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B**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB* COMPUTER SHARING SERVICES *BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**B
B**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB* COMPUTER SHARING SERVICES *BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**B

aaaa  aaaaa  a     aaa   aaa   aaa   aaa   aaa                a        a  a  aaa   aaaa  a  a  aaaaa  aaaa
a   a a   a  a    a   a a   a a   a a   a a   a               a        a  a a   a  a     a  a    a   a    a
a   a aaaa   a    a   a a aaa a   a a   a    a a               a        aa a a   a  a     a aaa a    a   a
aaaa  a      a    a   a a   a a   a a   a   aa a               a        a a a a   a  a     a a a a    a   aaaa
a   a a      a    a   a a   a a   a a   a   aa a               a     aa a  a  a   a a a   a a  aa a    a   a   a
a   a aaaaa  aaaaa aaa   aaa   aaa   aaaaa  aaa               aaaaa  aa a  a  aaa   aaaa  a  a    a    a   a   a

B**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB* COMPUTER SHARING SERVICES *BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**B
168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168
```

09/15/81   11:34:09   PRINTOUT #168

RELO8+MULTIPLE IOMS AND 256 DEVICES AND SMALLER CATALOGS
NCONTROL SEGMENT

```
DDDDD   EEEEE  N   N   N   IIIII   SSS
D   D   E      NN  N  NN   N    I    S   S
D   D   E      N N N N N N     I    S
D   D   EEEEE  N  NN  N  NN    I    SSS
D   D   E      N   N   N       I      S
DDDDD   EEEEE  N   N   N   IIIII   SSS     HAUGH
```

```
    1                 INDEX
    2                 TTL     DTSS EXECUTIVE (NCONTROL SEGMENT)                    DTSS TRADE SECRET
    3         *
    4         *
    5         *       *********************************************************************
    6         *       *********************************************************************
    7         *       **                                                               **
    8         *       **                                                               **
    9         *       **          PROPRIETARY TRADE SECRET INFORMATION                 **
   10         *       **                                                               **
   11         *       **   TO BE USED ONLY UNDER LICENSE FROM DTSS INCORPORATED.       **
   12         *       **                                                               **
   13         *       **                                                               **
   14         *       **     UNPUBLISHED COPYRIGHTED WORK OF DTSS INCORPORATED.        **
   15         *       **                                                               **
   16         *       **                                                               **
   17         *       *********************************************************************
   18         *       *********************************************************************
   19         *
   20         *
   21         *
   22         *       THE RELEASE DATE OF THIS VERSION OF DTSS EXECUTIVE (NCONTROL SEGMENT) IS:
   23         *
   24                 RDATE   1 JANUARY 1981
   25                 ALTDAT
   26         *
   27                 NAME    NCONTROL
   28         *
```

```
                       29              TTLS    ASSEMBLY CONTROL
                       30       *
                       31       *
                       32       *
                       33              RELOC                         MAKE A RELOCATABLE ASSEMBLY
                       34       *
                       35              LOAD    EIGHT                 LOAD ALL SEGMENTS ON AN EIGHT WORD BOUNDRY
                       36       *
                       37              SOURCE  ON                    LIST ALL SOURCE LINES
                       38       *
                       39              PMC     ON
                       40              PCC     OFF
                       41              CRSM    OFF
                       42       *
                       43       *      INDEX IS SET ON IN THE BEGINNING SO EVERYTHING IS INDEXED.        16AUG74
                       44       *
                       45              USELOK                        DON'T ALLOW DEFINITION OF ANY USE COUNTERS
                       46       *
          000000       47              ORG     0                     START THINGS OUT RIGHT
```

```
                    48                 TTLS     THE INSERT FILE                                                    [01SEP79]
                    49         *                                                                                   [01SEP79]
                    50         *                                                                                   [01SEP79]
                    51         *                                                                                   [01SEP79]
                    52         *       WE WILL TURN THE LISTING OFF FOR THE INSERT FILE                            [01SEP79]
                    53         *                                                                                   [01SEP79]
                    54                 INDEX    OFF             WE DON'T WANT TO SEE THE INSERT FILE TTLS          [01SEP79]
                    55                 LIST     OFF             TURN LISTING OFF, THE NEXT LINE IS SOURCE OFF      [01SEP79]
```

```
                        58                  SOURCE   ON                                                                    [01SEP79]
                        59                  LIST     ON                    LISTING BACK ON                                 [01SEP79]
                        60                  INDEX    ON                    INDEX BACK ON                                   [01SEP79]
```

```
                        61                    TTLS    SYMDEFS AND SYMREFS
                        62          *
                        63          *
                        64          *
                        65                    HEAD    0
                        66          *
                        67          *         SYMDEFS
                        68          *
                        69                    SYMDEF  EXTM06              INSTRUCTION WHICH MUST BE FIXED FOR NON-EXTENDED MEMORY
                        70                    SYMDEF  EXTM07              INSTRUCTION WHICH MUST BE FIXED FOR NON-EXTENDED MEMORY
                        71                    SYMDEF  N$CONX              ADDR OF INST WHICH HANDLES CONNECT FAULTS, DELETED BY DSTART
          000000        72                    APROC   SYMDEF,N$FV         FAULT TRANSFER VECTORS                                      [01SEP79]
                                              SYMDEF  N$FV0
                                              SYMDEF  N$FV1
                        73                    SYMDEF  N$IC                TALLY TO IC/IR STACKS                                       [14MAY77]
          000000        74                    APROC   SYMDEF,N$IC         IC/IR STACK TALLIES                                         [01SEP79]
                                              SYMDEF  N$IC0
                                              SYMDEF  N$IC1
                        75                    SYMDEF  N$JOB               TABLE OF JOB NUMBERS CURRENTLY EXECUTING IN CPUS
                        76                    SYMDEF  N$NOINT             MASK TO TURN OFF INTERRUPTS
                        77                    SYMDEF  N$REG               POINTER TO PLACE TO SAVE REGISTERS
                        78                    SYMDEF  N$RET               ROUTINE TO RETURN TO SLAVE JOB
                        79                    SYMDEF  N$SDIC              PLACE TO SAVE SHUTDOWN IC
                        80                    SYMDEF  N$SDREG             PLACE TO SAVE SHUTDOWN REGISTERS
          000000        81                    APROC   SYMDEF,N$SIC        SLAVE FAULT IC/IR                                           [01SEP79]
                                              SYMDEF  N$SIC0
                                              SYMDEF  N$SIC1
                        82                    SYMDEF  N$SWAIT             THE PLACE TO GO IF THERE ARE NO JOBS TO RUN
                        83                    SYMDEF  TSOP05              PLACE TO SAVE UPSHIFT INSTRUCTION ON 66/X7
                        84                    SYMDEF  TSOP06              PLACE TO SAVE UPSHIFT INSTRUCTION ON 66/X7
                        85                    SYMDEF  X$QLOCK             SEMAPHORE SEIZE ROUTINE
                        86                    SYMDEF  X$QNLCK             SEMAPHORE RELEASE ROUTINE
                        87          *
                        88          *         SYMREFS
                        89          *
                        90                    SYMREF  A$PF0               FLAG -- NON-ZERO IF EXEC IS LOW ON LIST ELEMENT STORAGE
                        91                    SYMREF  EXTMEM              FLAG -- NON-ZERO IF RUNNING WITH EXTENDED MEMORY    [08AUG77]
                        92                    SYMREF  I$FLOG              FLAG -- NON-ZERO IF LOG OUTPUT TO FILE ONLY
                        93                    SYMREF  I$LOG               ROUTINE TO LOG MESSAGES TO CONSOLE AND LOG FILE
                        94                    SYMREF  J$BIT               JOB TABLE -- BITS FOR JOB
                        95                    SYMREF  J$JSFLG             JOB TABLE -- FLAG THAT JOB NEEDS SERVICE            [01JAN81]
                        96                    SYMREF  J$LEN               JOB TABLE -- LENGTH/LOCATION OF JOB
                        97                    SYMREF  J$LOC               JOB TABLE -- LENGTH/LOCATION OF JOB
                        98                    SYMREF  J$LOCS              JOB TABLE -- LENGTH/LOCATION OF STATE VECTOR
                        99                    SYMREF  J$RQ                JOB TABLE -- LINK FOR RUN QUEUE AND PROCESSING QUEUE
                      -+100                    SYMREF  J$RAN               JOB TABLE -- JOB NUMBER OF JOB RESPONSIBLE FOR US   [01JAN81]
                      +101                    SYMREF  J$CTMEL             JOB TABLE -- TIMERS ELIGIBLE FOR CREDIT             [01JAN81]
                       102                    SYMREF  JSQI                JOB TABLE -- INSERT POINTER FOR JOB SERVICE QUEUE   [01JAN81]
                       103                    SYMREF  PROC                TABLE CONTAINING SCU PORT NUMBERS OF PROCESSORS     [01SEP80]
                       104                    SYMREF  RQF                 JOB TABLE -- POINTER TO FIRST JOB ON RUN QUEUE
                       105                    SYMREF  W$SWPIC             NUMBER OF SWAPINS IN PROGRESS                       [14MAY77]
                       106                    SYMREF  X$DABL              MASK TO DISABLE I/O INTERRUPTS
```

SYMDEFS AND SYMREFS

```
                         107        SYMREF   X$ENABL        BITS TO ENABLE I/O INTERRUPTS
            000000       108        APROC    SYMREF,X$FTV    FAULT VECTORS                                          [01SEP79]
                                    SYMREF   X$FTV0
                                    SYMREF   X$FTV1
                         109        SYMREF   X$GTIM         ROUTINE TO RETURN TIMER UNITS SINCE BOOTLOAD IN A
                         110        SYMREF   X$HANG         FLAG -- NON-ZERO WNEH SYSTEM HUNG (DON'T RUN JOBS)
                         111        SYMREF   X$IDLEA        STAS -- TIME SYSTEM IS IDLE
                         112        SYMREF   X$MCHEK        ROUTINE TO CHECK MEMORY FOR CONSISTENCY                  [14MAY77]
                         113        SYMREF   X$MEM          ADDRESS OF MEMORY FOR ISSUING RMCM/SMCM COMMANDS
                         114        SYMREF   X$NCQC         STATS -- NUMBER OF JOBS ON NON-CORE QUEUE
                         115        SYMREF   X$OVERH        STATS -- EXEC OVERHEAD
                         116        SYMREF   X$RQC          STATS -- NUMBER OF JOBS ON RUN QUEUE
                         117        SYMREF   X$SWPCT        STATS
                         118        SYMREF   X$TIME         TIME WHEN TIMER LOADED
                         119        SYMREF   X$TIMEL        LAST VALUE LOADED INTO TIMER
                         120        SYMREF   X$TIMQ         ADDRESS OF FIRST TASK ON TIMED TASK QUEUE
                         121        SYMREF   Z$BAR          BAR OF CRASHING PROCESSOR
                         122        SYMREF   Z$BER          BASE EXTENSION REGISTER OF CRASHING PROC                [08AUG77]
                         123        SYMREF   Z$CUHIS        CONTROL UNIT HISTORY REGISTERS
                         124        SYMREF   Z$DUHIS        DECIMAL (EIS) UNIT HISTORY REGISTERS
                         125        SYMREF   Z$FTREG        FAULT REGISTER FROM CRASHING PROCESSOR
                         126        SYMREF   Z$FTYPE        FAULT TYPE FROM CRASHING PROCESSOR
                         127        SYMREF   Z$IC           IR/IC OF CRASH FOR DUMP AND PRINTOUT                    [05NOV77]
                         128        SYMREF   Z$ININT        THE CRASH INTERRUPT
                         129        SYMREF   Z$INTC         CRASH AND DIE INTERRUPT PAIR
                         130        SYMREF   Z$MBA          MASTER BASE REG A OF CRASHING PROC                      [08AUG77]
                         131        SYMREF   Z$MBB          MASTER BASE REG B OF CRASHING PROC                      [08AUG77]
                         132        SYMREF   Z$MDREG        MODE REGISTER FROM CRASHING PROCESSOR
                         133        SYMREF   Z$OUHIS        OPERATIONS UNIT HISTORY REGISTERS
                         134        SYMREF   Z$PROC         CRASHING PROCESSOR
                         135        SYMREF   Z$REG          REGISTERS FROM CRASH                                    [05NOV77]
                         136        SYMREF   ZOPF           A WORD WHICH, WHEN REFERENCED INDIRECTLY, WILL CAUSE A ZOPF
```

```
        137              TTLS    EXEC ENTRY  --  STACKS                    [05NOV77]
        138      *                                                         [05NOV77]
        139      *       INTERRUPT USAGE FOR 6000 AND SERIES 66 PROCESSORS [05NOV77]
        140      *                                                         [05NOV77]
        141      *       PRIORITY    INTERRUPT                              [05NOV77]
        142      *                                                         [05NOV77]
        143      *        4          SYSTEM FAULT                          [01SEP80]
        144      *       12          INITIATE/TERMINATE                    [01SEP80]
        145      *       20          MARKER(USED TO AWAKEN MASTER)         [01SEP80]
        146      *       28          SPECIAL                               [05NOV77]
        147      *                                                         [05NOV77]
```

```
                              148                    TTLS    MULTIPROCESSING STACKS, TEMPS, AND SUCH
                              149                    HEAD    N
                              150
                              151          *
                              152          *         CURRENT JOB FOR EACH PROCESSOR
                              153          *
            000000            154    JOB        NULL
            000000            155               BSS     $NPROS
                              156          *
                              157          *         INTERRUPT/FAULT ICS ARE STACKED. IF A FAULT OCCURS IN THE          [01MAY79]
                              158          *         FAULT HANDLER THE STACK MAY OVERFLOW. AN EXTRA LEVEL OF            [01MAY79]
                              159          *         INDIRECTION IS USED SO THAT A FAULT WILL OCCUR                     [01MAY79]
                              160          *         IN THE INTERRUPT/FAULT CELL, HANGING THE CP.                      [01MAY79]
                              161          *
                              162    SIC        MACRO
                              163               OCT     0                       BUFFER FOR ERROR TRACING
                              164               OCT     0                       STARTUP FAULT IC CELL
                              165               OCT     0                       SHUTDOWN FAULT IC CELL
                              166    SIC#1      OCT     0                       USER FAULT IC/IR
                              167               ENDM    SIC
                              168                                                                                      [01MAY79]
                              169          *         INDIRECTION FOR STACK                                             [01MAY79]
                              170    SICP       MACRO   <PROC#>                                                        [01MAY79]
                              171               DUP     1,8                     CAPTURE A SERIES OF INTERRUPTS         [01MAY79]
                              172               ARG     0,F                     CAUSE FAULT ON OVERFLOW                [01MAY79]
                              173               ARG     SIC#1-3                 POINTER TO ERROR ENTRY                 [01MAY79]
                              174               ARG     SIC#1-2                  "      "  STARTUP "                   [01MAY79]
                              175               ARG     SIC#1-1                  "      "  SHUTDOWN "                  [01MAY79]
                              176    SICP#1     ARG     SIC#1-0                  "      "  USERFAULT "                  [01MAY79]
                              177               ENDM    SICP                                                          [01MAY79]
                              178                                                                                      [01MAY79]
                              179          *         CONTROL PROCESSOR STACK (SLIGHTLY LARGER)                         [01MAY79]
  000002  000000000000  ..    180               OCT     0                       BUFFER TO CATCH ERRORS
  000003  000000000000  ..    181               OCT     0                       STARTUP FAULT
  000004  000000000000  ..    182               OCT     0                       SHUTDOWN FAULT
  000005  000457 004200  R.   183               ZERO    N$SWAIT,M$OVMSK+M$MMODE  MASTER INTERRUPT - INITIALIZED
  000006  000000000000  ..    184    SICO       OCT     0                       SLAVE FAULT/INTERRUPT
                              185                                                                                      [01MAY79]
                              186               DUP     1,8                     CAPTURE A SERIES OF INTERRUPTS         [01MAY79]
  000007  000000 0000 40 ..   187               ARG     0,F                     CAUSE FAULT ON OVERFLOW                [01MAY79]
  000010  000000 0000 40 ..                     ARG     0,F                     CAUSE FAULT ON OVERFLOW
  000011  000000 0000 40 ..                     ARG     0,F                     CAUSE FAULT ON OVERFLOW
  000012  000000 0000 40 ..                     ARG     0,F                     CAUSE FAULT ON OVERFLOW
  000013  000000 0000 40 ..                     ARG     0,F                     CAUSE FAULT ON OVERFLOW
  000014  000000 0000 40 ..                     ARG     0,F                     CAUSE FAULT ON OVERFLOW
  000015  000000 0000 40 ..                     ARG     0,F                     CAUSE FAULT ON OVERFLOW
  000016  000000 0000 40 ..                     ARG     0,F                     CAUSE FAULT ON OVERFLOW
  000017  0C0002 0000 00 R.   188               ARG     SICO-4                  POINTER TO ERROR ENTRY                 [01MAY79]
  000020  000003 0000 00 R.   189               ARG     SICO-3                   "      "  STARTUP "                   [01MAY79]
  000021  000004 0000 00 R.   190               ARG     SICO-2                   "      "  SHUTDOWN "                  [01MAY79]
  000022  000005 0000 00 R.   191               ARG     SICO-1                   "      "  MASTER INTERRUPT            [01MAY79]
  000023  000006 0000 00 R.   192    SICPO      ARG     SICO-0                   "      "  USERFAULT "                 [01MAY79]
```

```
                                    193                                                                              [01MAY79]
                                    194      *          NON-CONTROL PROCESSORS                                       [01MAY79]
                                    195      *                                                                       [01MAY79]
                        000024      196             SPROC    SIC                                                     [01MAY79]
                        000024                      SIC      1
      000024  000000000000  ..                      OCT      0                   BUFFER FOR ERROR TRACING
      000025  000000000000  ..                      OCT      0                   STARTUP FAULT IC CELL
      000026  000000000000  ..                      OCT      0                   SHUTDOWN FAULT IC CELL
      000027  000000000000  ..             SIC1     OCT      0                   USER FAULT IC/IR
                        000030      197             SPROC    SICP                                                    [01MAY79]
                        000030                      SICP     1
                                                    DUP      1,8                 CAPTURE A SERIES OF INTERRUPTS
      000030  000000 0000 40  ..                    ARG      0,F                 CAUSE FAULT ON OVERFLOW
      000031  000000 0000 40  ..                    ARG      0,F                 CAUSE FAULT ON OVERFLOW
      000032  000000 0000 40  ..                    ARG      0,F                 CAUSE FAULT ON OVERFLOW
      000033  000000 0000 40  ..                    ARG      0,F                 CAUSE FAULT ON OVERFLOW
      000034  000000 0000 40  ..                    ARG      0,F                 CAUSE FAULT ON OVERFLOW
      000035  000000 0000 40  ..                    ARG      0,F                 CAUSE FAULT ON OVERFLOW
      000036  000000 0000 40  ..                    ARG      0,F                 CAUSE FAULT ON OVERFLOW
      000037  000000 0000 40  ..                    ARG      0,F                 CAUSE FAULT ON OVERFLOW
      000040  000024 0000 00  R.                    ARG      SIC1-3              POINTER TO ERROR ENTRY
      000041  000025 0000 00  R.                    ARG      SIC1-2                "      " STARTUP "
      000042  000026 0000 00  R.                    ARG      SIC1-1                "      " SHUTDOWN "
      000043  000027 0000 00  R.             SICP1   ARG      SIC1-0                "      " USERFAULT "
                                    198      *
                                    199      *          TALLY POINTERS FOR STACKS
                                    200      *
                                    201      IC       MACRO
                                    202      IC#1     TALLYC   SICP#1,0,*          TALLY WORD FOR IC STACK             [01MAY79]
                                    203               ENDM     IC                                                    [01MAY79]
                                    204                                                                              [01MAY79]
                        000044      205      IC       NULL                                                           [01MAY79]
      000044  000022 0001 20  R.    206      IC0      TALLYC   SICP0-1,1,*         CONTROL PROCESSOR -- SET FOR STARTUP [01MAY79]
                                    207                                                                              [01MAY79]
                        000045      208               SPROC    IC                 NON-CONTROL PROCESSORS
                        000045                      IC       1
      000045  000043 0000 20  R.             IC1      TALLYC   SICP1,0,*           TALLY WORD FOR IC STACK
                                    209      *
                                    210      *          REGISTER STORAGE AREAS
                                    211      *
                                    212      SREGS    MACRO
                                    213               EIGHT
                                    214      SREG#1   BSS      8                   REGISTER STORAGE ON FAULT
                                    215               BSS      8                   SHUTDOWN REGISTER STORAGE
                                    216               ENDM     SREGS
                                    217      REGP     MACRO
                                    218               ARG      SREG#1
                                    219               ENDM     REGP
                                    220      SDREG    MACRO
                                    221               ARG      SREG#1+8            SHUTDOWN REGISTER STORAGE
                                    222               ENDM     SDREG
                        000046      223               APROC    SREGS              GENERATE STORAGE AREA
```

```
               000046                      SREGS   0
000046  000002710004
               000050                      EIGHT
               000050           SREG0       BSS     8                  REGISTER STORAGE ON FAULT
               000060                       BSS     8                  SHUTDOWN REGISTER STORAGE
               000070                      SREGS   1
               000070                       EIGHT
               000070           SREG1       BSS     8                  REGISTER STORAGE ON FAULT
               000100                       BSS     8                  SHUTDOWN REGISTER STORAGE
               000110    224                EIGHT
                         225                HEAD    N
               000110    226   REG          APROC   REGP              POINTERS FOR FAULTS
               000110                        REGP   0
000110  000050 0000 00 R.                    ARG    SREG0
               000111                        REGP   1
000111  000070 0000 00 R.                    ARG    SREG1
               000112    227   MREG         APROC   REGP              POINTERS TO MASTER MODE REGISTER STORAGE
               000112                        REGP   0
000112  000050 0000 00 R.                    ARG    SREG0
               000113                        REGP   1
000113  000070 0000 00 R.                    ARG    SREG1
               000114    228   SDREG        APROC   SDREG             POINTERS FOR SHUTDOWN FAULTS
               000114                       SDREG   0
000114  000060 0000 00 R.                    ARG    SREG0+8          SHUTDOWN REGISTER STORAGE
               000115                       SDREG   1
000115  000100 0000 00 R.                    ARG    SREG1+8          SHUTDOWN REGISTER STORAGE
                         229   *
                         230   *            MISCELLANEOUS FOR SHUTDOWN FAULTS
                         231   *
               000116    232   SDBAR        BSS     $NPROS           SAVED BAR ON SHUTDOWN FAULT
               000120    233   SDIC         NULL
                         234                DUP     1,$NPROS
000120  000000000000  .. 235                OCT     0                IC ON SHUTDOWN FAULT
000121  000000000000  .. 236                OCT     0                IC ON SHUTDOWN FAULT
               000122    236                EVEN
               000122    237   SDMCM        BSS     2                CONTROLLER MASK ON SHUTDOWN
                         238
                         239   SDT          MACRO
                         240                XED     X$FTV#1+0        FAKE A SHUTDOWN FAULT
                         241                ENDM    SDT
               000124    242   SDT          APROC   SDT              FOR SLAVE SHUTDOWN FAULTS
               000124                       SDT     0
000124  000000 7170 00 X.                   XED     X$FTV0+0         FAKE A SHUTDOWN FAULT
               000125                       SDT     1
000125  000000 7170 00 X.                   XED     X$FTV1+0         FAKE A SHUTDOWN FAULT
                         243   *
                         244   *            SEMAPHORE LOCK/UNLOCK ROUTINES                                [17OCT76]
                         245   *
                         246                HEAD    X
                         247
               000126    248   QLOCK        EVEN
                         249                INHIB   ON               DON'T INTERRUPT WITH SEMAPHORE SIEZED  [01SEP80]
```

                   X   MULTIPROCESSING STACKS, TEMPS, AND SUCH   RELEASED 01JAN81

```
    000126   000136 2142 00 R.     250                    SZNC      QLKWD           ATTEMPT TO LOWER SEMAPHORE                [08AUG77]
    000127   000000 6042 10 ..     251                    TMI       0,0             RETURN IF WE GOT IT                       [08AUG77]
                                   252                    INHIB     OFF                                                       [08AUG77]
    000130   000000 7740 00 ..     253                    GTB                       DELAY                                     [08AUG77]
    000131   000000 7740 00 ..     254                    GTB                       DELAY
    000132   000126 7100 00 R.     255                    TRA       QLOCK           AND TRY AGAIN
    000133   000000011007
             000134                256          QNLCK     EVEN
    000134   000001 3360 07 ..     257                    LCQ       1,DL            GET A MINUS ONE
    000135   000136 7560 00 R.     258                    STQ       QLKWD           UP SEMAPHORE                              [08AUG77]
                                   259          *
                                   260          *
                                   261          *         THE QLOCK SEMAPHORE WORD
                                   262          *
    000136   777777777776   ..     263          QLKWD     DEC       -2
```

```
                              264                TTLS    MULTIPROCESSING - FAULT RECOGNITION
                              265                HEAD    N
                              266
                              267                INHIB   ON                      SENSITIVE CODE                      [01SEP80]
                              268        *
                              269        *       THIS CODE IS ENTERED FROM THE MASTER MODE FAULT
                              270        *       VECTOR BY THE XED OF A PAIR OF INSTRUCTIONS SUCH
                              271        *       AS
                              272        *
                              273        *       STC1    IC#N,DIC                SAVE IC                             [01MAY79]
                              274        *       TRA     */2-FTV#N/2+FV#N
                              275        *
                              276       FV        MACRO
                              277                EIGHT                           FOR HANDY DEBUGGING
                              278       FV#1     NULL                            IMAGE OF FAULT VECTOR
                              279                DUP     1,16
                              280                XED     FREG#1                  SAVE REGS AND REMEMBER CPU NUMBER
                              281                ENDM    FV
                              282       FREG      MACRO
                              283                EVEN
                              284       FREG#1   SREG    REG+#1,I                SAVE USER REGISTERS                 [09DEC79]
                              285                TSXO    *+1                     REMEMBER FAULT NUMBER
                              286                LDX     P,#1,DU                 SET P TO CPU NUMBER
                              287                SBXO    FV#1+1,DU               GET ACTUAL FAULT NUMBER IN X0
                              288                TRA     ENTER                   ENTER COMMON FAULT HANDLER
                              289                ENDM    FREG
             000137          290                APROC   FV
             000137                               FV      0
000137  000001710204
             000140                               EIGHT                         FOR HANDY DEBUGGING
             000140                       FV0     NULL                          IMAGE OF FAULT VECTOR
                                                 DUP     1,16
000140  000200 7172 00 R.                         XED     FREG0                  SAVE REGS AND REMEMBER CPU NUMBER
000141  000200 7172 00 R.                         XED     FREG0                  SAVE REGS AND REMEMBER CPU NUMBER
000142  000200 7172 00 R.                         XED     FREG0                  SAVE REGS AND REMEMBER CPU NUMBER
000143  000200 7172 00 R.                         XED     FREG0                  SAVE REGS AND REMEMBER CPU NUMBER
000144  000200 7172 00 R.                         XED     FREG0                  SAVE REGS AND REMEMBER CPU NUMBER
000145  000200 7172 00 R.                         XED     FREG0                  SAVE REGS AND REMEMBER CPU NUMBER
000146  000200 7172 00 R.                         XED     FREG0                  SAVE REGS AND REMEMBER CPU NUMBER
000147  000200 7172 00 R.                         XED     FREG0                  SAVE REGS AND REMEMBER CPU NUMBER
000150  000200 7172 00 R.                         XED     FREG0                  SAVE REGS AND REMEMBER CPU NUMBER
000151  000200 7172 00 R.                         XED     FREG0                  SAVE REGS AND REMEMBER CPU NUMBER
000152  000200 7172 00 R.                         XED     FREG0                  SAVE REGS AND REMEMBER CPU NUMBER
000153  000200 7172 00 R.                         XED     FREG0                  SAVE REGS AND REMEMBER CPU NUMBER
000154  000200 7172 00 R.                         XED     FREG0                  SAVE REGS AND REMEMBER CPU NUMBER
000155  000200 7172 00 R.                         XED     FREG0                  SAVE REGS AND REMEMBER CPU NUMBER
000156  000200 7172 00 R.                         XED     FREG0                  SAVE REGS AND REMEMBER CPU NUMBER
000157  000200 7172 00 R.                         XED     FREG0                  SAVE REGS AND REMEMBER CPU NUMBER
             000160                               FV      1
             000160                               EIGHT                         FOR HANDY DEBUGGING
             000160                       FV1     NULL                          IMAGE OF FAULT VECTOR
                                                 DUP     1,16
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000160   000206 7172 00 R.                XED     FREG1          SAVE REGS AND REMEMBER CPU NUMBER
000161   000206 7172 00 R.                XED     FREG1          SAVE REGS AND REMEMBER CPU NUMBER
000162   000206 7172 00 R.                XED     FREG1          SAVE REGS AND REMEMBER CPU NUMBER
000163   000206 7172 00 R.                XED     FREG1          SAVE REGS AND REMEMBER CPU NUMBER
000164   000206 7172 00 R.                XED     FREG1          SAVE REGS AND REMEMBER CPU NUMBER
000165   000206 7172 00 R.                XED     FREG1          SAVE REGS AND REMEMBER CPU NUMBER
000166   000206 7172 00 R.                XED     FREG1          SAVE REGS AND REMEMBER CPU NUMBER
000167   000206 7172 00 R.                XED     FREG1          SAVE REGS AND REMEMBER CPU NUMBER
000170   000206 7172 00 R.                XED     FREG1          SAVE REGS AND REMEMBER CPU NUMBER
000171   000206 7172 00 R.                XED     FREG1          SAVE REGS AND REMEMBER CPU NUMBER
000172   000206 7172 00 R.                XED     FREG1          SAVE REGS AND REMEMBER CPU NUMBER
000173   000206 7172 00 R.                XED     FREG1          SAVE REGS AND REMEMBER CPU NUMBER
000174   000206 7172 00 R.                XED     FREG1          SAVE REGS AND REMEMBER CPU NUMBER
000175   000206 7172 00 R.                XED     FREG1          SAVE REGS AND REMEMBER CPU NUMBER
000176   000206 7172 00 R.                XED     FREG1          SAVE REGS AND REMEMBER CPU NUMBER
000177   000206 7172 00 R.                XED     FREG1          SAVE REGS AND REMEMBER CPU NUMBER
         000200         291               APROC   FREG
         000200                           FREG    0
         000200                           EVEN
000200   000110 7532 51 R.        FREG0   SREG    REG+0,I        SAVE USER REGISTERS
000201   000202 7002 00 R.                TSX0    *+1            REMEMBER FAULT NUMBER
000202   000000 2262 03 ..                LDX     P,0,DU         SET P TO CPU NUMBER
000203   000141 1602 03 R.                SBX0    FV0+1,DU       GET ACTUAL FAULT NUMBER IN X0
000204   000213 7102 00 R.                TRA     ENTER          ENTER COMMON FAULT HANDLER
         000205                           FREG    1
000205   000000011207
         000206                           EVEN
000206   000111 7532 51 R.        FREG1   SREG    REG+1,I        SAVE USER REGISTERS
000207   000210 7002 00 R.                TSX0    *+1            REMEMBER FAULT NUMBER
000210   000001 2262 03 ..                LDX     P,1,DU         SET P TO CPU NUMBER
000211   000161 1602 03 R.                SBX0    FV1+1,DU       GET ACTUAL FAULT NUMBER IN X0
000212   000213 7102 00 R.                TRA     ENTER          ENTER COMMON FAULT HANDLER
         000213         292       FREGX   NULL                   NOTE END OF VULNERABLE AREA
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                              293                 TTLS    NON-CONTROL PROCESSOR EXECUTIVE
                              294                 HEAD    N                 N FOR NON-CONTROL
                              295
                              296          *
                              297          *      THIS ROUTINE RUNS IN ALL NON-CONTROL PROCESSORS, AND IN THE
                              298          *      CONTROL PROCESSOR WHEN THE CONTROL PROCESSOR ROUTINES ARE
                              299          *      IDLE.  IT REMOVES JOBS FROM THE SLAVE INPUT QUEUE ($RQF)
                              300          *      RUNS THEM, AND RETURNS THEM TO THE CONTROL EXEC.
                              301          *
              000213          302   ENTER  NULL                      ENTER HERE FROM FAULT PROCESSING ROUTINE
                              303          INHIB   ON                SENSITIVE CODE                                    [01SEP80]
                              304          *
                              305          *      CHECK FOR MASTER MODE FAULT
                              306          *
000213  000653 6072 00 R.     307          TTF     MFT               SKIP OUT IF MASTER MODE FAULT
              000214          308   ENTO   NULL                      ENTRY AFTER MASTER LOCKUP FAULT
000214  004200 6342 07 ..     309          LDI     M$OVMSK+M$MMODE,DL   MASK OFF OVERFLOWS
                              310          *
                              311          ******************************
                              312          *IOM
                              313          IFE     IOMFLG,1,%MARK
                              314          *
000215  000000 0112 03 ..     315   TSOP05 NOP     0,DU              SPACE FOR LCPR INST. ON 66/X7                     [30DEC76]
000216  001030 6742 04 R.     316          LCPR    UNLCK,04          UNLOCK THE HISTORY REGS ON A SLAVE FAULT
000217  001026 4522 01 R.     317          SCPR    JUNK,01           SAVE FAULT REGISTER TO CLEAR IT
                              318
                              319          *
                              320   MARK   MARK
                              321          *IOM
                              322          ******************************
                              323          *
                              324          *
                              325          *      FAULT FROM SLAVE MODE - SAVE IC AND REGISTERS
                              326          *
                              327          *                                                                          [17OCT76]
                              328          *      SLAVE MODE FAULT HANDLING                                           [17OCT76]
                              329          *                                                                          [17OCT76]
                              330          *      BRANCH ON TYPE OF FAULT; MOST FAULTS ARE RETURNED TO THE USER.      [17OCT76]
                              331          *      SOME CAUSE THE JOB TO BE RETURNED TO MASTER EXEC PROCESSING.        [17OCT76]
                              332          *                                                                          [17OCT76]
000220  000000 2252 16 R.     333          LDX     J,JOB,P           GET THE NUMBER OF THE JOB ACTIVE IN THIS PROCESSOR [17OCT76]
000221  000110 2272 16 R.     334          LDX     S,REG,P           GET A POINTER TO THE STATE VECTOR OF THAT JOB     [17OCT76]
000222  000112 2352 16 R.     335          LDA     MREG,P            GET THE ADDRESS OF THE MASTER MODE REGISTER SAVE AREA
000223  000110 7552 16 R.     336          STA     REG,P             SET IT UP AS THE REGULAR POINTER                 [17OCT76]
                              337          INHIB   OFF               END OF DANGER ZONE                               [17OCT76]
000224  000020 1000 03 ..     338          CMPX0   16,DU             IS THE FAULT IN RANGE?                           [17OCT76]
000225  000000 6030 20 X.     339          TRC     $ZOPF,*           IF NOT, WE BLEW IT                               [17OCT76]
000226  000227 7100 30 R.     340          TRA     *+1,0*            BRANCH ON FAULT TYPE                             [17OCT76]
                              341          *                                                                          [17OCT76]
                              342          *      TRANSFER TABLE                                                      [17OCT76]
                              343          *                                                                          [17OCT76]
000227  000247 7100 00 R.     344          TRA     SSDF              SHUTDOWN FAULT  --  STOP THIS PROCESSOR          [17OCT76]
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000230  000272 7100 00 R.   345            TRA     USERF           MEMORY FAULT  --  RETURN TO USER                       [17OCT76]
000231  000253 7100 00 R.   346            TRA     MME             MME FAULT  --  QUEUE FOR MASTER EXEC PROCESSING        [17OCT76]
000232  000272 7100 00 R.   347            TRA     USERF           FAULT TAG  --  RETURN TO USER                         [17OCT76]
000233  000322 7100 00 R.   348            TRA     CONT            TIMER FAULT  --  IGNORE, BUT RETURN JOB TO MASTER EXEC
000234  000267 7100 00 R.   349            TRA     CMD             COMMAND FAULT  --  RETURN TO USER, CRASH SYSTEM IF MONITOR
000235  000272 7100 00 R.   350            TRA     USERF           DERAIL  --  RETURN TO USER                            [17OCT76]
000236  000272 7100 00 R.   351            TRA     USERF           LOCKUP  --  RETURN TO USER                            [17OCT76]
000237  000260 7100 00 R.   352            TRA     CON             CONNECT  --  IGNORE, BUT RETURN JOB TO MASTER EXEC    [17OCT76]
000240  000264 7100 00 R.   353            TRA     PAR             PARITY  --  RETURN TO MASTER EXEC TO BE ABORTED       [17OCT76]
000241  000272 7100 00 R.   354            TRA     USERF           ZOP FAULT  --  RETURN TO USER                         [17OCT76]
000242  000272 7100 00 R.   355            TRA     USERF           ONC FAULT  --  RETURN TO USER                         [17OCT76]
000243  000000 7100 20 X.   356            TRA     $ZOPF,*         STARTUP FAULT (NEVER FROM SLAVE MODE)                 [17OCT76]
000244  000272 7100 00 R.   357            TRA     USERF           OVERFLOW FAULT  --  RETURN TO USER                    [17OCT76]
000245  000272 7100 00 R.   358            TRA     USERF           DIVIDE CHECK FAULT  --  RETURN TO USER                [17OCT76]
000246  000000 7100 20 X.   359            TRA     $ZOPF,*         EXECUTE FAULT  --  SOMEBODY HIT THE BUTTON            [17OCT76]
                            360      *                                                                                   [17OCT76]
                            361      *          SHUT DOWN FAULT  --  RETURN SLAVE JOB TO MASTER PROCESSOR                [17OCT76]
                            362      *          AS THOUGH ITS TIMER HAD RUN OUT.  THEN SHUT DOWN THIS PROCESSOR.         [17OCT76]
                            363      *                                                                                   [17OCT76]
          000247           364  SSDF    NULL                                                                            [17OCT76]
000247  000004 2210 03 ..   365            LDX     X,B$TROF,DU     TELL MASTER EXEC TO RESCHEDULE                        [17OCT76]
000250  000035 7410 17 ..   366            STX     X,S$FTYPE,S     SET REASON FOR RETURN IN STATE VECTOR                 [17OCT76]
000251  001014 5540 16 R.   367            STC1    SDFG,P          FLAG PROCESSOR AS SHUTTING DOWN                       [17OCT76]
000252  000322 7100 00 R.   368            TRA     CONT            COMMON FAULT CLEANUP                                  [17OCT76]
                            369      *                                                                                   [17OCT76]
                            370      *          MME FAULT  --  IF JOB IS SQUEEZED, RETURN FAULT.  OTHERWISE,             [17OCT76]
                            371      *          RETURN JOB TO MASTER EXEC FOR PROCESSING.                               [17OCT76]
                            372      *                                                                                   [17OCT76]
          000253           373  MME     NULL                                                                            [17OCT76]
000253  000031 2340 17 ..   374            SZN     S$BARS,S        WAS JOB SQUEEZED?                                     [17OCT76]
000254  000272 6010 00 R.   375            TNZ     USERF           IF SO, HANDLE LIKE OTHER USER FAULTS                  [17OCT76]
000255  000001 2210 03 ..   376            LDX     X,B$MME,DU      TELL MASTER EXEC TO HANDLE A MME                      [17OCT76]
000256  000035 7410 17 ..   377            STX     X,S$FTYPE,S     SET REASON IN STATE VECTOR                            [17OCT76]
000257  000322 7100 00 R.   378            TRA     CONT            COMMON FAULT CLEANUP                                  [17OCT76]
                            379      *                                                                                   [17OCT76]
                            380      *          CONNECT FAULT  --  RETURN SLAVE JOB TO MASTER PROCESSOR AS               [17OCT76]
                            381      *          THOUGH THE TIMER HAD RUN OUT.  THEN PICK UP FIRST JOB ON RQ.             [17OCT76]
                            382      *                                                                                   [17OCT76]
          000260           383  CON     NULL                                                                            [17OCT76]
000260  000017 0540 00 X.   384            AOS     X$SWPCT+15      COUNT CONNECT FAULTS PROCESSED                        [01FEB77]
000261  000004 2210 03 ..   385            LDX     X,B$TROF,DU     TELL MASTER EXEC TO RESCHEDULE                        [17OCT76]
000262  000035 7410 17 ..   386            STX     X,S$FTYPE,S     SET IN JOBS STATE VECTOR                              [17OCT76]
000263  000322 7100 00 R.   387            TRA     CONT            COMMON FAULT CLEANUP                                  [17OCT76]
                            388      *                                                                                   [17OCT76]
                            389      *          PARITY FAULT  --  SLAVE JOB WILL BE ABORTED... RETURN TO MASTER EXEC     [17OCT76]
                            390      *                                                                                   [17OCT76]
          000264           391  PAR     NULL                                                                            [17OCT76]
000264  000003 2210 03 ..   392            LDX     X,B$PAR,DU      GET THE PARITY FAULT CODE                             [17OCT76]
000265  000035 7410 17 ..   393            STX     X,S$FTYPE,S     SET IT IN THE STATE VECTOR                            [17OCT76]
000266  000322 7100 00 R.   394            TRA     CONT            COMMON FAULT CLEANUP                                  [17OCT76]
                            395      *                                                                                   [01FEB77]
                            396      *          COMMAND FAULT - IF A SLAVE MODURE WHICH HAS THE B$CRASH BIT GETS         [01FEB77]
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                              397        *        ONE OF THESE, CRASH THE SYSTEM.                                          [01FEB77]
                              398        *                                                                                 [01FEB77]
                   000267     399    CMD      NULL                                                                         [01FEB77]
000267  000000 2210 15 X. -+400             LDX      X,J$RAN,J          IF IT'S ABOVE THE MONITOR LEVEL                    [01JAN81]
000270  000002 1010 03 ..  +401             CMPX     X,2,DU             ...CRASH THE SYSTEM                                [01JAN81]
000271  000667 6020 00 R.  +402             TNC      MFT1                                                                  [01JAN81]
                              403                                       OTHERWISE PROCESS LIKE ANY OTHER FAULT             [01FEB77]
                              404        *                                                                                 [17OCT76]
                              405        *        USER FAULT  --  A USER JOB RECEIVES A FAULT BY HAVING ITS                [17OCT76]
                              406        *        IC/IR AT THE TIME OF THE FAULT SAVED IN THE FIRST WORD OF THE            [17OCT76]
                              407        *        APPROPRIATE FAULT CELL IN HIS LOW CORE AND CONTROL PASSED TO THE         [17OCT76]
                              408        *        SECOND WORD.  IF THE FIRST WORD OF THE FAULT CELL IS NON-ZERO            [17OCT76]
                              409        *        (THUS PRESUMABLY CONTAINING THE IC/IR OF AN EARLIER FAULT WHICH          [17OCT76]
                              410        *        HAS NOT YET BEEN PROCESSED), THE JOB IS SUSPENDED AND THE SUPRA-JOB      [17OCT76]
                              411        *        IS GIVEN THE OPTION OF ABORTING OR CONTINUING IT.                        [17OCT76]
                              412        *                                                                                 [17OCT76]
                   000272     413    USERF    NULL                                                                         [17OCT76]
000272  000000 6360 10 ..    414             EAQ      0,0               MOVE THE FAULT TYPE NUMBER TO Q                    [17OCT76]
000273  000001 7360 00 ..    415             QLS      1                 MULTIPLY BY 2 TO GET THE ADDRESS OF THE APPROPRIATE CELL
000274  000001 6350 02 ..    416             EAA      1,QU              GET ADDRESS OF THE SECOND WORD OF THE CELL         [17OCT76]
000275  001006 7550 16 R.    417             STA      JTEMP,P           STORE THE IC AT WHICH TO RESTART THE JOB           [17OCT76]
000276  000000 6210 02 ..    418             EAX      X,0,QU            PUT RELATIVE FAULT CELL ADDRESS IN X               [08AUG77]
000277  000044 2350 36 R.    419             LDA      IC,P*             PICK UP IC/IR AT TIME OF FAULT                     [17OCT76]
000300  777737 3750 07 ..    420             ANA      -1-M$MWRD,DL      MASK TO JUST IR BITS THAT SHOULD BE FORWARDED      [17OCT76]
000301  001006 0750 16 R.    421             ADA      JTEMP,P           GET ENTIRE IC/IR FOR RESTART                       [17OCT76]
000302  000044 2360 36 R.    422             LDQ      IC,P*             GET OLD IC/IR                                      [17OCT76]
000303  000044 7550 36 R.    423             STA      IC,P*             SET NEW IC/IR                                      [17OCT76]
000304  000031 2340 17 ..    424             SZN      S$BARS,S          WAS JOB SQUEEZED?                                  [17OCT76]
000305  000311 6000 00 R.    425             TZE      USRF1             IF NOT SKIP AHEAD                                  [17OCT76]
                              426        *                                                                                 [17OCT76]
                              427        *        UNSQUEEZE JOB                                                            [17OCT76]
                              428        *                                                                                 [17OCT76]
000306  000001 0760 07 ..    429             ADQ      1,DL              SET FAKE IR FLAG SAYING FAULT FROM SQUEEZED MODE   [17OCT76]
000307  000031 4500 17 ..    430             STZ      S$BARS,S          JOB IS NO LONGER SQUEEZED                          [17OCT76]
000310  000531 7000 00 R.    431             TSX0     LBAR              LOAD BARS FOR THIS JOB                             [08AUG77]
                              432                                                                                          [08AUG77]
                   000311     433    USRF1    NULL                                                                         [08AUG77]
000311  001016 0610 16 R.    434             ADX      X,JBASE,P         GET AN "ABSOLUTE" ADDRESS FOR THE FAULT CELL       [08AUG77]
000312  000000 2354 11 ..    435    EXTM06   MLDA     0,X               FIRST LOAD THE FAULT CELL                         [08AUG77]
000313  000000 7564 11 ..    436    EXTM07   MSTQ     0,X               SAVE THE NEW IC/IR                                 [08AUG77]
000314  000322 6000 00 R.    437             TZE      CONT              IF IT WASN'T DIRTY, COMMON FAULT EXIT              [17OCT76]
000315  000002 2210 03 ..    438             LDX      X,B$DIR,DU        FLAG THAT JOB HAD A DIRTY FAULT VECTOR             [17OCT76]
000316  000035 7410 17 ..    439             STX      X,S$FTYPE,S       SAVE FLAG IN STATE VECTOR                          [17OCT76]
000317  000000 2210 15 X. -+440             LDX      X,J$RAN,J         IF IT'S ABOVE MONITOR LEVEL...                     [01JAN81]
000320  000002 1010 03 ..  +441             CMPX     X,2,DU            ...CRASH THE SYSTEM                                [01JAN81]
000321  000667 6020 00 R.  +442             TNC      MFT1                                                                 [01JAN81]
000322  000072 2350 17 ..  +443    CONT     LDA      S$PTIMR,S         GET PREVIOUS INTERRUPT TIMER                       [01JAN81]
000323  000007 4540 17 ..  +444             STT      S$REG+7,S         CHARGE USER FOR TIME UNTIL NOW                     [01JAN81]
000324  000007 2360 17 ..  +445             LDQ      S$REG+7,S         UPDATE PREVIOUS INTERRUPT TIMER                    [01JAN81]
000325  000072 7560 17 ..  +446             STQ      S$PTIMR,S                                                            [01JAN81]
000326  000007 1750 17 ..  +447             SBA      S$REG+7,S         GET TIME FOR CREDIT ELIGIBILITY                    [01JAN81]
000327  000000 0550 15 X.  +448             ASA      J$CTMEL,J         UPDATE ELIGIBILTY COUNTER                          [01JAN81]
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       000330  000007 2340 17 ..   449              SZN     S$REG+7,S      HAS HIS TIMER RUN OUT?                           [17OCT76]
       000331  000336 6050 00 R.   450              TPL     CONT2          IF NOT, WE MAY CONTINUE HIM                      [17OCT76]
       000332  000035 2210 17 ..   451              LDX     X,S$FTYPE,S    IS THE JOB GOING TO THE MASTER EXEC ANYWAY?      [17OCT76]
       000333  000336 6010 00 R.   452              TNZ     CONT2          IF SO, IGNORE THE FACT THAT HIS TIMER HAS RUN OUT [17OCT76]
       000334  000004 2210 03 ..   453              LDX     X,B$TROF,DU    TELL THE MASTER EXEC TO RESCHEDULE HIM           [17OCT76]
       000335  000035 7410 17 ..   454              STX     X,S$FTYPE,S    SAVE FLAG IN STATE VECTOR                        [17OCT76]
               000336            455      CONT2     NULL                                                                    [17OCT76]
       000336  000035 2210 17 ..   456      CONT2   LDX     X,S$FTYPE,S    HAVE WE SET A REASON FOR MASTER EXEC PROCESSING? [17OCT76]
       000337  000343 6010 00 R.   457              TNZ     SEND           IF WE DO, GO SEND IT OFF                         [17OCT76]
       000340  000006 0540 00 X.   458              AOS     X$SWPCT+6      COUNT FAULTS PROCESSED BY SLAVE EXEC             [01FEB77]
                                   459              INHIB   ON             BETTER BE CAREFUL IN HERE                        [17OCT76]
       000341  000110 7472 16 R.   460              STX     S,REG,P        ON FAULTS, USE STATE VECTOR TO SAVE REGISTERS    [17OCT76]
       000342  001001 7102 16 R.   461              TRA     RET,P          RETURN TO SLAVE MODE                             [17OCT76]
                                   462      *                                                                              [17OCT76]
                                   463      *        SET UP JOB TO RETURN TO MASTER EXEC                                    [17OCT76]
                                   464      *                                                                              [17OCT76]
               000343            465      SEND      NULL                                                                    [17OCT76]
       000343  000007 2352 17 ..   466              LDA     S$REG+7,S      GET TIMER REGISTER AT TIME OF FAULT              [13MAY76]
       000344  001012 7552 16 R.   467              STA     TIMR,P         SAVE AS TIMER ENTERING EXEC                      [13MAY76]
       000345  000044 2352 36 R.   468              LDA     IC,P*          GET USER'S IC
       000346  000030 7552 17 ..   469              STA     S$IC,S         SAVE IN STATE VECTOR
                                   470              IFE     IOMFLG,1,2
       000347  000010 4436 17 ..   471      EIS009  SAREG   S$AREG,S       SAVE USER ADD. REGS (DELETED IF NON-EIS)
       000350  000020 4476 17 ..   472      EIS010  SPL     S$PTLEN,S      SAVE USER PTRS & LENS (DELETED IF NON-EIS)
       000351  200000 2352 07 ..   473              LDA     B$ENTRY,DL     GET EXEC ENTRY BIT
       000352  000047 2552 17 ..   474              ORSA    S$BIT,S        SET IN STATE VECTOR BITS
               000353            475      SEND1     NULL                                                                    [17OCT76]
               000353            476              QLOCK                   SIEZE MULTIPROCESSING QUEUE
       000353  000126 7002 00 R.                    TSX0    X$QLOCK        LOWER THE SEMAPHORE
                                   477      *
                                   478      *        SET INTERRUPT TO CALL CONTROL PROCESSOR
                                   479      *
       000354  001003 2352 00 R.   480              LDA     WKINT          GET INTERRUPT
       000355  000000 4512 00 X.   481              SMIC    X$MEM          SET IT PENDING
                                   482      *
                                   483      *        PLACE JOB ON QUEUE FOR MASTER PROCESSING
                                   484      *
       000356  000000 2212 00 X.   485              LDX     X,$JSQI        GET INSERT POINTER TO JSQ                        [01JAN81]
       000357  000000 7452 11 X.   486              STX     J,J$RQ,X       INSERT NEW JOB ON QUEUE                          [01JAN81]
       000360  000000 7452 00 X.   487              STX     J,$JSQI        SET NEW INSERT POINTER                           [01JAN81]
       000361  000000 2212 03 ..   488              LDX     X,0,DU         CLEAR XR-X                                       [01JAN81]
       000362  000000 7412 15 X.   489              STX     X,J$RQ,J       MARK END OF QUEUE                                [01JAN81]
       000363  000000 4452 15 X.   490              SXL     J,J$JSFLG,J    NOTE THAT THIS JOB NEEDS SERVICE                 [01JAN81]
       000364  000000 4502 16 R.   491              STZ     JOB,P          SHOW NO JOB RUNNINT NOW
               000365            492              QNLOCK                  RELEASE MULTIPROCESSING QUEUES
       000365  000134 7172 00 R.                    XED     X$QNLCK        RAISE THE SEMAPHORE
                                   493      *                                                                              [17OCT76]
                                   494      *        IF SHUT DOWN FAULT OCCURED, SIMULATE MASTER SHUT DOWN FAULT            [17OCT76]
                                   495      *        TO KILL PROCESSOR.                                                    [17OCT76]
                                   496      *                                                                              [17OCT76]
       000366  001014 2342 16 R.   497              SZN     SDFG,P         IS THE SHUTDOWN FAULT FLAG SET?                  [17OCT76]
       000367  000372 6002 00 R.   498              TZE     *+3            I DIDN'T THINK SO                                [17OCT76]
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000370   001014 4502 16 R.    499              STZ      SDFG,P           CLEAR IT AND PROCESS IT                           [170CT76]
000371   000124 7162 16 R.    500              XEC      SDT,P            PRETEND WE JUST GOT ONE NOW                       [170CT76]
                              501      *                                                                                  [170CT76]
                              502              INHIB    OFF              TAKE ANY PENDING FAULTS/AWAKES                    [170CT76]
                              503      *
                              504      *        CHECK HANG FLAG
                              505      *
                000372        506    SGO        NULL
000372   000000 2340 00 X.    507              SZN      A$PFO            IS THERE A LIST ELEMENT PANIC?                    [170CT76]
000373   000457 6010 00 R.    508              TNZ      SWAIT            IF SO, DON'T RUN ANY JOBS                         [170CT76]
000374   000000 2340 00 X.    509              SZN      X$HANG           IS SYSTEM HUNG?
000375   000457 6010 00 R.    510              TNZ      SWAIT            YES - JUST WAIT
                              511      *
                              512      *        GET NEXT JOB TO RUN
                              513      *
                              514              INHIB    ON               HAD OUR CHANCE FOR FAULTS/AWAKES -- BACK TO WORK  [01SEP80]
                000376        515              QLOCK                     LOWER THE SEMAPHORE
000376   000126 7002 00 R.                     TSXO     X$QLOCK          LOWER THE SEMAPHORE
000377   000000 2252 00 X.    516              LDX      J,$RQF           GET NEXT JOB TO RUN
000400   000411 6002 00 R.    517              TZE      SRUN0            SKIP IF NONE
                000401        518              DECCT    X$RQC            COUNT JOBS ON RQ
000401   000001 3352 07 ..                     LCA      1,DL             GET A MINUS ONE
000402   000000 0552 00 X.                     ASA      X$RQC            ADD TO APPROPRIATE COUNTER
000403   000000 6042 20 X.                     TMI      $ZOPF,*          ERROR IF IT WENT NEGATIV
000404   000000 2212 15 X.    519              LDX      X,J$RQ,J         POINT TO NEXT JOB ON RQ
000405   000000 7412 00 X.    520              STX      X,$RQF           MAKE IT THE FIRST
000406   000411 6012 00 R.    521              TNZ      *+3              SKIP IF NOT LAST JOB
000407   000000 2342 00 X.    522              SZN      X$RQC            MAKE SURE NO JOBS ARE ON X$RQ
000410   000000 6012 20 X.    523              TNZ      $ZOPF,*          WHERE ARE THEY?
                000411        524    SRUN0      NULL
000411   000000 7452 16 R.    525              STX      J,JOB,P          SAVE JOB NUMBER
                000412        526              QNLOCK                    RAISE THE SEMAPHORE
000412   000134 7172 00 R.                     XED      X$QNLCK          RAISE THE SEMAPHORE
                              527              INHIB    OFF              END OF SEMAPHORED CODE                            [01SEP80]
000413   000000 1050 03 ..    528              CMPX     J,0,DU           DID WE GET A JOB?
000414   000457 6000 00 R.    529              TZE      SWAIT            NO - JUST WAIT
000415   000000 2210 15 X.    530              LDX      X,J$BIT,J        GET THE JOB'S BITS                                [170CT76]
000416   100000 3010 03 ..    531              CANX     X,B$TERM,DU      IS THE JOB TERMINATING?                           [170CT76]
000417   000353 6010 00 R.    532              TNZ      SEND1            IF SO, BACK TO THE MASTER PROCESSOR               [170CT76]
                              533      *                                                                                  [170CT76]
                              534      *
                              535      *        PREPARE TO RUN THIS JOB
                              536      *
000420   000000 2340 00 X.    537              SZN      EXTMEM           ARE WE RUNNING EXTENDED MEMORY?                   [08AUG77]
000421   000426 6010 00 R.    538              TNZ      SRUN2            YES, SKIP                                         [08AUG77]
000422   000000 2350 15 X.    539              LDA      J$LOCS,J         GET LOCATION OF STATE VECTOR                      [08AUG77]
000423   000011 7350 00 ..    540              ALS      9                CONVERT LOC TO WORDS IN AL                        [08AUG77]
000424   000000 6270 05 ..    541              EAX      S,0,AL           MOVE TO STATE VECTOR REGISTER                     [08AUG77]
000425   000433 7100 00 R.    542              TRA      SRUN3            BRANCH TO COMMON CODE                             [08AUG77]
                              543                                                                                         [08AUG77]
                000426        544    SRUN2      NULL                     HERE TO SET UP SV FOR EXTENDED MEMORY             [08AUG77]
000426   000000 2350 15 X.    545              LDA      J$LOCS,J         LOAD SV LOCATION/2^9 IN AL                        [08AUG77]
```

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    000427  777600 6350 05 ..     546                      EAA      -2*64,AL         CORRECT FOR EXTENDED ADDRESSING, MOVE TO UPPER   [05NOV77]
    000430  001006 7550 16 R.     547                      STA      JTEMP,P                                                          [08AUG77]
    000431  001006 5700 16 R.     548                      LMBA     JTEMP,P          LOAD THE MBA TO POINT TO STATE VECTOR            [08AUG77]
    000432  200000 2270 03 ..     549                      LDX      S,64*1024,DU     SET XR-S TO POINT TO STATE VECTOR(??)            [08AUG77]
            000433                 550     SRUN3            NULL                                                                      [08AUG77]
                                   551     *
                                   552     *       IF WE ARE CPU0, MAINTAIN TIME OF DAY
                                   553     *
                                   554                      INHIB    ON               DON'T BE INTERRUPTED PLAYING WITH TIMERS         [01SEP80]
                                   555                      IFE      IOMFLG,1,2
    000433  000010 4636 17 ..     556     EISO11           LAREG    S$AREG,S         RELOAD USER ADD. REGS (DELETED IF NOPN-EIS)
    000434  000020 4676 17 ..     557     EISO12           LPL      S$PTLEN,S        RELOAD USER PTRS&LENS (DELETED IF NON-EIS)
    000435  001006 4542 16 R.     558                      STT      JTEMP,P          SAVE CURRENT TIMER                               [13MAY76]
    000436  001012 2362 16 R.     559                      LDQ      TIMR,P           GET TIMER ON ENTRY TO SLAVE EXEC                 [13MAY76]
    000437  001006 1762 16 R.     560                      SBQ      JTEMP,P          SUBTRACT CURRENT TIMER VALUE                     [13MAY76]
    000440  000014 7722 00 ..     561                      QRL      12               SHIFT TO TICKS                                   [13MAY76]
    000441  000000 0562 00 X.     562                      ASQ      X$OVERH          COUNT AS TIME SPENT IN EXEC                      [13MAY76]
    000442  000000 1062 03 ..     563                      CMPX     P,0,DU           IS THIS THE CONTROL PROCESSOR?
    000443  000450 6012 00 R.     564                      TNZ      SRUN1            NO - SKIP TIME- OF-DAY BOTHER
            000444                 565                      GTIM                      GET TIME NOW
    000444  000000 7002 00 X.             566              TSX0     X$GTIM           RETURN TIMER UNITS IN A
    000445  000000 7552 00 X.    -566              STA      X$TIME           SAVE TIME WHEN TIMER LOADED
    000446  000007 2352 17 ..     567                      LDA      S$REG+7,S        GET VALUE FOR TIMER
    000447  000000 7552 00 X.     568                      STA      X$TIMEL          PUT AS TIME LOADED INTO TIMER
            000450                 569     SRUN1            NULL
    000450  012000 0352 07 ..    +570              ADLA     =10B26,DL        ACCOUNT FOR OUR SLOP DOING THIS                  [01JAN81]
    000451  000007 6372 17 ..     571                      LDT      S$REG+7,S        LOAD TIMER
                                   572     *
                                   573     *       LOAD BASE ADDRESS REGISTER FOR JOB
                                   574     *
    000452  000531 7002 00 R.     575                      TSX0     LBAR             LOAD THE BARS FOR THIS JOB                       [08AUG77]
                                   576     *
                                   577     *       MOVE IC TO STACK
                                   578     *
    000453  000030 2352 17 ..     579                      LDA      S$IC,S           GET USER'S IC
    000454  000044 7552 36 R.     580                      STA      IC,P*            SAVE IN OUR RETURN STACK
                                   581     *
                                   582     *       POINT TO REGS TO LOAD
                                   583     *
    000455  000110 7472 16 R.     584                      STX      S,REG,P          SAVE POINTER
                                   585     *
                                   586     *       RETURN TO USER
                                   587     *
    000456  001001 7102 16 R.     588                      TRA      RET,P            GO TO APPROPRIATE LREG/RET PAIR
```

```
                                   589                     EJECT
                                   590          *
                                   591          *          NO JOB READY TO RUN - WAIT
                                   592          *
                     000457        593    SWAIT    NULL
                                   594             INHIB    ON                   MAKE SURE NO JOBS ARRIVE BEFORE WE'RE READY        [01SEP80]
  000457  000000 2252 03 ..        595             LDX      J,0,DU               SET JOB NUMBER TO ZERO
  000460  370000 2352 03 ..        596             LDA      =0370000,DU           SET LARGE TIMER  FOR US
  000461  001010 7552 16 R.        597             STA      IDLET,P              SAVE IT
  000462  000000 1062 03 ..        598             CMPX     P,0,DU               ARE WE CPU0?
  000463  000502 6012 00 R.        599             TNZ      SWAT1                NO -- DON'T WORRY ABOUT THE TIME
                                   600          *
                                   601          *          CONTROL PROCESSOR IS IDLE, MUST UPDATE TIMERS
                                   602          *
                     000464        603             GTIM                          GET TIME NOW
  000464  000000 7002 00 X.        604             TSX0     X$GTIM               RETURN TIMER UNITS IN A
  000465  000000 7552 00 X.   -604 605             STA      X$TIME               SAVE AS CURRENT TIME
  000466  000000 2212 00 X.        605             LDX      X,X$TIMQ             ARE THERE ANY TIMERS WAITING
  000467  000472 6012 00 R.        606             TNZ      *+3                  YES -- CHECK THEM
  000470  000037 2352 03 ..        607             LDA      =037,DU               NO TIMER - SET LARGE TIMER FOR IDLE LOOP
  000471  000476 7102 00 R.        608             TRA      *+5                  SKIP A LITTLE
  000472  000001 1352 11 ..        609             SBLA     X$TIM,X              GET TIME TILL TICKER RUNNOUT
  000473  000475 6022 00 R.        610             TNC      *+2                  CHECK FOR RUNNOUT IMMINENT
  000474  000001 3352 07 ..        611             LCA      1,DL                 YES -- SET IT FOR IMMEDIATE
  000475  000000 5312 00 ..        612             NEG
  000476  000014 7352 00 ..        613             ALS      12                   SHIFT OVER
  000477  001010 7552 16 R.  -+614 614             STA      IDLET,P              SAVE AS TIME TO LOAD                              [01JAN81]
  000500  036000 0352 07 ..  +615  615             ADLA     =30B26,DL            ACCOUNT FOR OUR SLOP DOING THIS                  [01JAN81]
  000501  000000 7552 00 X.  +616  616             STA      X$TIMEL              SAVE AS THE TIME WE LOADED                       [01JAN81]
                                   617          *
                                   618          *          WAIT NOW
                                   619          *
  000502  000000 2212 03 ..        620    SWAT1    LDX      X,0,DU               SET FLAG TO ZERO
  000503  000000 2362 00 X.        621             LDQ      W$SWPIC              GET COUNT OF SWAPS IN PROGRESS
  000504  000000 2762 00 X.        622             ORQ      X$NCQC               AND THE NUMBER OF JOBS ON THE NON-CORE QUEUE
  000505  000507 6002 00 R.        623             TZE      *+2                  IDLE IS TRULY IDLE
  000506  000001 2212 03 ..        624             LDX      X,1,DU               IDLE IS JUST OUR INEFFICIENCY
  000507  001006 4542 16 R.        625             STT      JTEMP,P              SAVE CURRENT TIMER                               [13MAY76]
  000510  001012 2362 16 R.        626             LDQ      TIMR,P               GET TIMER ON ENTRY TO SLAVE EXEC                 [13MAY76]
  000511  001006 1762 16 R.        627             SBQ      JTEMP,P              SUBTRACT CURRENT TIMER VALUE                     [13MAY76]
  000512  000014 7722 00 ..        628             QRL      12                   SHIFT TO TICKS                                   [13MAY76]
  000513  000000 0562 00 ..        629             ASQ      X$OVERH              COUNT AS TIME SPENT IN EXEC                      [13MAY76]
  000514  001020 2372 36 R.        630             LDAQ     LIGHT,P*             LOAD IDLE DISPLAY
  000515  000001 7752 00 ..        631             ALR      1                    CHANGE THE PATTERN
  000516  000043 7762 00 ..        632             QLR      36-1                 .
  000517  001020 7572 36 R.        633             STAQ     LIGHT,P*             AND RESTORE FOR NEXT TIME
  000520  001010 6372 16 R.        634             LDT      IDLET,P              LOAD TIMER FOR WAITING
                                   635             INHIB    OFF
  000521  000000 6160 00 ..        636             DIS      0                    WAIT FOR SOMETHING
                                   637             INHIB    ON
                                   638             IFE      IOMFLG,1
  000522  001006 2142 16 R.        639             SZNC     JTEMP,P              ISSUE LOAD AND CLEAR TO FLUSH CACHE (IF PRESENT)
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000523   001010 2362 16 R.      640              LDQ      IDLET,P          GET THE ORIGINAL VALUE FOR TIMER
000524   001012 4542 16 R.      641              STT      TIMR,P           SAVE TIMER REENTERING EXEC PROCESSING          [13MAY76]
000525   001012 1762 16 R.      642              SBQ      TIMR,P           COMPUTE TIME SPENT IDLE                        [13MAY76]
000526   000014 7722 00 ..      643              QRL      12               RIGHT JUSTIFY
000527   000000 0562 11 X.      644              ASQ      X$IDLEA,X        COUNT IN THE APPROPRIATE COUNTER
000530   000372 7102 00 R.      645              TRA      SGO              GO DO SOMETHING
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		646		EJECT			[08AUG77]
		647	*				[08AUG77]
		648	*				[08AUG77]
		649	*		THE LBAR ROUTINE WILL LOAD ANY AND ALL BARS NECESSARY TO RUN OR ACCESS	[08AUG77]
		650	*		A SLAVE JOB. IF WE ARE NOT RUNNING EXTENDED MEMORY, ALL THAT NEED	[08AUG77]
		651	*		BE LOADED IS THE BAR. WITH EXTENDED MEMORY, THE BER IS LOADED AND	[08AUG77]
		652	*		MBB IS SET TO POINT TO THE BASE OF THE JOB-64K.	[08AUG77]
		653	*				[08AUG77]
		654	*	CALLING SEQUENCE			[08AUG77]
		655	*				[08AUG77]
		656	*	LDX	J,<JOB NUMBER>		[08AUG77]
		657	*	TSX0	LBAR		[08AUG77]
		658	*				[08AUG77]
	000531	659	LBAR	NULL			[08AUG77]
		660		INHIB	OFF	NOT SENSITIVE CODE	[01SEP80]
000531	000031 2350 17 ..	661		LDA	S$BARS,S	LOAD SQUEEZED MODE BAR	[08AUG77]
000532	000536 6010 00 R.	662		TNZ	*+4	SKIP IFIT IS VALID	[08AUG77]
000533	000000 2350 15 X.	663		LDA	J$LEN,J	LOAD LENGTH OF JOB	[08AUG77]
000534	777777 3750 03 ..	664		ANA	-1,DU	ONLY	[08AUG77]
000535	000011 7710 00 ..	665		ARL	9	MOVE LEN TO BAR FIELD (BITS 9-17)	[08AUG77]
		666					[08AUG77]
000536	001006 7550 16 R.	667		STA	JTEMP,P	SAVE PARTIAL BAR	[08AUG77]
000537	000000 2350 15 X.	668		LDA	J$LOC,J	LOAD ABSOLUTE JOB/2^9 IN AL	[08AUG77]
000540	777777 3750 07 ..	669		ANA	-1,DL	ONLY	[08AUG77]
000541	000033 7750 00 ..	670		ALR	36-9	MOVE ADDRESS MOD 256K TO AU	[08AUG77]
000542	001006 0550 16 R.	671		ASA	JTEMP,P	ADD ADDRESS INTO PARTIAL BAR	[08AUG77]
000543	000000 6030 20 X.	672		TRC	$ZOPF,*	JOB STARTING IN ONE 256K REGION, SQUEEZED IN THE NEXT	
000544	001016 7550 16 R.	673		STA	JBASE,P	SAVE ADDRESS OF SLAVE JOB (IF NON-EXTENDED)	[08AUG77]
000545	001006 2300 16 R.	674		LBAR	JTEMP,P	LOAD THE BAR	[08AUG77]
		675					[08AUG77]
000546	000000 2340 00 X.	676		SZN	EXTMEM	ARE WE RUNNING EXTENDED MEMORY?	[08AUG77]
000547	000553 6010 00 R.	677		TNZ	LBAR1	YES, CONTINUE	[08AUG77]
		678					[08AUG77]
000550	001006 7220 16 R.	679		LXL	Y,JTEMP,P	LOAD ADDRESS/256K	[08AUG77]
000551	000000 6000 10 ..	680		TZE	0,0	IF ZERO, THEN WE'RE OK	[08AUG77]
000552	000000 7100 20 X.	681		TRA	$ZOPF,*	JOB IS RUNNING ABOVE 256K ON A NON-EXTENDED SYSTEM	[08AUG77]
		682	*				[08AUG77]
		683	*	EXTENDED MEMORY HANDLED HERE			[08AUG77]
		684	*				[08AUG77]
	000553	685	LBAR1	NULL			[08AUG77]
000553	001006 2350 16 R.	686		LDA	JTEMP,P	LOAD ADDRESS/256K IN AL	[08AUG77]
000554	000022 7750 00 .. -+	687		ALR	18	JUSTIFY FOR...BER..SAVE BAR	[01JAN81]
000555	001006 7550 16 R.	688		STA	JTEMP,P		[08AUG77]
000556	001006 5720 16 R.	689		LBER	JTEMP,P	LOAD BASE EXTENSION REGISTER	[08AUG77]
		690					[08AUG77]
000557	000011 7710 00 .. -+	691		ARL	9	ADJUST TO GET ABSOLUTE ADDRESS OF JOB	[01JAN81]
000560	777600 6350 05 ..	692		EAA	-2*64,AL	CORRECT FOR EXTENDED ADDRESSING	[05NOV77]
000561	001006 7550 16 R.	693		STA	JTEMP,P		[08AUG77]
000562	001006 5710 16 R.	694		LMBB	JTEMP,P	LOAD MBB TO POINT TO JOB'S CORE	[08AUG77]
		695					[08AUG77]
000563	200000 2350 03 ..	696		LDA	64*1024,DU	LOAD FAKE BASE FOR JOBS CORE	[08AUG77]
000564	001016 7550 16 R.	697		STA	JBASE,P	SAVE FOR FUTURE USE	[08AUG77]

    000565 000000 7100 10 ..   698   TRA   0,0   AND RETURN   [08AUG77]

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                                        699              EJECT
                                        700        *
                                        701        *       SHUTDOWN FAULT - STOP
                                        702        *
                                        703              INHIB     ON                    SENSITIVE CODE                         [01SEP80]
                         000566         704     SDF      NULL
000566    000120 2342 16 R.            705              SZN       SDIC,P                HAVE WE SHUT DOWN ALREADY?
000567    000756 6012 00 R.            706              TNZ       SHALT                 YES - JUST HALT
000570    000110 2212 16 R.            707              LDX       X,REG,P               POINT TO SHUTDOWN REGISTERS
000571    000114 2222 16 R.            708              LDX       Y,SDREG,P             POINT TO SAFE-STORE AREA
000572    000000011207
000573    011600 5602 02 ..            709              RPD       4,2                   MOVE REGISTERS
000574    000000 2372 11 ..            710              LDAQ      0,X                   FROM TEMPORARY STORAGE
000575    000000 7572 12 ..            711              STAQ      0,Y                   TO A SAFE PLACE
000576    000116 5502 16 R.            712              SBAR      SDBAR,P               SAVE BAR
000577    000044 2352 16 R.            713              LDA       IC,P                  GET IC POINTER
000600    000120 7552 16 R.            714              STA       SDIC,P                SAVE IT AND SET FLAG
000601    000000 1062 03 ..            715              CMPX      P,0,DU                IS THIS THE CONTROL PROCESSOR?
000602    000756 6012 00 R.            716              TNZ       SHALT                 NO - JUST STOP
000603    000000 2332 00 X.            717              RMCM      X$MEM                 YES - SAVE MASK REGISTER
000604    000122 7572 00 R.            718              STAQ      SDMCM
000605    001004 2372 00 R.            719              LDAQ      NOINT                 GET MASK FOR NO INTERRUPTS
000606    000000 5532 00 X.            720              SMCM      X$MEM                 MASK THEM ALL OFF
000607    000000 2332 00 X.            721              RMCM      X$MEM                 READ THEM AGAIN TO MAKE SURE THEY GET SET
000610    000610 0112 51 R.            722              NOP       *,I                   WASTE SOME MORE TIME JUST IN CASE
000611    000756 7102 00 R.            723              TRA       SHALT                 NOW HALT
                                        724        *
                                        725        *       STARTUP FAULT - BACK TO WORK
                                        726        *
                         000612         727     SUF      NULL
000612    000120 2342 16 R.            728              SZN       SDIC,P                HAS SHUTDOWN FAULT PRECEEDED?
000613    000667 6002 00 R.            729              TZE       MFT1                  NO -- DIE                              [09DEC79]
000614    000120 2352 16 R.            730              LDA       SDIC,P                GET SAVED IC POINTER
000615    000044 7552 16 R.            731              STA       IC,P                  SAVE FOR RETURN
000616    000114 2212 16 R.            732              LDX       X,SDREG,P             POINT TO SAVED REGS
000617    000110 2222 16 R.            733              LDX       Y,REG,P               POINT TO REGISTER LOAD AREA
000620    000000011207
000621    011600 5602 02 ..            734              RPD       4,2                   MOVE REGISTERS
000622    000000 2372 11 ..            735              LDAQ      0,X                   FROM SAFE STORAGE AREA
000623    000000 7572 12 ..            736              STAQ      0,Y                   TO LOAD AREA
000624    000116 2302 16 R.            737              LBAR      SDBAR,P               RESTORE BAR
000625    000000 6372 03 ..            738              LDT       0,DU                  SET TIMER RUNOUT PENDING
000626    777777 6372 12 ..            739              LDT       -1,Y                  RESET TIMER TO VALUE AT SHUTDOWN
000627    000120 4502 16 R.            740              STZ       SDIC,P                CLEAR SHUTDOWN FLAG
000630    000000 1062 03 ..            741              CMPX      P,0,DU                IS THIS THE CONTROL PROCESSOR?
000631    001001 6012 16 R.            742              TNZ       RET,P                 NO - RETURN
000632    000122 2372 00 R.            743              LDAQ      SDMCM                 YES - RESTORE CONTROLLER MASK
000633    000000 5532 00 X.            744              SMCM      X$MEM
000634    001001 7102 16 R.            745              TRA       RET,P                 NOW RETURN
                                        746        *
                                        747        *       IPR FAULT -- CHECK AND CORRECT INSTRUCTION IF AN EXTENDED INSTRUCTION   [08AUG77]
                                        748        *       ON AN NON-EXTENDED MACHINE.                                             [08AUG77]
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                                     749      *                                                                              [08AUG77]
                    000635           750      IPR     NULL                                                                   [08AUG77]
     000635  000000 2342 00 X.       751              SZN      EXTMEM          ARE WE RUNNING ON EXTENDED MEMORY?            [08AUG77]
     000636  000667 6012 00 R.       752              TNZ      MFT1            YES, ALL IPR FAULTS ARE FATAL                 [08AUG77]
                                     753                                                                                     [08AUG77]
     000637  000044 2212 36 R.       754              LDX      X,IC,P*         LOAD THE IC+1 OF THE FAULTING INSTRUCTION     [08AUG77]
     000640  777777 2352 11 ..       755              LDA      -1,X            LOAD THE FAULTING INSTRUCTION                 [08AUG77]
     000641  001034 2362 00 R.       756              LDQ      =0777777003377  LOAD A MASK FOR OPCODE FIELD                  [08AUG77]
     000642  234400 2112 07 ..       757              CMK      =0234400,DL     MLDA,MLDQ,MLDAQ?                              [08AUG77]
     000643  000646 6002 00 R.       758              TZE      *+3             YES, FIX                                      [08AUG77]
     000644  754400 2112 07 ..       759              CMK      =0754400,DL     MSTA,MSTQ,MSTAQ?                              [08AUG77]
     000645  000667 6012 00 R.       760              TNZ      MFT1            NONE OF THE ABOVE, CRASH                      [08AUG77]
     000646  000400 6752 07 ..       761              ERA      =0400,DL        TURN THE EXTENDED INSTRUCTION BACK TO A NORMAL ONE  [08AUG77]
     000647  777777 7552 11 ..       762              STA      -1,X            RESTORE                                      [08AUG77]
     000650  000001 1612 03 ..       763              SBX      X,1,DU          BACK THE IC UP ONE FOR THE RETRY             [08AUG77]
     000651  000044 7412 36 R.       764              STX      X,IC,P*         SAVE FOR RETURN                               [08AUG77]
     000652  001001 7102 16 R.       765              TRA      RET,P           AND RETURN TO RETRY                           [08AUG77]
                                     766      *                                                                              [08AUG77]
                                     767      *        MASTER FAULT - CHECK FOR SHUTDOWN, STARTUP, OR CONNECT                [08AUG77]
                                     768      *                                                                              [08AUG77]
                    000653           769      MFT     NULL                                                                   [08AUG77]
     000653  000000 0112 03 ..       770      TSOP06  NOP      0,DU            SPACE FOR LCPR INST. ON 66/X7                 [30DEC76]
     000654  000010 1002 03 ..       771              CMPX0    8,DU            IS THIS A CONNECT FAULT?
     000655  000000 6002 00 X.       772      CONX    TZE      X$MCHEK         (THIS INST DELETED BY DISK STARTUP)
     000656  001001 6002 16 R.       773              TZE      RET,P           YES - JUST RETURN
     000657  000000 1002 03 ..       774              CMPX0    0,DU            IS IT A SHUTDOWN FAULT?
     000660  000566 6002 00 R.       775              TZE      SDF             YES - SHUT UP SHOP
     000661  000014 1002 03 ..       776              CMPX0    12,DU           IS IT A STARTUP FAULT?
     000662  000612 6002 00 R.       777              TZE      SUF             YES - BACK TO WORK
     000663  000004 1002 03 ..       778              CMPX0    4,DU            CHECK FOR TIMER RUNNOUT FAULT
     000664  000760 6002 00 R.       779              TZE      TIMF            YES -- AWAKEN
     000665  000012 1002 03 ..       780              CMPX0    10,DU           ZOP(IPR) FAULT?                               [08AUG77]
     000666  000635 6002 00 R.       781              TZE      IPR             YES, GO CHECK IT OUT                          [08AUG77]
                                     782      *
                                     783      *        SYSTEM ERROR - DIE
                                     784      *
                    000667           785      MFT1    NULL
     000667  000000 2372 00 X.       786              LDAQ     Z$INTC          GET DIE INTERRUPT PAIR
     000670  000020 7572 00 X.       787              STAQ     X$FTV0+16       SAVE IN CONNECT FAULT CELL                    [01SEP80]
     000671  000000 7462 00 X.       788              STX      P,Z$PROC        SAVE GUILTY PROCESSOR NUMBER
     000672  000000 5502 00 X.       789              SBAR     Z$BAR           SAVE BAR OF CRASHING CPU
     000673  000000 4402 00 X.       790              SXL0     Z$FTYPE         SAVE TYPE OF FAULT IF NON-CONTROL PROCESSOR
                                     791                                                                                     [08AUG77]
     000674  000000 2342 00 X.       792              SZN      EXTMEM          ARE WE RUNNING EXTENDED MEMORY?               [08AUG77]
     000675  000701 6002 00 R.       793              TZE      *+4             NO, SKIP                                      [08AUG77]
     000676  000000 1572 00 X.       794              SBER     Z$BER           SAVE BASE EXTENSION REGISTER                  [08AUG77]
     000677  000000 5552 00 X.       795              SMBA     Z$MBA           SAVE MBA                                      [08AUG77]
     000700  000000 5562 00 X.       796              SMBB     Z$MBB           AND MBB                                       [08AUG77]
                                     797                                                                                     [08AUG77]
     000701  000000 4522 01 X.       798              SCPR     Z$FTREG,01      STORE FAULT REGISTER
     000702  000000 4522 06 X.       799              SCPR     Z$MDREG,06      AND THE MODE REGISTER
                                     800      *                                                                              [01SEP80]
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                                    801     *           KLUDGE:  THE DPS-E MODEL PROCESSORS HAVE 64 PAIRS OF              [01SEP80]
                                    802     *           HISTORY REGISTER INFORMATION.  WE ONLY HAVE ROOM TO DUMP         [01SEP80]
                                    803     *           16.  IN ORDER TO GET THE MOST RECENT 16, 48 MUST BE SKIPPED.     [01SEP80]
                                    804     *           WHEN THIS CODE IS EXECUTED ON NON-DPS-E PROCESSORS, IT           [01SEP80]
                                    805     *           WILL CYCLE THROUGH THE HISTORY REGISTERS THREE TIMES AND         [01SEP80]
                                    806     *           LEAVE THE POINTER WHERE IT STARTED.                              [01SEP80]
                                    807     *                                                                           [01SEP80]
000703   000060 2202 03 ..         808           LDX0     48,DU              NUMBER OF ENTRIES TO SKIP                   [01SEP80]
000704   001026 4522 20 R.         809           SCPR     JUNK,20            THROW AWAY SOME INFORMATION                 [01SEP80]
000705   000001 1602 03 ..         810           SBX0     1,DU               COUNT                                      [01SEP80]
000706   000704 6012 00 R.         811           TNZ      *-2                UNTIL DONE                                  [01SEP80]
                                    812     *                                                                           [01SEP80]
000707   000000 6202 00 X.         813           EAX0     Z$CUHIS            POINT TO CU HISTORY REG SAVE AREA
000710   000711 7402 00 R.         814           STX0     *+1                SAVE THE POINTER
000711   000000 4522 20 ..         815           SCPR     ...,20             SAVE A CU REG PAIR
000712   000002 0602 03 ..         816           ADX0     2,DU
000713   000040 1002 03 X.         817           CMPX0    Z$CUHIS+32,DU      CHECK FOR DONE
000714   000710 6022 00 R.         818           TNC      *-4                LOOP IF NOT
                                    819
000715   000002 2312 00 ..         820           RSW      2                  'GET PROCESSOR MODEL                        [01SEP80]
000716   030000 3752 03 ..         821           ANA      M$PTYPE,DU         ONLY                                       [01SEP80]
000717   020000 1152 03 ..         822           CMPA     M$ELS,DU           IS IT AN ELS MODEL?                         [01SEP80]
000720   000744 6002 00 R.         823           TZE      MFT2               IF SO, NO OU OR DU HISTORY REGISTERS        [01SEP80]
                                    824     *                                                                           [01SEP80]
000721   000060 2202 03 ..         825           LDX0     48,DU              NUMBER OF ENTRIES TO SKIP ON DPS-E MACHINES [01SEP80]
000722   001026 4522 40 R.         826           SCPR     JUNK,40            THROW AWAY SOME INFORMATION                 [01SEP80]
000723   000001 1602 03 ..         827           SBX0     1,DU               COUNT                                      [01SEP80]
000724   000722 6012 00 R.         828           TNZ      *-2                UNTIL DONE                                  [01SEP80]
                                    829     *                                                                           [01SEP80]
000725   000000 6202 00 X.         830           EAX0     Z$OUHIS            POINT TO OU HISTORY REGISTER SAVE AREA
000726   000727 7402 00 R.         831           STX0     *+1                **
000727   000000 4522 40 ..         832           SCPR     ...,40             *
000730   000002 0602 03 ..         833           ADX0     2,DU               * SAVE OU HISTORY REGISTERS
000731   000040 1002 03 X.         834           CMPX0    Z$OUHIS+32,DU      *
000732   000726 6022 00 R.         835           TNC      *-4                **
                                    836
000733   000002 2312 00 ..         837           RSW      2                  READ INFO SWITCHES                         [30DEC76]
000734   030000 3752 03 ..         838           ANA      M$PTYPE,DU         GET PROCESSOR TYPE                         [01SEP80]
000735   000744 6012 00 R.         839           TNZ      MFT2               NEWER MODELS DO NOT HAVE DU HISTORY REGISTERS [01SEP80]
000736   000000 6202 00 X.         840           EAX0     Z$DUHIS            POINT TO DU (EIS) HISTORY REGISTER SAVE AREA
000737   000740 7402 00 R.         841           STX0     *+1                **
000740   000000 4522 10 ..         842           SCPR     ...,10             *
000741   000002 0602 03 ..         843           ADX0     2,DU               * SAVE DU HISTORY REGISTERS
000742   000040 1002 03 X.         844           CMPX0    Z$DUHIS+32,DU      *
000743   000737 6022 00 R.         845           TNC      *-4                **
         000744                     846     MFT2  NULL                                                                  [30DEC76]
                                    847     *                                                                           [05NOV77]
                                    848     *     SAVE IC/IR AND REGISTERS FOR DUMP                                     [05NOV77]
                                    849     *                                                                           [05NOV77]
000744   000044 2352 36 R.         850           LDA      IC,P*              LOAD IC/IR FROM CRASH                       [05NOV77]
000745   000000 7552 00 X.         851           STA      Z$IC               SAVE FOR DUMP                              [05NOV77]
000746   000200 3152 07 ..         852           CANA     M$MMODE,DL         WAS FAULT FROM MASTER MODE?                [05NOV77]
```

```
    000747  000752 6012 00 R.    853                    TNZ     *+3             YES, SKIP                           [05NOV77]
    000750  000000 0732 17 ..    854                    LREG    S$REG,S         LOAD REGISTERS FROM SLAVE MODE      [05NOV77]
    000751  000753 7102 00 R.    855                    TRA     *+2             AND SKIP                            [05NOV77]
    000752  000110 0732 36 R.    856                    LREG    REG,P*          LOAD REGISTERS FROM MASTER MODE     [05NOV77]
    000753  000000 7532 00 X.    857                    SREG    Z$REG           SAVE FOR DUMP                       [05NOV77]
                                 858
    000754  001030 6742 04 R.    859                    LCPR    UNLCK,04        UNLOCK THE REGISTERS
                                 860          *
    000755  000000 0152 00 X.    861                    CIOC    $PROC+0         SEND A CONNECT TO THE CONTROL CPU   [01SEP80]
                    000756       862          SHALT     NULL                    WAIT FOREVER                        [01SEP80]
    000756  000000 6162 00 ..    863                    DIS     0               WAIT                                [01SEP80]
    000757  000756 7102 00 R.    864                    TRA     *-1             UNTIL A FAULT WAKES US              [01SEP80]
```

```
                                      865                EJECT                                                                  [01SEP80]
                                      866        *                                                                              [01SEP80]
                                      867        *        MASTER MODE TIMER RUNNOUT FAULT                                       [01SEP80]
                                      868        *                                                                              [01SEP80]
   000760   000000 1062 03  ..        869   TIMF    CMPX      P,0,DU            ARE WE THE CONTROL PROCESSOR
   000761   001001 6012 16 R.         870           TNZ       RET,P            NO -- DON'T WORRY
   000762   000000 2332 00 X.         871           RMCM      X$MEM            GET CURRENT MEMORY MASK
   000763   000000 3772 00 X.         872           ANAQ      X$ENABL          MASK TO SETTABLE BITS
   000764   000772 6002 00 R.         873           TZE       TIMF1            ALL THE SAME (OFF)
   000765   000000 6772 00 X.         874           ERAQ      X$ENABL          ALL ON?
   000766   000772 6002 00 R.         875           TZE       TIMF1            YES-- GOOD
                                      876        *
                                      877        *        IF THE SETTABLE BITS ARE NOT ALL THE SAME, WE LOST SOME
                                      878        *
   000767   000000 2332 00 X.         879           RMCM      X$MEM            GET THE FAULTY MASK AGAIN
   000770   001032 7572 00 R.         880           STAQ      X$MCMSK          SAVE FOR LOG
   000771   000000 7102 20 X.         881           TRA       $ZOPF,*          DIE AND LET SOMEONE INVESTIGATE FAULTY MASK     [01SEP80]
                                      882        *                                                                              [01SEP80]
   000772   001003 2352 00 R.         883   TIMF1   LDA       WKINT            WAKE UP CONTROL EXEC SO ITS TICKER WILL RUN      [01SEP80]
   000773   000000 4512 00 X.         884           SMIC      X$MEM            LIKE SO                                          [01SEP80]
   000774   001001 7102 16 R.         885           TRA       RET,P            RETURN TO OUR DIS                                [01SEP80]
```

```
                              886              EJECT
                              887       *
                              888       *        RETURN ROUTINES
                              889       *
                              890              INHIB      ON                    INHIBIT RETURN SEQUENCE                    [01SEP80]
                              891     RETN     MACRO
                              892     RET#1    LREG       REG+#1,I              RESTORE REGISTERS                          [09DEC79]
                              893              RET        IC#1,IDC             RETURN                                     [01MAY79]
                              894              ENDM       RETN
                  000775      895              APROC      RETN
                  000775               RETN    0
000775  000110 0732 51  R.             RET0     LREG      REG+0,I              RESTORE REGISTERS
000776  000044 6302 57  R.                     RET       IC0,IDC              RETURN
                  000777               RETN    1
000777  000111 0732 51  R.             RET1     LREG      REG+1,I              RESTORE REGISTERS
001000  000045 6302 57  R.                     RET       IC1,IDC              RETURN
                              896     RETNN    MACRO
                              897              TRA        RET#1
                              898              ENDM       RETNN
                  001001      899     RET      APROC      RETNN                POINTERS TO RETURN ROUTINES
                  001001               RETNN   0
001001  000775 7102 00  R.                     TRA       RET0
                  001002               RETNN   1
001002  000777 7102 00  R.                     TRA       RET1
                              900       *                                                                                [01SEP80]
001003  020000000001        ..  901   WKINT    OCT        020000000001         INTERRUPT TO AWAKEN MASTER PROCESSOR       [01SEP80]
                              902       *
                  001004      903              EVEN
001004  000000000017        ..  904   NOINT    OCT        17,17                MASK FOR NO INTERRUPTS
001005  000000000017
                              905       *
                              906       *
                              907       *        TEMPORARY STORAGE
                              908       *
                  001006      909     JTEMP    BSS        $NPROS
                  001010      910     IDLET    BSS        $NPROS               SPACE FOR IDLE TIMER
                  001012      911     TIMR     BSS        $NPROS               TIMER VALUE AT LAST ENRY TO SLAVE EXEC     [13MAY76]
                  001014      912     SDFG     BSS        $NPROS               SLAVE MODE SHUT DOWN FLAG                  [17OCT76]
                  001016      913     JBASE    BSS        $NPROS               BASE OF UNSQUEEZED JOB IF NORMAL, 64K IF EXTENDED  [08AUG77]
                              914
                              915     LGT      MACRO
                              916              ARG        2*#1+LGTTB
                              917              ENDM       LGT
                              918
                  001020      919     LIGHT    APROC      LGT
                  001020               LGT     0
001020  001022 0002 00  R.             ARG        2*0+LGTTB
                  001021               LGT     1
001021  001024 0002 00  R.             ARG        2*1+LGTTB
                  001022      920              EVEN
                  001022      921     LGTTB    NULL
                              922              DUP        2,$NPROS
```

```
       001022  777776000000    ..    923                   OCT    777776000000                                                              [13MAY76]
       001023  000000377777    ..    924                   OCT    000000377777
       001024  777776000000    ..                          OCT    777776000000
       001025  000000377777    ..                          OCT    000000377777
                                     925           *
                                     926           *
                                     927           *
                       001026        928                   EVEN
                       001026        929    JUNK   BSS     2                    SPACE TO SAVE WORTHLESS FAULT REGISTER
       001030  000000000071    ..    930    UNLCK  OCT     71                   UNLOCK HIST REGS; ALLOW RSW 2; LOCK HRS ON LOTS OF FAULTS
                                     931                                                                                           [05NOV77]
                                     932           HEAD    X                    MISC GARBAGE                                        [05NOV77]
       001031  000000011207
                       001032        933    MCMSK  EVEN                                                                            [05NOV77]
       001032  000000000000    ..    934                   OCT     0,0                  PATHOLOGICAL MEMORY MASK                    [05NOV77]
       001033  000000000000
```

```
              935              TTLS     PSEUDOSLAVE JOB
              936              HEAD     X
              937              IFE      0,1,82              DELETE CODE, BUT SAVE FOR HISTORIC INTERREST
              938      *
              939      *
              940      *           THIS JOB RUNS AS JOB 0 WHEN NO OTHER JOBS ARE ELIGIBLE TO RUN.
              941      *
              942      *
              943      *       STATE VECTOR FOR JOB 0
              944      *
              945              EIGHT
              946      PSSV    OCT      0,0,0               REGS X0-X5
              947              GTB                          X6,X7
              948              OCT      0,0,0,0             A,Q,E,T
              949              VFD      18/WT1,018/404000   IC / IR
              950              ZERO                         BARS
              951              OCT      777777777777        LIMIT
              952              ZERO                         TIMER
              953              OCT      377777777777        RTIME
              954              ZERO                         BUSY
              955              ZERO                         RUN
              956              OCT      377777777777        QUANT
              957              OCT      377777777777        JACES
              958              OCT      377777777777        CATW
              959              OCT      377777777777        SCRW
              960              ZERO                         JTIME
              961              ZERO                         INTP/BIT
              962              OCT      777777000000        JMEM   *** UPDATED IN STARTUP
              963              ZERO     64,PSSV             SVMEM  *** UPDATED IN STARTUP
              964              ZERO                         STIME
              965              ZERO                         IOCHG
              966              BSS      6                   NOT CURRENTLY USED
              967              ZERO     1,S$FR+2            FCB
              968              ZERO     S$FR+1,1            FRO
              969              ZERO     0,0                 FCBO
              970      PSSVE   EQU      *
              971              INE      PSSVE-PSSV,S$FR+2,1
              972              INCORR   T  STATE VECTOR FOR JOB ZERO
              973      *
              974      *       JOB TABLE FOR JOB 0
              975      *
              976              ORG      J$LEN
              977              OCT      777777000000
              978              ORG      J$LENS
              979              ZERO     64,PSSV
              980              ORG      J$BIT
              981              ZERO     B$CORE
              982              ORG      J$TYPE
              983              ZERO     0,B$MON+B$CRRES
              984              ORG      J$MEND
              985              ZERO     J$MLINK,0
              986              ORG      PSSVE
```

```
987      *
988      *
989      *          PSEUDO SLAVE JOB
990      *
991      *
992      *                    WANDER AIMLESSLY--TEDIOUSLY TEARING TORUSES TO BITS
993      *
994  WT1     NULL                          IDLE LOOP CHECKS PARITY AND KEEPS STATISTICS
995  PSFLT   GTB     PXED                  THIS ONE IS USED TO CAUSE A FAULT
996          GTB                           SLOW DOWN SO WE DON'T INTERFERE
997          LDA     NCQC                  ARE THERE ANY JOBS WAITING TO BE SWAPPED IN
998          ORA     W$SWPIC               OR SWAPPING IN JUST NOW?
999          TNZ     *+3                   YES
1000         AOS     IDLEA                 INCREMENT IDLE COUNTER
1001         TRA     *+3                   SKIP
1002         AOS     IDLEB                 INCREMENT SWAP-WAIT COUNTER
1003         TRA     *+1                   KEEP NUMBER OF INSTRUCTIONS IN EACH BRANCH    [      ]
1004         LDX0    WT4                   GET CURRENT WORD TO RESTORE
1005         TZE     WT3                   HAVE TO RESET COUNTER
1006  WT2    LDA     -1,0                  FETCH A WORD, MEMORY WILL RESTORE
1007         SBX     0,1,DU                KNOCK OFF 1
1008         STX     0,WT4                 KEEP CURRENT COUNT IN CORE
1009         TRA     WT1                   ROUND AGAIN
1010  WT3    LDX     0,$MSIZE              FETCH NUMBER OF WORDS WE HAVE
1011         ANX0    =0776000,DU            GET INTO ALLOWABLE BAR RANGE
1012         STX     0,WT4                 SAVE COUNTER IN CORE
1013         TRA     WT2                   FETCH THIS LOCATION
1014  WT4    ZERO    0                     INITIAL VALUE FOR COUNTER--UPDATED
1015  PXED   EVEN
1016         SXL7    PSFLT                 RESTORE OUR GTB
1017         DRL                           AND CAUSE A FAULT
1018         REM
1019         HEAD    X
```

```
                                  1020            EJECT
                                  1021     *
                                  1022     *
                                  1023     *
                                  1024     *
          001034  777777003377    ..  1025          THE END
```

0	A	PFO	90	507									
4000	B	AP	643	646									
10000	B	EX	642	646									
1000	B	RD	645	646									
2000	B	WT	644	646									
400000	B	CAP	697	701									
200000	B	CFC	658	676									
100000	B	CFD	659	676									
40000	B	CFR	660	676									
200000	B	CWT	698	701	702								
2	B	DFE	777	778									
2	B	DIR	628	438									
10000	B	MDA	567	583									
1	B	MME	627	376									
40000	B	OWN	640	646									
3	B	PAR	629	392									
1	B	SFE	776	778									
10000	B	CFCL	663	676									
20000	B	CFGA	662	676									
400	B	NTPD	686	688									
400000	B	NTPS	684	688									
200	B	RSVD	687	688									
200000	B	RSVS	685	688									
400000	B	SWAP	562	583									
100000	B	TERM	564	531									
4	B	TROF	630	365	385	453							
400	BCFRVM		667	676									
200000	BENTRY		590	473									
4000	BSWREQ		568	583									
10	C	CATR	1630	1649									
4	C	CLEN	477	495									
6	C	DALT	489	495									
11	C	FLAG	1633	1650									
11	C	PERM	1632	1649									
22	C	TACC	1646	1650									
6	C	TYPE	490	496									
10	C	USEP	1631	1650									
22	CCBITS		1644	1645	1649								
5	CENTRY		479	496									
340	CHTLEN		94	145	147								
5	CINDEX		478	495									
22	CMMENO		1645	1649									
21	CNAMND		1642	1643	1649								
21	CNAMPT		1643	1650									
4	COMIMW		2239	2247									
4	COMIOM		2240	2248									
17	CPASLE		1640	1650									
17	CPASPT		1639	1649									
400	DEVMAX		99	116	118	132	134	136	138	140	142	256	258
312	EXTM06		435	69									
313	EXTM07		436	70									
0	EXTMEM		91	537	676	751	792						

1	F	J	541	544			
1	F	FR	542	545			
0	F	ACC	381	428			
0	F	BIT	534	544			
6	F	DFR	424	429			
1	F	RET	386	429			
6	F	SFR	423	424	428		
0	F	LINK	536	545			
0	F	TYPE	382	429			
1	FABORT		383	428			
10	FPCHN		93	94	98	254	
2	I	CMD	380	882			
10	I	DAC	892	893			
1	I	DEV	878	900			
0	I	LOG	93				
3	I	PUB	882	883	884	885	900
0	I	FLOG	92				
15	I	IDCW	897	898			
7	I	MODE	890	891	892	900	
3	I	PUBL	883	901			
1	I	TYPE	879	880	901		
6	I	URET	887	889	890	900	
6	IADEXT		889	901			
12	IDCWWD		894	895			
7	IMODEL		891	901			
1	IOMFLG		67	313	470	555	638
11	IQUEWD		893	894			
5	IQWORD		886	887			
4	ISEKAD		885	886			
13	ISIDCW		895	896			
14	ISKDCW		896	897			
3	ISPRET		884	901			
0	J	RQ	99	486	489	519	
0	J	BIT	94	530			
0	J	LEN	96	663			
0	J	LOC	97	668			
0	J	RAN	100	400	440		
0	J	LOCS	98	539	545		
0	JCTMEL		101	448			
0	JJSFLG		95	490			
0	JSQI		102	485	487		
20	M	EIS	282	288			
20000	M	ELS	271	822			
4000	M	NSA	275	288			
40	M	MWRD	233	420			
400	MBXLEN		95	126			
400	MCACHE		278	288			
200	MEXMEM		279	288			
7740	MFTVMK		272	287			
200	MMMODE		232	183	309	852	
4000	MOVMSK		229	183	309		
4	MOVRLP		284	288			

CROSS REFERENCE TABLE

3	MPROCN		285	288											
30000	MPTYPE		269	821	838										
2000	MSER66		276	288											
10	MSLMEM		283	238											
40000	MTSOPT		274	288											
5	N	J	175	333	400	440	448	486	487	489	490	516	519	525	528
				530	539	545	595	663	668						
6	N	P	176	291	333	334	335	336	367	417	419	421	422	423	434
				460	461	467	468	491	497	499	500	525	547	548	558
				559	560	563	580	584	588	597	598	614	625	626	627
				630	633	634	639	640	641	642	667	671	673	674	679
				686	688	689	693	694	697	705	707	708	712	713	714
				715	728	730	731	732	733	737	740	741	742	745	754
				764	765	773	788	850	856	869	870	885			
7	N	S	177	334	366	374	377	386	393	424	430	439	443	444	445
				446	447	449	451	454	456	460	466	469	471	472	474
				541	549	556	557	567	571	579	584	661	854		
1	N	X	171	365	366	376	377	385	386	392	393	400	401	418	434
				435	436	438	439	440	441	451	453	454	456	485	486
				488	489	519	520	530	531	605	609	620	624	644	707
				710	732	735	754	755	762	763	764				
2	N	Y	172	679	708	711	733	736	739						
44	N	IC	205	73	419	422	423	468	580	713	731	754	764	850	
0	N	...	179	815	832	842									
267	N	CMD	399	349											
260	N	CCN	383	352											
140	N	FV0	290	72	291										
160	N	FV1	290	72	291										
44	N	IC0	206	74	895										
45	N	IC1	208	74	895										
635	N	IPR	750	781											
0	N	JOB	154	75	333	491	525								
653	N	MFT	769	307											
253	N	MME	373	346											
264	N	PAR	391	353											
110	N	REG	226	77	291	334	336	460	584	707	733	856	895		
1001	N	RET	899	78	461	588	742	745	765	773	870	885			
566	N	SDF	704	775											
124	N	SDT	242	500											
372	N	SGO	506	645											
612	N	SUF	727	777											
322	N	CONT	443	348	368	378	387	394	437						
655	N	CONX	772	71											
1026	N	JUNK	929	317	809	826									
531	N	LBAR	659	431	575										
667	N	MFT1	785	402	442	729	752	760							
744	N	MFT2	846	823	839										
112	N	MREG	227	335											
775	N	RET0	895	899											
777	N	RET1	895	899											
1014	N	SDFG	912	367	497	499									
120	N	SDIC	233	79	705	714	728	730	740						

343	N SEND	465	457											
6	N SIC0	184	81	188	189	190	191	192						
27	N SIC1	196	81	197										
247	N SSDF	364	344											
760	N TIMF	869	779											
1012	N TIMR	911	467	559	626	641	642							
100	NCHAN	92	94	95	98	253	255							
336	NCONT2	455	450	452										
213	NENTER	302	291											
200	NFREG0	291	290											
206	NFREG1	291	290											
1010	NIDLET	910	597	614	634	640								
2	NIOMS	88	126	130	145	147								
1016	NJBASE	913	434	673	697									
1006	NJTEMP	909	417	421	547	548	558	560	625	627	639	667	671	674
			679	686	688	689	693	694						
553	NLBAR1	685	677											
1022	NLGTTB	921	919											
1020	NLIGHT	919	630	633										
1004	NNOINT	904	76	719										
2	NPROS	87	128	72	74	81	108	155	196	197	208	223	226	227
			223	232	234	242	290	291	895	899	909	910	911	912
			913	919	922									
116	NSDBAR	232	712	737										
122	NSDMCM	237	718	743										
114	NSDREG	228	80	708	732									
353	NSEND1	475	532											
756	NSHALT	862	706	716	723									
23	NSICP0	192	206											
43	NSICP1	197	208											
50	NSREG0	223	226	227	228									
70	NSREG1	223	226	227	228									
411	NSRUN0	524	517											
450	NSRUN1	569	564											
426	NSRUN2	544	538											
433	NSRUN3	550	542											
457	NSWAIT	593	82	183	508	510	529							
502	NSWAT1	620	599											
772	NTIMF1	883	873	875										
1030	NUNLCK	930	316	859										
272	NUSERF	413	345	347	350	351	354	355	357	358	375			
311	NUSRF1	433	425											
1003	NWKINT	901	480	883										
5	PDACON	2241	2247											
10	PDAENV	2244	2247											
6	PDARDR	2242	2247											
7	PDATAP	2243	2247											
0	PROC	103	861											
0	Q RUN	848	849	852	2277									
777777	Q BUSY	1034	1039											
0	Q LINK	847	851											
777777	Q NPRI	1033	1038											

0	RQF	104	516	520						
30	S IC	330	331	469	579					
47	S BIT	350	351	377	474					
73	S FCB	371	373							
64	S PID	366	367							
0	S REG	327	328	444	445	447	449	466	567	571	854
45	S TIO	347	348							
10	S AREG	328	329	471	556					
31	S BARS	331	332	374	424	430	661			
35	S BUSY	338	339	377						
41	S CATW	343	344							
55	S CLEN	356	357							
60	S FREE	360	363							
36	S FRUN	340	341	377						
57	S HOLE	358	360	376						
47	S INTP	349	350	376						
50	S JMEM	351	352							
42	S SCRW	344	345							
63	S SFAC	365	366							
56	S SPEC	357	358							
36	S SWAP	339	340	376						
44	S TCPU	346	347							
67	S UMPY	367	368							
54	SCORET	355	356							
61	SCPFAC	363	364							
35	SFTYPE	337	338	376	366	377	386	393	439	451	454	456
53	SIOCHG	354	355							
62	SIOFAC	364	365							
71	SIOTIM	369	370							
70	SIOUCH	368	369							
40	SISTKL	96	130							
40	SJACES	342	343							
43	SJTIME	345	346							
32	SLIMIT	333	334	377						
20	SPSTKL	97	126							
72	SPTIMR	370	371	443	446					
20	SPTLEN	329	330	472	557					
37	SQUANT	341	342							
52	SSTIME	353	354							
51	SSVMEM	352	353							
32	STACES	332	333	376						
46	STCORE	348	349							
33	STIMER	334	335							
160	STTSKL	98	126							
34	SUTYPE	335	337	376						
777777	T LEN	858	861							
777777	T LINK	857	860							
215	TSOP05	315	83							
653	TSOP06	770	84							
5600	V ADA	140	142							
1340	V IMW	122	124	930						
1400	V MBX	124	126	927						

100	V PDA	114	116							
7100	V PQS	145	147							
5200	V UQS	138	140							
3000	V FTVS	126	128							
0	V INTV	112	114							
500	V PREF	116	118							
10000	VCFILE	147	1012							
1100	VPATCH	118	120							
6200	VPTABS	142	145							
4600	VPTYPE	136	138							
3100	VSISTK	128	130							
4200	VUSPEC	134	136							
3600	VUSTAT	132	134							
3200	VUTICK	130	132							
1300	VXSTAT	120	122							
14	WGIBKL	2267	2280							
0	WGIFLG	2262	2263							
2	WGIPBT	2264	2265							
3	WGIPTK	2265	2267							
1	WGIPUN	2263	2264							
1	WPTBAS	2277	2278	2288						
34	WPTCLN	2285	2287							
21	WPTEBT	2281	2232							
23	WPTEDT	2283	2284							
35	WPTEND	2287	2288							
20	WPTEUN	2230	2281							
22	WPTEWC	2282	2283							
25	WPTFAC	2284	2285							
4	WPTGIF	2279	2280							
2	WPTUSR	2278	2279							
0	WSWPIC	105	621							
1400	X MBX	927	934							
0	X MEM	113	481	717	720	721	744	871	879	884
0	X RQC	116	518	522						
1	X TIM	1046	609							
0	X DABL	106								
0	X FTV0	108	242	787						
0	X FTV1	108	242							
0	X GTIM	109	565	603						
0	X HANG	110	509							
0	X NCQC	114	622							
1412	X PCWA	934	935							
0	X TIME	118	566	604						
0	X TIMQ	120	605							
10	XCONCH	908	934							
0	XENABL	107	872	874						
0	XIDLEA	111	644							
0	XMCHEK	112	772							
1032	XMCMSK	933	880							
0	XOVERH	115	562	629						
136	XQLKWD	263	250	258						
126	XQLOCK	248	85	255	476	515				

134	XQNLCK	256	86	492	526				
0	XSWPCT	117	384	458					
0	XTIMEL	119	568	616					
0	Z IC	127	851						
0	Z BAR	121	789						
0	Z BER	122	794						
0	Z MBA	130	795						
0	Z MBB	131	796						
0	Z REG	135	857						
0	Z INTC	129	786						
0	Z PROC	134	788						
0	ZCUHIS	123	813	817					
0	ZDUHIS	124	840	844					
0	ZFTREG	125	798						
0	ZFTYPE	126	790						
0	ZININT	128							
0	ZMDREG	132	799						
0	ZOPF	136	339	356	359	518	523	672	681	881
0	ZOUHIS	133	830	834					

MACRO CROSS REFERENCE TABLE

0	ALARM	1548												
0	ALC	1115												
14	APROC	1150	72	74	81	108	223	226	227	228	242	290	291	895
			899	919										
0	ATACH	1930												
0	BUG	1226												
0	BUGA	1236												
0	CATC	1769												
0	CATH	1792												
0	CATL	1823												
0	CATN	1844												
0	CHAN	2027												
0	CKPT	1270												
0	COPY	1578												
0	DABL	1188												
0	DEALOC	2057												
1	DECCT	2138	518											
0	DELC	1973												
0	DEQ	1371												
0	DQJ	2091												
0	DTACH	1933												
0	DUSE	1890												
0	ENABL	1194												
0	ENQ	1320												
0	ENQJ	2108												
0	EQJ	2075												
0	EXPAND	1497												
0	FCBLIS	2049												
0	FCBPNT	1682												
0	FREE	2007												
2	FREG	282	291											
0	FUSE	1872												
2	FV	276	290											
0	GET	1424												
0	GETB	1446												
0	GETBQ	1468												
0	GETD	1434												
0	GFCBC	1956												
0	GFDA	1778												
0	GFR	1690												
2	GTIM	1983	565	603										
1	IC	201	208											
0	IFIOC	75												
0	IFIOM	71												
0	INSC	1908												
0	INVERT	1139												
2	LGT	915	919											
0	LOG	1513												
0	LOGF	1531												
0	MTASK	1383												
0	MTQ	1348												
0	MTQA	1357												

MACRO CROSS REFERENCE TABLE

0	ORDER	1566											
0	OVCPY	1992											
0	PIO	2168											
17	PROS	1172	72	74	81	108	196	197	208	223	226	227	228	242
			290	291	895	899	919						
0	PROTO	1132											
0	PTQ	1306											
2	QLOCK	1697	476	515									
2	QNLOCK	1701	492	526									
0	QUEUE	1285											
4	REGP	217	226	227									
0	REL	1477											
0	RELC	1965											
2	RETN	891	895										
2	RETNN	896	899										
0	RFCB	2040											
0	RFCBC	1927											
2	SDREG	220	228										
2	SDT	239	242										
0	SHRINK	1484											
1	SIC	162	196										
1	SICP	170	197										
0	SPEBLK	2064											
3	SPROC	1163	196	197	208								
2	SREGS	212	223										
0	TCATL	1828											
0	TREE	2133											
0	WSC	1718											
0	XLOG	2195											

OPCODE CROSS REFERENCE TABLE

1	CIOC	861						
2	DIS	636	863					
2	LBAR	674	737					
2	LCPR	316	859					
4	LDT	571	634	738	739			
1	LMBA	548						
1	LMBB	694						
2	MLDA	1809	435					
1	MSTQ	436						
6	RMCM	1189	1195	717	721	871	879	
2	RSW	820	837					
8	SCPR	317	798	799	809	815	826	832	842
4	SMCM	1191	1197	720	744			
2	SMIC	481	884					
2	SZNC	250	639					

THERE WEREN'T ANY WARNING FLAGS IN THIS ASSEMBLY
   1035   IS THE NEXT AVAILABLE LOCATION
     22   K CORE USED IN THIS ASSEMBLY

THERE WERE 35 ALTERS IN THIS ASSEMBLY.
THE ALTERS ARE ON PAGES   5   16   19   20   22

```
aaaaa  a   a  aaaa                                              a              a   a  aaa    aaaa  a    a  aaaaa  aaaa
a        a  a  a    a                                           a              a   a  a   a  a     a    a    a    a   a
aaaa    aa  a  a    a                                           a              aa  a  a        a   a  aa  a    a    a   a
a       a  aa  a    a                                           a              a  a a  a        a   aa  a  a    a    aaaa
a       a   aa a    a               aa                          a       aa     a   aa  a  aa   a   a  a  aa     a    a  a
aaaaa  a   a  aaaa                                              aaaaa   aa     a   a  aaa    aaaa  a    a  a    a   a
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09/15/81   11:36:57   PRINTOUT #168