(NO) BRANCHES
3766
3767  007330  105761  016701                  TSTB    CLV.CB+1(R1)    ;HAS CODE BEEN EXECUTED BEFORE
```

```
3768  007334  001012                          BNE     ERRINH          ;(YES) BRANCHES
3769
3770  007336  062703  000040                  ADD     #40,R3          ;AUTO ASSIGN (RESTORE LEVEL)
3771  007342  010361  013306                  MOV     R3,LVL.HO(R1)   ;RECORD NEW DEFAULT
3772  007346  110361  016701                  MOVB    R3,CLV.CB+1(R1) ;RECORD ACTIVE ENTRY
3773  007352  162703  000040                  SUB     #40,R3  ;RESTORE
3774  007356  000137  007450                  JMP     ENBRTN          ;CONTINUE
3775
3776  007362  104004                ERRINH: HLT+4   ;(PSW) INTERRUPT PRIORITY INHIBIT FAILURE
3777
3778                                ;PROBABLE FAULT LOGIC:  (D3 A7) E13
3779                                ;                       (D3 D2) E18
3780
3781                                ;       CHECK DEVICE PRIORITY PLUG
3782                                ;
3783
3784  007364  000000                        HALT    ;UNRECOVERABLE ERROR HALT
3785                                ;
3786                                ;       CONTINUIATION WILL RESULT IN UNMEANINGFUL ERRORS
3787                                ;       BEING REPORTED IN DYNAMIC TESTING.
3788                                ;       NOTE:
3789                                ;               IF DEFAULT PRIORITY OF SOFTWARE (PROGRAM)
3790                                ;               IS HIGHER THAN ACTUAL DEVICE PRIORITY (PLUG)
3791                                ;               DEPRESS THE START SWITCH AND RECONFIGURE THE
3792                                ;               DEVICE PRIORITY LEVEL.
3793
3794  007366  000137  001320                  JMP     START2          ;CONFIGURATION PROCESS RESTART
3795
3796
3797                                ;PROBABLE FAULT:
3798
3799                                ;                       CHECK DEVICE PRIORITY PLUG
3800                                ;*************************************************************************
```

```
                                        ;       INTERRUPT PRIORITY ENABLE TESTING
                                        ;
                                        ;       TEST INTERRUPT OCCURS AT ONE LEVEL BELOW DEVICE LEVEL
                                        ;
007372  012765  007450  177776  RB17:   MOV     #ENBRTN,-2(R5)  ;SET INTERRUPT ENABLE RETURN
                                        ;
                                        ;NOTE:
                                        ;       IF THE PROCESSOR "HANGS" (CONTINUES TO RUN WITH THE
                                        ;       HALT ENABLE SWITCH SET), THIS INDICATES THAT THE INTERRUPT
                                        ;       REQUEST HAS BEEN GRANTED BUT THE DEVICE FAILED TO CLEAR BBSY
                                        ;       TO RELEASE THE BUS TO THE PROCESSOR.
                                        ;PROBABLE FAULT LOGIC:  M7291 (D3 B2) E12, E15
                                        ;                              (D3 C7) E05, E09, E11
                                        ;                              (D3 D5,D6) E09, E11, E19
                                        ;
                                        ;         ALSO CHECK:  M9000 GRANT CONTINUITY MODULE(S)


007400  162703  000040          RTN17:  SUB     #40,R3          ;LOWER PROCESSOR PRIORITY DISPLAY>R3
007404  042703  177400                  BIC     #177400,R3
007410  010337  177776                  MOV     R3,PSW          ;LOWER PROCESS PRIORITY (PSW)
007414  032703  000340                  BIT     #340,R3         ;TEST FOR FULL RANGE
007420  001002                          BNE     1$              ;ADDITIONAL FETCH CYCLE 11/15 OR 11/20
                                                                ;AND UNRECOVERABLE ERROR LINK
007422  000000                          HALT    ;DEVICE FAILED TO INTERRUPT AT LEVEL ZERO
                                                ;DEPRESS CONTINUE SWITCH FOR DYNAMIC DEBUG

007424  000001                          WAIT    ;STALL ON HARD FAILURE

                                ;***************************************************************

007426  010537  013216          1$:     MOV     R5,$VEC
007432  011237  007446                  MOV     (R2),RX5

                                        ;       DEVICE DID NOT INTERRUPT WHEN ENABLED
                                        ;SIGNIFICANCE:
                                        ;       (R2)DEVICE ADDRESS(CSR) UNDER TEST
                                        ;       (R3) PROCESSOR PRIORITY DISPLAY (PSW)
                                        ;       (R4) DEVICE PRIORITY DISPLAY (VECTOR ADDRESS+2)
                                        ;       (RX5) CSR CONTENTS AT TIME OF FAILURE

007436  104004                  ERRENB: HLT+4   ;DEVICE INTERRUPT PRIORITY ENABLE FAILURE TO INTERRUPT

007440  013705  013216                  MOV     $VEC,R5
007444  000755                          BR      RTN17           ;CONTINUE


                                ;PROBABLE FAULT LOGIC:  (D3 A7) E13
                                ;                       (D3 D2) E18
                                ;                       (D6 C1,C2) E33, "DL1"

                                ;       CHECK DEVICE PRIORITY PLUG

                                ;                       (D3 D2,C2) E15, E34
```

```
                                        ;                       (D3 C5) E09, E11
                                        ;                       (D3 D6,D7) E06, E17, E19
                                        ;               DELAY NETWORK(S)
                                        ;                       (D6 C2)  "DL1"
                                        ;                       (D3 B2)  "DL2"

                                        ;*******************************************************************************

007446  000000                        RX5:    0

007450  012765  007542  177776  ENBRTN: MOV     #EXTRTN,-2(R5)  ;SET INTERRUPT ENABLE RETURN LINKAGE
007456  022626                          CMP     (SP)+,(SP)+     ;ADJUST THE STACK
007460  012737  000340  177776          MOV     #340,PSW
007466  042712  040000                  BIC     #40000,(R2)     ;TOGGLE INT/ENB ZERO
007472  052712  040000                  BIS     #40000,(R2)     ;TOGGLE INT/ENB ONE
007476  116104  016701                  MOVB    CLV.CB+!(R1),R4 ;SET DEVICE PRIORITY DISPLAY>R4
007502  042704  177400                  BIC     #177400,R4
007506  010415                          MOV     R4,(R5) ;SET DEVICE SERVICE PRIORITY=ACTUAL

                                        ;NOTE:
                                        ;       THE EXISTING INTERRUPT CONDITION HAS NOT BEEN DISMISSED , THE
                                        ;       DEVICE SHOULD INTERRUPT A MINIMUM OF ONE FETCH CYCLE (11/15-11/20)
                                        ;       FOLLOWING THE LOWERING OF THE PROCESSOR PRIORITY

007510  005003                          CLR     R3              ;SET PROCESSOR PRIORITY DISPLAY>R3
007512  010337  177776          RTNZ:   MOV     R3,PSW          ;SET PROCESSOR PRIORITY>PSW=ZERO
007516  000240                          NOP                     ;ADDITIONAL FETCH CYCLE 11/15 OR 11/20
007520  001236                          BNE     TEST17          ;AND UNRECOVERABLE ERROR LINK
                                        ;*******************************************************************************

007522  011237  007446                  MOV     (R2),RX5

                                        ;       DEVICE DID NOT INTERRUPT WHEN ENABLED
                                        ;SIGNIFICANCE:
                                        ;               (R2) DEVICE ADDRESS (CSR) UNDER TEST
                                        ;               (R3) PROCESSOR PRIORITY DISPLAY (PSW)
                                        ;               (R4) DEVICE PRIORITY DISPLAY (VECTOR ADDRESS+2)
                                        ;               (RX5) CSR CONTENTS AT TIME OF FAILURE

007526  104004                  ERBENB: HLT+4   ;DEVICE INTERRUPT PRIORITY ENABLE FAILURE TO INTERRUPT
                                        ;       AT LEVEL ZERO
                                        ;PROBABLE FAULT LOGIC:  (D3 A5) E13
                                        ;                       (D3 D2) E18

                                        ;       CHECK DEVICE PRIORITY PLUG

                                        ;                       (D3 C2) E15, E34
                                        ;                       (D3 C5) E09, E11
                                        ;                       (D3 D6,D7) E06, E17, E19

007530  013705  013216                  MOV     $VEC,R5
007534  062703  000040                  ADD     #40,R3          ;SET UNRECOVERABLE SWITCH+TRY AGAIN
007540  000717                          BR      RTN17           ;CONTINUE

                                        ;*******************************************************************************
```

```
                                        ;
                                        ;       TEST DEVICE VECTOR ADDRESS + 2 PRIORITY PRESENTATION
                                        ;               ABILITY TO INHIBIT INTERRUPTS
                                        ;
007542  062737  000040  177776  EXTRTN: ADD     #40,PSW         ;ANTI HANG CONTROL ADVANCE

007550  012765  007616  177776          MOV     #ENTERM,-2(R5)  ;LINK ERROR REPORT ENTRY VECTADD +2
007556  032737  000340  177776          BIT     #340,PSW        ;CHECK LEVEL #7 OR BELOW
007564  001404                          BEQ     1$              ;(NO) BRANCHES
007566  162737  000040  177776          SUB     #40,PSW         ;(YES) LEVEL BELOW #7
                                                                ;RESTORE ORIGINAL DEVICE LEVEL
007574  000403                          BR      2$              ;CONTINUE
007576  012737  000340  177776  1$:     MOV     #340,PSW        ;RESTORE ORIGINAL LEVEL #7
                                                                ;ENABLE DEVICE INTERRUPT AGAIN
007604  042712  040000          2$:     BIC     #40000,(R2)     ;TOGGLE INT/ENB ZERO
007610  052712  040000                  BIS     #40000,(R2)     ;TOGGLE INT/ENB ONE

                                        ;       NO INTERRUPT IS EXPECTED AT NORMAL DEVICE LEVEL

007614  000415                          BR      RT017           ;CONTINUE TO TEST

                                        ;*******************************************************************

007616  012737  000340  177776  ENTERM: MOV     #340,PSW        ;DISABLE FURTHER INTERRUPTS
007624  116104  016701                  MOVB    CLV.CB+1(R1),R4 ;DEVICE PRIORITY SHOULD BE TO DISPLAY>R4
007630  042704  177400                  BIC     #177400,R4
007634  016603  000002                  MOV     2(SP),R3        ;CENTRAL PROCESS PRIORITY WAS TO DISPLAY>R3
007640  042703  177437                  BIC     #177437,R3      ;MASK OUT PRIORITY DISPLAY LEVEL

007644  104004                  ERMINT: HLT+4   ;SELECTED DEVICE PRIORITY LEVEL FAILURE TO INHIBIT INTERRUPTS

                                        ;PROBABLE FAULT LOGIC:  (D3 A5) E13

                                        ;       CHECK DEVICE PRIORITY PLUG


                                        ;SIGNIFICANCE:
                                        ;       (R2) DEVICE ADDRESS (CSR) UNDER TEST
                                        ;       (R3) PROCESSOR PRIORITY DISPLAY (PSW) LEVEL REQUIRED TO INHIBIT
                                        ;       (R4) DEVICE PRIORITY DISPLAY (VECTOR ADDRESS+2)SHOULD HAVE INHIBITED

                                        ;*******************************************************************

                                        ;       CLEANUP
007646  022626                          CMP     (SP)+,(SP)+


007650  022626                  RT017:  CMP     (SP)+,(SP)+     ;ADJUST THE STACK
007652  012737  000340  177776          MOV     #340,PSW
007660  005762  000004                  TST     4(R2)           ;INT/RDY TSR CLR
007664  023737  012430  007764          CMP     ERRORS,RERR17   ;TEST FOR RECORDED ERRORS
007672  001406                          BEQ     1$              ;(NO)BRANCHES
007674  032737  000400  177570          BIT     #BIT8,SWR       ;TEST LOCK ON ERROR SELECTED
007702  001402                          BEQ     1$              ;(NO)BRANCHES
007704  000137  007204                  JMP     RA17            ;(YES)LOCK ON CURRENT DEVICE
```

```
3969  007710  005012                    1$:     CLR     (R2)            ;CLEAR CONTROL +STATUS REGISTER
3970  007712  005762  000004                    TST     4(R2)           ;CLEAR TRANSITION(CHANGE OF STATE)
3971  007716  005062  000006                    CLR     6(R2)           ;CLEAR TRANSITION ENABLE REGISTER
3972  007722  013705  013216              MOV     $VEC,R5
3973  007726  012765  000004  000002            MOV     #IOT,2(R5)      ;RESTORE
3974  007734  005725                            TST     (R5)+
3975  007736  010565  177776                    MOV     R5,-2(R5)       ;TRAP CATCHER
3976
3977  007742  006201                            ASR     R1              ;ADVANCE
3978  007744  005201                            INC     R1              ;DEVICE INDEX
3979  007746  000137  007176                    JMP     LOP17           ;CONTINUE
3980
3981  007752  123700  177570          END17:  CMPB    SWR,R0          ;TEST LOCK ON SUBTEST SELECTED
3982  007756  001003                            BNE     OUT17           ;(NO) BRANCHES
3983
3984  007760  000137  007160                    JMP     TST17           ;(YES)JUMPS
3985
3986  007764  000000          RERR17: 0                               ;RECORED ERROR COUNT
3987
3988  007766  005737  000230          OUT17:  TST FLGPTY              ;TEST AUTO ENTRY (MONITOR MODE)
3989  007772  001401                            BEQ     RZ17            ;(NO) BRANCHES
3990  007774  000207                            RTS     PC              ;(YES) CONTINUE
3991  007776  104400                  RZ17:   SCOPE                   ;TEST SCOPE SELECTION
3992
3993
3994
```

```
 3995            000021                  N=N+1
 3996
 3997                                    .SBTTL  TST20:  DYNAMIC TEST ROUTINE
 3998
 3999                                    ;       THIS TEST VERIFIES THE DYNAMIC INTERRUPT CAPABILITY
 4000                                    ;       OF THE CB11-HA(S)
 4001
 4002
 4003  010000  012700  000020           DYNTST: MOV     #20,R0          ;DYNAMIC TEST DISPLAY #20 > R0
 4004  010004  004737  011206                   JSR     PC,SCANER       ;LINK APPROPERIATE INTERRUPT SERVICE ROUTINE
 4005  010010  012737  000340  177776   DYN1:   MOV     #340,PSW
 4006
 4007  010016  012737  017152  012712           MOV     #CNTL,WORK      ;SET BASE TEST DATA TABLE ADDRESS
 4008
 4009  010024  012706  001200                   MOV     #1200,SP        ;SET PROCESSOR STACK POINTER
 4010
 4011
 4012  010030  004737  010216           DYN2:   JSR     PC,PRIME        ;PRIME DEVICES
 4013
 4014  010034  005737  002176                   TST     DSTADR          ;TEST DISTRIBUTE TIED TO INTERRUPT MODULE
 4015  010040  001003                           BNE     1$              ;(YES) BRANCHES
 4016  010042  004737  010452                   JSR     PC,SERV         ;SERVICE DEVICE REGISTERS
 4017  010046  000402                           BR      2$
 4018
 4019  010050  004737  010664           1$:     JSR     PC,SERVD        ;SERVICE DISTB/INTR MODE
 4020  010054  005037  177776           2$:     CLR     PSW             ;LOWER PRIORITY TO ZERO
 4021  010060  004737  011044                   JSR     PC,VERFY        ;VERIFY RESULTS OF ACTIVITY
 4022  010064  062737  000002  012712           ADD     #2,WORK         ;ADVANCE TO NEXT DATA CONFIGURATION
 4023
 4024  010072  013704  012712                   MOV     WORK,R4
 4025  010076  011404                           MOV     (R4),R4         ;TEST DATA BASE SCAN COMPLETED
 4026
 4027  010100  001353                           BNE     DYN2            ;(NO) CONTINUES
 4028  010102  122737  000020  177570   ENDDYN: CMPB    #20,SWR ;TEST FOR LOCK ON SUBTEST SELECTION
 4029
 4030  010110  001737                           BEQ     DYN1            ;(YES) BRANCHES
 4031
 4032  010112  104400                           SCOPE                   ;TEST SCOPE LOOP
 4033
 4034
 4035  010114  005237  001262           PASEND: INC     PASSES          ;ADVANCE PASS COUNT
 4036  010120  032737  020000  177570           BIT     #BIT13,SWR      ;TEST TYPEOUT INHIBIT SELECTION SWITCH
 4037  010126  001016                           BNE     PS1$            ;(YES) BRANCHES
 4038  010130  000004  015650                   TYPE,   MSGPAS          ;TYPE PASS(ES)
 4039  010134  013705  001262                   MOV     PASSES,TTY      ;OCTAL
 4040  010140  004737  013452                   JSR     PC,PRINTR
 4041  010144  000004  015666                   TYPE,   MSGERR          ;TYPE ERROR(S)
 4042  010150  013705  012430                   MOV     ERRORS,TTY      ;OCTAL
 4043  010154  004737  013452                   JSR     PC,PRINTR
 4044  010160  000004  015412                   TYPE,   MCRLF           ;TYPE RETURN
 4045
 4046  010164  013700  000042           PS1$:   MOV     @#42,R0         ;FETCH SOFT VECTOR (MONITOR CONTROL)
 4047  010170  001410                           BEQ     OUTT            ;BRANCH IF NO MONITOR
 4048  010172  022700  017146                   CMP     #ENDPRO,R0      ;TEST ACT11 OR PSEUDO
 4049  010176  001401                           BEQ     PROEND          ;PSEUDO BYPASS RESET
 4050  010200  000005                           RESET                   ;CLEAR ALL I/O
```

```
 4051  010202  004710                PROEND: JSR     PC,(R0)         ;RETURN TO MONITOR
 4052  010204  000240                        NOP
 4053  010206  000240                        NOP
 4054  010210  000240                        NOP
 4055
 4056  010212  000137  002300        OUTT:   JMP     TST1            ; CONTINUE
 4057
 4058
 4059
 4060                                .SBTTL  PRIME DEVICE REGISTER(S) ROUTINE LINK APPROPIATE INTERRUPT SERVICE ROUTINE
 4061
 4062
 4063  010216  004737  013114        PRIME:  JSR     PC,INITR        ;INITIALIZE REGISTERS
```

```
 4064  010222  006301                  PRIMA:  ASL     R1              ;FORM WORD OFFSET
 4065
 4066  010224  016102  016262                  MOV     CADCSR(R1),R2
 4067  010230  001507                          BEQ     OUTPRI          ;TEST CYCLE COMPLETED BRANCHES
 4068
 4069  010232  012704  040000                  MOV     #40000,R4       ;SET SHOULD BE
 4070  010236  010412                          MOV     R4,(R2)         ;SET BITS 14
 4071  010240  056104  016612                  BIS     CVT.CB(R1),R4   ;MASK IN VECTOR RESPONSE ENTRY
 4072
 4073  010244  011203                          MOV     (R2),R3 ;VERIFY RESULTS
 4074  010246  020304                          CMP     R3,R4
 4075  010250  001401                          BEQ     PRIMB           ;(OK) BRANCHES
 4076
 4077  010252  104004                  ECSR:   HLT+4   ;CSR BIT 14 OR 08 THRU 02  FAILURE
 4078
 4079  010254  016102  016612          PRIMB:  MOV     CVT.CB(R1),R2   ;SETUP VECTOR LINKAGE
 4080
 4081  010260  032761  000400  016700          BIT     #400,CLV.CB(R1) ;CHECK GROUP ID
 4082  010266  001403                          BEQ     1$              ;1ST BRANCHES
 4083  010270  012722  011270          2$:     MOV     #ISR1,(R2)+     ;LINK GROUP 2
 4084  010274  000402                          BR      3$
 4085
 4086  010276  012722  011304          1$:     MOV     #ISR,(R2)+      ;TO INTERRUPT SERVICE ROUTINE
 4087  010302  005737  011266          3$:     TST     LINKER          ;TEST MULTIPLE DEVICE/VECTOR
 4088  010306  001403                          BEQ     4$              ;(NO) BRANCHES
 4089  010310  013762  011266  177776          MOV     LINKER,-2(R2)   ;(YES)LINK MULTIPLE SCAN ISR
 4090  010316  116112  016700          4$:     MOVB    CLV.CB(R1),(R2) ;SETUP PRIORITY LEVEL =7 AND DEVICE OFFSET
 4091
 4092
 4093  010322  013704  012712                  MOV     WORK,R4         ;DATA (TEST) BASE
 4094  010326  011404                          MOV     (R4),R4         ;TO R4
 4095
 4096  010330  005737  000042                  TST     @#42            ;TEST AUTO ACCEPT (MONITOR)
 4097  010334  001017                          BNE     PRIMC           ;(YES) BRANCHES
 4098
 4099  010336  032737  001000  177570          BIT     #BIT9,SWR       ;TEST FOR WORD SWITCH REG PATTERN
 4100  010344  001413                          BEQ     PRIMC           ;EXCLUSIVELY FIRST PASS
 4101
 4102                          ; SET DATA PATTERN TO BE TESTED INTO SWITCH REGISTER SWITCHES
 4103
 4104  010346  000000                          HALT            ;HALT FOR SWITCH REGISTER PATTERN HERE
 4105  010350  013704  012712                  MOV     WORK,R4
 4106  010354  013714  177570                  MOV     SWR,(R4)        ;RETAIN NEW ENTRY
 4107  010360  005064  000002                  CLR     2(R4)           ;DELIMIT (ONLY ONE PATTERN)
 4108
 4109  010364  012700  177777                  MOV     #177777,R0      ;ALL ONES HALT INDICATION
 4110
 4111                          ; RESET SWITCH REGISTER TO PROGRAM CONTROL SETTINGS
 4112
 4113  010370  000000                          HALT                    ;SET SWITCH REGISTER FOR PROGRAM CONTROL
 4114
 4115  010372  011404                          MOV     (R4),R4         ;FETCH CURRENT PATTERN
 4116  010374  005061  017054          PRIMC:  CLR     CNGBUF(R1)
 4117
 4118  010400  016102  016524                  MOV     CADTER(R1),R2
 4119  010404  005737  002176                  TST     DSTADR          ;TEST DISTRIBUTE TIED TO INTERRUPT
```

```
 4120  010410  001407                          BEQ     1$                      ;(NO) BRANCHES
 4121  010412  012762  020000  177772          MOV     #20000,-6(R2)           ;FIRST
 4122  010420  004737  011614                  JSR     PC,DLYGMS               ;NEG/TRANS BLOCK
 4123  010424  012704  177777                  MOV     #177777,R4              ;(YES) SET TER ENABLE SHOULD BE TO ONES
 4124  010430  010412                  1$:     MOV     R4,(R2)                 ;MAKE TRANS DETECTION ENABLE REG ENTRY (TER)
 4125
 4126  010432  011203                          MOV     (R2),R3
 4127  010434  020304                          CMP     R3,R4                   ;VERIFY RESULTS
 4128  010436  001401                          BEQ     PRIMD                   ;(OK) BRANCHES
 4129
 4130  010440  104004                  ETER:   HLT+4   ;TER BIT(S) FAILED TO RESPOND CORRECTLY
 4131  010442  006201                  PRIMD:  ASR     R1
 4132  010444  005201                          INC     R1
 4133  010446  000665                          BR      PRIMA                   ;CONTINUE
 4134
 4135  010450  000207                  OUTPRI: RTS     PC                      ;CONTINUE
 4136
 4137
```

```
4138
4139                                    .SBTTL  SERVICE DEVICE REGISTERS ROUTINE NORMAL (NO DISTRIBUTE MODE TESTING)
4140
4141
4142  010452  004737  013114    SERV:   JSR PC,INITR            ;INITIALIZE REGISTERS
4143
4144  010456  006301            SERV1:  ASL     R1
4145
4146  010460  016102  016262            MOV     CADCSR(R1),R2
4147  010464  001416                    BEQ     SERV3
4148
4149  010466  012704  060000            MOV     #60000,R4       ;SET MAINT/TRANS INT/ENB CSR
4150  010472  056104  016612            BIS     CVT.CB(R1),R4   ;MASK IN VECTOR RESPONSE ENTRY
4151
4152  010476  050412                    BIS     R4,(R2)         ;SET DEVICE TRANS/MAINT INT/ENB
4153
4154  010500  011203                    MOV     (R2),R3         ;FETCH RESULTS
4155  010502  042703  100000            BIC     #100000,R3      ;DON'T CARE BIT 15
4156  010506  020304                    CMP     R3,R4           ;VERIFY RESULTS
4157
4158  010510  001401                    BEQ     SERV2           ;OK BRANCHES
4159
4160  010512  104004            ESER:   HLT+4   ;CSR BIT(S) 14 OR 13 FAILURE
4161
4162  010514  006201            SERV2:  ASR     R1
4163  010516  005201                    INC     R1
4164  010520  000756                    BR      SERV1           ;CONTINUE
4165
4166  010522  004737  011614    SERV3:  JSR     PC,DLYGMS       ;DELAY
4167  010526  004737  013114            JSR     PC,INITR        ;INITIALIZE REGISTERS
4168
4169
4170  010532  006301            SER4:   ASL     R1
4171
4172  010534  016102  016262            MOV     CADCSR(R1),R2
4173  010540  001417                    BEQ     SEROUT
4174
4175  010542  042712  020000    SERV5:  BIC     #20000,(R2)     ;RESET MAINT/TRANS BIT 13 OF CSR
4176  010546  012704  040000            MOV     #40000,R4       ;SET INT/ENB SHOULD BE > R4
4177
4178  010552  056104  016612            BIS     CVT.CB(R1),R4   ;MASK IN VECTOR RESPONSE ENTRY
4179
4180  010556  011203                    MOV     (R2),R3         ;VERIFY RESULTS
4181  010560  042703  100000            BIC     #100000,R3      ;BIT 15 DON'T CARE
4182  010564  020304                    CMP     R3,R4
4183  010566  001401                    BEQ     SERV6           ;(OK) BRANCHES
4184
```

```
4185  010570  104004                ESERO:  HLT+4   ;CSR BIT(S) 14 OR 13  FAILURE OR BIT(S) 08 THRU 02
4186
4187  010572  006201                SERV6:  ASR     R1
4188  010574  005201                        INC     R1
4189  010576  000755                        BR      SER4            ;CONTINUE
4190
4191  010600  004737  011614        SEROUT: JSR     PC,DLYGMS       ;DELAY
4192
4193  010604  004737  013114                JSR     PC,INITR        ;INITIALIZE REGISTERS
4194
4195  010610  006301                SER7:   ASL     R1
4196  010612  013704  012712                MOV     WORK,R4
4197  010616  011427                        MOV     (R4),(PC)+
4198  010620  000000                TEMP:   0
4199  010622  012704  040000                MOV     #40000,R4
4200  010626  056104  016612                BIS     CVT.CB(R1),R4   ;MASK IN VECTOR RESPONSE ENTRY
4201  010632  016102  016262                MOV     CADCSR(R1),R2   ;SET CURRENT CSR ADDRESS > R2
4202  010636  001411                        BEQ     SER9            ;SCAN COMPLETED BRANCHES
4203  010640  011203                        MOV     (R2),R3         ;FETCH CURRENT CSR CONTENTS
4204
4205  010642  042703  100000                BIC     #100000,R3      ; CLR INT/RDY BIT 15 SHOULD BE DON'T CARE
4206  010646  020304                        CMP     R3,R4           ;VERIFY RESULTS
4207  010650  001401                        BEQ     SER8            ;(OK) BRANCHES
4208
4209  010652  104004                ESTAT:  HLT+4   ;CSR STATUS FAILURE BITS 15 THRU 13 OR 08 THRU 02
4210
4211  010654  006201                SER8:   ASR     R1
4212  010656  005201                        INC     R1
4213  010660  000753                        BR      SER7            ;CONTINUE
4214
4215  010662  000207                SER9:   RTS     PC              ;CONTINUE
4216
4217
4218                                .SBTTL  SERVICE DEVICE REGISTER(S) ROUTINE (DISTRIBUTE TIED TO INTERRUPT)
```

```
4219  010664  004737  013114          SERVD:  JSR     PC,INITR        ;INITIALIZE REGISTERS
4220  010670  006301                  SERVD1: ASL     R1
4221  010672  016102  016262                  MOV     CADCSR(R1),R2   ;SET DEVICE CSR ADDRESS > R2
4222  010676  001461                          BEQ     SDOUT   ;(NO ACTIVITY) BRANCHES
4223  010700  012704  060000                  MOV     #60000,R4       ;SET INT/ENB MAINT/TRANS CSR SHOULD BE
4224  010704  010412                          MOV     R4,(R2)         ;ACTIVATE DEVICE
4225  010706  056104  016612                  BIS     CVT.CB(R1),R4   ;MASK IN VECTOR RESPONSE
4226  010712  011203                          MOV     (R2),R3         ;FETCH RESULTS
4227  010714  042703  100000                  BIC     #100000,R3      ;BIT# 15 DON'T CARE
4228  010720  020304                          CMP     R3,R4           ;VERIFY
4229  010722  001401                          BEQ     SERVD2          ;(OK) BRANCHES
4230                                  ;       DEVICE CSR (R2) RESPONSE FAILURE
4231  010724  104004                  ESDCSR: HLT+4   ;CSR REGISTER (R2) BITS 15 THRU 00 FAILURE
4232
4233  010726  013704  012712          SERVD2: MOV     WORK,R4
4234  010732  011404                          MOV     (R4),R4         ;CURRENT DATA CONFIGURATION TO R4
4235  010734  010437  010620                  MOV     R4,TEMP         ;RECORD
4236  010740  013702  002176                  MOV     DSTADR,R2       ;DISTRIBUTE MODULE ADDRESS > R2
4237  010744  010412                          MOV     R4,(R2)         ;SET DISTB ASSOCIATED DATA BITS
4238  010746  011203                          MOV     (R2),R3         ;FETCH RESULTS
4239  010750  020304                          CMP     R3,R4           ;VERIFY
4240  010752  001401                          BEQ     SERVD3          ;(OK) BRANCHES
4241                                  ;       DISTRIBUTE MODULE (R2) DATA RESPONSE ERROR
4242  010754  104004                  ESERDST: HLT+4  ;DISTRIBUTE MODULE (R2) RESPONSE FAILURE
4243                                  ;       BITS "IN" R3 FAILURE TO RESPOND TO "OUT" R4 DATA
4244  010756  004737  011606          SERVD3: JSR     PC,DDLYMS       ;DELAY 7.3 (X2) MILLISECONDS
4245  010762  016102  016350                  MOV     CADDDR(R1),R2   ;DEVICE DDR ADDRESS > R2
4246  010766  013704  010620                  MOV     TEMP,R4         ;RECORD DATA "OUT" TO DISTRIBUTE
4247  010772  011203                          MOV     (R2),R3         ;INPUT RESULTS "IN" DDR
4248  010774  020304                          CMP     R3,R4           ;VERIFY RESULTS
4249  010776  001401                          BEQ     SERVD4          ;(OK) BRANCHES
4250                                  ;       DDR (R2) DATA RESPONSE ERROR
4251  011000  104004                  ESERDDR: HLT+4  ;DEVICE DDR (R2) DATA RESPONSE ERROR
4252                                  ;       BITS "IN" R3 FAILED TO RESPOND TO DIST "OUT" R4
4253  011002  013702  002176          SERVD4: MOV     DSTADR,R2       ;DIST ADDRESS > R2
4254  011006  005004                          CLR     R4              ;CLEAR SHOULD BE
4255  011010  010412                          MOV     R4,(R2)         ;CLEAR DISTRIBUTE MODULE
4256  011012  011203                          MOV     (R2),R3         ;FETCH RESULTS
4257  011014  001401                          BEQ     SERVD5          ;(OK) BRANCHES
4258                                  ;       DATA DISTRIBUTE MODULE (R2) CLEAR RESPONSE FAILURE
4259  011016  104004                  ESECDST: HLT+4  ;DISTRIBUTE MODULE (R2) CLEAR RESPONSE FAILURE
4260  011020  004737  011606          SERVD5: JSR     PC,DDLYMS       ;DELAY 7.3 (X2) MILLISECONDS
4261  011024  011203                          MOV     (R2),R3         ;FETCH  RESULTS (POST)
4262  011026  020304                          CMP     R3,R4           ;VERIFY
4263  011030  001401                          BEQ     SERVD6          ;(OK) BRANCHES
4264                                  ;       DISTRIBUTE DATA BITS "IN" R3 FAILURE
4265  011032  104004                  ESE2DST: HLT+4  ;DISTRIBUTE MODULE (R2) DATA RESPONSE FAILURE
4266
4267  011034  006201                  SERVD6: ASR     R1
4268  011036  005201                          INC     R1
4269  011040  000713                          BR      SERVD1          ;CONTINUE
4270  011042  000207                  SDOUT:  RTS     PC              ;EXIT
4271
```

```
4272
4273                                    .SBTTL  DEVICE VERIFICATION ROUTINE
4274
4275  011044  004737  013114  VERFY:  JSR     PC,INITR
4276  011050  012700  000020          MOV     #20,R0
4277  011054  006301          VRFY0:  ASL     R1              ;NOTE LAST TOGGLE WAS MAINT BIT #13 = 1
4278                                                          ;IF DISTRIBUTE TIED TO SCAN
4279  011056  013704  012712          MOV     WORK,R4         ;DATA ADDRESS
4280  011062  011404                  MOV     (R4),R4         ;CURRENT CONFIGURATION
4281  011064  005737  002176          TST     DSTADR          ;TEST DISTB/MODE TESTING
4282  011070  001003                  BNE     1$              ;(YES) BRANCHES
4283  011072  012704  177777          MOV     #-1,R4  ;
4284  011076  000401                  BR      2$
4285  011100  005004          1$:     CLR     R4
4286  011102  016102  016262  2$:     MOV     CADCSR(R1),R2   ;TEST FOR COMPLETION OF SCAN
4287  011106  001436                  BEQ     VEROUT          ;(YES) BRANCHES
4288  011110  062702  000002          ADD     #2,R2           ;FORM DDR ADDRESS
4289  011114  011203                  MOV     (R2),R3         ;FETCH CURRENT CONTENTS
4290  011116  020304                  CMP     R3,R4           ;DDR REG SHOULD EQUAL ALL ONES NORMALLY
4291                                                          ;CLEAR TO ZERO  IF DISTB/MODE TESTING
4292  011120  001401                  BEQ     VERFY1          ;(OK) BRANCHES
4293
4294  011122  104004          VEDDR:  HLT+4   ;VERIFICATION ERROR OF DDR CONTENTS
4295
4296  011124  012702  017054  VERFY1: MOV     #CNGBUF,R2      ;FETCH RECORDED ACTIVITY ADDRESS
4297  011130  060102                  ADD     R1,R2           ;SET ADDRESS OF BUFFER >R2
4298
4299  011132  011203                  MOV     (R2),R3         ;FETCH ACTIVITY ENTRY > R3
4300  011134  013704  012712          MOV     WORK,R4         ;FETCH CURRENT DATA WORD ADDRESS
4301  011140  011404                  MOV     (R4),R4         ;FETCH CURRENT DATA CONFIGURATION
4302  011142  020304                  CMP     R3,R4           ;VERIFY RESULTS
4303  011144  001410                  BEQ     VRFY2           ;(OK) BRANCHES
4304                                ;SIGNIFICANCE:
4305                                ;                       (R1) (TSR) DEVICE ADDRESS UNDER TEST
4306                                ;                       (R2) (RECEIVE) DATA TABLE ADDRESS
4307                                ;                       (R3) DATA WORD WAS
4308                                ;                       (R4) DATA WORD SHOULD BE
4309
4310  011146  010137  011426          MOV     R1,RS1
4311  011152  016101  016436          MOV     CADTSR(R1),R1
4312
4313  011156  006301                  ASL     R1
4314  011160  104004          VETER:  HLT+4   ;VERIFICATION ERROR OF TSR CONTENTS
4315
4316  011162  013701  011426          MOV     RS1,R1
4317  011166  005061  017054  VRFY2:  CLR     CNGBUF(R1)      ;CLEAR PREVIOUS SCAN ENTRY
4318  011172  005061  016766          CLR     DATABF(R1)
4319  011176  006201                  ASR     R1
4320  011200  005201                  INC     R1
4321  011202  000724                  BR      VRFY0           ;CONTINUE
4322  011204  000207          VEROUT: RTS     PC              ;CONTINUE
```

```
                                        .SBTTL  MULTIPLE DEVICE TO SINGULAR VECTOR ADDRESS DETECTOR
                                        ;
                                        ;NOTE:
                                        ;       THIS SUBROUTINE SCANS ACTIVE VECTOR TABLE ENTRIES
                                        ;       AND UPON DETECTION OF DUPLICATE ASSIGNMENTS IT
                                        ;       LINKS ALL DEVICES TO THE MULTIPLE INTERRUPT SERVICE
                                        ;       ROUTINE BY ENTRY IN "LINKER".
                                        ;
011206  005001                  SCANER: CLR     R1              ;CLEAR
011210  005002                          CLR     R2              ;REGISTERS
011212  005003                          CLR     R3              ;AND
011214  005037  011266                  CLR     LINKER          ;CONTROL FLAG
                                        ;
011220  005723                  LXA:    TST     (R3)+           ;SET BASE OFFSET SUBSCAN
011222  010302                          MOV     R3,R2           ;RECORD>R2
011224  005761  016262                  TST     CADCSR(R1)      ;TEST SCAN COMPLETED
011230  001415                          BEQ     LXOUT           ;(YES) BRANCHES
                                        ;
011232  026162  016612  016612  LXB:    CMP     CVT.CB(R1),CVT.CB(R2) ;TEST FOR DUPLICATE ENTRY
011240  001406                          BEQ     PXOUT           ;(YES) BRANCHES
011242  005722                          TST     (R2)+           ;ADVANCE SUBSCAN INDEX
011244  005762  016260                  TST     CADCSR-2(R2)    ;TEST SUBSCAN COMPLETED
011250  001370                          BNE     LXB             ;(NO) BRANCHES
                                        ;
011252  005721                          TST     (R1)+           ;ADVANCE SUBSCAN BASE INDEX
011254  000761                          BR      LXA             ;CONTINUE
                                        ;
011256  012737  011432  011266  PXOUT:  MOV     #MISR,LINKER    ;SET MULTIPLE DEVICE/VECTOR LINKER
                                        ;
011264  000207                  LXOUT:  RTS     PC              ;EXIT
011266  000000                  LINKER: 0                       ;MULTIPLE DEVICE/VECTOR LINKER
                                        ;                       ;CONTAINS #MISR WHEN ACTIVE
                                        ;***************************************************************
                                        ;
```

```
                                                .SBTTL  INTERRUPT SERVICE ROUTINE (SINGLE DEVICE PER VECTOR)

011270  013737  177776  011310      5.2  ISR1:   MOV     PSW,IPSW        ;GROUP 2 ENTRY
011276  006337  011310              3.7          ASL     IPSW            ;FORM INDEX OFFSET
011302  000403                      2.6          BR      ISRPSH          ;TO SECOND GROUP

011304  013727  177776              5.2  ISR:    MOV     PSW,(PC)+

011310  000000                           IPSW:   0

011312  010146                      4.9  ISRPSH: MOV     R1,-(SP)
011314  010246                      4.9          MOV     R2,-(SP)
011316  010346                      4.9          MOV     R3,-(SP)
011320  010446                      4.9          MOV     R4,-(SP)

011322  013701  011310              3.8  IXRX:   MOV     IPSW,R1         ;FETCH CURRENT PROCESSOR STATUS WORD

011326  042701  177740              4.4          BIC     #177740,R1      ;CLEAR TO DEVICE LEVEL ENTRY
011332  006301                      2.3          ASL     R1              ;FORM WORD OFFSET

011334  016102  016262              5.0          MOV     CADCSR(R1),R2

011340  012704  140000              3.8          MOV     #140000,R4      ;SHOULD BE TO R4
011344  056104  016612              5.0          BIS     CVT.CB(R1),R4   ;MASK IN VECTOR RESPONSE
011350  011203                      3.8          MOV     (R2),R3         ;FETCH CONTENTS OF CSR
011352  042703  020000              4.4          BIC     #20000,R3       ;MASK OUT MAINTENANCE TOGGLE
011356  020304                      2.3          CMP     R3,R4           ;VERIFY CSR CONTENTS
011360  001403                      2.6          BEQ     OK$             ;(OK) BRANCHES
011362  012700  000020              3.8          MOV     #20,R0          ;SET MODULE NUMBER IN R0

011366  104004                           XCER:   HLT+4   ;CSR BITS 15,14 OR 08 THRU 00 FAILURE

011370  062702  000002              3.8  OK$:    ADD     #2,R2           ;FORM DDR (DATA) ADDRESS

011374  051261  016766              6.4          BIS     (R2),DATABF(R1) ;COLLECT DATA REGISTER (N) ENTRIES
                                                                        ;FOR DISTRIBUTE MODULE VERIFICATION
011400  062702  000002              3.8          ADD     #2,R2           ;FORM TSR (CHANGE OF STATE) ADDRESS

011404  051261  017054              6.4          BIS     (R2),CNGBUF(R1) ;COLLECT CHANGE REGISTER (N) ENTRIES
011410  051261  017054              6.4          BIS     (R2),CNGBUF(R1) ;COLLECT CHANGE REGISTER TWICE
011414  012604                      3.8  ISRPOP: MOV     (SP)+,R4                ;RESTORE REGISTERS
011416  012603                      3.8          MOV     (SP)+,R3
011420  012602                      3.8          MOV     (SP)+,R2
011422  012601                      3.8          MOV     (SP)+,R1
011424  000002                      4.8  RTB:    RTI             ;EXIT INTERRUPT SCAN
011426  000000                           RS1:    0
011430  000000                           RS2:    0
```

```
                                        .SBTTL  INTERRUPT SERVICE ROUTINE (MULTIPLE DEVICE TO COMMON VECTOR)
                                        ;NOTE:
                                        ;       DURING AUTO SIZING OR CONFIGURATION PROCESSING THE PROGRAM
                                        ;       SCANS THE VECTOR ASSIGNMENT TABLE.  IF MORE THAN ONE DEVICE IS
                                        ;       ASSIGNED TO ANY VECTOR ADDRESS ALL DEVICE INTERRUPT SERVICE IS
                                        ;       PROCESSED BY THE FOLLOWING INTERRUPT SERVICE ROUTINE.
011432  010146                    4.9   MISR:   MOV     R1,-(SP)                ;SAVE
011434  010246                    4.9           MOV     R2,-(SP)                ;REGISTERS
011436  010346                    4.9           MOV     R3,-(SP)
011440  010446                    4.9           MOV     R4,-(SP)
011442  005001                    2.3           CLR     R1
011444  012700  000020            3.8           MOV     #20,R0          ;TEST #20 TO DISPLAY>R0
011450  000404                    5.0           BR      MRL2
011452  012727  000400            5.2   MRL0:   MOV     #400,(PC)+
011456  000400                        HANGCT: 400                     ;INITIALIZE ANTIHANG COUNTER
011460  005721                    3.2   MRL1:   TST     (R1)+           ;ADVANCE TO NEXT DEVICE INDEX
011462  016102  016262            5.0   MRL2:   MOV     CADCSR(R1),R2   ;FETCH DEVICE CSR ADDRESS>R2
011466  001442                    2.6           BEQ     MOUT            ;SCAN COMPLETED BRANCHES
011470  011203                    3.8           MOV     (R2),R3         ;FETCH CONTENTS OF CURRENT CSR
011472  100372                    2.5           BPL     MRL1            ;NOT ACTIVE BRANCHES
011474  005337  011456            3.7           DEC     HANGCT          ;TEST FOR HUNG DEVICE
011500  100415                    2.6           BMI     BADB15          ;(YES) BRANCHES
011502  116137  016701  177776    6.4           MOVB    CLV.CB+1(R1),PSW;SET PRIORITY LEVEL FOR CURRENT DEVICE
011510  062702  000004            3.8           ADD     #4,R2           ;SET DEVICE TSR ADDRESS>R2
011514  051261  017054            6.4           BIS     (R2),CNGBUF(R1) ;RECORD DATA (TSR)
011520  051261  017054            6.4           BIS     (R2),CNGBUF(R1) ;ANOTHER FOR PULSE WIDTH (TSR)
011524  056261  177776  016766    7.6           BIS     -2(R2),DATABF(R1);COLLECT DATA REGISTER (N) ENTRIES
                                                                        ;FOR DYNAMIC DISTRIBUTE MODULE VERIFICATION
011532  000752                    2.6           BR      MRL1            ;CONTINUE
                                ;*******************************************************************************
011534  010304                    2.3   BADB15: MOV     R3,R4           ;CONSTRUCT SHOULD BE>R4
011536  056104  016612            5.0           BIS     CVT.CB(R1),R4   ;MASK IN ASSOCIATED VECTOR RESPONSE
011542  042704  100000            4.4           BIC     #BIT15,R4       ;CLEAR INT/RDY BIT 15 >R4 SHOULD BE
                                ;SIGNIFICANCE:
                                ;               (R2) (CSR) DEVICE ADDRESS UNDER TEST
                                ;               (R3) WAS
                                ;               (R4) SHOULD BE
011546  010237  011430            3.7           MOV     R2,RS2
011552  016102  016262            5.0           MOV     CADCSR(R1),R2
011556  012700  000020            3.8           MOV     #20,R0          ;SET MODULE NUMBER IN R0

011562  104004                    D15ERR: HLT+4   ;DEVICE CSR (R2) INT/RDY BIT 15 FAILING TO CLEAR
011564  013702  011430            3.8           MOV     RS2,R2
011570  000000                    1.8           HALT                    ;CONTINUATION WILL RESULT IN CONSTANT ERRORS
011572  000727                    2.6           BR      MRL0            ;CONTINUE
                                ;*******************************************************************************
011574  012604                    3.8   MOUT:   MOV     (SP)+,R4
011576  012603                    3.8           MOV     (SP)+,R3
011600  012602                    3.8           MOV     (SP)+,R2        ;RESTORE
011602  012601                    3.8           MOV     (SP)+,R1        ;REGISTERS
011604  000002                    4.8   RT2:    RTI                     ;EXIT
                                ;*******************************************************************************
```

```
                                                        .SBTTL          6.4 MILLISECOND DELAY
                                                        ;
011606  012737  000004  011674     5.2  DDLYMS: MOV     #4,MS6D+2       ;DISTRIBUTE MODE CALL
                                             ;          NOTE:
                                             ;          THE NORMAL 7.3 MILLISECOND INTERVAL MAY BE REDUCED
                                             ;          BY 10% VIA SETTING SWITCH REGISTER BIT #12 = 1.
                                             ;          THE NORMAL 7.3 MILLISECOND DELAY INTERVAL MAY BE INCREASED
                                             ;          BY 10% VIA SETTING SWITCH REGISTER BIT #14 = 1.
                                             ;
                                             ;          DISTRIBUTE MODE CALL USE TWICE THE SELECTED INTERVAL
                                             ;
011614  010527                      3.7  DLYGMS: MOV     R5,(PC)+
011616  000000                           TSS:    0
011620  013737  011742  011746     5.2          MOV     TIMEX,TIME      ;PRESET NOMINAL TIME INTERVAL
011626  013705  177570              3.8          MOV     SWR,R5
011632  042705  127777              4.4          BIC     #127777,R5
011636  001415                      2.6          BEQ     MS6D
011640  022705  050000              3.8          CMP     #50000,R5
011644  001412                      2.6          BEQ     MS6D
011646  032705  010000              4.4          BIT     #BIT12,R5
011652  001404                      2.6          BEQ     1$
011654  013737  011740  011746     5.2          MOV     TIMEW,TIME      ;-10% DELAY > TIME
011662  000403                      2.6          BR      MS6D
011664  013737  011744  011746     5.2  1$:     MOV     TIMEY,TIME      ;+10% DELAY > TIME
011672  012727  000002              5.2  MS6D:   MOV     #2,(PC)+        ;  NO   DELAY = 7.308 MILLISECOND INTERVAL
011676  000000                           1$:     0
011700  013737  011746  011710     5.2  2$:     MOV     TIME,4$
011706  005327                      3.7  3$:     DEC     (PC)+           ;DELAY
011710  000000                           4$:     0               ;INTERVAL
011712  001375                      2.6          BNE     3$              ;EXECUTION
011714  005337  011676              3.7          DEC     1$              ;HERE
011720  001367                      2.6          BNE     2$
                                             ;
011722  012737  000002  011674     5.2          MOV     #2,MS6D+2       ;RESTORE NON DISTRIBUTE MODE INTERVAL CONTROL
011730  013705  011616              3.8          MOV     TSS,R5
011734  000207                      3.5          RTS     PC              ;RETURN


011736  000000                           DTIME:  0               ;REPLACED BY 10% INTERVAL
                                                                ;LONG
011740  017700                           TIMEW:  17700           ;-10%
011742  017777                           TIMEX:  17777           ;DELAY INTERVAL
011744  020777                           TIMEY:  20777           ;+10%

011746  017777                           TIME:   17777           ;DYNAMIC DELAY INTERVAL
                                         ;NOTE:
                                         ;       ENTRY "TIME:" ABOVE IS MODIFIED BY SOFTWARE
                                         ;       CLKSCN  TO 7.3 /2 MILLISECOND DELAY INTERVAL.


                                         .SBTTL          SOFTWARE CLOCK 7.3 MILLISECOND TIME INTERVAL GENERATOR


011750  005737  011736              3.2  CLKSCN: TST      DTIME          ;TEST CODE EXECUTION FLAG
011754  001002                      2.6          BNE     CLKOUT          ;BYPASS (ALREADY EXECUTED)
```

```
4519  011756  000137  016264          3.7           JMP     CLKRTN          ;EXECUTE TIME INTERVAL GENERATOR
4520  011762  012700  016362          3.8   CLKOUT: MOV     #TABLEB,R0      ;SET BASE
4521  011766  012701  017142          3.8           MOV     #TABLEN,R1      ;SET LIMIT
4522  011772  005020                  3.7   1$:     CLR     (R0)+           ;CLEAR
4523  011774  020001                  2.3           CMP     R0,R1           ;TABLE
4524  011776  001375                  2.6           BNE     1$              ;AREA
4525  012000  000207                  3.5           RTS     PC              ;EXIT
4526
4527
4528                                  ;       DEVICE TRAP TO ZERO
4529                                  ;               AND
4530                                  ;       BUS ERROR TIME-OUT
4531                                  ;       ERROR REPORT ROUTINE
4532
4533  012002  000004  015332          TRAP0:  TYPE,   MSGTP0          ;OUTPUT "DEVICE TRAPPED TO ZERO"
4534  012006  000402                  BR      BUSL1                   ;CONTINUE
4535
4536                                  ;       ON DEVICE TRAPPED TO ZERO IT IS SUGGESTED
4537                                  ;       THAT EACH DEVICE BE CONFIGURED SEPERATELY
4538                                  ;       FOR TESTING UNTIL THE FAILING DEVICE IS
4539                                  ;       ISOLATED.
4540
4541
4542  012010  000004  015300          BUSERR: TYPE,   MSGBUS
4543  012014  011603                  BUSL1:  MOV     (SP),R3
4544  012016  162703  000002                  SUB     #2,R3
4545
4546  012022  104003                  ERRSYN: HLT+3   ;BUS ERROR TIME-OUT TRAP
4547
4548                                  ;SIGNIFICANCE:
4549                                                  ;DEVICE ADDRESS (R2)
4550                                                  ;FAILED TO RESPOND AT
4551                                                  ;PROGRAM LOCATION (R3)
4552
4553
4554                                  ;PROBABLE FAULT LOGIC:  (D3 D4) E23, E25
4555                                  ;                       (D2 A6,A7,B6,B7) E32 (SWITCH SETTINGS)
4556
4557  012024  000002                  ERRRTT: RTI     ;RETURN
4558
4559                                  .SBTTL          SWAP OUT BUS ERROR CONTROL FOR RTI ROUTINE
4560
4561  012026  005004                  SWAP0:  CLR     R4                      ;UNIQUE SIZER ENTRY
4562  012030  012702  160000                  MOV     #160000,R2
4563  012034  010237  001566                  MOV     R2,LOWADD
4564  012040  000004  015141                  TYPE,   MSG2X
4565  012044  000004  015157                  TYPE,   MSG3X
4566
4567  012050  013727  000004          SWAP0:  MOV     @#4,(PC)+
4568  012054  012010                  SWAP4:  BUSERR
4569  012056  013727  000006                  MOV     @#6,(PC)+
4570  012062  000340                  SWAP6:  340
4571  012064  012737  000006  000004          MOV     #6,@#4
4572  012072  013737  013372  000006          MOV     RTX,@#6
4573  012100  000207                          RTS     PC
4574
```

```
                                        .SBTTL          SWAP IN BUS ERROR CONTROL REPLACE RTI
                                
004575                                  
004576                                  
004577  012102  013737  012054  000004  SWAPI:  MOV     @#SWAP4,@#4
004578  012110  013737  012062  000006          MOV     @#SWAP6,@#6
004579  012116  000207                  RTS     PC
004580                                  ;
004581  012120  001260                  $END:   RESTAR
004582  012122  000002                          YESRT:  RTI                     ;RETURN FROM TRACE TRAP
004583                                  ;       $SCOPE          SCOPE LOOP HANDLER
004584                                  
004585                                  ;THIS ROUTINE HANDLES THE ITERATIONS, LOOPING, ERROR
004586                                  ;LOOPING, AND THE DISPLAYING OF THE TEST NUMBER.
004587                                  
004588                                  ;"SCOPE" IS PLACED BETWEEN EACH SUBTEST IN THE TEST AND
004589                                  ;RECORDS THE STARTING ADDRESS OF THE SUBTEST IN "LAD:"
004590                                  
004591  012124  032737  000400  177570  TRAP$:  BIT     #SW8,@#SWR      ;LOOP ON SPEC. TEST?
004592  012132  001404                  BEQ     1$              ;NO LOOP ON SPEC. TEST
004593  012134  123737  177570  001200          CMPB    @#SWR,ICNT      ;ON RIGHT TEST?   *SW7-0*
004594  012142  001433                  BEQ     OVER$           ;NOT RIGHT TEST
004595                                  
004596  012144  005737  001262          1$:     TST     PASSES          ;TEST PASS COUNT
004597  012150  001416                  BEQ     SVLAD$          ;FIRST PASS BYPASS ITERATIONS
004598  012152  032737  004000  177570          BIT     #SW11,@#SWR     ;KILL ITERATIONS
004599  012160  001012                  BNE     SVLAD$          ;YES - KILL ITERATIONS
004600  012162  105737  001201                  TSTB    ICNT+1          ;FIRST ONE?
004601  012166  001404                  BEQ     2$              ;BRANCH IF FIRST
004602  012170  123737  012256  001201          CMPB    TIMES,ICNT+1    ;DONE?
004603  012176  001013                  BNE     KIT$            ;BRANCH IF NOT
004604  012200  112737  000001  001201  2$:     MOVB    #1,ICNT+1       ;FIRST ITERATION
004605  012206  105237  001200          SVLAD$: INCB    ICNT            ;COUNT TEST NUMBERS
004606  012212  011637  012254                  MOV     (6),LAD         ;SAVE LOOP ADDRESS
004607  012216  013737  001200  177570          MOV     ICNT,@#DISPLAY  ;DISPLAY TEST NO. AND ITERATION COUNT
004608  012224  000002                  RTE:    RTI                     ;RETURN
004609                                  
004610  012226  105237  001201          KIT$:   INCB    ICNT+1          ;INC THE ITERATION COUNT
004611  012232  013737  001200  177570  OVER$:  MOV     ICNT,@#DISPLAY  ;SET UP DISPLAY
004612  012240  005737  012254                  TST     LAD             ;FIRST ONE?
004613  012244  001760                  BEQ     SVLAD$          ;YES
004614  012246  013716  012254                  MOV     LAD,(6)         ;FUDGE RETURN ADDRESS
004615  012252  000002                  RTF:    RTI                     ;FIXES PS
004616                                  
004617  012254  000000                  LAD:    0                       ;LOOP ADDRESS
004618  012256  000020                  TIMES:  20                      ;RUN 20 TIMES
```

```
                                        ;       $HLT            ERROR TYPEOUT HANDLER
                                        ;
                                        ;THIS ROUTINE PRINTS OUT ERROR MESSAGES STARTING WITH THE
                                        ;ADDRESS OF THE "HLT". IT ALSO COUNTS THE NUMBER OF ERRORS
                                        ;AND HAS THE CAPABILITY OF LOOPING ON ERROR, BELL ON ERROR,
                                        ;"HALT" ON ERROR, AND INHIBIT TYPEOUTS. AN OPTIONAL ARGUEMENT
                                        ;(HLT+(N)) WILL BE PLACED IN "HLTCT$:" FOR ADITIONAL TYPEOUTS.
                                        ;
012260  004737  013132          EMT$:   JSR     PC,PUSHX        ;SAVE REGISTERS
012264  005237  012430                  INC     ERRORS          ;COUNT THE NUMBER OF ERRORS
012270  032737  020000  177570          BIT     #SW13,@#SWR     ;SKIP TYPEOUT IF SET
012276  001041                          BNE     Y$              ;SKIP TYPEOUTS
012300  023737  013410  013440          CMP     R5O,FLAGH       ;TEST FOR HEADER REQUIREMENT
012306  001413                          BEQ     X$              ;(NO) BRANCHES
012310  004737  013374                  JSR     PC,HTST$        ;OUTPUT TEST #
012314  013737  013410  013440          MOV     R5O,FLAGH       ;SET HEADER INHIBIT FLAG
012322  000004  015446                  TYPE,   MSGHED          ;OUTPUT (PC),(PS),(SP) ETC.
                                        ;
012326  000004  015550                  TYPE,   MSGSUB
                                        ;
012332  000004  015412                  TYPE,   MCRLF
                                        ;
012336  000004  015412          X$:     TYPE,   MCRLF
012342  011637  012434                  MOV     (6),HLTADR      ;PUT ADDRESS OF INSTRUCTION ON STACK
012346  162737  000002  012434          SUB     #2,HLTADR       ;FUDGE ADDRESS
012354  117737  000054  012432          MOVB    @HLTADR,HLTCT$  ;GET HLT ARGUEMENT
012362  013705  012434                  MOV     HLTADR,TTY      ;TYPE HLTADR IN OCTAL
012366  004737  013452                  JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
012372  000004  015704                  TYPE,   SPACE   ;.ASCII " "
012376  004737  012436                  JSR     PC,ERROR$       ;GO TO USER ERROR ROUTINE
012402  004737  013164          Y$:     JSR     PC,POPX         ;RESTORE REGISTERS
012406  005737  177570                  TST     @#SWR           ;HALT ON ERROR
012412  100001                          BPL     .+4             ;SKIP IF CONTINUE
012414  000000                          HALT                    ;HALT ON ERROR!
012416  000002          RTH:            RTI                     ;RETURN
012420  105037  001201                  CLRB    ICNT+1          ;CLEAR ITERATION COUNT
012424  000137  012226                  JMP     KIT$            ;LOOP ON TEST UNTIL NO ERRORS
                                        ;
012430  000000          ERRORS: 0                               ;ERROR COUNT
012432  000000          HLTCT$: 0                               ;HLT ARGUEMENT
012434  000000          HLTADR: 0                               ;LAST HLT INSTRUCTION EXECUTED
                                        ;
012436                  ERROR$:
012436  016605  000004                  MOV     4(SP),TTY
012442  004737  013452                  JSR     PC,PRINTR       ;OUTPUT (PS)
012446  000004  015704                  TYPE,   SPACE
012452  010605                          MOV     SP,TTY
012454  062705  000002                  ADD     #2,TTY
012460  004737  013452                  JSR     PC,PRINTR       ;OUTPUT (SP)
012464  004737  013164                  JSR     PC,POPX
012470  005237  012432                  INC     HLTCT$
012474  006201                          ASR     R1
012476  042737  007700  012516          BIC     #7700,2$
012504  105337  012432          1$:     DECB    HLTCT$
012510  100411                          BMI     3$
012512  000004  015704                  TYPE,   SPACE
```

```
4675  012516  010005                    2$:     MOV     %0,TTY          ;OUTPUT (REG"N")IN OCTAL
4676  012520  004737  013452                    JSR     %7,PRINTR
4677  012524  062737  000100  012516            ADD     #100,2$
4678  012532  000764                            BR      1$
4679  012534  006301                    3$:     ASL     R1
4680  012536  000207                            RTS     PC
4681
4682
4683                                    ;SUBROUTINE TO SAVE INPUT AS OCTAL NUMBER
4684
4685  012540  004737  013634            READIN: JSR     PC,READ$        ;GO READ TTY UNTIL CR
4686  012544  010146                            MOV     R1,-(6)         ;PUSH R1 ON STACK
4687  012546  010246                            MOV     R2,-(6)         ;PUSH R2 ON STACK
4688  012550  010346                            MOV     R3,-(6)         ;PUSH R3 ON STACK
4689  012552  012501                            MOV     (R5)+,R1
4690  012554  012702  013734                    MOV     #INPUT,R2
4691  012560  042712  000200                    BIC     #200,(R2)       ;REDUCE TO 7 LEVEL CODE
4692  012564  122712  000120                    CMPB    #120,(R2)       ;CHECK"P"
4693  012570  001412                            BEQ     POK
4694  012572  122712  000131                    CMPB    #131,(R2)       ;CHECK "Y"
4695  012576  001407                            BEQ     POK
4696  012600  122712  000116                    CMPB    #116,(R2)       ;CHECK "N"
4697  012604  001404                            BEQ     POK
4698  012606  005011                            CLR     (R1)
4699  012610  122712  000052                    CMPB    #52,(R2)        ;CHECK FOR ASTERICK "*"
4700  012614  001002                            BNE     TOK             ;(NO) BRANCHES
4701  012616  111211                    POK:    MOVB    (R2),(R1)       ;(YES) RECORD
4702  012620  000417                            BR      MOK             ;REPORT
4703  012622  112203                    TOK:    MOVB    (R2)+,R3
4704  012624  001416                            BEQ     ZOK             ;BRANCH DONE
4705  012626  162703  000060                    SUB     #60,R3
4706  012632  032703  177770                    BIT     #177770,R3
4707  012636  001011                            BNE     ZOK             ;BRANCH BAD DATREG
4708  012640  006311                            ASL     (R1)
4709  012642  103406                            BCS     MOK
4710  012644  006311                            ASL     (R1)
4711  012646  103404                            BCS     MOK
4712  012650  006311                            ASL     (R1)
4713  012652  103402                            BCS     MOK
4714  012654  050311                            BIS     R3,(R1)
4715  012656  000761                            BR      TOK
4716  012660  000244                    MOK:    CLZ                     ;CLR"Z"BIT
4717  012662  013737  177776  012706    ZOK:    MOV     @#PS,PSTEMP     ;SAVE CONDITION CODES
4718  012670  012603                            MOV     (6)+,R3         ;POP STACK INTO R3
4719  012672  012602                            MOV     (6)+,R2         ;POP STACK INTO R2
4720  012674  012601                            MOV     (6)+,R1         ;POP STACK INTO R1
4721  012676  013737  012706  177776            MOV     PSTEMP,@#PS     ;RESTORE CONDITION CODES
4722  012704  000205                            RTS     R5
4723  012706  000000                    PSTEMP: 0
4724  012710  000000                            0
4725  012712  000000                    WORK:   0
4726  012714  000000                            0
4727  012716  000000                            0
4728                                    .SBTTL          TABLE AND REGISTER INITIALIZATION SUBROUTINES
4729
4730                                    ;       INITIALIZE STACK LIMIT REGISTER ON 11/40 OR 11/45
```

```
                                        ;       CHANGE RTI TO RTT  11/40 OR 11/45
                                        ;       CLEAR REGISTERS
                                        ;       CLEAR TABLES
                                        ;
012720  005037  014410          INITA:  CLR     NSCAN
012724  005037  002176                  CLR     DSTADR
012730  012737  012764  000010          MOV     #INITB,@#10     ;SET RESERVE INSTRUCTION TRAP VECTOR
012736  012737  000340  000012          MOV     #340,@#12
012744  005046                          CLR     -(SP)
012746  012746  012754                  MOV     #INITZ,-(SP)
012752  000006                          RTT                     ;TEST RTT EXECUTION
012754  012737  000006  013372  INITZ:  MOV     #6,RTX          ;SET RTT CONTROL ENTRY

012762  000402                          BR      INITC           ;(OK) BRANCHES

012764  022626                  INITB:  CMP     (SP)+,(SP)+     ;RESTORE STACK
012766  022626                          CMP     (SP)+,(SP)+     ;TWICE ON TIMEOUT
012770  013737  013372  012122  INITC:  MOV     RTX,YESRT       ;REPLACE RTI WITH RTT
012776  012737  000012  000010          MOV     #12,@#10
013004  005037  000012                  CLR     @#12
013010  012737  000006  000004          MOV     #6,@#4
013016  013737  013372  000006          MOV     RTX,@#6         ;SET TIME OUT TRAP VECTOR
013024  012737  000400  177774          MOV     #400,SLR        ;SET STACK LIMIT REGISTER
013032  005037  000006                  CLR     @#6             ;TRAP CATCHER
013036  012700  000630          INITX:  MOV     #630,R0         ;DEVICE VECTOR BASE
013042  012701  000632                  MOV     #632,R1         ;SET "IOT"
013046  010120          4$:     MOV     R1,(R0)+        ;UNEXPECTED
013050  012720  000004                  MOV     #IOT,(R0)+      ;INTERRUPT
013054  062701  000004                  ADD     #4,R1           ;VECTOR(S)
013060  022701  001000                  CMP     #1000,R1        ;TRAP
013064  101370                          BHI     4$              ;CATCHER

013066  005037  001262                  CLR     PASSES

013072  012737  000340  177776  INITQ:  MOV     #340,PSW        ;SET PROCESSOR PRIORITY = 7
013100  012737  012010  000004          MOV     #BUSERR,@#4     ;LINK BUS TIME-OUT ERROR TRAP CATCHER
013106  012737  000340  000006          MOV     #340,@#6        ;LEVEL = 7

                                        ;       CLEAR REGISTERS
013114  005000                  INITR:  CLR     R0              ;CLEAR
013116  005001                          CLR     R1
013120  005002                          CLR     R2              ;ALL
013122  005003                          CLR     R3              ;WORKING
013124  005004                          CLR     R4              ;REGISTERS
013126  005005                          CLR     R5
                                        ;
013130  000207                          RTS     PC              ;CONTINUE

013132  010027                  PUSHX:  MOV     R0,(PC)+
013134  000000                  S0:     0                       ;SAVE REGISTERS
013136  010127                          MOV     R1,(PC)+
013140  000000                  S1:     0
013142  010227                          MOV     R2,(PC)+
013144  000000                  S2:     0
013146  010327                          MOV     R3,(PC)+
```

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4787  013150  000000                  S3:     0
4788  013152  010427                          MOV     R4,(PC)+
4789  013154  000000                  S4:     0
4790  013156  010527                          MOV     R5,(PC)+
4791  013160  000000                  S5:     0                       ;
4792  013162  000207                          RTS     PC              ;RETURN
4793
4794  013164  013705  013160          POPX:   MOV     S5,R5
4795  013170  013704  013154                  MOV     S4,R4           ;RESTORE REGISTERS
4796  013174  013703  013150                  MOV     S3,R3
4797  013200  013702  013144                  MOV     S2,R2
4798  013204  013701  013140                  MOV     S1,R1
4799  013210  013700  013134                  MOV     S0,R0
4800  013214  000207                          RTS     PC              ;RETURN
4801
4802  013216  000774                  $VEC:   774                     ;CB11-HA INTERRUPT VECTOR ADDRESS UNDER TEST
4803  013220  000000                  ZERO:   0
4804
4805
4806  013222  000774                  VT.H0:  774                     ;DEFAULT VECTOR ADDRESS BUFFER
4807  013224  000770                  VT.H1:  770
4808  013226  000764                  VT.H2:  764
4809  013230  000760                  VT.H3:  760
4810  013232  000754                  VT.H4:  754
4811  013234  000750                  VT.H5:  750
4812  013236  000744                  VT.H6:  744
4813  013240  000740                  VT.H7:  740
4814  013242  000734                  VT.H10: 734
4815  013244  000730                  VT.H11: 730
4816  013246  000724                  VT.H12: 724
4817  013250  000720                  VT.H13: 720
4818  013252  000714                  VT.H14: 714
4819  013254  000710                  VT.H15: 710
4820  013256  000704                  VT.H16: 704
4821  013260  000700                  VT.H17: 700
4822  013262  000674                  VT.H20: 674
4823  013264  000670                  VT.H21: 670
4824  013266  000664                  VT.H22: 664
4825  013270  000660                  VT.H23: 660
4826  013272  000654                  VT.H24: 654
4827  013274  000650                  VT.H25: 650
4828  013276  000644                  VT.H26: 644
4829  013300  000640                  VT.H27: 640
4830  013302  000634                  VT.H30: 634
4831  013304  000630                  VT.H31: 630
4832  013306  000040                  LVL.H0: 40
4833  013310  000040                  LVL.H1: 40
4834  013312  000040                  LVL.H2: 40
4835  013314  000040                  LVL.H3: 40
4836  013316  000040                  LVL.H4: 40
4837  013320  000040                  LVL.H5: 40
4838  013322  000040                  LVL.H6: 40
4839  013324  000040                  LVL.H7: 40
4840  013326  000040                  LVLH10: 40
4841  013330  000040                  LVLH11: 40
4842  013332  000040                  LVLH12: 40
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 4843  013334  000040                    LVLH13: 40
 4844  013336  000040                    LVLH14: 40
 4845  013340  000040                    LVLH15: 40
 4846  013342  000040                    LVLH16: 40
 4847  013344  000040                    LVLH17: 40
 4848  013346  000040                    LVLH20: 40
 4849  013350  000040                    LVLH21: 40
 4850  013352  000040                    LVLH22: 40
 4851  013354  000040                    LVLH23: 40
 4852  013356  000040                    LVLH24: 40
 4853  013360  000040                    LVLH25: 40
 4854  013362  000040                    LVLH26: 40
 4855  013364  000040                    LVLH27: 40
 4856  013366  000040                    LVLH30: 40
 4857  013370  000040                    LVLH31: 40
 4858  013372  000002                    RTX:    RTI                     ;
 4859
 4860  013374  032737  020000  177570    HTST$:  BIT     #BIT13,SWR      ;TEST SUPPRESS TYPEOUT SELECTED
 4861  013402  001401                    BEQ     1$                      ;(NO) BRANCHES
 4862  013404  000207                    RTS     PC                      ;(YES) EXIT
 4863
 4864  013406  020027                    1$:     CMP     R0,(PC)+
 4865  013410  000000                    RS0:    0                       ;TEST HEADER REQUIRED
 4866  013412  001407                            BEQ     HOUT            ;(NO) BRANCHES
 4867  013414  010037  013410                    MOV     R0,RS0          ;SET SINGLE OUTPUT CONTROL FLAG
 4868  013420  000004  015375                    TYPE,   MTST
 4869  013424  010005                            MOV     R0,TTY
 4870  013426  004737  013462                    JSR     PC,PRINTS
 4871
 4872  013432  000004  015412            HOUT:   TYPE,   MCRLF
 4873  013436  000207                            RTS     PC
 4874
 4875  013440  177777                    FLAGH:  177777
```

```
 4876                                   ;       $OCTAL          OCTAL TYPEOUT ROUTINE
 4877
 4878                                   ;THIS ROUTINE IS USED TO TYPE AN OCTAL NUMBER ON THE TTY. IT WILL TYPE
 4879                                   ;ALL 6 CHARACTERS, SUPPRESS LEADING ZEROES, TYPE AN 18 BIT ADDRESS, OR TYPE
 4880                                   ;THE 16 BITS. IT IS CALLED VIA THE DUMP, SDUMP, DUMP18, OR BITYPE MACRO'S.
 4881
 4882  013442  012737  170101  013610  BITYP$: MOV     #170101,.PR     ;SET BIT FLAG ANS 16. CHARACTER COUNT
 4883  013450  000411                  BR      .PTIT           ;NOW TYPE IT IN BIT FORM
 4884  013452  112737  000001  013610  PRINTR: MOVB    #1,.PR          ;SET ZERO FILL SWITCH
 4885  013460  000402                  BR      .+6             ;SKIP
 4886  013462  005037  013610          PRINTS: CLR     .PR             ;SUPRESS LEADING ZERO'S
 4887  013466  112737  177772  013611          MOVB    #-6,.PR+1       ;SET COUNT
 4888  013474  010446                  .PTIT:  MOV     R4,-(6)         ;SAVE R4
 4889  013476  012704  013612                  MOV     #.PR+2,R4       ;SET POINTER TO FIRST ASCII CHAR.
 4890  013502  105014                  CLRB    (4)             ;CLEAR FIRST BYTE
 4891  013504  000411                  BR      .PRF            ;ROTATE FIRST BIT
 4892  013506  105014                  .PRL:   CLRB    (4)             ;CLEAR BYTE OF CHARACTER
 4893  013510  032737  000100  013610          BIT     #100,.PR        ;BIT TYPING MODE?
 4894  013516  001004                  BNE     .PRF            ;YES - SKIP 2 ROTATES
 4895  013520  006105                  ROL     TTY             ;ROTATE BIT INTO C
 4896  013522  106114                  ROLB    (4)             ;PACK IT
 4897  013524  006105                  ROL     TTY             ;ROTATE BIT INTO C
 4898  013526  106114                  ROLB    (4)             ;PACK IT
 4899  013530  006105                  .PRF:   ROL     TTY             ;ROTATE BIT INTO C
 4900  013532  106114                  ROLB    (4)             ;PACK IT
 4901  013534  105714                  TSTB    (4)             ;IS IT ZERO?
 4902  013536  001402                  BEQ     .+6             ;SKIP INC
 4903  013540  105237  013610          INCB    .PR             ;SET FILL SWITCH
 4904  013544  105737  013610          TSTB    .PR             ;CHECK FILL SWITCH
 4905  013550  001402                  BEQ     .+6             ;SKIP BITSET
 4906  013552  152724  000060          BISB    #'0,(4)+        ;MAKE INTO ASCII CHAR
 4907  013556  105237  013611          INCB    .PR+1           ;INC COUNT
 4908  013562  001351                  BNE     .PRL            ;REPEAT
 4909  013564  022704  013612          CMP     #.PR+2,R4       ;EMPTY BUFFER?
 4910  013570  001002                  BNE     .+6             ;SKIP IF NOT
 4911  013572  112724  000060          MOVB    #'0,(4)+        ;LOAD 1 ZERO
 4912  013576  105014                  CLRB    (4)             ;NULL TERMINATOR
 4913  013600  000004  013612          TYPE    .PR+2           ;TYPE IT
 4914  013604  012604                  MOV     (6)+,R4         ;RESTORE R4
 4915  013606  000207                  RTS     PC              ;RETURN
 4916  013610  000012                  .PR:    .BLKW   12              ;COUNT, SWITCH, AND OUTPUT BUFFER
```

```
 4917  013634  010346                READ$:  MOV     R3,-(6)         ;SAVE R3
 4918  013636  012703  013734        1$:     MOV     #INPUT,R3       ;GET ADDRESS
 4919  013642  022703  013754        2$:     CMP     #INPUT+20,R3    ;BUFFER FULL?
 4920  013646  001412                        BEQ     4$              ;YES - TYPE "?"
 4921  013650  105737  177560                TSTB    @#177560        ;WAIT FOR
 4922  013654  100375                        BPL     .-4             ;A CHARACTER
 4923  013656  113713  177562                MOVB    @#177562,(3)    ;GET CHARACTER
 4924  013662  142713  000200                BICB    #200,(3)        ;GET RID OF JUNK
 4925  013666  122713  000177                CMPB    #177,(3)        ;IS IT A RUBOUT
 4926  013672  001003                        BNE     3$              ;SKIP IF NOT
 4927  013674  000004  016011        4$:     TYPE,   MSGQQ           ;.ASCII "?"<15><12>
 4928  013700  000756                        BR      1$              ;ZAP THE BUFFER AND LOOP
 4929  013702  111337  014370        3$:     MOVB    (3),.TYPE       ;SET UP FOR TYPING
 4930  013706  000004  014370                TYPE    ,.TYPE          ;ECHO IT
 4931  013712  122723  000015                CMPB    #15,(3)+        ;CHECK FOR RETURN
 4932  013716  001351                        BNE     2$              ;LOOP IF NOT RETURN
 4933  013720  105063  177777                CLRB    -1(3)           ;ZAP RETURN (THE 15)
 4934  013724  000004  000012                TYPE    ,12             ;TYPE A LINE FEED
 4935  013730  012603                        MOV     (6)+,R3         ;RESTORE R3
 4936  013732  000207                        RTS     PC              ;RETURN
 4937  013734  000020                INPUT:  .BLKW   20              ;TTY INPUT AREA
```

```
4938  013774  012777  014120  000124  PDOWN$: MOV     #ILLUP,@PUVEC$  ;SET FOR FAST UP
4939  014002  012777  000340  000120          MOV     #340,@PUVEC$+2  ;PRIO:7
4940  014010  010046                          MOV     R0,-(6)         ;PUSH R0 ON STACK
4941  014012  010146                          MOV     R1,-(6)         ;PUSH R1 ON STACK
4942  014014  010246                          MOV     R2,-(6)         ;PUSH R2 ON STACK
4943  014016  010346                          MOV     R3,-(6)         ;PUSH R3 ON STACK
4944  014020  010446                          MOV     R4,-(6)         ;PUSH R4 ON STACK
4945  014022  010546                          MOV     R5,-(6)         ;PUSH R5 ON STACK
4946  014024  010637  014124                  MOV     SP,.SAVR6       ;SAVE SP
4947  014030  012777  014040  000070          MOV     #PUP$,@PUVEC$   ;SET UP VECTOR
4948  014036  000000                          HALT                    ;WAIT FOR PF
4949
4950  014040  013706  014124          PUP$:   MOV     .SAVR6,SP       ;GET SP
4951  014044  005001                          CLR     R1              ;WAIT LOOP FOR THE TTY
4952  014046  005201                  1$:     INC     R1              ;WAIT FOR THE INC
4953  014050  001376                          BNE     1$              ;OF  WORD
4954  014052  012605                          MOV     (6)+,R5         ;POP STACK INTO R5
4955  014054  012604                          MOV     (6)+,R4         ;POP STACK INTO R4
4956  014056  012603                          MOV     (6)+,R3         ;POP STACK INTO R3
4957  014060  012602                          MOV     (6)+,R2         ;POP STACK INTO R2
4958  014062  012601                          MOV     (6)+,R1         ;POP STACK INTO R1
4959  014064  012600                          MOV     (6)+,R0         ;POP STACK INTO R0
4960  014066  012737  013774  000024          MOV     #PDOWN$,@#24    ;SET UP THE POWER DOWN VECTOR
4961  014074  012737  000340  000026          MOV     #340,@#26       ;PRIO:7
4962  014102  052737  000017  000022          BIS     #17,@#22        ;SET UNCONDITIONAL TEXT CONTROL ACTIVE
4963  014110  000004  016015                  TYPE,   MSGPWR          ;<15><12> POWER
4964  014114  000137  001260                  JMP     RESTAR          ;JMP TO USER ADDRESS
4965
4966  014120  000000          ILLUP:  HALT                            ;THE POWER UP SEQUENCE WAS STARTED
4967  014122  000776                  BR      .-2                     ; BEFORE THE POWER DOWN WAS COMPLETE
4968
4969  014124  000000          .SAVR6: 0                               ;PUT THE SP HERE
4970  014126  000024  000026  PUVEC$: 24,26                           ;POWER UP VECTOR
```

```
                                ;*****************************************************************
                                ;
                                ;IOT PROCESSOR: DETERMINE IF CALL IS A "FALSE INTERRUPT/TRAP"
                                ;       OR "TYPE MESSAGE CALL".
                                ;*****************************************************************
                                
014132  013737  177776  014226  IOTRAP: MOV     PSW,PSWS        ;RECORD CONDITION CODES
014140  022716  000100                  CMP     #100,(SP)       ;TEST FOR FALSE INTERRUPT/TRAP
014144  002431                          BLT     IOT$            ;(NO) "TYPE" COMMAND BRANCHES
                                ;       UNEXPECTED INTERRUPT
014146  012737  000340  177776          MOV     #340,PSW        ;RAISE PRIORITY LEVEL TO 7
014154  010127                          MOV     R1,(PC)+
014156  000000                  SAV1:   0                       ;SAVE R1
014160  010227                          MOV     R2,(PC)+
014162  000000                  SAV2:   0                       ;SAVE R2
014164  010527                          MOV     R5,(PC)+
014166  000000                  SAV5:   0                       ;SAVE R5
014170  162716  000004                  SUB     #4,(SP)         ;FETCH VECTOR ADDRESS
014174  012601                          MOV     (SP)+,R1        ;VECTOR ADDRESS>R1
014176  005726                          TST     (SP)+           ;POP STACK
014200  011602                          MOV     (SP),R2         ;RETURN PC> R2
                                ;*****************************************************************
                                ;
                                ;       UNEXPECTED INTERRUPT
                                ;
                                ;       DISPLAY SIGNIFICANCE
                                ;
014202  006301                          ASL     R1
                                ;  (PC)  (PS)   (SP)    TEST    VECTOR  INSTADD
                                ;  (R7)  (PSW)  (R6)    (R0)    (R1)    (R2)
                                ;
014204  104002                  ERTRAP: HLT+2                   ;UNEXPECTED INTERRUPT TO VECTOR ADDRESS (R1)
                                                                ;WHILE EXECUTING CODE PRIOR TO ADDRESS (R2)
                                                                ;IN TEST NUMBER (R0)
                                ;
014206  000000                          HALT                    ;NOT EXPECTED TO RECOVER
                                ;
014210  013705  014166                  MOV     SAV5,R5         ;RESTORE R5
014214  013702  014162                  MOV     SAV2,R2         ;RESTORE R2
014220  013701  014156                  MOV     SAV1,R1         ;RESTORE R1
014224  000002                  RTA:    RTI                     ;CONTINUE
014226  000000                  PSWS:   0
                                
                                .MCALL $TYPE
                                ;       $TYPE           MESSAGE TYPEOUT ROUTINE
                                
                                ;THIS ROUTINE IS USE TO TYPE ASCII MESSAGES ON THE TTY. THE
                                ;CALL CAN BE IN ONE OF 3 FORMS: 1) "TYPE ,ADR" - TYPES THE
                                ;MESSAGE STARTING IN LOCATION "ADR:", 2) "TYPE ,CHAR" - TYPES
                                ;THE ASCII "CHAR", AND 3) "PRINT <<15><12>"MESSAGE"> - TYPES
                                ;THE MESSAGE WHICH IS INLINE ASCII.
                                
014230  032737  020000  177570  IOT$:   BIT     #BIT13,SWR              ;INHIBIT OUTPUT SELECTED
014236  001412                          BEQ     F$              ;(NO) BRANCHES
                                
014240  042737  177760  014226          BIC     #177760,PSWS
```

```
5027  014246  022737  000017  014226          CMP     #17,PSWS
5028  014254  001403                          BEQ     F$
5029  014256  062716  000002                  ADD     #2,(6)          ;BYPASS ADDRESS
5030  014262  000441                          BR      RTK             ; EXIT
5031  014264  010546                  F$:     MOV     TTY,-(6)        ;SAVE TTY
5032  014266  017605  000002                  MOV     @2(6),TTY       ;GET ADDRESS TO BE TYPED
5033  014272  032705  177400                  BIT     #177400,TTY     ;IS IT A TYPEM?
5034  014276  001004                          BNE     1$              ;NO
5035  014300  010537  014370                  MOV     TTY,.TYPE       ;GET THE CHARACTER
5036  014304  012705  014370                  MOV     #.TYPE,TTY      ;FUDGE THE ADDRESS
5037  014310  105715                  1$:     TSTB    (TTY)           ;TERMINATOR?
5038  014312  001406                          BEQ     2$              ;GET OUT IF SO
5039  014314  112537  177566                  MOVB    (TTY)+,@#177566 ;LOAD AND TYPE THE CHARACTER
5040  014320  105737  177564                  TSTB    @#177564        ;IS THE PRINTER READY
5041  014324  100375                          BPL     .-4             ;WAIT UNTIL IT IS
5042  014326  000770                          BR      1$              ;GET THE NEXT CHARACTER
5043  014330  017646  000002          2$:     MOV     @2(6),-(6)      ;GET ADDRESS TO BE TYPED
5044  014334  062766  000002  000004          ADD     #2,4(6)         ;ADD 2 TO THE ADDRESS
5045  014342  022666  000002                  CMP     (6)+,2(6)       ;IS IT .+2?
5046  014346  001006                          BNE     3$              ;NO
5047  014350  062705  000002                  ADD     #2,TTY          ;ADD 2 TO THE ADDRESS
5048  014354  042705  000001                  BIC     #1,TTY          ;BACK UP TO AN EVEN BYTE
5049  014360  010566  000002                  MOV     TTY,2(6)        ;RESTORE ADDRESS
5050  014364  012605                  3$:     MOV     (6)+,TTY        ;RESTORE TTY
5051  014366  000002                  RTK:    RTI                     ;RETURN
5052  014370  000000                  .TYPE:  0                       ;CHARACTER TYPE LOCATION
5053                                  .EVEN
5054
```

```
5055
5056                                    .SBTTL          SYSTEMS SIZER (SCAN) MODULE
5057
5058  014372  004737  013114            SCNMAP: JSR     PC,INITR
5059  014376  012700  164000                    MOV     #164000,R0      ;SET BASE SCAN ADDRESS
5060  014402  010037  000316                    MOV     R0,FSTADR
5061  014406  005027                            CLR     (PC)+
5062  014410  000000                    NSCAN:  0
5063  014412  005037  014456                    CLR     FSCAN
5064  014416  112760  000377  000001  MAP.S0: MOVB    #377,1(R0)      ;INITIALIZE MAINTENANCE SCAN RESPONSE
5065  014424  000261                            SEC                     ;SET CARRY
5066  014426  005710                            TST     (R0)            ;TEST DEVICE RESPONSE
5067  014430  103002                            BCC     MAP.S1          ;ACTIVE BRANCHES
5068  014432  000137  014506                    JMP     MAP.S2          ;NONE JUMPS
5069  014436  122760  000017  000001  MAP.S1: CMPB    #17,1(R0)       ;TEST SCAN MAINTAINENANCE RESPONSE
5070  014444  001011                            BNE     XA$             ;NOT A SCAN BRANCHES
5071  014446  005737  014456                    TST     FSCAN
5072  014452  001002                            BNE     M1$
5073  014454  010027                            MOV     R0,(PC)+
5074  014456  000000                    FSCAN:  0
5075  014460  010027                    M1$:    MOV     R0,(PC)+
5076  014462  000000                    LSCAN:  0
5077  014464  005237  014410                    INC     NSCAN
5078  014470  005010                    XA$:    CLR     (R0)
5079  014472  020027                            CMP     R0,(PC)+        ;TEST SCAN LIMIT
5080  014474  167770                    LIMITS: 167770
5081  014476  101014                            BHI     XXA$
5082  014500  062700  000010                    ADD     #10,R0          ;NEXT ADDRESS
5083  014504  000744                            BR      MAP.S0
5084  014506  005737  014410  MAP.S2: TST     NSCAN           ;TEST ACTIVITY
5085  014512  001766                            BEQ     XA$             ;(NO) BRANCHES
5086  014514  062700  000010                    ADD     #10,R0          ;OFFSET MODULO 10
5087  014520  010037  000316  MAP.S3: MOV     R0,FSTADR       ;SET INTERRUPT MODULE BASE
5088  014524  010037  001566                    MOV     R0,LOWADD       ;SET LOW ADDRESS
5089  014530  005737  014410  XXA$:   TST     NSCAN           ;CHECK ACTIVITY
5090  014534  001420                            BEQ     SCNOUT          ;(NO) BRANCHES
5091  014536  013705  014456                    MOV     FSCAN,TTY
5092  014542  000004  015707                    TYPE,   MSCN            ;OUTPUT SCAN ADDRESSES
5093  014546  004737  013462                    JSR     PC,PRINTS       ;IN OCTAL
5094  014552  023737  014456  014462           CMP     FSCAN,LSCAN     ;TEST ADDITIONAL
5095  014560  001406                            BEQ     SCNOUT          ;(NO) BRANCHES
5096  014562  000004  015740                    TYPE,   MTHRU           ;OUTPUT "THRU"
5097  014566  013705  014462                    MOV     LSCAN,TTY
5098  014572  004737  013462                    JSR     PC,PRINTS
5099  014576  000207                    SCNOUT: RTS     PC              ;RETURN
5100
```

```
                                        .SBTTL          SYSTEMS SIZER (DISTRIBUTE) MODULE

014600  004737  013114        DSTMAP: JSR     PC,INITR
014604  013700  000352                MOV     LSTADR,R0       ;SET BASE DISTRIBUTE ADDRESS
014610  010037  000316                MOV     R0,FSTADR
014614  005027                        CLR     (PC)+
014616  000000                NDSTB:  0
014620  005037  014652                CLR     FDSTB
014624  012710  177777        MAP.D0: MOV     #177777,(R0)    ;INITIALIZE MAINTENANCE DISTB RESPONSE
014630  000261                        SEC                     ;SET CARRY
014632  005710                        TST     (R0)            ;TEST DEVICE RESPONSE
014634  103002                        BCC     MAP.D1          ;ACTIVE BRANCHES
014636  000137  014722                JMP     MAP.D2          ;NONE JUMPS
014642  022710  177777        MAP.D1: CMP     #177777,(R0)    ;TEST DISTB MAINTAINENANCE RESPONSE
014646  001016                        BNE     XB$             ;NOT A DISTRIBUTE BRANCHES
014650  005727                        TST     (PC)+
014652  000000                FDSTB:  0
014654  001002                        BNE     1$
014656  010037  014652                MOV     R0,FDSTB
014662  010027                1$:     MOV     R0,(PC)+
014664  000000                LDSTB:  0
014666  005010                        CLR     (R0)            ;INITIALIZE DISTRIBUTE
014670  005710                        TST     (R0)            ;TEST RESULTS
014672  001402                        BEQ     2$              ;(OK) BRANCHES

014674  000000                        HALT            ;DISTRIBUTE MODULE (R0) FAILED TO CLEAR
                                                        ;SUGGEST YOU RUN THE DISTRIBUTE DIAGNOSTICS
014676  000740                        BR      DSTMAP  ;NO GO BRANCH

014700  005237  014616        2$:     INC     NDSTB
014704  005010                XB$:    CLR     (R0)
014706  062700  000004                ADD     #4,R0           ;NEXT ADDRESS
014712  020027                        CMP     R0,(PC)+        ;TEST SCAN LIMIT
014714  170000                LIMITD: 170000
014716  101033                        BHI     DSTOUT          ;EXCEEDED EXIT
014720  000741                        BR      MAP.D0
014722  005737  014616        MAP.D2: TST     NDSTB           ;TEST ACTIVITY
014726  001766                        BEQ     XB$             ;(NO) BRANCHES
014730  062700  000004                ADD     #4,R0           ;OFFSET MODULO 4
014734  010037  000316        MAP.D3: MOV     R0,FSTADR       ;SET DISTRIBUTE MODULE BASE
014740  005737  014616        MAP.D4: TST     NDSTB           ;CHECK ACTIVITY
014744  001420                        BEQ     DSTOUT          ;(NO) BRANCHES
014746  000004  015755                TYPE,   MDST            ;OUTPUT DISTRIBUTE ADDRESSES
014752  013705  014652                MOV     FDSTB,TTY
014756  004737  013462                JSR     PC,PRINTS       ;IN OCTAL
014762  023737  014652  014664        CMP     FDSTB,LDSTB     ;TEST ADDITIONAL
014770  001406                        BEQ     DSTOUT          ;(NO) BRANCHES
014772  000004  015740                TYPE,   MTHRU           ;OUTPUT "THRU"
014776  013705  014664                MOV     LDSTB,TTY
015002  004737  013462                JSR     PC,PRINTS
015006  000207                DSTOUT: RTS     PC              ;RETURN

015010  000032                MX.CBH: 32
```

```
 015012  005015  041103  030461  MSG1:   .ASCIZ  <15><12>"CB11-HA"<15><12>"CONFIGURATION"<15><12>
 015020  044055  006501  041412
 015026  047117  044506  052507
 015034  040522  044524  047117
 015042  005015     000
 015045     101  042104  042522  MSG2:   .ASCIZ  "ADDRESS(ES) VECTOR(S) PRIORITY   (-)TRANS      (+)TRANS"<15><12><15><12
 015052  051523  042450  024523
 015060  053040  041505  047524
 015066  024122  024523  050040
 015074  044522  051117  052111
 015102  020131  020040  026450
 015110  052051  040522  051516
 015116  020040  020040  020040
 015124  025450  052051  040522
 015132  051516  005015  005015
 015140     000
 015141     015  044412  052116  MSG2X:  .ASCIZ  <15><12>"INTERRUPT"<15><12>
 015146  051105  052522  052120
 015154  005015     000
 015157     015  040412  042104  MSG3X:  .ASCIZ  <15><12>"ADDRESS(ES)"<15><12>
 015164  042522  051523  042450
 015172  024523  005015     000
 015177     015  000012          CRLF:   .ASCIZ  <15><12>
 015202  005015  042524  052123  MSG3:   .ASCIZ  <15><12>"TEST:"<15><12>
 015210  006472  000012
 015214  005015  047516  042040  MSG6:   .ASCIZ  <15><12>"NO DEVICE RESPONSE TO ADDRESS ?"<15><12>
 015222  053105  041511  020105
 015230  042522  050123  047117
 015236  042523  052040  020117
 015244  042101  051104  051505
 015252  020123  006477  000012
 015260  005015  047516  020127  MSG7:   .ASCIZ  <15><12>"NOW TESTING" <15><12>
 015266  042524  052123  047111
 015274  006507  000012
 015300  005015  052502  020123  MSGBUS: .ASCIZ  <15><12>"BUS TIME-OUT ERROR TRAP"
 015306  044524  042515  047455
 015314  052125  042440  051122
 015322  051117  052040  040522
 015330  000120
 015332  005015  042504  044526  MSGTPO: .ASCIZ  <15><12>"DEVICE TRAPPING TO LOCATION ZERO"
 015340  042503  052040  040522
 015346  050120  047111  020107
 015354  047524  046040  041517
 015362  052101  047511  020116
 015370  042532  047522     000
 015375     015  006412  052012  MTST:   .ASCIZ  <15><12><15><12>"TEST# : "
 015402  051505  021524  035040
 015410  000040
 015412  005015     000          MCRLF:  .ASCIZ  <15><12>
 015415     040  020040  020040  MSGSP:  .ASCIZ  "      "
 015422  020040  000040
 015426  036440  044440  046114  MSGE:   .ASCIZ  " = ILLEGAL ? "<15><12>
```

```
5211  015434  043505  046101  037440
5212  015442  006440  000012
5213  015446  005015  024040  041520  MSGHED: .ASCIZ  <15><12>" (PC)    (PS)    (SP)    TEST    DEV#  ADDRESS   WAS     SHD BE
5214  015454  020051  020040  024040
5215  015462  051520  020051  020040
5216  015470  024040  050123  020051
5217  015476  020040  052040  051505
5218  015504  020124  020040  042040
5219  015512  053105  020043  040440
5220  015520  042104  042522  051523
5221  015526  020040  053440  051501
5222  015534  020040  020040  051440
5223  015542  042110  041040  000105
5224  015550  005015  024040  033522  MSGSUB: .ASCIZ  <15><12>" (R7)    (PSW)   (R6)    (R0)    (R1)   (R2)     (R3)    (R4)"
5225  015556  020051  020040  024040
5226  015564  051520  024527  020040
5227  015572  024040  033122  020051
5228  015600  020040  024040  030122
5229  015606  020051  020040  024040
5230  015614  030522  020051  020040
5231  015622  051050  024462  020040
5232  015630  020040  024040  031522
5233  015636  020051  020040  024040
5234  015644  032122  000051
5235  015650  005015  040520  051523  MSGPAS: .ASCIZ  <15><12>"PASS(ES) = "
5236  015656  042450  024523  036440
5237  015664  000040
5238  015666  005015  051105  047522  MSGERR: .ASCIZ  <15><12>"ERROR(S) = "
5239  015674  024122  024523  036440
5240  015702  000040
5241  015704  020040     000          SPACE:  .ASCIZ  "  "
5242
5243
5244  015707     015  020012  020040  MSCN:   .ASCIZ  <15><12>"   SCAN"<15><12>"ADDRESS(ES)"<15><12>
5245  015714  041523  047101  005015
5246  015722  042101  051104  051505
5247  015730  024123  051505  006451
5248  015736  000012
5249  015740  005015  020040  020040  MTHRU:  .ASCIZ  <15><12>"    THRU"<15><12>
5250  015746  044124  052522  005015
5251  015754     000
5252  015755     015  042012  051511  MDST:   .ASCIZ  <15><12>"DISTRIBUTE"<15><12>"ADDRESS(ES)"<15><12>
5253  015762  051124  041111  052125
5254  015770  006505  040412  042104
5255  015776  042522  051523  042450
5256  016004  024523  005015     000
5257  016011     077  005015     000  MSGQQ:  .ASCIZ  "?"<15><12>
5258  016015     015  020012  047520  MSGPWR: .ASCIZ  <15><12>" POWER "
5259  016022  042527  020122     000
5260
5261                               ;       THE FOLLOWING ASCII TEXT IS UNCONDITIONAL
5262                               ;       I.E. IT CAN NOT BE INHIBITED BY SWR BIT 13
5263                               ;       (INHIBIT/TYPEOUT) IT IS RESPONSE  REQUEST RELPY TEXT.
5264
5265
5266  016027     015  042012  051511  MSGO:   .ASCIZ  <15><12>"DISCONNECT USER INTERFACE"
```

```
5267  016034  047503  047116  041505
5268  016042  020124  051525  051105
5269  016050  044440  052116  051105
5270  016056  040506  042503     000
5271  016063     015  052012  050131  MSG0:   .ASCIZ  <15><12>"TYPE 'P' TO PROCEED ?"<15><12>
5272  016070  020105  050047  020047
5273  016076  047524  050040  047522
5274  016104  042503  042105  037440
5275  016112  005015     000
5276  016115     015  040412  042104  MSG4:   .ASCIZ  <15><12>"ADDRESS: ?"<15><12>
5277  016122  042522  051523  020072
5278  016130  006477  000012
5279  016134  005015  042526  052103  MSG5:   .ASCIZ  <15><12>"VECTOR: ?"<15><12>
5280  016142  051117  020072  006477
5281  016150  000012
5282  016152  005015  051120  047511  MSG8:   .ASCIZ  <15><12>"PRIORITY: ?"<15><12>
5283  016160  044522  054524  020072
5284  016166  006477  000012
5285
5286  016172  005015  044504  052123  MDSTB:  .ASCIZ  <15><12>"DISTB TIED TO INTERRUPT ?"<15><12>
5287  016200  020102  044524  042105
5288  016206  052040  020117  047111
5289  016214  042524  051122  050125
5290  016222  020124  006477  000012
5291  016230  005015  044504  052123  MDADR:  .ASCIZ  <15><12>"DISTRIBUTE"<15><12>"ADDRESS ?"<15><12>
5292  016236  044522  052502  042524
5293  016244  005015  042101  051104
5294  016252  051505  020123  006477
5295  016260  000012
5296
5297                                  .EVEN
5298
5299  016262  000000                  TABLEB: 0
5300
5301          016262                  CADCSR=TABLEB
5302          016350                  CADDDR=CADCSR+54.
5303          016436                  CADTSR=CADDDR+54.
5304          016524                  CADTER=CADTSR+54.
5305          016612                  CVT.CB=CADTER+54.
5306          016700                  CLV.CB=CVT.CB+54.
5307          016766                  DATABF=CLV.CB+54.
5308          017054                  CNGBUF=DATABF+54.
5309          017142                  TABLEN=CNGBUF+54.
5310
5311
5312
```

```
5313                                    .SBTTL          CLOCK TIMING ONCE ONLY EXECUTION CODE
5314
5315                                    ;       THE FOLLOWING CODE IS "ONCE ONLY EXECUTION CODE"
5316                                    ;       I.E. ONCE THE CODE IS EXECUTED IN THIS AREA OF
5317                                    ;       THE PROGRAM, THE AREA IS CLEARED OUT AND UTILIZED
5318                                    ;       FOR CONTROL TABLE STORAGE.
5319
5320
5321  016264  012737  016402  000100    5.2   CLKRTN: MOV     #TICK,@#100
5322  016272  012737  016402  000104    5.2           MOV     #TICK,@#104
5323  016300  012737  016346  000004    5.2           MOV     #XLINK,@#4
5324  016306  012737  000240  000006    5.2           MOV     #240,@#6
5325  016314  004737  013114            5.8           JSR     PC,INITR        ;CLEAR ALL REGISTERS
5326
5327  016320  005037  016442            3.7   CLKRTX: CLR     TIMEXX          ;INITIALIZE
5328  016324  005037  177776            3.7           CLR     PSW
5329                                            ;
5330                                            ;         CLOCK ENABLE
5331                                            ;
5332  016330  012737  000001  172542    5.2           MOV     #1,@#172542     ;KW11P COUNT SET BUFFER = 1
5333  016336  012737  000115  172540    5.2           MOV     #115,@#172540   ;KW11P CONTROL + STATUS REGISTER ENB
5334  016344  000411                    2.6           BR      Q2$
5335  016346  022626                    4.7   XLINK:  CMP     (SP)+,(SP)+
5336  016350  012737  016366  000004    5.2           MOV     #Q1$,@#4
5337  016356  012737  000115  177546    5.2           MOV     #115,@#177546   ;KW11L CONTROL + STATUS REGISTER ENB
5338  016364  000401                    2.6           BR      Q2$
5339  016366  022626                    4.7   Q1$:    CMP     (SP)+,(SP)+
5340  016370  005205                    2.3   Q2$:    INC     R5
5341  016372  001376                    2.6           BNE     Q2$             ;STALL FOR FIRST CLOCK TICK
5342
5343  016374  104000                        ERRCLK: HLT             ;NO REAL TIME CLOCK PRESENT
5344
5345                                            ;       PLUG IN A KW11L OR KW11P PLEASE
5346
5347  016376  000000                    1.8           HALT            ;NO GO HALT
5348  016400  000731                    2.6           BR      CLKRTN          ;TRY AGAIN
5349
5350                                            ;       ENTRY FOLLOWING FIRST CLOCK TICK
5351
5352  016402  022626                    4.7   TICK:   CMP     (SP)+,(SP)+             ;RESTORE STACK
5353  016404  012737  000006  000004    5.2           MOV     #6,@#4
5354  016412  013737  013372  000006    5.2           MOV     RTX,@#6
5355  016420  012737  016454  000100    5.2           MOV     #TOCK,@#100
5356  016426  012737  016454  000104    5.2           MOV     #TOCK,@#104
5357  016434  005037  177776            3.7           CLR     PSW
5358
5359  016440  005227                    3.7   TIMIT:  INC     (PC)+   ;CALCULATE 16.7 MILLISECOND
5360  016442  017777                    TIMEXX: 17777           ;HERE
5361  016444  001375                    2.6           BNE     TIMIT
5362
5363  016446  104000                        ERTCLK: HLT             ;TIME INTERVAL MUCH TO LONG ERROR
5364  016450  000000                    1.8           HALT            ;NO GO HALT
5365
5366                                            ;       WIND YOUR CLOCK AND TRY AGAIN
5367
5368  016452  000704                    2.6           BR      CLKRTN  ;TRY AGAIN
```

```
                                                ;       ENTRY FOLLOWING SECOND CLOCK TICK
                                                ;
016454  022626                          4.7     TOCK:   CMP     (SP)+,(SP)+     ;RESTORE THE STACK
016456  005037  172540                  3.7             CLR     @#172540        ;TURN OFF KW11P
016462  005037  177546                  3.7             CLR     @#177546        ;TURN OFF KW11L
                                                ;
                                                ;       REFINE TIME INTERVAL CALCULATIONS
                                                ;
016466  013705  016442                  3.8             MOV     TIMEXX,R5       ;RECORD 16.7 MILLISECOND INTERVAL
016472  010504                          2.3             MOV     R5,R4           ;
                                                ;       REFINE
                                                ;
                                                ;       THE FOLLOWING CODE IS "ONCE ONLY EXECUTION CODE"
                                                ;       I.E. ONCE THE CODE IS EXECUTED IN THIS AREA OF THE PROGRAM
                                                ;       IT IS CLEARED OUT AND UTILIZED FOR CONTROL TABLE STORAGE.
                                                ;
                                                ;       CALCULATE 60 CPS INTERVALS
                                                ;
016474  022737  050000  177570          4.7             CMP     #50000,SWR      ;TEST LINE FREQUENCY SELECTION
016502  001002                          2.6             BNE     CPS60           ;60 CPS BRANCHES
016504  000137  016614                  3.7             JMP     CPS50           ;50 CPS JUMPS

016510  006204                          2.3     CPS60:  ASR     R4
016512  005200                          2.3             INC     R0
016514  020027  000005                  3.2             CMP     R0,#5
016520  001373                          2.6             BNE     CPS60
                                                ;
                                                ;       R4 NOW = .522 MILLISECOND INTERVAL (1/32 OF 16.7)
                                                ;
016522  010403                          2.3             MOV     R4,R3
016524  006203                          2.3             ASR     R3
016526  006203                          2.3             ASR     R3
                                                ;
                                                ;       R3 NOW = .130 MILLISECOND INTERVAL (1/128 OF 16.7)
                                                ;
016530  005002                          2.3             CLR     R2
016532  060402                          2.3     3$:     ADD     R4,R2
016534  005200                          2.3             INC     R0
016536  020027  000023                  2.2             CMP     R0,#23
016542  001373                          2.6             BNE     3$

                                                ;       R2 NOW = 7.308 MILLISECOND INTERVAL

016544  000240                          1.5             NOP

016546  006202                          2.3             ASR     R2              ;/2
016550  010237  011742                  3.7             MOV     R2,TIMEX        ;RECORD 7.308 MILLISECOND INTERVAL      /2
016554  006303                          2.3             ASL     R3              ;R3 = .260 MILLISECOND INTERVAL
016556  060304                          2.3             ADD     R3,R4           ;R4 = .782 MILLISECOND INTERVAL
016560  006204                          2.3             ASR     R4              ;/2
016562  010437  011736                  3.7             MOV     R4,DTIME        ;DTIME.782 MILLISECOND INTERVAL /2
                                                                                ;I.E. 10% OF 7.308
016566  010204                          2.3             MOV     R2,R4
```

```
5425  016570  163702  011736          3.8          SUB     DTIME,R2
5426  016574  010237  011740          3.7          MOV     R2,TIMEW        ;RECORD -10% INTERVAL
5427  016600  063704  011736          3.8          ADD     DTIME,R4
5428  016604  010437  011744          3.7          MOV     R4,TIMEY        ;RECORD +10% INTERVAL
5429  016610  000137  011762          3.7          JMP     CLKOUT          ;EXIT
5430
5431                                        ;       CALCULATE 50 CPS INTERVALS
5432
5433  016614  006204                    2.3  CPS50:  ASR     R4
5434  016616  006204                    2.3          ASR     R4              ;RECORD
5435  016620  010400                    2.3          MOV     R4,R0           ;1/4 > R0  .2500000
5436  016622  006204                    2.3          ASR     R4
5437  016624  010401                    2.3          MOV     R4,R1           ;1/8 > R1  .1250000
5438  016626  006204                    2.3          ASR     R4
5439  016630  010402                    2.3          MOV     R4,R2           ;1/16> R2  .0625000
5440  016632  006204                    2.3          ASR     R4
5441  016634  006204                    2.3          ASR     R4
5442  016636  010403                    2.3          MOV     R4,R3           ;1/64> R3  .0156250
5443  016640  006204                    2.3          ASR     R4              ;1/128>R4  .0078125
5444  016642  010037  011742            3.7          MOV     R0,TIMEX        ;.2500000
5445  016646  060137  011742            3.7          ADD     R1,TIMEX        ;.0625000
5446  016652  160437  011742            3.7          SUB     R4,TIMEX        ;.3671875 OF 20 MS, IE 7.343 MS.
5447  016656  013700  011742            3.8          MOV     TIMEX,R0
5448  016662  006200                    2.3          ASR     R0
5449  016664  006200                    2.3          ASR     R0
5450  016666  006200                    2.3          ASR     R0              ;1/8 OF 7.3M >R0
5451  016670  010001                    2.3          MOV     R0,R1
5452  016672  006201                    2.3          ASR     R1
5453  016674  006201                    2.3          ASR     R1
5454  016676  006201                    2.3          ASR     R1              ;1/64 OF 7.3M>R1
5455  016700  160100                    2.3          SUB     R1,R0           ;7/64'S OF 7.3 > R0
5456  016702  006201                    2.3          ASR     R1              ;1/128 OF 7.3M > R1
5457  016704  160100                    2.3          SUB     R1,R0           ;13/128'S OF 7.3M >R0
5458                                                                        ;13 X .078125 = .1015625 OF 7.3M
5459                                                                        ;I.E. .73 MILLISECONDS
5460  016706  010037  011736            3.7          MOV     R0,DTIME        ;RECORD
5461  016712  013737  011742  011740    5.2          MOV     TIMEX,TIMEW
5462  016720  013737  011742  011744    5.2          MOV     TIMEX,TIMEY
5463  016726  160037  011740            3.7          SUB     R0,TIMEW        ;-10% > TIMEW
5464  016732  060037  011744            3.7          ADD     R0,TIMEY        ;+10% > TIMEY
5465  016736  006237  011736            3.7          ASR     DTIME           ;/2
5466  016742  006237  011740            3.7          ASR     TIMEW           ;/2
5467  016746  006237  011744            3.7          ASR     TIMEY           ;/2
5468  016752  006237  011742            3.7          ASR     TIMEX           ;/2
5469  016756  000137  011762            3.7          JMP     CLKOUT
5470
5471
5472          017142                          .=TABLEN
5473
5474  017142  000000                                  0
5475  017144  177777                                  177777
5476
5477  017146  000207                    3.5  ENDPRO: RTS     PC
5478
5479
5480
```

```
 5481  017150  177777                          177777
```

```
                                        .SBTTL          TEST DATA CONFIGURATION TABLE
                                        ;NOTE:
                                        ;       WHEN A SELECTED DATA PATTERN FOR TEST IS MADE (I.E.
                                        ;       SWITCH REGISTER BIT 9 = 1), THE CONTENTS OF LOCATION
                                        ;       "CNTL" IS MODIFIED TO THE DATA PATTERN SELECTED FOR
                                        ;       TEST AND THE CONTENTS OF "CNTL+2" IS CLEARED. HOWEVER
                                        ;       WHEN THE PROGRAM IS RESTARTED AT LOCATION 200 (OCTAL)
                                        ;       THE CONTENTS OF THESE TWO LOCATIONS ("CNTL" AND "CNTL+2")
                                        ;       ARE RESTORED TO THEIR ORIGINAL VALUES.

 017152  000000                         CNTL:   0
 017154  177776                                 177776
 017156  177775                                 177775
 017160  177773                                 177773
 017162  177767                                 177767
 017164  177757                                 177757
 017166  177737                                 177737
 017170  177677                                 177677
 017172  177577                                 177577
 017174  177377                                 177377
 017176  176777                                 176777
 017200  175777                                 175777
 017202  173777                                 173777
 017204  167777                                 167777
 017206  157777                                 157777
 017210  137777                                 137777
 017212  077777                                 077777
 017214  000001                                 1
 017216  000002                                 2
 017220  000004                                 4
 017222  000010                                 10
 017224  000020                                 20
 017226  000040                                 40
 017230  000100                                 100
 017232  000200                                 200
 017234  000400                                 400
 017236  001000                                 1000
 017240  002000                                 2000
 017242  004000                                 4000
 017244  010000                                 10000
 017246  020000                                 20000
 017250  040000                                 40000
 017252  100000                                 100000
 017254  052525                                 052525
 017256  125252                                 125252
 017260  177777                                 177777
 017262  155555                                 155555
 017264  022222                                 022222
 017266  123456                                 123456
 017270  011111                                 011111
 017272  176543                                 176543

                                        ;NOTE:
                                        ;       THE DATA CONFIGURATION TABLE IS POSITIONED AT THE PHYSICAL END
                                        ;       OF THE PROGRAM TO ALLOW THE USER THE ABILITY TO EXPAND TEST DATA
```

```
                                ;       TABLE ENTRIES AS REQUIRED. THE FOLLOWING LOCATIONS MAY BE ALTERED
                                ;       TO ANY NON ZERO ENTRY MANUALLY BY THE USER. THE NEXT ZERO ENTRY
                                ;       INSERTED BY THE USER WILL TERMINATE (DELIMIT) THE DATA TABLE SCAN
                                ;       DURING PROGRAM EXECUTION.
                                ;
                                ;       THE USER MUST BE AWARE HOWEVER THAT ANY INCREASE IN THE NUMBER OF
                                ;       DATA PERMUTATIONS (ENTRIES ADDED), WILL ALSO RESULT IN AN INCREASE
                                ;       IN TEST PASS EXECUTION TIMING.
                                ;
                                ;       ALSO BE AWARE THAT ON MINIMAL (4K) MEMORY SYSTEMS THAT ADDITIONAL
                                ;       PERMUTATIONS (ENTRIES ADDED) MAY OVERWRITE (DESTROY) THE "ABS"
                                ;       LOADER AND THE BOOTSTRAP LOADER CODE RESIDENT. THIS WILL REQUIRE
                                ;       RESTORATION OF THAT CODE PRIOR TO ATTEMPTING REUSE.
                                ;
017274  000000                  ;       000000
017276  000000                  ;       000000
017300  177777                  ;       177777

        000001          .END
```

```
ADDX$   001272          1019    1065#   1176
AUTO    000042           857#
BADB15  011534          4431    4440#
BB$     000166           878     893#
BEGINX  002102          1185    1187#
BELL  = 000007           801#
BITYP$  013442          4882#
BIT0  = 000001           811#
BIT1  = 000002           812#
BIT10 = 002000           821#   1241    1257
BIT11 = 004000           822#
BIT12 = 010000           823#   4484
BIT13 = 020000           824#    943    1097    1673    1677    2592    2711    2720    2724    2744    2869    2988    2997
                        3001    3021    3152    3271    3280    3284    3304    3435    3554    3563    3567    3587    4036
                        4860    5023
BIT14 = 040000           825#   1767    1771    2591    2710    2741    2868    2987    3018    3151    3270    3301    3434
                        3553    3584
BIT15 = 100000           826#   1865    2366    2388    2714    2723    2747    2991    3000    3024    3274    3283    3307
                        3557    3566    3590    4442
BIT2  = 000004           813#
BIT3  = 000010           814#
BIT4  = 000020           815#
BIT5  = 000040           816#
BIT6  = 000100           817#
BIT7  = 000200           818#
BIT8  = 000400           819#   1294    1336    1375    1410    1498    1544    1587    1626    1728    1822    1916    1935
                        2074    2204    2302    2357    2378    2400    2432    2450    2467    2499    2801    3078    3361
                        3644    3966
BIT9  = 001000           820#   4099
BUSERR  012010           848    4542#   4568    4767
BUSL1   012014          4534    4543#
CADCSR= 016262           929*    945*    948*   1132*   1187*   1209*   1254    1448    1668    1762    1856    2123    2253
                        2335    2359    2473    2586    2709    2739    2863    2986    3016    3146    3269    3299    3429
                        3552    3582    3684    4066    4146    4172    4201    4221    4286    4338    4344    4381    4426
                        4448    5301#   5302
CADDDR= 016350          1066*   2659    2936    3219    3502    4245    5302#   5303
CADTER= 016524           950*   1070*   1189*   1211*   1950    2029    2113    2243    2618    2689    2895    2966    3178
                        3249    3461    3532    4118    5304#   5305
CADTSR= 016436           949*   1068*   1188*   1210*   2108    2129    2238    2259    2760    2775    3037    3052    3320
                        3335    3603    3618    4311    5303#   5304
CBMW    000454           969     974#
CBM2    000332           938     942#
CBM3    001202           940    1025    1036#
CBM4    001236          1037    1049#
CBNV    001542          1117    1119#
CBNY    002072          1118    1182    1184#
CBN2    001612          1129    1132#
CB.MMP  000320           935#   1031    1042
CB.XXX  001474          1104    1106#   1183
CLKOUT  011762          4518    4520#   5429    5469
CLKRTN  016264          4519    5321#   5348    5368
CLKRTX  016320          5327#
CLKSCN  011750           915    1084    4517#
CLRTSR  004362          2459#
CLR11   003776          2269#
CLV.CB= 016700           979*   1001*   1012*   1014*   1016*   1017*   1166*   1170*   1172*   1174*   1175*   3746    3767
```

```
                    3772*   3873    3938    4081    4090    4432    5306#   5307
CNGBUF= 017054       999*   4116*   4296    4317*   4399*   4400*   4434*   4435*   5308#   5309
CNTL    017152      1218*   1219*   2332    4007    5493#
CPS50   016614      5391    5433#
CPS60   016510      5390    5394#   5397
CRLF    015177      5181#
CSR    =%000000      788#
CVT.CB= 016612       952*    954*    965    1148*   1268    1468    1680    1774    1868    2364    2385    2405    2472
                    2599    2712    2748    2876    2989    3025    3159    3272    3308    3442    3555    3591    3698
                    4071    4079    4150    4178    4200    4225    4341    4384    4441    5305#   5306
CXBM    000522       981     985#
C$      001510      1110#   1120    1122    1125    1131
DATABF= 016766       995*   4318*   4395*   4436*   5307#   5308
DDLYMS  011606      2658    2684    2935    2961    3218    3244    3501    3527    4244    4260    4465#
DEVADR  001532      1106*   1113    1116#   1119    1121    1123    1126
DEVPTY  001746      1154    1156    1158    1161#   1162*   1163*   1164*   1165    1175
DEVVCT  001650      1138    1141#   1143    1145    1148
DISPLA= 177570       800#   4607*   4611*
DLYGMS  011614      1308    1512    2125    2127    2255    2257    2363    2384    2614    2708    2735    2891    2985
                    3012    3174    3268    3295    3457    3551    3578    3713    3715    4122    4166    4191    4476#
DSP    = 177570      774#
DSTADR  002176      1092*   1194    1196    1198    1203    1205#   1213*   2611    2645    2673    2742    2888    2922
                    2950    3019    3171    3205    3233    3302    3454    3488    3516    3585    4014    4119    4236
                    4253    4281    4736*
DSTMAP  014600      1050    5103#   5128
DSTOUT  015006      5135    5142    5147    5151#
DTIME   011736      4503#   4517    5422*   5425    5427    5460*   5465*
DYNTST  010000      4003#
DYN1    010010      4005#   4030
DYN2    010030      4012#   4027
DS      001604      1130#   1186
D15ERR  011562      4451#
EBXX13  004750      2698#
EBXX14  005462      2975#
EBXX15  006174      3258#
EBXX16  006706      3541#
ECSR    010252      4077#
ECSR13  004576      2604#
ECSR14  005310      2881#
ECSR15  006022      3164#
ECSR16  006534      3447#
EDDR13  004700      2664#
EDDR14  005412      2941#
EDDR15  006124      3224#
EDDR16  006636      3507#
EDDZ13  004716      2678#
EDDZ14  005430      2955#
EDDZ15  006142      3238#
EDDZ16  006654      3521#
EDST13  004660      2652#
EDST14  005372      2929#
EDST15  006104      3212#
EDST16  006616      3495#
EMT$    012260       853    4627#
ENBRTN  007450      3774    3805    3868#
ENDDYN  010102      4028#
```

```
ENDPRO  017146            907    1077    4048    5477#
END1    002556           1255    1425#
END10   003662           2109    2211#
END11   004024           2239    2309#
END12   004474           2337    2511#
END13   005204           2588    2805#
END14   005716           2865    3082#
END15   006430           3148    3365#
END16   007142           3431    3648#
END17   007752           3686    3981#
END2    003044           1449    1641#
END3    003142           1669    1735#
END4    003240           1763    1829#
END5    003336           1857    1923#
END6    003430           1951    2002#
END7    003522           2030    2081#
ENTERM  007616           3920    3937#
ERA2    002670           1489#
ERBENB  007526           3897#
ERB2    002732           1536#
ERC24   002762           1579#
ERD2    003016           1619#
ERERDY  004276           2415#
ERF13   005010           2718#
ERF14   005522           2995#
ERF15   006234           3278#
ERF16   006746           3561#
ERH13   005034           2728#
ERH14   005546           3005#
ERH15   006260           3288#
ERH16   006772           3571#
ERINH   007322           3700    3764#
ERIRDY  004422           2478#
ERJ13   005110           2753#
ERJ14   005622           3030#
ERJ15   006334           3313#
ERJ16   007046           3596#
ERK13   005146           2784#
ERK14   005660           3061#
ERK15   006372           3344#
ERK16   007104           3627#
ERMINT  007644           3943#
ERNCLK  016374           5343#
ERRENB  007436           3750    3844#
ERRINH  007362           3765    3768    3776#
ERRORS  012430           1216*   2585    2793    2862    3070    3145    3353    3428    3636    3680    3964    4042    4628*
                         4657#
ERRORS  012436           4648    4661#
ERRTT   012024           4557#
ERRSYN  012022           4546#
ERR1    002402           1289#
ERR10   003642           2163#
ERR11   004004           2294#
ERR3    003122           1717#
ERR4    003220           1811#
ERR5    003316           1905#
```

```
ERR6    003410          1988#
ERR7    003502          2067#
ERTCLK  016446          5363#
ERTRAP  014204          5002#
ERW1    002444          1332#
ERX1    002474          1371#
ERY1    002530          1407#
ESDCSR  010724          4231#
ESER    010512          4160#
ESER0   010570          4185#
ESTAT   010652          4209#
ETER    010440          4130#
ETER13  004636          2630#
ETER14  005350          2907#
ETER15  006062          3190#
ETER16  006574          3473#
ETR10   003576          2120#
ETR11   003736          2250#
ETSR13  005130          2766#
ETSR14  005642          3043#
ETSR15  006354          3326#
ETSR16  007066          3609#
EXD13   005042          2685    2739#
EXD14   005554          2962    3016#
EXD15   006266          3245    3299#
EXD16   007000          3528    3582#
EXTRTN  007542          3868    3918#
ES      001704          1150#   1155    1157    1159
FDSTB   014652          5108*   5117#   5119*   5144    5146
FLAGH   013440          1214*   4631    4634*   4875#
FLGPTY  000230           910#    927*   1052*   1093*   3764    3988
FSCAN   014456          5063*   5071    5074#   5091    5094
FSTADR  000316           931#   5060*   5087*   5105*   5140*
FST1    002312          1008    1242    1246#
FS      014264          5024    5028    5031#
GETADR  001514          1109    1111#
GETPTY  001710          1149    1152#
GETVEC  001630          1134    1136#
HANGCT  011456          4424#   4430*
HGHADD  001072          1027#   1040    1121
HLT   = 104000           779#    796#   1289    1332    1371    1407    1489    1536    1579    1619    1717    1811    1905
                        1988    2067    2120    2163    2250    2294    2349    2370    2393    2415    2444    2459    2478
                        2604    2630    2652    2664    2678    2698    2718    2728    2753    2766    2784    2881    2907
                        2929    2941    2955    2975    2995    3005    3030    3043    3061    3164    3190    3212    3224
                        3238    3258    3278    3288    3313    3326    3344    3447    3473    3495    3507    3521    3541
                        3561    3571    3596    3609    3627    3776    3844    3897    3943    4077    4130    4160    4185
                        4209    4231    4242    4251    4259    4265    4294    4314    4391    4451    4546    5002    5343
                        5363
HLTADR  012434          4642*   4643*   4644    4645    4659#
HLTCTS  012432          4644*   4658#   4669*   4672*
HOUT    013432          4866    4872#
HTSTS   013374          1399    1611    4633    4860#
ICNT    001200           912    1033#   1074    1247    4593    4600    4602    4604*   4605*   4607    4610*   4611    4617
                        4654*
ILLUP   014120          4938    4966#
INITA   012720           916    4735#
```

```
INITB   012764          4737    4747#
INITC   012770          4745    4749#
INITQ   013072          1249    1444    1663    1757    1851    1945    2024    2103    2233    2329    2581    2858    3141
                        3424    4766#
INITR   013114          1100    3678    4063    4142    4167    4193    4219    4275    4771#   5058    5103    5325
INITX   013036          1095    4756#
INITZ   012754          4740    4742#
INPUT   013734          4690    4918    4919    4937#
IOT   = 000004           769#    797    3973    4759
IOTRAP  014132           725     851    4977#
IOTS    014230          4979    5023#
IPSW    011310          4362*   4363*   4369#   4376
ISR     011304          4086    4367#
ISRPOP  011414          4401#
ISRPSH  011312          4364    4371#
ISR1    011270          4083    4362#
IXRX    011322          4376#
KITS    012226          4603    4610#   4655
K2S     002160          1201#   1208
K4S     002210          1206    1209#
LAD     012254          1246*   4606*   4612    4614    4617#
LCBHA   000144           887#
LDSTB   014664          5121#   5146    5149
LIMITD  014714          5134#
LIMITH  000120           877#
LIMITS  014474          5080#
LINKER  011266          4087    4089    4334*   4350*   4353#
LNK0    004070          2336    2338#
LNK1    004132          2347    2359#   2379
LNK3    004244          2391    2403#
LNK4    004320          2413    2433    2437#
LNK5    004352          2442    2451    2454#
LNK6    004400          2457    2468    2471#
LNK7    004450          2476    2500    2502#
LNK8    004464          2504    2507#
LOPX13  005160          2797#   2802
LOPX14  005672          3074#   3079
LOPX15  006404          3357#   3362
LOPX16  007116          3640#   3645
LOP1    002336          1254#
LOP10   003546          2106#   2209
LOP11   003706          2236#   2307
LOP12   004054          2333#
LOP13   004522          2584#   2799
LOP14   005234          2861#   3076
LOP15   005746          3144#   3359
LOP16   006460          3427#   3642
LOP17   007176          3681#   3979
LOP2    002604          1448#
LOP3    003070          1666#   1733
LOP4    003166          1760#   1827
LOP5    003264          1854#   1921
LOP6    003362          1948#   2000
LOP7    003454          2027#   2079
LOWADD  001566          1124#   4563*   5088*
LPA1    002456          1315    1340#
```

```
LPA2    002744          1519    1548#
LPB1    002506          1353    1378#
LPB2    002774          1561    1590#
LPC1    002542          1391    1415#
LPC2    003030          1603    1631#
LSCAN   014462          5076#   5094    5097
LSTADR  000352           947#   1049*   1133*   5104
LVLH10  013326          4840#
LVLH11  013330          4841#
LVLH12  013332          4842#
LVLH13  013334          4843#
LVLH14  013336          4844#
LVLH15  013340          4845#
LVLH16  013342          4846#
LVLH17  013344          4847#
LVLH20  013346          4848#
LVLH21  013350          4849#
LVLH22  013352          4850#
LVLH23  013354          4851#
LVLH24  013356          4852#
LVLH25  013360          4853#
LVLH26  013362          4854#
LVLH27  013364          4855#
LVLH30  013366          4856#
LVLH31  013370          4857#
LVL.H0  013306           985    1017    1165*   3771*   4832#
LVL.H1  013310          4833#
LVL.H2  013312          4834#
LVL.H3  013314          4835#
LVL.H4  013316          4836#
LVL.H5  013320          4837#
LVL.H6  013322          4838#
LVL.H7  013324          4839#
LVL7  =  000340          844#
LXA     011220          4336#   4348
LXB     011232          4341#   4345
LXOUT   011264          4339    4352#
L1$     004434          2485    2499#
MAP.D0  014624          5109#   5136
MAP.D1  014642          5112    5114#
MAP.D2  014722          5113    5137#
MAP.D3  014734          5140#
MAP.D4  014740          5141#
MAP.S0  014416          5064#   5083
MAP.S1  014436          5067    5069#
MAP.S2  014506          5068    5084#
MAP.S3  014520          5087#
MCRLF   015412           890    1000    4044    4639    4641    4872    5207#
MDADR   016230          1201    5291#
MDST    015755          5143    5252#
MDSTB   016172          1192    5286#
MISR    011432          4350    4416#
MOK     012660          4702    4709    4711    4713    4716#
MOUT    011574          4427    4456#
MRL0    011452          4423#   4454
MRL1    011460          4425#   4429    4438
```

```
MRL2    011462          4422    4426#
MSCN    015707          5092    5244#
MSGBUS  015300          4542    5193#
MSGE    015426           971    1110    1135    1150    1207    5210#
MSGERR  015666          4041    5238#
MSGHED  015446          4635    5213#
MSGO    016063          1085    5271#
MSGPAS  015650          4038    5235#
MSGPWR  016015          4963    5258#
MSGQQ   016011          4927    5257#
MSGSP   015415           959     967     992     996    5208#
MSGSUB  015550          4637    5224#
MSGTPO  015332          4533    5198#
MSG0    016027           921    1083    5266#
MSG1    015012           919    1082    5159#
MSG2    015045           926    5164#
MSG2X   015141           925    4564    5175#
MSG3    015202          1103    5182#
MSG3X   015157          4565    5178#
MSG4    016115          1111    5276#
MSG5    016134          1136    5279#
MSG6    015214          1043    1130    5184#
MSG7    015260          1221    5190#
MSG8    016152          1152    5282#
MS6D    011672          4465*   4481    4483    4487    4489#   4498*
MTHRU   015740          5096    5148    5249#
MTST    015375          4868    5204#
MX.CBH  015010          1023    1181    5153#
M1$     014460          5072    5075#
N     = 000021           725#   1222#   1223#   1431#   1647    1650#   1741    1744#   1835    1838#   1929    1932#   2008
                        2011#   2087    2090#   2217    2220#   2315    2316#   2536#   2813#   3090#   3373#   3656#   3995#
NDSTB   014616          5107#   5130*   5137    5141
NITX    000000           725#
NOP   = 000240           778#
NSCAN   014410          1091*   4735*   5062#   5077*   5084    5089
OK$     011370          4388    4393#
ONES  = 177777           792#    942    1450    1955    1959    2114    2133    2244    2619    2646    2690    2745    2762
                        2896    3179    3206    3250    3305    3322    3462
OPEN  = 000000           845#
OUTPRI  010450          4067    4135#
OUTT    010212          4047    4056#
OUT1    002570          1426    1430#
OUT10   003674          2212    2214#
OUT11   004036          2310    2312#
OUT12   004506          2517    2534#
OUT13   005220          2806    2811#
OUT14   005732          3083    3088#
OUT15   006444          3366    3371#
OUT16   007156          3649    3654#
OUT17   007766          3982    3988#
OUT2    003056          1642    1646#
OUT3    003154          1736    1738#
OUT4    003252          1830    1832#
OUT5    003350          1924    1926#
OUT6    003442          2003    2005#
OUT7    003534          2082    2084#
```

```
OVER$   012232          4594    4611#
PASEND  010114          4035#
PASSES  001262          1061#   1215*   4035*   4039    4596    4764*
PC    =%000007           791#    810#    874*    876     886*    889*    898*    909*    915*    916*    923*    924*    930
                         946*    958*    966*    982*    983*    984*    991*    994*    998*   1019*   1026    1050*   1060
                        1072*   1084*   1088    1095*   1099*   1100*   1115    1123    1140    1160*   1176*   1204    1220*
                        1249*   1308*   1399*   1444*   1512*   1611*   1663*   1757*   1851*   1945*   2024*   2103*   2125*
                        2127*   2233*   2255*   2257*   2329*   2363*   2384*   2581*   2614*   2658*   2684*   2708*   2735*
                        2858*   2891*   2935*   2961*   2985*   3012*   3141*   3174*   3218*   3244*   3268*   3295*   3424*
                        3457*   3501*   3527*   3551*   3578*   3678*   3713*   3715*   3990*   4004*   4012*   4016*   4019*
                        4021*   4040*   4043*   4051*   4063*   4122*   4135*   4142*   4166*   4167*   4191*   4193*   4197*
                        4215*   4219*   4244*   4260*   4270*   4275*   4322*   4352*   4367*   4423*   4476*   4489*   4492*
                        4500*   4525*   4567*   4569*   4573*   4579*   4627*   4633*   4646*   4648*   4649*   4663*   4667*
                        4668*   4680*   4685*   4778*   4780*   4782*   4784*   4786*   4788*   4790*   4792*   4800*   4862*
                        4864    4870*   4873*   4915*   4936*   4982*   4984*   4986*   5058*   5061*   5073*   5075*   5079
                        5093*   5098*   5099*   5103*   5106*   5116    5120*   5133    5145*   5150*   5151*   5325*   5359*
                        5477*
PDOWN$  013774           852    4938#   4960
POK     012616          4693    4695    4697    4701#
POPX    013164           984    4649    4668    4794#
PRESTR  000204           903#   1079
PRIMA   010222          4064#   4133
PRIMB   010254          4075    4079#
PRIMC   010374          4097    4100    4116#
PRIMD   010442          4128    4131#
PRIME   010216          4012    4063#
PRINTR  013452           994     998    4040    4043    4646    4663    4667    4676    4884#
PRINTS  013462           889     958     966     991    4870    4886#   5093    5098    5145    5150
PROCEE  001420          1087    1089#
PROEND  010202          4049    4051#
PS    = 177776           798#   4717    4721*
PSTEMP  012706          4717*   4721    4723#
PSW   = 177776           777#    903*   1073*   3703*   3749*   3823*   3870*   3883*   3918*   3921    3923*   3926*   3937*
                        3962*   4005*   4020*   4362    4367    4432*   4766*   4977    4981*   5328*   5357*
PSW$    014226          4977*   5012#   5026*   5027
PS1$    010164          4037    4046#
PUP$    014040          4947    4950#
PUSHX   013132           982    4627    4780#
PUVEC$  014126          4938*   4939*   4947*   4970#
PXOUT   011256          4342    4350#
Q1$     016366          5336    5339#
Q2$     016370          5334    5338    5340#   5341
RAA10   003600          2118    2123#
RAA11   003740          2248    2253#
RA10    003550          2108#   2205
RA11    003710          2238#   2303
RA12    004056          2335#   2435    2452    2469    2491    2501    2505
RA13    004524          2585#   2803
RA14    005236          2862#   3080
RA15    005750          3145#   3363
RA16    006462          3428#   3646
RA17    007204          3684#   3968
RA3     003072          1668#   1729
RA4     003170          1762#   1823
RA5     003266          1856#   1917
RA6     003364          1950#   1996
```

```
RA7     003456          2029*   2075
RBC13   004640          2626    2638#
RBC14   005352          2903    2915#
RBC15   006064          3186    3198#
RBC16   006576          3469    3481#
RB10    003654          2141    2207#
RB11    004016          2272    2305#
RB12    004110          2344*   2358
RB13    004600          2601    2611#
RB14    005312          2878    2888#
RB15    006024          3161    3171#
RB16    006536          3444    3454#
RB17    007372          3747    3805#
RB3     003134          1685    1731#
RB4     003232          1779    1825#
RB5     003330          1873    1919#
RB6     003422          1966    1998#
RB7     003514          2045    2077#
RC12    004200          2368    2381#   2401
RDA13   004662          2650    2658#
RDA14   005374          2927    2935#
RDA15   006106          3210    3218#
RDA16   006620          3493    3501#
RDB13   004702          2662    2672#
RDB14   005414          2939    2949#
RDB15   006126          3222    3232#
RDB16   006640          3505    3515#
READIN  012540          1086    1112    1137    1153    1193    1202    4685#
READ$   013634          4685    4917#
RERR13  005216          2585*   2793    2809#
RERR14  005730          2862*   3070    3086#
RERR15  006442          3145*   3353    3369#
RERR16  007154          3428*   3636    3652#
RERR17  007764          3680*   3964    3986#
RESET   002310          1244#
RESTAR  001260          1060#   4581    4964
RE13    004730          2613    2689#
RE14    005442          2890    2966#
RE15    006154          3173    3249#
RE16    006666          3456    3532#
RF13    004752          2694    2708#
RF14    005464          2971    2985#
RF15    006176          3254    3268#
RF16    006710          3537    3551#
RG13    005012          2716    2720#
RG14    005524          2993    2997#
RG15    006236          3276    3280#
RG16    006750          3559    3563#
RH13    005036          2726    2735#
RH14    005550          3003    3012#
RH15    006262          3286    3295#
RH16    006774          3569    3578#
RI13    005112          2751    2760#
RI14    005624          3028    3037#
RI15    006336          3311    3320#
RI16    007050          3594    3603#
```

```
RJ13    005132          2764    2775#
RJ14    005644          3041    3052#
RJ15    006356          3324    3335#
RJ16    007070          3607    3618#
RK13    005150          2779    2793#
RK14    005662          3056    3070#
RK15    006374          3339    3353#
RK16    007106          3622    3636#
RL13    005170          2795    2801#
RL14    005702          3072    3078#
RL15    006414          3355    3361#
RL16    007126          3638    3644#
RS0     013410          4631    4634    4865#   4867*
RS1     011426          4310*   4316    4406#
RS2     011430          4407#   4447*   4452
RTA     014224          5011#
RTB     011424          4405#
RTE     012224          4608#
RTF     012252          4615#
RTH     012416          4653#
RTI   = 000002           772#
RTK     014366          5030    5051#
RTNZ    007512          3883#
RTN17   007400          3821#   3847    3910
RTO17   007650          3933    3961#
RTT   = 000006           770#
RTX     013372          4572    4742*   4749    4753    4858#   5354
RT2     011604          4460#
RX12    004050          2332#   2509
RX13    004720          2676    2684#
RX14    005432          2953    2961#
RX15    006144          3236    3244#
RX16    006656          3519    3527#
RX5     007446          3835*   3865#   3888*
RZ17    007776          3989    3991#
R0    =%000000           780#    802#    930*    937     942*    943*    945     946     952     957     960     961*    968
                         974     977     978*    1026    1039*   1040    1065    1066    1067    1068    1069    1070    1071
                        1126*   1128    1132    1133    1251*   1425    1445*   1641    1664*   1735    1758*   1829    1852*
                        1923    1946*   2002    2025*   2081    2104*   2211    2234*   2309    2331*   2511    2582*   2805
                        2859*   3082    3142*   3365    3425*   3648    3679*   3981    4003*   4046*   4048    4051    4109*
                        4276*   4389*   4421*   4449*   4520*   4522*   4523    4756*   4758*   4759*   4771*   4780    4799*
                        4864    4867    4869    4940    4959*   5059*   5060    5064*   5066    5069    5073    5075    5078*
                        5079    5082*   5086*   5087    5088    5104*   5105    5109*   5111    5114    5119    5120    5122*
                        5123    5131*   5132*   5133    5139*   5140    5395*   5396    5409*   5410    5435*   5444    5447*
                        5448*   5449*   5450*   5451    5455*   5457*   5460    5463    5464
R1    =%000001           781#    803#    1002    1011*   1012    1013*   1016    1018*   1023    1036    1167    1169*   1170
                        1171*   1174    1179*   1181    1184    1190    1252*   1254    1268    1420*   1421*   1446*   1448
                        1468    1636*   1637*   1666*   1668    1680    1731*   1732*   1760*   1762    1774    1825*   1826*
                        1854*   1856    1868    1919*   1920*   1948*   1950    1998*   1999*   2027*   2029    2077*   2078*
                        2106*   2108    2113    2123    2129    2207*   2208*   2236*   2238    2243    2253    2259    2305*
                        2306*   2333*   2335    2359    2364    2385    2405    2472    2473    2507*   2508*   2584*   2586
                        2599    2618    2659    2689    2709    2712    2739    2748    2760    2775    2797*   2798*   2861*
                        2863    2876    2895    2936    2966    2986    2989    3016    3025    3037    3052    3074*   3075*
                        3144*   3146    3159    3178    3219    3249    3269    3272    3299    3308    3320    3335    3357*
                        3358*   3427*   3429    3442    3461    3502    3532    3552    3555    3582    3591    3603    3618
                        3640*   3641*   3682*   3684    3698    3746    3767    3771*   3772*   3873    3938    3977*   3978*
```

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                    4917    4918*   4919    4935*   4943    4956*   5401*   5402*   5403*   5419*   5420    5442*
R4      =%000004     784#    806#    888*    893    1268*   1270    1311*   1313    1349*   1387*   1451*   1456    1457
                    1468*   1470    1515*   1517    1557*   1599*   1673*   1680*   1684    1767*   1774*   1778    1861*
                    1868*   1872    1955*   1965    2034*   2044    2114*   2115    2117    2133*   2140    2244*   2245
                    2247    2263*   2271    2342*   2344    2346    2360*   2361    2364*   2367    2381*   2385*   2388*
                    2390    2403*   2405*   2409*   2412    2437*   2441    2454*   2456    2471*   2472*   2475    2591*
                    2592*   2597    2599*   2600    2619*   2620    2625    2646*   2647    2649    2661    2672*   2690*
                    2691    2693    2710*   2711*   2712*   2715    2724*   2725    2741*   2744*   2747*   2748*   2750
                    2762*   2763    2776*   2778    2868*   2869*   2874    2876*   2877    2896*   2897    2902    2923*
                    2924    2926    2938    2949*   2967*   2968    2970    2987*   2988*   2989*   2992    3001*   3002
                    3018*   3021*   3024*   3025*   3027    3039*   3040    3053*   3055    3151*   3152*   3157    3159*
                    3160    3179*   3180    3185    3206*   3207    3209    3221    3232*   3250*   3251    3253    3270*
                    3271*   3272*   3275    3284*   3285    3301*   3304*   3307*   3308*   3310    3322*   3323    3336*
                    3338    3434*   3435*   3440    3442*   3443    3462*   3463    3468    3489*   3490    3492    3504
                    3515*   3533*   3534    3536    3553*   3554*   3555*   3558    3567*   3568    3584*   3587*   3590*
                    3591*   3593    3605*   3606    3619*   3621    3704*   3873*   3874*   3875    3938*   3939*   4024*
                    4025*   4069*   4070    4071*   4074    4093*   4094*   4105*   4106*   4107*   4115*   4123*   4124
                    4127    4149*   4150*   4152    4156    4176*   4178*   4182    4196*   4197    4199*   4200*   4206
                    4223*   4224    4225*   4228    4233*   4234*   4235    4237    4239    4246*   4248    4254*   4255
                    4262    4279*   4280*   4283*   4285*   4290    4300*   4301*   4302    4374    4383*   4384*   4387
                    4401*   4419    4440*   4441*   4442*   4456*   4561*   4775*   4788    4795*   4888    4889*   4909
                    4914*   4944    4955*   5380*   5394*   5401    5408    5420*   5421*   5422    5424*   5427*   5428
                    5433*   5434*   5435    5436*   5437    5438*   5439    5440*   5441*   5442    5443*   5446
R5      =%000005     785#    807#   1086*   1112*   1137*   1153*   1193*   1202*   2332*   2342    2386    2407    2437
                    2502    2503    3698*   3699    3700*   3701*   3805*   3834    3846*   3868*   3875*   3908*   3920*
                    3972*   3973*   3974    3975*   4476    4479*   4480*   4482    4484    4499*   4689    4722*   4776*
                    4790    4794*   4945    4954*   4986    5008*   5340*   5379*   5380
R6      =%000006     786#
R7      =%000007     787#
SAV1    014156      4983#   5010
SAV2    014162      4985#   5009
SAV5    014166      4987#   5008
SCANER  011206      4004    4331#
SCNMAP  014372       924    5058#
SCNOUT  014576      5090    5095    5099#
SCOPE = 104400       795#   1430    1646    1738    1832    1926    2005    2084    2214    2312    2534    2811    3088
                    3371    3654    3991    4032
SDOUT   011042      4222    4270#
SECDST  011016      4259#
SECSR1  004166      2370#
SECSR2  004232      2393#
SERDDR  011000      4251#
SERDST  010754      4242#
SEROUT  010600      4173    4191#
SERV    010452      4016    4142#
SERVD   010664      4019    4219#
SERVD1  010670      4220#   4269
SERVD2  010726      4229    4233#
SERVD3  010756      4240    4244#
SERVD4  011002      4249    4253#
SERVD5  011020      4257    4260#
SERVD6  011034      4263    4267#
SERV1   010456      4144#   4164
SERV2   010514      4158    4162#
SERV3   010522      4147    4166#
SERV5   010542      4175#
```

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SERV6   010572          4183    4187#
SER4    010532          4170#   4189
SER7    010610          4195#   4213
SER8    010654          4207    4211#
SER9    010662          4202    4215#
SETER1  004120          2349#
SETSR   004334          2444#
SE2DST  011032          4265#
SIZE    000110           874#    897    1099
SLR     = 177774         773#   4754*
SP      =%000006         790#    809#    912*   1074*   1247*   3869    3940    3958    3961    4009*   4371*   4372*   4373*
                        4374*   4401    4402    4403    4404    4416*   4417*   4418*   4419*   4456    4457    4458    4459
                        4543    4662    4665    4739*   4740*   4747    4748    4946    4950*   4978    4988*   4989    4990
                        4991    5335    5339    5352    5372
SPACE   015704          4647    4664    4674    5241#
SPW     =%000006         775#
START   000200           900#
STARTW  002226          1054    1191    1197    1213#
STARTX  002232          1212    1214#
STARTZ  000232           912#   1047
START2  001320           900    1062    1073#   3794
SVLAD$  012206          4597    4599    4605#   4613
SWAPI   012102          1220    4577#
SWAPO   012050           923    4567#
SWAPO   012026           874    4561#
SWAP4   012054          4568#   4577
SWAP6   012062          4570#   4578
SWR     = 177570         776#    799#    800    1097    1241    1257    1294    1336    1375    1410    1425    1498    1544
                        1587    1626    1641    1728    1735    1822    1829    1916    1923    1995    2002    2074    2081
                        2204    2211    2302    2309    2357    2378    2400    2432    2450    2467    2499    2511    2801
                        2805    3078    3082    3361    3365    3644    3648    3966    3981    4028    4036    4099    4106
                        4479    4591    4593    4598    4629    4650    4860    5023    5389
SW0     = 000001         828#
SW1     = 000002         829#
SW10    = 002000         838#   4627
SW11    = 004000         839#   4598
SW12    = 010000         840#
SW13    = 020000         841#   4629
SW14    = 040000         842#
SW15    = 100000         843#
SW2     = 000004         830#
SW3     = 000010         831#
SW4     = 000020         832#
SW5     = 000040         833#
SW6     = 000100         834#
SW7     = 000200         835#
SW8     = 000400         836#   4591
SW9     = 001000         837#   4653
S0      013134          4781#   4799
S0X     001354          1078    1080#
S1      013140          4783#   4798
S1X     001360          1076    1081#
S1$     001402          1085#   1090
S2      013144          4785#   4797
S3      013150          4787#   4796
S3$     002202          1195    1207#
```

```
S4          013154          4789#   4795
S5          013160          4791#   4794
TABLEB      016262          4520    5299#   5301
TABLEN=     017142          4521    5309#   5472
TEMP        010620          4198#   4235*   4246
TEST17      007216          3685    3697#   3885
TICK        016402           860     861    5321    5322    5352#
TIM    =    000010           771#
TIME        011746          4478*   4486*   4488*   4491    4509#
TIMES       012256          4602    4618#
TIMEW       011740          4486    4505#   5426*   5461*   5463*   5466*
TIMEX       011742          4478    4506#   5418*   5444*   5445*   5446*   5447    5461    5462    5468*
TIMEXX      016442          5327*   5360#   5379
TIMEY       011744          4488    4507#   5428*   5462*   5464*   5467*
TIMIT       016440          5359#   5361
TOCK        016454          5355    5356    5372#
TOK         012622          4700    4703#   4715
TRAP$       012124           854    4591#
TRAP0       012002           725    4533#
TST1        002300          1063    1241#   1246    1295    1337    1376    1411    1428    4056
TST10       003536          2103#   2213
TST11       003676          2233#   2311
TST12       004040          2329#   2518
TST13       004510          2580#   2807
TST14       005222          2857#   3084
TST15       005734          3140#   3367
TST16       006446          3423#   3650
TST17       007160           983    3678#   3984
TST2        002572          1444#   1499    1545    1588    1627    1644
TST3        003060          1663#   1737
TST4        003156          1757#   1831
TST5        003254          1851#   1925
TST6        003352          1945#   2004
TST7        003444          2024#   2083
TS1         002334          1252#   1423
TS2         002602          1446#   1639
TTY    =%000005              789#    808#    875*    879     881     885*    888     957*    965*    985*    986*    987*    988*
                             989*    990*    993*    997*   4039*   4042*   4645*   4662*   4665*   4666*   4675*   4869*   4895*
                            4897*   4899*   5031    5032*   5033    5035    5036*   5037    5039    5047*   5048*   5049    5050*
                            5091*   5097*   5144*   5149*
TYPE   = 000004              797#    890     919     921     925     926     959     967     971     992     996    1000    1043
                            1082    1083    1085    1103    1110    1111    1130    1135    1136    1150    1152    1192    1201
                            1207    1221    4038    4041    4044    4533    4542    4564    4565    4635    4637    4639    4641
                            4647    4664    4674    4868    4872    4913    4927    4930    4934    4963    5092    5096    5143
                            5148
T$1         002414          1272    1300#
T$2         002702          1472    1504#
TSS         011616          4477#   4499
VEDDR       011122          4294#
VERFY       011044          4021    4275#
VERFY1      011124          4292    4296#
VEROUT      011204          4287    4322#
VETER       011160          4314#
VRFY0       011054          4277#   4321
VRFY2       011166          4303    4317#
VT.HO       013222          4806#
```

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VT.H1   013224          4807#
VT.H10  013242          4814#
VT.H11  013244          4815#
VT.H12  013246          4816#
VT.H13  013250          4817#
VT.H14  013252          4818#
VT.H15  013254          4819#
VT.H16  013256          4820#
VT.H17  013260          4821#
VT.H2   013226          4808#
VT.H20  013262          4822#
VT.H21  013264          4823#
VT.H22  013266          4824#
VT.H23  013270          4825#
VT.H24  013272          4826#
VT.H25  013274          4827#
VT.H26  013276          4828#
VT.H27  013300          4829#
VT.H3   013230          4809#
VT.H30  013302          4830#
VT.H31  013304          4831#
VT.H4   013232          4810#
VT.H5   013234          4811#
VT.H6   013236          4812#
VT.H7   013240          4813#
WORK    012712           960#   977#   993    997   4007#  4022#  4024   4093   4105   4196   4233   4279   4300
                        4725#
XA$     014470          5070   5078#  5085
XB$     014704          5115   5131#  5138
XCER    011366          4391#
XD$     001624          1135#  1139   1142   1144   1146
XLINK   016346          5323   5335#
XXA$    014530          5081   5089#
XX$     001064          1025#  1028
X$      012336          4632   4641#
X1$     001004          1004   1011#
YESRT   012122           850   4582#  4749#
YY$     001070          1024   1026#
Y$      012402          4630   4649#
ZAZ     000446           971#   975
ZERO    013220          1861   2034   2038   2263   2923   2967   3022   3039   3489   3533   3588   3605   4803#
ZOK     012662          4704   4707   4717#
Z1$     001030          1003   1016#
Z2$     001034          1015   1017#
$END    012120          4581#
$INIT   002300          1222#
$VEC    013216          3699#  3834#  3846   3908   3972   4802#
.     = 017302           725#   847#   849#   856#   859#  1008#  1033#  4617   4651   4657   4659   4885   4902
                        4905   4910   4916#  4922   4937#  4967   5041   5472#
.BIT  = 177777           725#  4591   4627   4629   4653
.PR     013610          4882#  4884#  4886#  4887#  4889   4893   4903#  4904   4907#  4909   4913   4916#
.PRF    013530          4891   4894   4899#
.PRL    013506          4892#  4908
.PTIT   013474          4883   4888#
.SAVR6  014124          4946#  4950   4969#
.TYPE   014370          4929#  4930   5035#  5036   5052#
```

```
$ITYPE       1#    827#
BLKBLK       1#
BUFHDR       1#
DUMP         1#    827#   4645
DUMP18       1#
FILBLK       1#
LNKBLK       1#
ODT11        1#
ODT11X       1#
POP          1#    725#    827#   4718    4954
PRINT        1#    827#
PUSH         1#    725#    827#   4686    4940
SCOPE.       1#
SCOP.        1#
SDUMP        1#    827#
TRACE        1#
TRNBLK       1#
TYPEM        1#
WRITE        1#
SCATCH       1#
SCMTAG       1#
SDATAI    1222#   2315
SEND         1#    725#
SEQUAT       1#    725#    795
SHLT         1#    725#   4619
SINIT     1222#   1223    1431
SINTR     1222#   2536    2813    3090    3373
SIOCAT     725#
SIOT       725#   4971
SKRAT        1#
SLOADR       1#
SOCTAL       1#    725#   4876
SPOWER       1#   4682#   4938
SPRIOT    1222#   3656
SRAND        1#
SRAND4       1#
SREAD        1#    725#   4917
SSCOPE       1#    725#   4583
SSETUP       1#
SSRAT        1#
STREG     1222#   1647    1741    1835    1929    2008    2087    2217
SSWDOC       1#    725#
STRAP        1#
STYPE        1#    725#   5014#   5015
SURAT        1#
.SCOP        1#
.SCOPE       1#
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```
ADC     1302  1342  1380  1416  1506  1550  1592  1632
ADD      891  1039  1049  2341  2438  3770  3909  3918  4022  4288  4297  4393  4397  4433  4666
        4677  4760  5029  5044  5047  5082  5086  5132  5139  5408  5420  5427  5445  5464
ASL      987   988   989  1022  1105  1180  1252  1446  1666  1760  1854  1948  2027  2106  2236
        2323  2584  2861  3144  3427  3682  4064  4144  4170  4195  4220  4277  4313  4363  4379
        4679  4708  4710  4712  4998  5419
ASR     1020  1162  1163  1164  1177  1420  1636  1731  1825  1919  1998  2077  2207  2305  2507
        2797  3074  3357  3640  3977  4131  4162  4187  4211  4267  4319  4670  5394  5402  5403
        5417  5421  5433  5434  5436  5438  5440  5441  5443  5448  5449  5450  5452  5453  5454
        5456  5465  5466  5467  5468
BCC      938  1129  5067  5112
BCS     4709  4711  4713
BEQ      878   969   975   981  1003  1062  1076  1078  1168  1182  1195  1197  1206  1242  1255
        1272  1315  1353  1391  1449  1472  1519  1561  1603  1669  1685  1763  1779  1857  1873
        1951  1966  2030  2045  2109  2118  2141  2239  2248  2272  2347  2368  2387  2391  2413
        2433  2442  2451  2457  2468  2476  2500  2504  2601  2626  2650  2662  2676  2694  2716
        2726  2743  2746  2751  2764  2779  2802  2878  2903  2927  2939  2953  2971  2993  3003
        3020  3023  3028  3041  3056  3079  3161  3186  3210  3222  3236  3254  3276  3286  3303
        3306  3311  3324  3339  3362  3444  3469  3493  3505  3519  3537  3559  3569  3586  3589
        3594  3607  3622  3645  3750  3765  3922  3965  3967  3989  4030  4047  4049  4067  4075
        4082  4088  4100  4120  4126  4147  4158  4173  4183  4202  4207  4222  4229  4240  4249
        4257  4263  4287  4292  4303  4339  4342  4388  4427  4481  4483  4485  4592  4594  4597
        4601  4613  4632  4693  4695  4697  4704  4861  4866  4902  4905  4920  5024  5028  5038
        5085  5090  5095  5124  5138  5142  5147
BHI      882  1028  1041  1122  1144  1146  1157  4762  5081  5135
BIC      914   954   986  1011  1169  1217  2126  2256  2366  2409  2714  2720  2723  2724  2991
        2997  3000  3001  3274  3280  3283  3284  3557  3563  3566  3567  3822  3871  3874  3928
        3939  3941  4155  4175  4181  4205  4227  4378  4386  4442  4480  4671  4691  5026  5048
BICB    4924
BIS      943  1012  1013  1014  1016  1081  1107  1170  1171  1172  1174  1680  1774  1868  2124
        2254  2364  2385  2388  2405  2472  2592  2599  2711  2712  2744  2747  2748  2869  2876
        2988  2989  3021  3024  3025  3152  3159  3271  3272  3304  3307  3308  3435  3442  3554
        3555  3587  3590  3591  3872  3929  4071  4150  4152  4178  4200  4225  4384  4395  4399
        4400  4434  4435  4436  4441  4714  4962
BISB    1017  1175  4906
BIT      968  1002  1097  1119  1140  1167  1204  1241  1257  1294  1336  1375  1410  1498  1544
        1587  1626  1728  1822  1916  1995  2074  2204  2302  2357  2378  2400  2432  2450  2467
        2499  2801  3078  3361  3644  3824  3921  3966  4036  4081  4099  4484  4591  4598  4629
        4706  4860  4893  5023  5033
BLO     1125  1159
BLOS     880  3747
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BMI     4431  4673
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Spooler runtime 17 Seconds, 74 KCS, 484 disk reads, 3 disk writes, 136 pages

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