B**BB**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**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**BB**BB* COMPUTER SHARING SERVICES *BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**BB**B
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09/15/81 11:37:28 PRINTOUT #171

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

```
    DDDDD   EEEEE  N   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   N    I        S
    DDDDD   EEEEE  N   N  N   N  IIIII  SSS     HAUGH
```

```
1               INDEX
2               TTL     DTSS EXECUTIVE (PIO 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14      *       **    UNPUBLISHED COPYRIGHTED WORK OF DTSS INCORPORATED.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 (PIO SEGMENT) IS:
23      *
24              RDATE   1 DECEMBER 1980.
25              ALTDAT
26      *
27                      NAME    PIO
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]
                000001  54      INSSET  EQU     1               DISABLE RDATE/ALTDATE IN INSERT FILE            [01DEC80]
                        55              INDEX   OFF             WE DON'T WANT TO SEE THE INSERT FILE TTLS        [01SEP79]
                        56              LIST    OFF             TURN LISTING OFF, THE NEXT LINE IS SOURCE OFF   [01SEP79]
```

W ** PRODUCT TRACKING AND GENERAL INFO DEFINITIONS RELEASED 01DEC80

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

```
                    TTLS    SYMDEFS AND SYMREFS
*
*
*
                    HEAD    0
*
*       SYMDEFS
*
                    SYMDEF  B$IO301         U$STAT BIT TO SPECIFY PRT301 PRINTER                    [05NOV77]
                    SYMDEF  B$IOMDD         U$STAT BIT TO SPECIFY DECIMAL MODE ON DEVICE             [05NOV77]
                    SYMDEF  B$IONSK         U$STAT BIT TO NOT ISSUE PRE-SEEK ON DEVICE               [05NOV77]
                    SYMDEF  B$IORCH         P$STAT BIT TO INDICATE CHANNEL RELEASED                  [05NOV77]
                    SYMDEF  I$CHAN          ROUTINE TO SEIZE A SPECIFIC CHANNEL
                    SYMDEF  I$CHLOC         SUBROUTINE THAT RETURNS LOC IN P$CHAN TABLE OF AN IOM-CH# *OTIS
                    SYMDEF  I$CNSP          ADDRESS OF TASK FOR CONSOLE SPECIAL INTERRUPT
                    SYMDEF  I$CONV          ROUTINE TO CONVERT LOGICAL TO PHYSICAL DEVICE ADDRESS
                    SYMDEF  I$CRSP          ADDRESS OF TASK FOR CARD READER SPECIAL INTERRUPT
                    SYMDEF  I$D2Q           QUEUE FOR DUAL DEVICE
                    SYMDEF  I$DAMSK         MASK FOR ADDRESS OF A LOGICAL DA
                    SYMDEF  I$FREE          ROUTINE TO FREE A CHANNEL
                    SYMDEF  I$IO            ENTRY TO ISSUE PHYSICAL I/O
                    SYMDEF  I$L2314         LIMITS FOR 2314 CATALOG TRACKS
                    SYMDEF  I$LM190         LIMITS FOR DSS191 CATALOG TRACKS
                    SYMDEF  I$LM451         LIMITS FOR MSU451 CATALOG TRACKS
                    SYMDEF  I$PRSP          ADDRESS OF TASK FOR PRINTER SPECIAL INTERRUPT
                    SYMDEF  I$ROTA1         ROTATE SIZE ON WORDS FOR DUAL DEVICE
                    SYMDEF  I$ROTAT         ROTATE SIZE IN RECORDS FOR DUAL DEVICE
                    SYMDEF  I$RREG          SUBROUTINE TO RESTORE REGISTERS FROM PIO LIST ELEMENT
                    SYMDEF  I$SYS1          TLOG CALL FOR I/O INITIATE
                    SYMDEF  I$SYS2          TLOG CALL FOR I/O COMPLETE
                    SYMDEF  I$TOCK          LIST ELEMENT FOR I/O TIMEOUT ROUTINE
                    SYMDEF  T$CATSZ         THE NUMBER OF PHYSICAL DEVICES WHICH MAKE UP A CAT DEVICE
                    SYMDEF  T$DNAME         TABLE OF BCD NAMES FOR DEVICES
                    SYMDEF  T$DNL           LENGTH OF DEVICE NAME TABLE
                    SYMDEF  T$FILE          TABLE OF CYLINDER BOUNDRYS BY ALLOCATABLE DEVICE
                    SYMDEF  T$MT9H          PIO TABLE ENTRY FOR DEFAULT 9 TRACK HIGH DENSITY        [21APR77]
                    SYMDEF  T$MT9L          PIO TABLE ENTRY FOR DEFAULT 9 TRACK LOW  DENSITY        [21APR77]
                    SYMDEF  T$MTSH          PIO TABLE ENTRY FOR DEFAULT 7 TRACK HIGH DENSITY        [21APR77]
                    SYMDEF  T$MTSL          PIO TABLE ENTRY FOR DEFAULT 7 TRACK LOW  DENSITY        [21APR77]
                    SYMDEF  T$RANGE         TABLE OF SIZES OF ALLOCATABLE DEVICES
                    SYMDEF  T$REC           TABLE OF LOGICAL RECORD SIZES
                    SYMDEF  T$SIZE          TABLE OF SIZES OF PAGE TABLES (SORT OF) FOR ALLOCATABLE
                    SYMDEF  TSOP01          **
                    SYMDEF  TSOP02          * PLACES TO PUT UPSHIFT INSTRUCTIONS ON 66/X7
                    SYMDEF  TSOP03          **
                    SYMDEF  TSOP07          PLACE FOR GEARSHIFT                                     [09DEC79]
                    SYMDEF  X$ITINT         INTERRUPT PAIR FOR INITIATE/TERMINATE INTERRUPTS         [09DEC79]
                    SYMDEF  X$LPDCW         SCW/DCW PAIR FOR SYSTEM FAULTS                          [09DEC79]
                    SYMDEF  X$QINT          QUESTIONABLE INTERRUPT HANDLER                          [09DEC79]
                    SYMDEF  X$SPDCW         SCW/DCW PAIR FOR SPECIAL CHANNEL INTERRUPTS
                    SYMDEF  X$SPINT         INTERRUPT PAIR FOR SPECIAL INTERRUPTS
                    SYMDEF  X$SYINT         INTERRUPT PAIR FOR SYSTEM FAULTS
```

```
                    *
                    *       SYMREFS
                    *
                            SYMREF  A$EXP           ROUTINE TO EXPAND A LIST ELEMENT
                            SYMREF  A$GET           GET A LIST ELEMENT (LENGTH IN AU)
                            SYMREF  A$GETNB         GET A LIST ELEMENT WITHOUT BUGGING IT
                            SYMREF  A$REL           RELEASE A LIST ELEMENT (ADDRESS IN T)
                            SYMREF  C$UR4B          REENTRY TO COPY SUBROUTINE FOR USER READ OF CONSOLE
                            SYMREF  CKPT            ENTRY TO SAVE REGISTERS IN CHECKPOINT QUEUE
                            SYMREF  D$ATYPE         ALLOCATION TYPE FOR LOGICAL DEVICES
                            SYMREF  D$IOCT          TABLE OF I/O OPERATIONS ISSUED PER DEVICE          [21APR77]
                            SYMREF  EXIT            THE GET NEXT TASK ROUTINE
                            SYMREF  EXIT1           ENTRY TO START TASK POINTED TO BY T
                            SYMREF  EXTMEM          FLAG -- NON-ZERO WHEN RUNNING EXTENDED MEMORY      [05NOV77]
                            SYMREF  H$COM           ENTRY TO CONSOLE INTERFACE
                            SYMREF  H$COMRD         LOGICAL DEVICE NUMBER WHERE SPECIAL IS FROM
                            SYMREF  H$TLOG          LOG A WORD TO TAPE IF LOGGING
                            SYMREF  I$FLOG          FLAG TO CONTROL LOG (UPPER NON-ZERO = TO FILE ONLY)
                            SYMREF  I$LOG           ROUTINE TO LOG MESSAGE ON CONSOLE
                            SYMREF  I$LOGPB         THE CHANNEL NUMBER OF THE LOGGING DEVICE
                            SYMREF  MSIZE           CURRENT MEMORY SIZE IN WORDS                       [05NOV77]
                            SYMREF  N$ICO           TALLY TO IC/IR RETURNS
                            SYMREF  P$CHAN          POINTERS INTO U$CHAN LIST
                            SYMREF  P$Q             THE CHANNEL QUEUES
                            SYMREF  P$STAT          STATE OF THE CHANNEL
                            SYMREF  P$TEMP          A PAIR OF TEMPS BY CHANNEL
                            SYMREF  P$TICK          I/O TIMEOUT TABLE
                            SYMREF  Q$DEQ           DEQUEUE A TASK
                            SYMREF  Q$ENQ           QUEUE A TASK
                            SYMREF  Q$MTQ           QUEUE A TASK ON MASTER TASK QUEUE
                            SYMREF  Q$MTQA          QUEUE A MASTER TASK
                            SYMREF  U$CHAN          LINKED LIST OF DEVICES ON CHANNELS
                            SYMREF  U$PDA           TABLE OF PHYSICAL DEVICE ADDRESSES
                            SYMREF  U$PTYPE         PHYSICAL DEVICE TYPE BY LOGICAL DEVICE
                            SYMREF  U$Q             POINTERS TO QUEUES FOR LOGICAL DEVICES
                            SYMREF  U$RETRY         RETRY COUNT FOR I/O
                            SYMREF  U$SPEC          TABLE OF EXEC SPECIAL-DRIVEN TASKS
                            SYMREF  U$STAT          STATE OF THE LOGICAL DEVICE
                            SYMREF  U$TICK          SPECIAL TIMEOUT TICKERS
                            SYMREF  X$DABL          MASK TO DISABLE INTERRUPTS
                            SYMREF  X$GTIM          RETURNS TIMER UNITS SINCE BOOTLOAD IN A
                            SYMREF  X$INTX          ROUTINE TO EXIT(RETURN) FROM INTERRUPTS            [08AUG77]
                            SYMREF  X$IODTB         STATS -- CHANNEL QUEUED TIMES
                            SYMREF  X$IOM           IOM PORT ON MEMORY
                            SYMREF  X$IOQTB         STATS -- CHANNEL QUEUED TIMES
                            SYMREF  X$IOSTB         STATS -- CHANNEL BUSY TIMES
                            SYMREF  X$IOUTB         STATS -- CHANNEL BUSY TIMES
                            SYMREF  X$IREGT         TALLY TO SAVED INTERRUPT REGISTERS
                            SYMREF  X$LHEAD         LOG A RECORD HEADER IF TAPE LOGGING
                            SYMREF  X$MEM           ADDRESS FOR RMCM AND SMCM
                -+164       SYMREF  X$MBXP          TABLE OF IOM MBX BASES*OTIS                        [01DEC80]
                 +165       SYMREF  X$SISTP         TABLE OF IOM SYS FAULT BASES*OTIS                  [01DEC80]
```

```
                +166            SYMREF  X$SPSTP         TABLE OF IOM SPECIAL STATUS BASES*OTIS          [01DEC80]
                 167            SYMREF  X$STIM          ROUTINE TO SET A REALTIME TIMER
               -+168            SYMREF  X$STTSP         TABLE OF IOM PAYLOAD CHAN SW BASE*OTIS          [01DEC80]
                 169            SYMREF  X$SWPCT         STATISTICS
                 170            SYMREF  Z$IMW           PLACE TO SAVE IMW FOR Z$IMWCK
                 171            SYMREF  Z$IMWC1         ANOTHER ENTRY POINT FOR Z$IMWCK
                 172            SYMREF  Z$IMWCK         ROUTINE TO GET NEXT CHANNEL # FROM IMW
                 173            SYMREF  ZOPF            A WORD WHICH WILL CAUSE A ZOP FAULT
```

```
                    174             TTLS    PHYSICAL I/O -- BIT DEFINITIONS                                  [05NOV77]
                    175     *                                                                                [05NOV77]
                    176     *                                                                                [05NOV77]
                    177     *       BIT DEFINITIONS FOR I$MODE (DIAGNOSTICS)                                 [05NOV77]
                    178     *                                                                                [05NOV77]
                    179             HEAD    B                                                                [05NOV77]
000040              180     DGHDV   BOOL    000040          HOLD DEVICE ON TERMINATION                       [05NOV77]
000020              181     DGUHD   BOOL    000020          USE HELD DEVICE (BYPASS QUEUEING)                [05NOV77]
000010              182     DGHPB   BOOL    000010          HOLD PUB ON TERMINATION                          [05NOV77]
000004              183     DGUHP   BOOL    000004          USE HELD PUB (BYPASS QUEUEING)                   [05NOV77]
                    184     *                                                                                [05NOV77]
                    185     *       BITS FOR P$STAT                                                          [05NOV77]
                    186     *                                                                                [05NOV77]
                    187             HEAD    B                                                                [05NOV77]
400000              188     IOBSY   BOOL    400000          PUB BUSY (INTERRUPT EXPECTED)                    [05NOV77]
200000              189     IOCPM   BOOL    200000          CARD PUNCH MODE SETUP BIT                        [05NOV77]
100000              190     IOCDM   BOOL    100000          DRUM OP SETUP BIT                                [05NOV77]
040000             -+191    IOLV6   BOOL    040000          LEVEL6 DIA                                       [01DEC80]
020000              192     IOCDN   BOOL    020000          SET UP D-30 READ                                 [05NOV77]
010000              193     IORCH   BOOL    010000          CHANNEL RELEASE FLAG                             [05NOV77]
000002              194     SPIOP   BOOL    000002          SPECIAL OPERATION - NO ERROR CHECKING            [05NOV77]
000001              195     IOPDH   BOOL    000001          PUB DIAGNOSTIC HOLD                              [05NOV77]
                    196     *                                                                                [05NOV77]
                    197     *       BITS FOR U$STAT                                                          [05NOV77]
                    198     *                                                                                [05NOV77]
                    199             HEAD    B                                                                [05NOV77]
400000              200     IOSPC   BOOL    400000          SPECIAL INTERRUPT PENDING                        [05NOV77]
200000              201     IOSKC   BOOL    200000          SEEK-COMPLETE BIT FOR 2314/HSFC                  [05NOV77]
100000              202     IOMDD   BOOL    100000          DECIMAL MODE SET                                 [05NOV77]
040000              203     IOMDA   BOOL    040000          ASCII MODE SET (9 TRACK TAPE)                    [05NOV77]
020000              204     IONSK   BOOL    020000          DON'T SEEK FOR DSS180                            [05NOV77]
010000              205     IO301   BOOL    010000          IMAGE SETTABLE DEVICE                            [05NOV77]
007700              206     BUTON   BOOL    007700          SPACE FOR PRINTER BUTTON STATUS                  [05NOV77]
000002              207     IONRV   BOOL    000002          SUPRESS ERROR RECOVERY                           [05NOV77]
000001              208     IODGH   BOOL    000001          IO DIAGNOSTIC HOLD BIT                           [05NOV77]
```

```
                                209             TTLS    PHYSICAL I/O -- DEVICE INFO TABLES
                                210     *
                                211     *       TABLE OF RECORD SIZES (MINIMUM WRITTEN)
                                212     *
                                213             HEAD    T
000000  000000000000  ..        214     REC     DEC     0               0 NO SUCH DEVICE
000001  000000000100  ..        215             DEC     64              1 DRUM
000002  000000000200  ..        216             DEC     128             2 2314, FILE PREFERENCE
000003  000000000200  ..        217             DEC     128             3 2314, CATALOG PREFERENCE
000004  000000000200  ..        218             DEC     128             4 DSS167
000005  000000000000  ..        219             DEC     0               5 = SPARE
000006  000000000100  ..        220             DEC     64              6 = SPLIT DEVICE
000007  000000000200  ..        221             DEC     128             7 = 2314, ENTIRE PACK
000010  000000000200  ..        222             DEC     128             8 = DSS190, ENTIRE PACK
000011  000000000200  ..        223             DEC     128             9 = DSS190, CATALOG TRACKS
000012  000000000200  ..        224             DEC     128             10 = DSS190, FILE TRACKS
000013  000000000400  ..        225             DEC     256             11 = MSU451 ENTIRE PACK                 [170CT76]
000014  000000000400  ..        226             DEC     256             12 = MSU451 CATALOG TRACKS              [170CT76]
000015  000000000400  ..        227             DEC     256             13 = MSU451 FILE TRACKS                 [170CT76]
000016  000000000000  ..        228             DEC     0               14 = PATCH SPACE                        [170CT76]
                                229     *
                                230     *
                                231     *       TABLE OF MAX NUMBER OF RECORDS PER FILE OPERATION
                                232     *       (LOGICAL CYLINDER SIZE IN UNITS OF LOGICAL RECORDS)     [01MAY79]
                                233     *
                                234             HEAD    T
000017  000000000000  ..        235     FILE    DEC     0               0 NO SUCH DEVICE
000020  000000010000  ..        236             DEC     4096            1 = DRUM
000021  000000000264  ..        237             DEC     180             2 = 2314, FILE PREFERENCE
000022  000000000264  ..        238             DEC     180             3 = 2314, CATALOG PREFERENCE
000023  000000000144  ..        239             DEC     100             4 = DSS167
000024  000000000000  ..        240             DEC     0                5 = SPARE
000025  000000010000  ..        241             DEC     4096            6 = SPLIT DEVICE
000026  000000000264  ..        242             DEC     180             7 = 2314, ENTIRE PACK
000027  000000001370  ..        243             DEC     760             8 = DSS190 FAMILY, ENTIRE PACK
000030  000000001370  ..        244             DEC     760             9 = DSS190 FAMILY, CATALOG TRACKS
000031  000000001370  ..        245             DEC     760             10 = DSS190 FAMILY, FILE TRACKS
000032  000000000574  ..        246             DEC     380             11 = MSU451 ENTIRE PACK                 [170CT76]
000033  000000000574  ..        247             DEC     380             12 = MSU451 CATALOG TRACKS              [170CT76]
000034  000000000574  ..        248             DEC     380             13 = MSU451 FILE TRACKS                 [170CT76]
000035  000000000000  ..        249             DEC     0               14 = PATCH SPACE                        [170CT76]
```

T PHYSICAL I/O -- DEVICE INFO TABLES RELEASED 01DEC80

```
                                    250             EJECT                                                                   [01MAY79]
                                    251     *
                                    252     *       TABLE OF ALLOCATION RANGES
                                    253     *
    000036  000000000000    ..      254     RANGE   OCT     0               0 NO SUCH DEVICE
    000037  000000027676    ..      255             OCT     000000027676    1 UNIVAC DRUM
    000040  000100 077200   ..      256             ZERO    64,9*20*180-16  2 2314, FILE TRACKS                             [21APR77]
    000041  000000 007006   ..      257             ZERO    0,9*20*20-10    3 2314, CATALOG TRACKS                          [21APR77]
    000042  000100047000    ..      258             OCT     000100047000    4 DSS167                                        [21APR77]
    000043  000000000000    ..      259             DEC     0               5 = SPARE                                       [21APR77]
    000044  000000057400    ..      260             OCT     000000057400    6 = SPLIT DEVICE                                [21APR77]
    000045  000100 106220   ..      261             ZERO    64,9*20*200-16  7 = 2314, ENTIRE PACK                            [21APR77]
    000046  000100 456032   ..      262             ZERO    64,20*19*407-10 8 = DSS190 FAMILY, ENTIRE PACK                  [21APR77]
    000047  000000 035526   ..      263             ZERO    0,20*19*40-10   9 = DSS190 FAMILY, CATALOG TRACKS             [21APR77]
    000050  000100 420272   ..      264             ZERO    64,20*19*367-10 10 = DSS190 FAMILY, FILE TRACKS                 [21APR77]
    000051  000100 454740   ..      265             ZERO    64,10*19*811-10 11 = MSU451 ENTIRE PACK                         [09DEC79]
    000052  000000 016646   ..      266             ZERO    0,10*19*40-10   12 = MSU451 CATALOG TRACKS (SAME SIZE AS DSS191) [09DEC79]
    000053  000100 436060   ..      267             ZERO    64,10*19*771-10 13 = MSU451 FILE TRACKS                         [09DEC79]
    000054  000000 000000   ..      268             ZERO                    14 = PATCH SPACE                                [17OCT76]
                                    269     *
                                    270     *       UPPER - T$SIZE - MAXIMUM ALLOCATION SIZE PLUS TWO                       [01MAY79]
                                    271     *       LOWER - T$CONV - SUBROUTINE FOR LOGICAL TO PHYSICAL CONVERSION          [01MAY79]
                                    272     *
                  000055            273     SIZE    NULL                    UPPER HALF
                  000055            274     CONV    NULL                    LOWER HALF
    000055  000000 002007   .R      275             ZERO    0,I$CONV1       0 = NOT ALLOCATABLE
    000056  000022 002007   .R      276             ZERO    18,I$CONV2      1 = UNIVAC DRUM
    000057  000022 002012   .R      277             ZERO    18,I$CONV3      2 = 2314, FILE PREFERENCE
    000060  000022 002014   .R      278             ZERO    18,I$CONV4      3 = 2314, CATALOG PREFERENCE
    000061  000022 002016   .R      279             ZERO    18,I$CONV5      4 = DSS167
    000062  000000 002005   .R      280             ZERO    0,I$CONV0       5 = SPARE
    000063  000022 002007   .R      281             ZERO    18,I$CONV2
    000064  000022 002024   .R      282             ZERO    18,I$CONV7      7 = 2314, ENTIRE PACK
    000065  000024 002024   .R      283             ZERO    20,I$CONV8      8 = DSS190 FAMILY, ENTIRE PACK
    000066  000024 002034   .R      284             ZERO    20,I$CONV9      9 = DSS190 FAMILY, CATALOG TRACKS
    000067  000024 002036   .R      285             ZERO    20,I$CNV10      10 = DSS190 FAMILY, FILE TRACKS
    000070  000024 002024   .R      286             ZERO    20,I$CNV11      11 = MSU451 ENTIRE PACK                         [17OCT76]
    000071  000024 002040   .R      287             ZERO    20,I$CNV12      12 = MSU451 CATALOG TRACKS                      [17OCT76]
    000072  000024 002042   .R      288             ZERO    20,I$CNV13      13 = MSU451 FILE TRACKS                         [17OCT76]
    000073  000000 002005   .R      289             ZERO    0,I$CONV0       14 = PATCH SPACE                                [17OCT76]
                                    290     *
                                    291     *        NUMBER OF PHYSICAL DEVICES PER LOGICAL CATALOG TRACKS DEVICE
                                    292     *
    000074  000000000001    ..      293     CATSZ   OCT     1
```

```
                                    294             EJECT                                                   [01MAY79]
                                    295     *
                                    296     *       T$IOCMD - INITIAL POINTERS TO I/O COMMAND LISTS
                                    297     *       T$SWAIT - NUMBER OF TICKS TO AWAIT SPECIAL INTERRUPT
                                    298     *
                          000075    299     IOCMD   NULL                    UPPER HALF
                          000075    300     SWAIT   NULL                    LOWER HALF
000075  000177 000001  R.   301             ZERO    BDAD,1                  0 = INVALID DEVICE
000076  000177 000002  R.   302             ZERO    DSRD,2                  1 = 2314 (DSS170)
000077  000177 000001  R.   303             ZERO    DRRD,1                  2 = UNIVAC DRUM
000100  000177 000002  R.   304             ZERO    DQRD,2                  3 = DSS167
000101  000177 000001  R.   305             ZERO    BDAD,1                  4 = PATCH SPACE
000102  000177 000001  R.   306             ZERO    BDAD,1                  5 = SPARE
000103  000177 000001  R.   307             ZERO    D2RD,1                  6 = SPLIT DEVICE
000104  000366 000024  R.   308             ZERO    MTRD,20                 7 = SEVEN TRACK MAG TAPE
000105  000726 000024  R.   309             ZERO    MTR9,20                 8 = NINE TRACK MAG TAPE
000106  000314 000001  R.   310             ZERO    CNWT,1                  9 = CONSOLE TYPEWRITER
000107  001016 000010  R.   311             ZERO    CRRD,8                  10 = CARD READER
000110  001052 000010  R.   312             ZERO    CPWT,8                  11 = CARD PUNCH
000111  001106 000010  R.   313             ZERO    PRWT,8                  12 = LINE PRINTER
000112  001275 000002  R.   314             ZERO    DNRD,2                  13 = DN30
000113  001070 000010  R.   315             ZERO    BPWT,8                  14 = BULL PUNCH
000114  000233 000004  R.   316             ZERO    D9RD,4                  15 = DSS190 FAMILY
000115  001331 000002  R.   317             ZERO    H7RD,2                  16 = HONEYWELL 716
000116  001106 000010  R.   318             ZERO    PRWT,8                  17 = 301 PRINTER
000117  001167 000010  R.   319             ZERO    P4WT,8                  18 = URMPC PRINTER
000120  001446 000024  R.   320             ZERO    MPRD,20                 19 = MPC                        [18AUG76]
000121  000233 000004  R.   321             ZERO    D9RD,4                  20 = MSU451                     [17OCT76]
000122  001365 000002  R.   322             ZERO    L6RD,2                  H'WELL LEVEL 6 FEP              [01DEC80]
                                    323     *
                                    324     *       T$DNAME - BCD NAME OF DEVICE FOR ERROR MESSAGES
                                    325     *
                                    326             HEAD    T               T FOR TABLES
                          000123    327     DNAME   NULL                    FULL WORD
000123  203145652143      ..   328             BCI     1, INVAL             0 = INVALID DEVICE
000124  202024316242      ..   329             BCI     1,  DISK             1 = 2314/ASC
000125  202451644420      ..   330             BCI     1, DRUM              2 = UNIVAC DRUM
000126  246262010607      ..   331             BCI     1,DSS167             3 = DSS167
000127  202020202020      ..   332             BCI     1,                   4 = PATCH SPACE
000130  202020202020      ..   333             BCI     1,                   5 = PATCH SPACE
000131  022451644462      ..   334             BCI     1,2DRUMS             6 = SPLIT DEVICE
000132  202063214725      ..   335             BCI     1,  TAPE             7 = SEVEN TRACK MAG TAPE
000133  202063214711      ..   336             BCI     1,  TAP9             8 = NINE TRACK MAG TAPE
000134  234645624643      ..   337             BCI     1,CONSOL             9 = CONSOLE TYPEWRITER
000135  512521242551      ..   338             BCI     1,READER             10 = CARD READER
000136  204764452330      ..   339             BCI     1, PUNCH             11 = CARD PUNCH
000137  475131456351      ..   340             BCI     1,PRINTR             12 = PRINTER
000140  202445520300      ..   341             BCI     1, DN-30             13 = DN30
000141  204764452330      ..   342             BCI     1, PUNCH             14 = BULL PUNCH
000142  202024011101      ..   343             BCI     1,  D191             15 = DSS191                     [21APR77]
000143  203007010620      ..   344             BCI     1, H716              16 = HONEYWELL 716              [21APR77]
000144  475163030001      ..   345             BCI     1,PRT301             17 = 301 PRINTER                [21APR77]
```

T PHYSICAL I/O -- DEVICE INFO TABLES RELEASED 01DEC80

```
000145 475163040000  ..  346          BCI   1,PRT400        18 = URMPC PRINTER                    [21APR77]
000146 444723202020  ..  347          BCI   1,MPC           19 = MPC                              [21APR77]
000147 202044040501  ..  348          BCI   1,  M451        20 = MSU451                           [21APR77]
000150 432565254306  ..  349          BCI   1,LEVEL6      21 = HISI LEVEL 6 MINICOMPUTER          [09DEC79]
              000026     350    DNL    EQU   *-DNAME                                            [09DEC79]
                         351    *                                                               [09DEC79]
              000151     352           IFIOM                                                    [09DEC79]
                         353    *
                         354    *
                         355    *      DETAILED STATUS COMMANDS
                         356    *
              000151     357    DVSTB  NULL                  FULL WORDS                         [09DEC79]
000151 000000000000  ..  358          OCT   000000000000    0 = INVALID DEVICE
000152 000000000000  ..  359          OCT   000000000000    1 = 2314 (DSS170)
000153 000000000000  ..  360          OCT   000000000000    2 = UNIVAC DRUM
000154 000000000000  ..  361          OCT   000000000000    3 = DSS167
000155 000000000000  ..  362          OCT   000000000000    4 = PATCH SPACE
000156 000000000000  ..  363          OCT   000000000000    5 = SPARE
000157 000000000000  ..  364          OCT   000000000000    6 = SPLIT DEVICE
000160 500000000000  ..  365          OCT   500000000000    7 = SEVEN TRACK MAG TAPE              [21APR77]
000161 500000000000  ..  366          OCT   500000000000    8 = NINE TRACK MAG TAPE
000162 000000000000  ..  367          OCT   000000000000    9 = CONSOLE TYPEWRITER
000163 000000000000  ..  368          OCT   000000000000    10 = CARD READER
000164 000000000000  ..  369          OCT   000000000000    11 = CARD PUNCH
000165 000000000000  ..  370          OCT   000000000000    12 = LINE PRINTER
000166 000000000000  ..  371          OCT   000000000000    13 = DN30
000167 000000000000  ..  372          OCT   000000000000    14 = BULL PUNCH
000170 220000000000  ..  373          OCT   220000000000    15 = DSS190 FAMILY
000171 000000000000  ..  374          OCT   000000000000    16 = HONEYWELL 716
000172 000000000000  ..  375          OCT   000000000000    17 = 301 PRINTER
000173 030000000000  .. -+376  URPRT  OCT   030000000000    18 = URMPC PRINTER                    [01DEC80]
000174 000000000000  ..  377          OCT   000000000000    19 = MPC                              [18AUG76]
000175 220000000000  ..  378          OCT   220000000000    20 = MSU451                           [17OCT76]
000176 000000000000  ..  379          OCT   000000000000    21 = HISI LEVEL 6 FEP                 [09DEC79]
                         380    *                                                               [09DEC79]
                         381    ENDIOM MARK                                                    [09DEC79]
```

T PHYSICAL I/O -- MAIN DRIVER TABLES RELEASED 01DEC80

```
                        382              TTLS    PHYSICAL I/O -- MAIN DRIVER TABLES                                  [01MAY79]
                        383     *
                        384              HEAD    T                   T FOR TABLES
                        385     *
                        386     *
                        387     *        THESE TABLES ARE LINKED LISTS OF BLOCKS, ONE BLOCK PER
                        388     *        COMMAND.  EACH BLOCK CONTAINS THE INFORMATION NECESSARY
                        389     *        TO EXECUTE THAT COMMAND, IN THE FOLLOWING FORMAT.
                        390     *
                        391     *                                                                                    [09DEC79]
                        392              HEAD    T                                                                   [09DEC79]
000001                  393     IOCPC    EQU     1                   (FULL) PHYSICAL COMMAND WORD                    [09DEC79]
000002                  394     IOPSS    EQU     IOCPC+1             (UPPER) PRE-SIEZE SUBROUTINE                    [09DEC79]
000002                  395     IOCIO    EQU     IOPSS               (LOWER) CONNECT ROUTINE                         [09DEC79]
000003                  396     IOPCS    EQU     IOCIO+1             (UPPER) PRE-CONNECT SUBROUTINE                  [09DEC79]
                        397                                          (LOWER) PARAMETERS FOR ABOVE                    [09DEC79]
000004                  398     IOSTS    EQU     IOPCS+1             (UPPER) STATUS CHECK ROUTINE                    [09DEC79]
000004                  399     IOTMO    EQU     IOSTS               (LOWER) TIMEOUT TIME                            [09DEC79]
000005                  400     IORTM    EQU     IOTMO+1             (UPPER) MAXIMUM RETRY COUNT                     [09DEC79]
000005                  401     IORTY    EQU     IORTM               (LOWER) RETRY OPERATION LINK                    [09DEC79]
000006                  402     IONXT    EQU     IORTY+1             (UPPER) NEXT ROUTINE                            [09DEC79]
                        403                                          (LOWER) NEXT OPERATION LINK                     [09DEC79]
                        404     *
                        405     *
                        406     *        THE FOLLOWING MACRO GENERATES SUCH BLOCKS
                        407     *
                        408     IT       MACRO   <LABEL>,<LINK>,<MODE>,IOCPC,IOPSS,IOPCS,IOCIO,IOSTS,IOTMO,IORTM,IORTY,IONXT
                        409              CRSM    SAVE,OFF
                        410     #1       ZERO    #2,I$MD#3           LINK/MODE
                        411              OCT     #4                  IOCPC
                        412              INE     '#5','',4
                        413              IFE     '#7','',2
                        414              ZERO    I$#5                IOPSS/IOCIO
                        415              IFE     1,2,1
                        416              ZERO    I$#5,I$#7           IOPSS,IOCIO
                        417              IFE     '#5','',4
                        418              IFE     '#7','',2
                        419              ZERO    I$MPSSR             IOPSS/IOCIO
                        420              IFE     1,2,1
                        421              ZERO    I$MPSSR,I$#7        IOPSS/IOCIO
                        422              INE     '#6','',2
                        423              ZERO    I$#6                IOPCS
                        424              IFE     1,2,1
                        425              ZERO    I$MPCSR             IOPCS
                        426              ZERO    I$#8,#9             IOSTS,IOTMO
                        427              ZERO    #10,#11             IORTM,IORTY                                     [01MAY79]
                        428              ZERO    I$#12               IONXT
                        429              CRSM    RESTORE
                        430              ENDM    IT
```

```
                    EJECT                                                    [09DEC79]
                                                                             [09DEC79]
*       THE COMMAND BLOCKS ARE LABELLED SO THAT THEY CAN                     [09DEC79]
*       BE LINKED. SOME OF THESE LABELS ARE ALSO USED                        [09DEC79]
*       INTERNALLY, FOR CHAINING AND I$MDDG.                                 [09DEC79]
                                                                             [09DEC79]
*O UPPER -- LINK TO NEXT COMMAND BLOCK FOR THIS TYPE.                        [09DEC79]
*       THE COMMANDS DEFINED FOR A PHYSICAL DEVICE TYPE ARE                  [09DEC79]
*       ON A LIST. THESE LISTS MERGE FOR COMMON COMMANDS SUCH                [09DEC79]
*       AS SUPPRESS/ENABLE ERROR RECOVERY. THE LISTS TERMINATE               [09DEC79]
*       IN RJCT, WHICH SIMULATES A COMMAND REJECT STATUS.                    [09DEC79]
                                                                             [09DEC79]
*O LOWER -- I$MODE CODE FOR THIS BLOCK (SEE INSERT). THESE                   [09DEC79]
*       CODES ARE USED BY OTHER SEGMENTS TO DO OPERATIONS.                   [09DEC79]
*       THE LIST OF COMMANDS (SEE O UPPER) IS SEARCHED FOR                   [09DEC79]
*       A MATCHING I$MODE. THE I$MDDG CODE INDICATES A COMMAND               [09DEC79]
*       USED ONLY WITHIN PIO, TYPICALLY FOR ERROR RECOVERY,                  [09DEC79]
*       WHICH CAN'T BE ISSUED FROM OUTSIDE.                                  [09DEC79]
                                                                             [09DEC79]
*IOCPC -- FULLWORD DEVICE COMMAND. THIS WORD                                 [09DEC79]
*       IS OR'D WITH OTHER BITS TO MAKE THE ACTUAL IDCW.                     [09DEC79]
*       REMEMBER THAT CERTAIN I$MODES (E.G. SET DECIMAL)                     [09DEC79]
*       DON'T DO ANY I/O.                                                    [09DEC79]
                                                                             [09DEC79]
*IOPSS -- PRE-SIEZE ROUTINES. THESE DO SUCH THINGS                           [09DEC79]
*       AS CHECK & RETURN BUTTON STATUS ON PRINTERS. THE                     [09DEC79]
*       NORMAL RETURN IS TO MPSSR, WHICH SIEZES THE CHANNEL                  [09DEC79]
*       AND QUEUES THE INTERRUPT RETURN.                                     [09DEC79]
                                                                             [09DEC79]
*IOPCS -- PRE-CONNECT ROUTINE. THIS GETS THE RIGHT                           [09DEC79]
*       COMMAND FOR DUAL-MODE (DECIMAL-BINARY) DEVICES,                      [09DEC79]
*       WAITS FOR A SPECIAL ON D30S, SETS UP THE CHARACTER                   [09DEC79]
*       IN A WRITE-SINGLE-CHARACTER COMMAND, SETS TI BITS                    [09DEC79]
*       IN THE SEEK ADDRESS, &C. RETURN IS TO MPCSR.                         [09DEC79]
*       THE LOWER HALF MAY CONTAIN AN ARGUMENT.                              [09DEC79]
                                                                             [09DEC79]
*IOCIO -- SPECIAL CONNECT SEQUENCE (IF ANY). THESE HANDLE                    [09DEC79]
*       COMMON PERIPHERAL, D30, AND DIRECT CHANNEL CONNECT                   [09DEC79]
*       IDIOSYNCRACIES. THEY RETURN TO CIOC.                                 [09DEC79]
                                                                             [09DEC79]
*       CIOC MARKS THE CHANNEL BUSY, ISSUES THE CONNECT                      [09DEC79]
*       AND EVAPORATES.                                                      [09DEC79]
                                                                             [09DEC79]
*IOTMO -- TICKS TO TIMEOUT. THERE IS A GLOBAL 8K MS.                         [09DEC79]
*       TICKER. WHEN (IOTMO) TICKS PASS, THE I/O TIMES OUT.                  [09DEC79]
*       THUS IOTMO SHOULD BE > 1 FOR ACTUAL I/O.                             [09DEC79]
                                                                             [09DEC79]
*       WHEN THE CHANNEL RETURNS AN INTERRUPT THE LIST                       [09DEC79]
*       IS DEQUEUED (SEE IOPSS, MPSSR).                                      [09DEC79]
```

```
                    480             EJECT                                                   [09DEC79]
                    481                                                                     [09DEC79]
                    482     *IOSTS -- STATUS CHECK ROUTINE. FOR SPECIAL I/O                 [09DEC79]
                    483     *       (B$SPIOP IS SET) OR IOM ERRORS THIS IS CALLED           [09DEC79]
                    484     *       DIRECTLY. FOR NORMAL I/O AND STATUS (IOSTS)+1 IS        [09DEC79]
                    485     *       CALLED. IT IS RESPONSIBLE FOR RETRIES (TRA RETRY).      [09DEC79]
                    486     *       IT MAY ISSUE SPECIAL (I$MDDG) COMMANDS, SUCH AS REREAD, [09DEC79]
                    487     *       BACKSPACE TO REREAD, ERASE THEN REWRITE (SEE BELOW).    [09DEC79]
                    488                                                                     [09DEC79]
                    489     *IORTY -- RETRY COMMAND. THIS USED FOR RETRYING SOME           [09DEC79]
                    490     *       OPERATIONS, SUCH AS READ-BACKSPACE-REREAD, WRITE-       [09DEC79]
                    491     *       ERASE-REWRITE.                                          [09DEC79]
                    492                                                                     [09DEC79]
                    493     *IORTM -- RETRY COUNT. THIS IS THE NUMBER OF TIMES TO           [09DEC79]
                    494     *       RETRY I/O. IT US USED BY RETRY & FRIENDS.               [09DEC79]
                    495                                                                     [09DEC79]
                    496     *IONXT -- NEXT OPERATION LINK. THE UPPER HALF IS                [09DEC79]
                    497     *       CALLED WHEN THIS OPERATION COMPLETES SUCCESSFULLY.      [09DEC79]
                    498     *       THE LOWER HALF MAY CONTAIN AN ARGUMENT.                 [09DEC79]
```

```
                                499             EJECT
                                500     *
                                501     *       REJECT INVALID DAC IN PIO CALL
                                502     *
                        000177  503             IT      BDAD,0,DG,000,BDAD,,,ERROR,,,,ERROR
000177  000000 700000   ..              BDAD    ZERO    0,I$MDDG        LINK/MODE
000200  000000000000   ..                      OCT     000             IOCPC
000201  004333 000000   R.                      ZERO    I$BDAD          IOPSS/IOCIO
000202  002667 000000   R.                      ZERO    I$MPCSR         IOPCS
000203  002577 000000   R.                      ZERO    I$ERROR,        IOSTS,IOTMO
000204  000000 000000   ..                      ZERO    ,               IORTM,IORTY
000205  002577 000000   R.                      ZERO    I$ERROR         IONXT
                                504     *                                               [09DEC79]
                                505     *       DIAGNOSTIC BLOCK FOR READ DETAIL STATS  [09DEC79]
                                506     *                                               [09DEC79]
                        000206  507             IFIOM                                   [09DEC79]
                                508     *                                               [09DEC79]
                        000206  509             IT      RDDTS,0,DG,777777777777,,,,DVST1,3,3,,ERROR  DETAILED STATUS  [09DEC79]
000206  000000 700000   ..              RDDTS   ZERO    0,I$MDDG        LINK/MODE
000207  777777777777   ..                      OCT     777777777777    IOCPC
000210  002663 000000   R.                      ZERO    I$MPSSR         IOPSS/IOCIO
000211  002667 000000   R.                      ZERO    I$MPCSR         IOPCS
000212  004073 000003   R.                      ZERO    I$DVST1,3       IOSTS,IOTMO
000213  000003 000000   ..                      ZERO    3,              IORTM,IORTY
000214  002577 000000   R.                      ZERO    I$ERROR         IONXT
                                510     *                                               [09DEC79]
                                511     ENDIOM  MARK                                    [09DEC79]
                                512     *                                               [09DEC79]
                                513     *                                               [09DEC79]
                                514     *       FAKE BLOCK FOR DIAGNOSTIC DRIVES        [09DEC79]
                                515     *                                               [09DEC79]
                        000215  516             IT      IODG,0,DG,000,,,,DIAGX,,,,ERROR [09DEC79]
000215  000000 700000   ..              IODG    ZERO    0,I$MDDG        LINK/MODE
000216  000000000000   ..                      OCT     000             IOCPC
000217  002663 000000   R.                      ZERO    I$MPSSR         IOPSS/IOCIO
000220  002667 000000   R.                      ZERO    I$MPCSR         IOPCS
000221  004224 000000   R.                      ZERO    I$DIAGX,        IOSTS,IOTMO
000222  000000 000000   ..                      ZERO    ,               IORTM,IORTY
000223  002577 000000   R.                      ZERO    I$ERROR         IONXT
                                517     *                                               [09DEC79]
                                518     *       REJECT INVALID COMMAND                  [09DEC79]
                                519     *                                               [09DEC79]
                        000224  520             IT      RJCT,0,DG,000,RJCT,,,ERROR,,,,ERROR [09DEC79]
000224  000000 700000   ..              RJCT    ZERO    0,I$MDDG        LINK/MODE
000225  000000000000   ..                      OCT     000             IOCPC
000226  004325 000000   R.                      ZERO    I$RJCT          IOPSS/IOCIO
000227  002667 000000   R.                      ZERO    I$MPCSR         IOPCS
000230  002577 000000   R.                      ZERO    I$ERROR,        IOSTS,IOTMO
000231  000000 000000   ..                      ZERO    ,               IORTM,IORTY
000232  002577 000000   R.                      ZERO    I$ERROR         IONXT
```

T PHYSICAL I/O -- MAIN DRIVER TABLES -- DRUM RELEASED 01DEC80

```
                    521              TTLS    PHYSICAL I/O -- MAIN DRIVER TABLES -- DRUM                    [09DEC79]
                    522    *
                    523    *         DRUM TABLES
                    524    *
                    525    *
          000233    526              IFIOM                                                                 [09DEC79]
          000177    527    DRRD      EQU     BDAD            NO DRUMS ON IOM                               [09DEC79]
                    528    ENDIOM    MARK                                                                  [09DEC79]
          000233    529              IFIOC                                                                 [09DEC79]
                    530    *
                    531              IT      DRRD,DRWT,RD,250000240002,,,CIODM,DRRD1,2,3,,FIN1
                    532              IT      DRWT,MTRV,WR,310000240002,,,CIODM,DRWT1,2,3,,FIN1
                    533    *
                    534    ENDIOC    MARK                                                                  [09DEC79]
                    535    *                                                                               [09DEC79]
                    536    *         SPECIAL SPLIT DEVICE TABLES                                           [09DEC79]
                    537    *                                                                               [09DEC79]
          000233    538              IFIOM                                                                 [09DEC79]
          000177    539    D2RD      EQU     BDAD            NO SPLIT DEVICES ON IOM                       [09DEC79]
                    540    ENDIOM    MARK                                                                  [09DEC79]
          000233    541              IFIOC                                                                 [09DEC79]
                    542    *                                                                               [21APR77]
                    543              IT      D2RD,D2WT,RD,000,D2PSS,,,ERROR,,,,ERROR                       [21APR77]
                    544              IT      D2WT,MTRV,WR,000,D2PSS,,,ERROR,,,,ERROR                       [21APR77]
                    545    *                                                                               [21APR77]
                    546    ENDIOC    MARK                                                                  [09DEC79]
                    547    *                                                                               [09DEC79]
          000233    548              IFIOC                                                                 [09DEC79]
                    549    *                                                                               [21APR77]
                    550              IT      DKREQ,0,DG,000000020001,DKPS1,,,DKRQ1,2,3,,DKRQX              [21APR77]
                    551              IT      DPRR,0,DG,220000000000,DKPS1,,CIORR,DPRR1,2,3,,DPRR2          [21APR77]
                    552              IT      DPRRA,0,DG,220000000000,,,CIOR1,DPRA1,3,3,,ERROR
                    553              IT      DPRRB,0,DG,260000000000,,,CIOR1,DPRA1,3,3,,ERROR
                    554              IT      DPRS,0,DG,420000020001,,,,DPRS1,5,3,,DPRSX
                    555    *
                    556    ENDIOC    MARK                                                                  [09DEC79]
```

T PHYSICAL I/O -- MAIN DRIVER TABLES -- DISK RELEASED 01DEC80

```
                        557              TTLS    PHYSICAL I/O -- MAIN DRIVER TABLES -- DISK                    [09DEC79]
                        558     *
                        559     *
                        560     *        DSU167 TABLES
                        561     *
                000233  562              IFIOM                                                                 [09DEC79]
                000177  563     DQRD     EQU     BDAD            NO DSS167 ON IOM                              [09DEC79]
                        564     ENDIOM   MARK                                                                  [09DEC79]
                000233  565              IFIOC                                                                 [09DEC79]
                        566     *                                                                              [21APR77]
                        567              IT      DQRD,DQWT,RD,340000000000,DKPS1,,CIOCS,DQSK1,2,3,,(DKWTX,     [21APR77]
                        568              ETC     DQRDA)                                                        [21APR77]
                        569              IT      DQRDA,0,DG,250000240002,,,CIODM,DQRD1,2,3,DQRDA,FIN1          [21APR77]
                        570              IT      DQWT,MTRV,WR,340000000000,DKPS1,,CIOCS,DQSK1,                 [21APR77]
                        571              ETC     2,3,,(DKWTX,DQWTA)                                            [21APR77]
                        572              IT      DQWTA,0,DG,310000240002,,,CIODM,DQWT1,2,3,DQWTA,FIN1
                        573     *
                        574     ENDIOC   MARK                                                                  [09DEC79]
                        575     *
                        576     *
                        577     *        2314/APOLLO SUPPORT TABLES
                        578     *
                000233  579              IFIOM                                                                 [09DEC79]
                000177  580     DSRD     EQU     BDAD            NO 2314 OR DSS180 ON IOM                      [09DEC79]
                        581     ENDIOM   MARK                                                                  [09DEC79]
                000233  582              IFIOC                                                                 [09DEC79]
                        583     *                                                                              [21APR77]
                        584              IT      DSRD,DSWT,RD,340000000000,DKPS1,,CIOCS,DPSK1,2,3,,(DPWTX,     [21APR77]
                        585              ETC     DSRDA)                                                        [21APR77]
                        586              IT      DSRDA,0,DG,250000240002,,,CIODM,DPRD1,2,3,DSRDA,FIN1          [21APR77]
                        587              IT      DSWT,MTRV,WR,340000000000,DKPS1,,CIOCS,DPSK1,                 [21APR77]
                        588              ETC     2,3,,(DPWTX,DSWTA)                                            [21APR77]
                        589     *                                                                              [21APR77]
                        590     ENDIOC   MARK                                                                  [09DEC79]
                        591     *                                                                              [21APR77]
                        592     *
                        593     *        DSS190 FAMILY READ/WRITE/FORMAT TABLES                                [01MAY79]
                        594     *                                                                              [01MAY79]
                000233  595              IFIOM                                                                 [09DEC79]
                        596     *                                                                              [09DEC79]
                000233  597              IT      D9RD,D9WT,RD,250000000000,,,CIODM,D9RD1,2,50,,FIN1            [01MAY79]
000233  000242 400000  R.       D9RD     ZERO    D9WT,I$MDRD     LINK/MODE
000234  250000000000   ..               OCT     250000000000    IOCPC
000235  002663 003077  RR               ZERO    I$MPSSR,I$CIODM IOPSS/IOCIO
000236  002667 000000  R.               ZERO    I$MPCSR         IOPCS
000237  004352 000002  R.               ZERO    I$D9RD1,2       IOSTS,IOTMO
000240  000062 000000  ..               ZERO    50,             IORTM,IORTY
000241  004252 000000  R.               ZERO    I$FIN1          IONXT
                000242  598              IT      D9WT,D9RH,WR,310000000000,,,CIODM,D9WT1,2,50,,FIN1            [01MAY79]
000242  000251 600000  R.       D9WT     ZERO    D9RH,I$MDWR     LINK/MODE
000243  310000000000   ..               OCT     310000000000    IOCPC
000244  002663 003077  RR               ZERO    I$MPSSR,I$CIODM IOPSS/IOCIO
```

```
000245  002667 000000  R.              ZERO    I$MPCSR          IOPCS
000246  004352 000002  R.              ZERO    I$D9WT1,2        IOSTS,IOTMO
000247  000062 000000  ..              ZERO    50,              IORTM,IORTY
000250  004252 000000  R.              ZERO    I$FIN1           IONXT
                000251          599     IT      D9RH,D9FT0,RH,270000000000,,,CIODM,D9RD1,2,50,,FIN1          [01MAY79]
000251  000260 420000  R.      D9RH    ZERO    D9FT0,I$MDRH     LINK/MODE
000252  270000000000   ..              OCT     270000000000     IOCPC
000253  002663 003077  RR              ZERO    I$MPSSR,I$CIODM  IOPSS/IOCIO
000254  002667 000000  R.              ZERO    I$MPCSR          IOPCS
000255  004352 000002  R.              ZERO    I$D9RD1,2        IOSTS,IOTMO
000256  000062 000000  ..              ZERO    50,              IORTM,IORTY
000257  004252 000000  R.              ZERO    I$FIN1           IONXT
                000260          600     IT      D9FT0,D9FT1,FT0,170000000000,,(TIBIT,0),CIODM,D9FT1,2,50,,FIN1    [01MAY79]
000260  000267 430000  R.      D9FT0   ZERO    D9FT1,I$MDFT0    LINK/MODE
000261  170000000000   ..              OCT     170000000000     IOCPC
000262  002663 003077  RR              ZERO    I$MPSSR,I$CIODM  IOPSS/IOCIO
000263  002220 000000  R.              ZERO    I$TIBIT,0        IOPCS
000264  004352 000002  R.              ZERO    I$D9FT1,2        IOSTS,IOTMO
000265  000062 000000  ..              ZERO    50,              IORTM,IORTY
000266  004252 000000  R.              ZERO    I$FIN1           IONXT
                000267          601     IT      D9FT1,D9FT2,FT1,170000000000,,(TIBIT,1),CIODM,D9FT1,2,50,,FIN1    [01MAY79]
000267  000276 431000  R.      D9FT1   ZERO    D9FT2,I$MDFT1    LINK/MODE
000270  170000000000   ..              OCT     170000000000     IOCPC
000271  002663 003077  RR              ZERO    I$MPSSR,I$CIODM  IOPSS/IOCIO
000272  002220 000001  R.              ZERO    I$TIBIT,1        IOPCS
000273  004352 000002  R.              ZERO    I$D9FT1,2        IOSTS,IOTMO
000274  000062 000000  ..              ZERO    50,              IORTM,IORTY
000275  004252 000000  R.              ZERO    I$FIN1           IONXT
                000276          602     IT      D9FT2,D9FT3,FT2,170000000000,,(TIBIT,2),CIODM,D9FT1,2,50,,FIN1    [01MAY79]
000276  000305 432000  R.      D9FT2   ZERO    D9FT3,I$MDFT2    LINK/MODE
000277  170000000000   ..              OCT     170000000000     IOCPC
000300  002663 003077  RR              ZERO    I$MPSSR,I$CIODM  IOPSS/IOCIO
000301  002220 000002  R.              ZERO    I$TIBIT,2        IOPCS
000302  004352 000002  R.              ZERO    I$D9FT1,2        IOSTS,IOTMO
000303  000062 000000  ..              ZERO    50,              IORTM,IORTY
000304  004252 000000  R.              ZERO    I$FIN1           IONXT
                000305          603     IT      D9FT3,MTRV,FT3,170000000000,,(TIBIT,3),CIODM,D9FT1,2,50,,FIN1    [01MAY79]
000305  000701 433000  R.      D9FT3   ZERO    MTRV,I$MDFT3     LINK/MODE
000306  170000000000   ..              OCT     170000000000     IOCPC
000307  002663 003077  RR              ZERO    I$MPSSR,I$CIODM  IOPSS/IOCIO
000310  002220 000003  R.              ZERO    I$TIBIT,3        IOPCS
000311  004352 000002  R.              ZERO    I$D9FT1,2        IOSTS,IOTMO
000312  000062 000000  ..              ZERO    50,              IORTM,IORTY
000313  004252 000000  R.              ZERO    I$FIN1           IONXT
                        604     *
                        605     ENDIOM  MARK                                                                [09DEC79]
                000314  606             IFIOC                                                               [09DEC79]
                        607     D9RD    EQU     BDAD             NO DSS 190'S ON IOC'S          16AUG74     [09DEC79]
                        608     ENDIOC  MARK                                                                [09DEC79]
                        609     *                                                                           [09DEC79]
                000314  610             IFIOC                                                               [09DEC79]
                        611             IT      DSWTA,0,DG,310000240002,,,CIODM,DPWT1,2,3,DSWTA,FIN1        [09DEC79]
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                    612     ENDIOC  MARK                                                    [09DEC79]
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T PHYSICAL I/O -- MAIN DRIVER TABLES -- CONSOLE RELEASED 01DEC80

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                                  613                TTLS    PHYSICAL I/O -- MAIN DRIVER TABLES -- CONSOLE                    [09DEC79]
                                  614     *                                                                                   [09DEC79]
                                  615     *
                                  616     *          CONSOLE TYPEWRITER TABLES
                                  617     *
                                  618     *
                        000314    619                IFIOM                                                                    [09DEC79]
                                  620     *                                                                                   [09DEC79]
                        000314    621                IT      CNWT,CNRD,WR,130000000000,,,CIOCP,CNWT1,50,3,,FIN1               [09DEC79]
000314  000323 600000  R.                    CNWT    ZERO    CNRD,I$MDWR       LINK/MODE
000315  130000000000   ..                            OCT     130000000000      IOCPC
000316  002663 003063  RR                            ZERO    I$MPSSR,I$CIOCP   IOPSS/IOCIO
000317  002667 000000  R.                            ZERO    I$MPCSR           IOPCS
000320  004544 000062  R.                            ZERO    I$CNWT1,50        IOSTS,IOTMO
000321  000003 000000  ..                            ZERO    3,                IORTM,IORTY
000322  004252 000000  R.                            ZERO    I$FIN1            IONXT
                        000323    622                IT      CNRD,CNAL,RD,030000000000,,,CIOCP,CNRD1,30,3,CNWTA,(CLINK,CNWTB) [09DEC79]
000323  000350 400000  R.                    CNRD    ZERO    CNAL,I$MDRD       LINK/MODE
000324  030000000000   ..                            OCT     030000000000      IOCPC
000325  002663 003063  RR                            ZERO    I$MPSSR,I$CIOCP   IOPSS/IOCIO
000326  002667 000000  R.                            ZERO    I$MPCSR           IOPCS
000327  004572 000036  R.                            ZERO    I$CNRD1,30        IOSTS,IOTMO
000330  000003 000332  .R                            ZERO    3,CNWTA           IORTM,IORTY
000331  004016 000341  RR                            ZERO    I$CLINK,CNWTB     IONXT
                                  623     *                                                                                   [09DEC79]
                                  624     ENDIOM  MARK                                                                        [09DEC79]
                        000332    625                IFIOC                                                                    [09DEC79]
                                  626                IT      CNWT,CNRD,WR,130000000000,,,,CNWT1,50,3,,FIN1                    [09DEC79]
                                  627                IT      CNRD,CNAL,RD,030000000000,,,,CNRD1,30,3,CNWTA,(CLINK,CNWT        [09DEC79]
                                  628                ETC     B)                                                               [09DEC79]
                                  629     ENDIOC  MARK                                                                        [09DEC79]
                                  630     *                                                                                   [09DEC79]
                        000332    631                IFIOM                                                                    [09DEC79]
                        000332    632                IT      CNWTA,0,DG,130000000000,,,CIOTY,CNWT2,2,2,,CNDLX                 [09DEC79]
000332  000000 700000  ..                    CNWTA   ZERO    0,I$MDDG          LINK/MODE
000333  130000000000   ..                            OCT     130000000000      IOCPC
000334  002663 003074  RR                            ZERO    I$MPSSR,I$CIOTY   IOPSS/IOCIO
000335  002667 000000  R.                            ZERO    I$MPCSR           IOPCS
000336  004674 000002  R.                            ZERO    I$CNWT2,2         IOSTS,IOTMO
000337  000002 000000  ..                            ZERO    2,                IORTM,IORTY
000340  004707 000000  R.                            ZERO    I$CNDLX           IONXT
                                  633     ENDIOM  MARK                                                                        [09DEC79]
                        000341    634                IFIOC                                                                    [09DEC79]
                                  635                IT      CNWTA,0,DG,130000000000,,,CIOTY,CNWT2,2,2,,MTBSX                 [09DEC79]
                                  636     ENDIOC  MARK                                                                        [09DEC79]
                                  637     *                                                                                   [09DEC79]
                        000341    638                IT      CNWTB,0,DG,130000000000,,,CIOTY,CNWT2,2,2,,CNRDX                 [09DEC79]
000341  000000 700000  ..                    CNWTB   ZERO    0,I$MDDG          LINK/MODE
000342  130000000000   ..                            OCT     130000000000      IOCPC
000343  002663 003074  RR                            ZERO    I$MPSSR,I$CIOTY   IOPSS/IOCIO
000344  002667 000000  R.                            ZERO    I$MPCSR           IOPCS
000345  004674 000002  R.                            ZERO    I$CNWT2,2         IOSTS,IOTMO
```

```
000346  000002 000000  ..                    ZERO    2,              IORTM,IORTY
000347  004712 000000  R.                    ZERO    I$CNRDX         IONXT
                              639     *                                                       [09DEC79]
                    000350    640             IFIOM                                           [09DEC79]
                              641     *
                    000350    642             IT      CNAL,CNRS,ER,510000000201,,,CIOCP,CNAL1,2,3,,FINO       [01SEP79]
000350  000357 340000  R.                    CNAL    ZERO    CNRS,I$MDER     LINK/MODE
000351  510000000201  ..                    OCT     510000000201    IOCPC
000352  002663 003063  RR                    ZERO    I$MPSSR,I$CIOCP IOPSS/IOCIO
000353  002667 000000  R.                    ZERO    I$MPCSR         IOPCS
000354  004557 000002  R.                    ZERO    I$CNAL1,2       IOSTS,IOTMO
000355  000003 000000  ..                    ZERO    3,              IORTM,IORTY
000356  004247 000000  R.                    ZERO    I$FINO          IONXT
                    000357    643             IT      CNRS,MTRV,RS,400000070201,,MPPC2,CIOCP,CNRS1,2,2,,FINO  [01SEP79]
000357  000701 070000  R.                    CNRS    ZERO    MTRV,I$MDRS     LINK/MODE
000360  400000070201  ..                    OCT     400000070201    IOCPC
000361  002663 003063  RR                    ZERO    I$MPSSR,I$CIOCP IOPSS/IOCIO
000362  002433 000000  R.                    ZERO    I$MPPC2         IOPCS
000363  005314 000002  R.                    ZERO    I$CNRS1,2       IOSTS,IOTMO
000364  000002 000000  ..                    ZERO    2,              IORTM,IORTY
000365  004247 000000  R.                    ZERO    I$FINO          IONXT
                              644     *
                              645     ENDIOM  MARK                                            [09DEC79]
                    000366    646             IFIOC                                           [09DEC79]
                              647             IT      CNAL,MTRV,ER,510000020001,,,,CNAL1,2,3,,FINO            [09DEC79]
                              648     ENDIOC  MARK                                            [09DEC79]
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T PHYSICAL I/O -- MAIN DRIVER TABLES -- TAPES RELEASED 01DEC80

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                                649              TTLS    PHYSICAL I/O -- MAIN DRIVER TABLES -- TAPES                    [09DEC79]
                                650     *
                                651     *
                                652     *        MAGNETIC TAPE TABLES
                                653     *
                      000366    654              IT      MTRD,MTWT,RD,050000000000,,(CKMD,MTRDA),MTCIO,MTRD1,3,6,       [21APR77]
                                655              ETC     MTBSA,MTR9X                                                    [17OCT76]
000366  000404 400000  R.               MTRD    ZERO    MTWT,I$MDRD      LINK/MODE
000367  050000000000   ..                       OCT     050000000000     IOCPC
000370  002663 003111  RR                       ZERO    I$MPSSR,I$MTCIO  IOPSS/IOCIO
000371  002236 000375  RR                       ZERO    I$CKMD,MTRDA     IOPCS
000372  004731 000003  R.                       ZERO    I$MTRD1,3        IOSTS,IOTMO
000373  000006 000422  .R                       ZERO    6,MTBSA          IORTM,IORTY
000374  002351 000000  R.                       ZERO    I$MTR9X          IONXT
                      000375    656              IT      MTRDA,0,DG,060000000000,,,MTCIO,MTRD1,3,6,MTBSA,MTR9X          [17OCT76]
000375  000000 700000  ..               MTRDA   ZERO    0,I$MDDG         LINK/MODE
000376  060000000000   ..                       OCT     060000000000     IOCPC
000377  002663 003111  RR                       ZERO    I$MPSSR,I$MTCIO  IOPSS/IOCIO
000400  002667 000000  R.                       ZERO    I$MPCSR          IOPCS
000401  004731 000003  R.                       ZERO    I$MTRD1,3        IOSTS,IOTMO
000402  000006 000422  .R                       ZERO    6,MTBSA          IORTM,IORTY
000403  002351 000000  R.                       ZERO    I$MTR9X          IONXT
                      000404    657              IT      MTWT,MTBR,WR,150000000000,,(CKMD,MTWTA),,MTWT1,3,10,MTBSA
                                658              ETC     ,FIN1
000404  000440 600000  R.               MTWT    ZERO    MTBR,I$MDWR      LINK/MODE
000405  150000000000   ..                       OCT     150000000000     IOCPC
000406  002663 000000  R.                       ZERO    I$MPSSR          IOPSS/IOCIO
000407  002236 000413  RR                       ZERO    I$CKMD,MTWTA     IOPCS
000410  004731 000003  R.                       ZERO    I$MTWT1,3        IOSTS,IOTMO
000411  000012 000422  .R                       ZERO    10,MTBSA         IORTM,IORTY
000412  004252 000000  R.                       ZERO    I$FIN1           IONXT
                      000413    659              IT      MTWTA,0,DG,140000000000,,,,MTWT1,3,10,MTBSA,FIN1
000413  000000 700000  ..               MTWTA   ZERO    0,I$MDDG         LINK/MODE
000414  140000000000   ..                       OCT     140000000000     IOCPC
000415  002663 000000  R.                       ZERO    I$MPSSR          IOPSS/IOCIO
000416  002667 000000  R.                       ZERO    I$MPCSR          IOPCS
000417  004731 000003  R.                       ZERO    I$MTWT1,3        IOSTS,IOTMO
000420  000012 000422  .R                       ZERO    10,MTBSA         IORTM,IORTY
000421  004252 000000  R.                       ZERO    I$FIN1           IONXT
                                660     *
                      000422    661              IFIOM                                                                  [09DEC79]
                                662     *
                      000422    663              IT      MTBSA,0,DG,460000000201,,,,MTBS1,3,0,,(MTBSX,MTERA)            [17OCT76]
000422  000000 700000  ..               MTBSA   ZERO    0,I$MDDG         LINK/MODE
000423  460000000201   ..                       OCT     460000000201     IOCPC
000424  002663 000000  R.                       ZERO    I$MPSSR          IOPSS/IOCIO
000425  002667 000000  R.                       ZERO    I$MPCSR          IOPCS
000426  005026 000003  R.                       ZERO    I$MTBS1,3        IOSTS,IOTMO
000427  000000 000000  ..                       ZERO    0,               IORTM,IORTY
000430  005013 000431  RR                       ZERO    I$MTBSX,MTERA    IONXT
                      000431    664              IT      MTERA,0,DG,540000000201,,,,MTBS1,2,0,,MTBX1                    [17OCT76]
000431  000000 700000  ..               MTERA   ZERO    0,I$MDDG         LINK/MODE
```

```
000432  540000000201   ..                    OCT     540000000201     IOCPC
000433  002663 000000  R.                    ZERO    I$MPSSR          IOPSS/IOCIO
000434  002667 000000  R.                    ZERO    I$MPCSR          IOPCS
000435  005026 000002  R.                    ZERO    I$MTBS1,2        IOSTS,IOTMO
000436  000000 000000  ..                    ZERO    0,               IORTM,IORTY
000437  005016 000000  R.                    ZERO    I$MTBX1          IONXT
                000440        665           IT      MTBR,MTRW,BR,460000000201,,,,MTBR1,3,3,,FIN0
000440  000447 310000  R.            MTBR    ZERO    MTRW,I$MDBR      LINK/MODE
000441  460000000201   ..                    OCT     460000000201     IOCPC
000442  002663 000000  R.                    ZERO    I$MPSSR          IOPSS/IOCIO
000443  002667 000000  R.                    ZERO    I$MPCSR          IOPCS
000444  005076 000003  R.                    ZERO    I$MTBR1,3        IOSTS,IOTMO
000445  000003 000000  ..                    ZERO    3,               IORTM,IORTY
000446  004247 000000  R.                    ZERO    I$FIN0           IONXT
                000447        666           IT      MTRW,MTWF,RW,700000000201,,,,MTRW1,2,3,,FIN0
000447  000456 370000  R.            MTRW    ZERO    MTWF,I$MDRW      LINK/MODE
000450  700000000201   ..                    OCT     700000000201     IOCPC
000451  002663 000000  R.                    ZERO    I$MPSSR          IOPSS/IOCIO
000452  002667 000000  R.                    ZERO    I$MPCSR          IOPCS
000453  005076 000002  R.                    ZERO    I$MTRW1,2        IOSTS,IOTMO
000454  000003 000000  ..                    ZERO    3,               IORTM,IORTY
000455  004247 000000  R.                    ZERO    I$FIN0           IONXT
                000456        667           IT      MTWF,MTRU,EF,550000000201,,,,MTWF1,2,10,MTBSA,FIN0
000456  000465 350000  R.            MTWF    ZERO    MTRU,I$MDEF      LINK/MODE
000457  550000000201   ..                    OCT     550000000201     IOCPC
000460  002663 000000  R.                    ZERO    I$MPSSR          IOPSS/IOCIO
000461  002667 000000  R.                    ZERO    I$MPCSR          IOPCS
000462  004731 000002  R.                    ZERO    I$MTWF1,2        IOSTS,IOTMO
000463  000012 000422  .R                    ZERO    10,MTBSA         IORTM,IORTY
000464  004247 000000  R.                    ZERO    I$FIN0           IONXT
                000465        668           IT      MTRU,MTFR,RU,720000000201,,,,MTRU1,2,3,,FIN0
000465  000474 371000  R.            MTRU    ZERO    MTFR,I$MDRU      LINK/MODE
000466  720000000201   ..                    OCT     720000000201     IOCPC
000467  002663 000000  R.                    ZERO    I$MPSSR          IOPSS/IOCIO
000470  002667 000000  R.                    ZERO    I$MPCSR          IOPCS
000471  005076 000002  R.                    ZERO    I$MTRU1,2        IOSTS,IOTMO
000472  000003 000000  ..                    ZERO    3,               IORTM,IORTY
000473  004247 000000  R.                    ZERO    I$FIN0           IONXT
                000474        669           IT      MTFR,MTFF,FR,440000000201,,,,MTFR1,3,3,MTBSA,FIN0
000474  000503 300000  R.            MTFR    ZERO    MTFF,I$MDFR      LINK/MODE
000475  440000000201   ..                    OCT     440000000201     IOCPC
000476  002663 000000  R.                    ZERO    I$MPSSR          IOPSS/IOCIO
000477  002667 000000  R.                    ZERO    I$MPCSR          IOPCS
000500  004731 000003  R.                    ZERO    I$MTFR1,3        IOSTS,IOTMO
000501  000003 000422  .R                    ZERO    3,MTBSA          IORTM,IORTY
000502  004247 000000  R.                    ZERO    I$FIN0           IONXT
                000503        670           IT      MTFF,MTBF,FF,450000000201,,,,MTFF1,50,3,MTBSA,FIN0
000503  000512 320000  R.            MTFF    ZERO    MTBF,I$MDFF      LINK/MODE
000504  450000000201   ..                    OCT     450000000201     IOCPC
000505  002663 000000  R.                    ZERO    I$MPSSR          IOPSS/IOCIO
000506  002667 000000  R.                    ZERO    I$MPCSR          IOPCS
000507  004731 000062  R.                    ZERO    I$MTFF1,50       IOSTS,IOTMO
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T PHYSICAL I/O -- MAIN DRIVER TABLES -- TAPES RELEASED 01DEC80

```
000510  000003 000422  .R                ZERO    3,MTBSA          IORTM,IORTY
000511  004247 000000  R.                ZERO    I$FINO           IONXT
                000512      671           IT      MTBF,MTSH,BF,470000000201,,,,MTBF1,50,3,,FINO
000512  000521 330000  R.          MTBF  ZERO    MTSH,I$MDBF      LINK/MODE
000513  470000000201   ..                OCT     470000000201     IOCPC
000514  002663 000000  R.                ZERO    I$MPSSR          IOPSS/IOCIO
000515  002667 000000  R.                ZERO    I$MPCSR          IOPCS
000516  005076 000062  R.                ZERO    I$MTBF1,50       IOSTS,IOTMO
000517  000003 000000  ..                ZERO    3,               IORTM,IORTY
000520  004247 000000  R.                ZERO    I$FINO           IONXT
                        672       *                                                          [21APR77]
                        673       *     NOTE THAT THE MTSH AND MTSL COMMANDS ARE THE DEFAULT 7 TRACK SET  [21APR77]
                        674       *     HIGH AND LOW COMMANDS AND MAY BE CHANGED WITH AN ENV DENSITY CARD. [21APR77]
                        675       *                                                          [21APR77]
                        676       *     THE COMMANDS MTD1-MTD4 ARE SET 200/556/800/1600.     [21APR77]
                        677       *                                                          [21APR77]
                000521      678           IT      MTSH,MTSL,SH,600000000201,,,,MTSH1,2,3,,FINO      [21APR77]
000521  000530 240000  R.          MTSH  ZERO    MTSL,I$MDSH      LINK/MODE
000522  600000000201   ..                OCT     600000000201     IOCPC
000523  002663 000000  R.                ZERO    I$MPSSR          IOPSS/IOCIO
000524  002667 000000  R.                ZERO    I$MPCSR          IOPCS
000525  005063 000002  R.                ZERO    I$MTSH1,2        IOSTS,IOTMO
000526  000003 000000  ..                ZERO    3,               IORTM,IORTY
000527  004247 000000  R.                ZERO    I$FINO           IONXT
                000530      679           IT      MTSL,MTD1,SL,610000000201,,,,MTSL1,2,3,,FINO       [21APR77]
000530  000537 250000  R.          MTSL  ZERO    MTD1,I$MDSL      LINK/MODE
000531  610000000201   ..                OCT     610000000201     IOCPC
000532  002663 000000  R.                ZERO    I$MPSSR          IOPSS/IOCIO
000533  002667 000000  R.                ZERO    I$MPCSR          IOPCS
000534  005063 000002  R.                ZERO    I$MTSL1,2        IOSTS,IOTMO
000535  000003 000000  ..                ZERO    3,               IORTM,IORTY
000536  004247 000000  R.                ZERO    I$FINO           IONXT
                000537      680           IT      MTD1,MTD2,D1,640000000201,,,,MTD11,2,3,,FINO       [21APR77]
000537  000546 231000  R.          MTD1  ZERO    MTD2,I$MDD1      LINK/MODE
000540  640000000201   ..                OCT     640000000201     IOCPC
000541  002663 000000  R.                ZERO    I$MPSSR          IOPSS/IOCIO
000542  002667 000000  R.                ZERO    I$MPCSR          IOPCS
000543  005063 000002  R.                ZERO    I$MTD11,2        IOSTS,IOTMO
000544  000003 000000  ..                ZERO    3,               IORTM,IORTY
000545  004247 000000  R.                ZERO    I$FINO           IONXT
                000546      681           IT      MTD2,MTD3,D2,610000000201,,,,MTD21,2,3,,FINO       [21APR77]
000546  000555 232000  R.          MTD2  ZERO    MTD3,I$MDD2      LINK/MODE
000547  610000000201   ..                OCT     610000000201     IOCPC
000550  002663 000000  R.                ZERO    I$MPSSR          IOPSS/IOCIO
000551  002667 000000  R.                ZERO    I$MPCSR          IOPCS
000552  005063 000002  R.                ZERO    I$MTD21,2        IOSTS,IOTMO
000553  000003 000000  ..                ZERO    3,               IORTM,IORTY
000554  004247 000000  R.                ZERO    I$FINO           IONXT
                000555      682           IT      MTD3,MTD4,D3,600000000201,,,,MTD31,2,3,,FINO       [21APR77]
000555  000564 233000  R.          MTD3  ZERO    MTD4,I$MDD3      LINK/MODE
000556  600000000201   ..                OCT     600000000201     IOCPC
000557  002663 000000  R.                ZERO    I$MPSSR          IOPSS/IOCIO
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```
000560  002667 000000  R.                ZERO    I$MPCSR          IOPCS
000561  005063 000002  R.                ZERO    I$MTD31,2        IOSTS,IOTMO
000562  000003 000000  ..                ZERO    3,               IORTM,IORTY
000563  004247 000000  R.                ZERO    I$FINO           IONXT
                000564          683       IT      MTD4,MTD5,D4,650000000201,,,,MTD41,2,3,,FINO                [01MAY79]
000564  000573 234000  R.          MTD4  ZERO    MTD5,I$MDD4      LINK/MODE
000565  650000000201   ..                OCT     650000000201     IOCPC
000566  002663 000000  R.                ZERO    I$MPSSR          IOPSS/IOCIO
000567  002667 000000  R.                ZERO    I$MPCSR          IOPCS
000570  005063 000002  R.                ZERO    I$MTD41,2        IOSTS,IOTMO
000571  000003 000000  ..                ZERO    3,               IORTM,IORTY
000572  004247 000000  R.                ZERO    I$FINO           IONXT
                000573          684       IT      MTD5,MTD16,D5,410000000201,,,,MTD51,2,3,,FINO               [01MAY79]
000573  000602 235000  R.          MTD5  ZERO    MTD16,I$MDD5     LINK/MODE
000574  410000000201   ..                OCT     410000000201     IOCPC
000575  002663 000000  R.                ZERO    I$MPSSR          IOPSS/IOCIO
000576  002667 000000  R.                ZERO    I$MPCSR          IOPCS
000577  005063 000002  R.                ZERO    I$MTD51,2        IOSTS,IOTMO
000600  000003 000000  ..                ZERO    3,               IORTM,IORTY
000601  004247 000000  R.                ZERO    I$FINO           IONXT
                        685       *                                                                           [21APR77]
                        686       *       THE FOLLOWING COMMAND IS HERE FOR COMPATABILITY WITH                [21APR77]
                        687       *       OLD SOFTWARE.  AS SOON AS EVERYONE CHANGES OVER TO THE              [21APR77]
                        688       *       ABOVE DENSITY DRIVES,  IT SHOULD BE REMOVED.                        [21APR77]
                        689       *        (NOTE) MAY 79 LDUMP IS STILL USING THIS DRIVE.                     [01MAY79]
                        690       *               IT SHOULD BE FIXED - A.C.                                   [01MAY79]
                        691       *                                                                           [21APR77]
                        692               HEAD    I                RESET TO DEFINE THE SOFTWARE COMMAND SYMBOL [21APR77]
                241000  693       MDD16   BOOL    241000           OBSELETE SET 1600 BPI COMMAND              [21APR77]
                        694               HEAD    T                RESET HEAD                                 [21APR77]
                        695                                                                                   [21APR77]
                000602  696               IT      MTD16,MTSP,D16,650000000201,,,,MTD41,2,3,,FINO              [21APR77]
000602  000611 241000  R.          MTD16 ZERO    MTSP,I$MDD16     LINK/MODE
000603  650000000201   ..                OCT     650000000201     IOCPC
000604  002663 000000  R.                ZERO    I$MPSSR          IOPSS/IOCIO
000605  002667 000000  R.                ZERO    I$MPCSR          IOPCS
000606  005063 000002  R.                ZERO    I$MTD41,2        IOSTS,IOTMO
000607  000003 000000  ..                ZERO    3,               IORTM,IORTY
000610  004247 000000  R.                ZERO    I$FINO           IONXT
                        697       *                                                                           [09DEC79]
                000611  698               IT      MTSP,MTW0,SP,620000000201,,,,MTSP1,2,3,,FINO
000611  000620 270000  R.          MTSP  ZERO    MTW0,I$MDSP      LINK/MODE
000612  620000000201   ..                OCT     620000000201     IOCPC
000613  002663 000000  R.                ZERO    I$MPSSR          IOPSS/IOCIO
000614  002667 000000  R.                ZERO    I$MPCSR          IOPCS
000615  005063 000002  R.                ZERO    I$MTSP1,2        IOSTS,IOTMO
000616  000003 000000  ..                ZERO    3,               IORTM,IORTY
000617  004247 000000  R.                ZERO    I$FINO           IONXT
                000620  699               IT      MTW0,MTER,W0,550000000201,,,,MTWF1,2,10,MTBSA,FINO
000620  000627 360000  R.          MTW0  ZERO    MTER,I$MDW0      LINK/MODE
000621  550000000201   ..                OCT     550000000201     IOCPC
000622  002663 000000  R.                ZERO    I$MPSSR          IOPSS/IOCIO
```

```
000623  002667 000000  R.                ZERO    I$MPCSR          IOPCS
000624  004731 000002  R.                ZERO    I$MTWF1,2        IOSTS,IOTMO
000625  000012 000422  .R                ZERO    10,MTBSA         IORTM,IORTY
000626  004247 000000  R.                ZERO    I$FINO           IONXT
                000627        700       IT      MTER,MTDSE,ER,540000000201,,,,MTER1,2,3,,FINO                    [01MAY79]
000627  000636 340000  R.          MTER  ZERO    MTDSE,I$MDER     LINK/MODE
000630  540000000201   ..                OCT     540000000201     IOCPC
000631  002663 000000  R.                ZERO    I$MPSSR          IOPSS/IOCIO
000632  002667 000000  R.                ZERO    I$MPCSR          IOPCS
000633  005076 000002  R.                ZERO    I$MTER1,2        IOSTS,IOTMO
000634  000003 000000  ..                ZERO    3,               IORTM,IORTY
000635  004247 000000  R.                ZERO    I$FINO           IONXT
                000636        701       IT      MTDSE,MTSB,DSE,730000000201,,,,MTER1,10,3,,FINO                  [01MAY79]
000636  000645 351000  R.          MTDSE ZERO    MTSB,I$MDDSE     LINK/MODE
000637  730000000201   ..                OCT     730000000201     IOCPC
000640  002663 000000  R.                ZERO    I$MPSSR          IOPSS/IOCIO
000641  002667 000000  R.                ZERO    I$MPCSR          IOPCS
000642  005076 000012  R.                ZERO    I$MTER1,10       IOSTS,IOTMO
000643  000003 000000  ..                ZERO    3,               IORTM,IORTY
000644  004247 000000  R.                ZERO    I$FINO           IONXT
                              702       *
                              703       ENDIOM  MARK                                                             [09DEC79]
                000645        704               IFIOC                                                            [09DEC79]
                              705       *
                              706               IT      MTBSA,0,DG,460000020001,,,,MTBS1,3,0,,(MTBSX,MTERA)      [17OCT76]
                              707               IT      MTERA,0,DG,540000020001,,,,MTBS1,2,0,,MTBX1              [17OCT76]
                              708               IT      MTBR,MTRW,BR,460000020001,,,,MTBR1,3,3,,FINO
                              709               IT      MTRW,MTWF,RW,700000020001,,,,MTRW1,2,3,,FINO
                              710               IT      MTWF,MTRU,EF,550000020001,,,,MTWF1,2,10,MTBSA,FINO
                              711               IT      MTRU,MTFR,RU,720000020001,,,,MTRU1,2,3,,FINO
                              712               IT      MTFR,MTFF,FR,440000020001,,,,MTFR1,3,3,MTBSA,FINO
                              713               IT      MTFF,MTBF,FF,450000020001,,,,MTFF1,50,3,MTBSA,FINO
                              714               IT      MTBF,MTSH,BF,470000020001,,,,MTBF1,50,3,,FINO
                              715               IT      MTSH,MTSL,SH,600000020001,,,,MTSH1,2,3,,FINO
                              716               IT      MTSL,MTSP,SL,610000020001,,,,MTSL1,2,3,,FINO
                              717               IT      MTSP,MTWO,SP,620000020001,,,,MTSP1,2,3,,FINO
                              718               IT      MTWO,MTER,WO,150000100000,,(MTPCO,MTWOA),CIOTY,MTWO1,2,10
                              719               ETC     ,MTBSA,FINO
                              720               IT      MTWOA,0,DG,140000100000,,,CIOTY,MTWO1,2,10,MTBSA,FINO
                              721               IT      MTER,MTSB,ER,540000020001,,,,MTER1,2,3,,FINO
                              722       *
                              723       ENDIOC  MARK                                                             [09DEC79]
                              724       *
                000645        725               IT      MTSB,MTSD,SB,000,MTSB1,,,ERROR,,,,ERROR
000645  000654 200000  R.          MTSB  ZERO    MTSD,I$MDSB      LINK/MODE
000646  000000000000   ..                OCT     000              IOCPC
000647  002276 000000  R.                ZERO    I$MTSB1          IOPSS/IOCIO
000650  002667 000000  R.                ZERO    I$MPCSR          IOPCS
000651  002577 000000  R.                ZERO    I$ERROR,         IOSTS,IOTMO
000652  000000 000000  ..                ZERO    ,                IORTM,IORTY
000653  002577 000000  R.                ZERO    I$ERROR          IONXT
                000654        726               IT      MTSD,MTAR,SD,000,MTSD1,,,ERROR,,,,ERROR
```

T PHYSICAL I/O -- MAIN DRIVER TABLES -- TAPES RELEASED 01DEC80

```
000654  000663 210000  R.          MTSD    ZERO    MTAR,I$MDSD      LINK/MODE
000655  000000000000   ..                  OCT     000              IOCPC
000656  002301 000000  R.                  ZERO    I$MTSD1          IOPSS/IOCIO
000657  002667 000000  R.                  ZERO    I$MPCSR          IOPCS
000660  002577 000000  R.                  ZERO    I$ERROR,         IOSTS,IOTMO
000661  000000 000000  ..                  ZERO    ,                IORTM,IORTY
000662  002577 000000  R.                  ZERO    I$ERROR          IONXT
                               727    *
                 000663        728         IFIOM                                                    [09DEC79]
                 000663        729         IT      MTAR,MTAS,AR,400000000201,,,,MTAR1,2,10,,FINO    [09DEC79]
000663  000672 100000  R.          MTAR    ZERO    MTAS,I$MDAR      LINK/MODE
000664  400000000201   ..                  OCT     400000000201     IOCPC
000665  002663 000000  R.                  ZERO    I$MPSSR          IOPSS/IOCIO
000666  002667 000000  R.                  ZERO    I$MPCSR          IOPCS
000667  005117 000002  R.                  ZERO    I$MTAR1,2        IOSTS,IOTMO
000670  000012 000000  ..                  ZERO    10,              IORTM,IORTY
000671  004247 000000  R.                  ZERO    I$FINO           IONXT
                               730    ENDIOM  MARK                                                     [09DEC79]
                 000672        731         IFIOC                                                    [09DEC79]
                               732         IT      MTAR,MTAS,AR,400000020001,,,,MTAR1,2,10,,FINO    [09DEC79]
                               733    ENDIOC  MARK                                                     [09DEC79]
                               734    *
                 000672        735         IT      MTAS,MTRV,AS,000,MTAS1,,,ERROR,,,,ERROR
000672  000701 110000  R.          MTAS    ZERO    MTRV,I$MDAS      LINK/MODE
000673  000000000000   ..                  OCT     000              IOCPC
000674  002317 000000  R.                  ZERO    I$MTAS1          IOPSS/IOCIO
000675  002667 000000  R.                  ZERO    I$MPCSR          IOPCS
000676  002577 000000  R.                  ZERO    I$ERROR,         IOSTS,IOTMO
000677  000000 000000  ..                  ZERO    ,                IORTM,IORTY
000700  002577 000000  R.                  ZERO    I$ERROR          IONXT
                 000701        736         IT      MTRV,MTNR,RV,000,MTRV1,,,ERROR,,,,ERROR
000701  000710 140000  R.          MTRV    ZERO    MTNR,I$MDRV      LINK/MODE
000702  000000000000   ..                  OCT     000              IOCPC
000703  002312 000000  R.                  ZERO    I$MTRV1          IOPSS/IOCIO
000704  002667 000000  R.                  ZERO    I$MPCSR          IOPCS
000705  002577 000000  R.                  ZERO    I$ERROR,         IOSTS,IOTMO
000706  000000 000000  ..                  ZERO    ,                IORTM,IORTY
000707  002577 000000  R.                  ZERO    I$ERROR          IONXT
                               737    *                                                                [170CT76]
                 000710        738         IFIOM                                                    [09DEC79]
                               739    *                                                                [170CT76]
                 000710        740         IT      MTNR,MTDS,NR,000,MTNR1,,,ERROR,,,,ERROR          [170CT76]
000710  000717 150000  R.          MTNR    ZERO    MTDS,I$MDNR      LINK/MODE
000711  000000000000   ..                  OCT     000              IOCPC
000712  002310 000000  R.                  ZERO    I$MTNR1          IOPSS/IOCIO
000713  002667 000000  R.                  ZERO    I$MPCSR          IOPCS
000714  002577 000000  R.                  ZERO    I$ERROR,         IOSTS,IOTMO
000715  000000 000000  ..                  ZERO    ,                IORTM,IORTY
000716  002577 000000  R.                  ZERO    I$ERROR          IONXT
                 000717        741         IT      MTDS,RJCT,DS,777777777777,DSPS1,,DSAC1,DSST2,2,3,,FIN1   [170CT76]
000717  000224 670000  R.          MTDS    ZERO    RJCT,I$MDDS      LINK/MODE
000720  777777777777   ..                  OCT     777777777777     IOCPC
```

T PHYSICAL I/O -- MAIN DRIVER TABLES -- TAPES RELEASED 01DEC80

```
000721  003122 003126  RR                    ZERO    I$DSPS1,I$DSAC1 IOPSS,IOCIO
000722  002667 000000  R.                    ZERO    I$MPCSR         IOPCS
000723  005324 000002  R.                    ZERO    I$DSST2,2       IOSTS,IOTMO
000724  000003 000000  ..                    ZERO    3,              IORTM,IORTY
000725  004252 000000  R.                    ZERO    I$FIN1          IONXT
                               742     *                                                                    [17OCT76]
                               743     ENDIOM  MARK                                                         [09DEC79]
                      000726   744             IFIOC                                                        [09DEC79]
                               745             IT      MTNR,RJCT,NR,000,MTNR1,,,ERROR,,,,ERROR              [09DEC79]
                               746     ENDIOC  MARK                                                         [09DEC79]
                               747     *                                                                    [17OCT76]
                               748     *
                               749     *       9 - TRACK TAPE TABLES
                               750     *
                               751     *                                                                    [17OCT76]
                      000726   752             IT      MTR9,MTW9,RD,030000000000,,CKM9R,MTCIO,MTRD1,3,6,MTBSA,FIN1  [04JUL77]
000726  000744 400000  R.                    MTR9    ZERO    MTW9,I$MDRD     LINK/MODE
000727  030000000000   ..                    OCT     030000000000    IOCPC
000730  002663 003111  RR                    ZERO    I$MPSSR,I$MTCIO IOPSS/IOCIO
000731  002244 000000  R.                    ZERO    I$CKM9R         IOPCS
000732  004731 000003  R.                    ZERO    I$MTRD1,3       IOSTS,IOTMO
000733  000006 000422  .R                    ZERO    6,MTBSA         IORTM,IORTY
000734  004252 000000  R.                    ZERO    I$FIN1          IONXT
                      000735   753             IT      MTR9E,0,DG,250000000000,,,MTCIO,MTRD1,3,6,MTBSA,FIN1  [04JUL77]
000735  000000 700000  ..                    MTR9E   ZERO    0,I$MDDG        LINK/MODE
000736  250000000000   ..                    OCT     250000000000    IOCPC
000737  002663 003111  RR                    ZERO    I$MPSSR,I$MTCIO IOPSS/IOCIO
000740  002667 000000  R.                    ZERO    I$MPCSR         IOPCS
000741  004731 000003  R.                    ZERO    I$MTRD1,3       IOSTS,IOTMO
000742  000006 000422  .R                    ZERO    6,MTBSA         IORTM,IORTY
000743  004252 000000  R.                    ZERO    I$FIN1          IONXT
                      000744   754             IT      MTW9,MTSE,WR,130000000000,,CKM9W,,MTWT1,3,6,MTBSA,FIN1  [04JUL77]
000744  000762 600000  R.                    MTW9    ZERO    MTSE,I$MDWR     LINK/MODE
000745  130000000000   ..                    OCT     130000000000    IOCPC
000746  002663 000000  R.                    ZERO    I$MPSSR         IOPSS/IOCIO
000747  002246 000000  R.                    ZERO    I$CKM9W         IOPCS
000750  004731 000003  R.                    ZERO    I$MTWT1,3       IOSTS,IOTMO
000751  000006 000422  .R                    ZERO    6,MTBSA         IORTM,IORTY
000752  004252 000000  R.                    ZERO    I$FIN1          IONXT
                      000753   755             IT      MTW9E,0,DG,350000000000,,,,MTWT1,3,10,MTBSA,FIN1  [04JUL77]
000753  000000 700000  ..                    MTW9E   ZERO    0,I$MDDG        LINK/MODE
000754  350000000000   ..                    OCT     350000000000    IOCPC
000755  002663 000000  R.                    ZERO    I$MPSSR         IOPSS/IOCIO
000756  002667 000000  R.                    ZERO    I$MPCSR         IOPCS
000757  004731 000003  R.                    ZERO    I$MTWT1,3       IOSTS,IOTMO
000760  000012 000422  .R                    ZERO    10,MTBSA        IORTM,IORTY
000761  004252 000000  R.                    ZERO    I$FIN1          IONXT
                      000762   756             IT      MTSE,MTSA,SE,000,MTSE1,,,ERROR,,,,ERROR              [04JUL77]
000762  000771 220000  R.                    MTSE    ZERO    MTSA,I$MDSE     LINK/MODE
000763  000000000000   ..                    OCT     000             IOCPC
000764  002305 000000  R.                    ZERO    I$MTSE1         IOPSS/IOCIO
000765  002667 000000  R.                    ZERO    I$MPCSR         IOPCS
```

T PHYSICAL I/O -- MAIN DRIVER TABLES -- TAPES RELEASED 01DEC80

```
000766  002577 000000  R.                ZERO    I$ERROR,          IOSTS,IOTMO
000767  000000 000000  ..                ZERO    ,                 IORTM,IORTY
000770  002577 000000  R.                ZERO    I$ERROR           IONXT
                000771        757               IT      MTSA,MT9H,SA,000,MTSA1,,,ERROR,,,,ERROR                    [21APR77]
000771  001000 260000  R.          MTSA  ZERO    MT9H,I$MDSA       LINK/MODE
000772  000000000000   ..                OCT     000               IOCPC
000773  002314 000000  R.                ZERO    I$MTSA1           IOPSS/IOCIO
000774  002667 000000  R.                ZERO    I$MPCSR           IOPCS
000775  002577 000000  R.                ZERO    I$ERROR,          IOSTS,IOTMO
000776  000000 000000  ..                ZERO    ,                 IORTM,IORTY
000777  002577 000000  R.                ZERO    I$ERROR           IONXT
                              758       *                                                                          [21APR77]
                              759       *       NOTE THAT MT9H AND MT9L ARE THE DEFAULT 9 TRACK SET HIGH AND SET   [21APR77]
                              760       *       LOW DENSITY COMMANDS.  THEY MAY BE MODIFIED BY THE ENV DENSITY CARD.[21APR77]
                              761       *                                                                          [21APR77]
                001000        762               IT      MT9H,MT9L,SH,600000000201,,,,MT9H1,2,3,,FINO               [21APR77]
001000  001007 240000  R.          MT9H  ZERO    MT9L,I$MDSH       LINK/MODE
001001  600000000201   ..                OCT     600000000201      IOCPC
001002  002663 000000  R.                ZERO    I$MPSSR           IOPSS/IOCIO
001003  002667 000000  R.                ZERO    I$MPCSR           IOPCS
001004  005063 000002  R.                ZERO    I$MT9H1,2         IOSTS,IOTMO
001005  000003 000000  ..                ZERO    3,                IORTM,IORTY
001006  004247 000000  R.                ZERO    I$FINO            IONXT
                001007        763               IT      MT9L,MTBR,SL,610000000201,,,,MT9L1,2,3,,FINO               [21APR77]
001007  000440 250000  R.          MT9L  ZERO    MTBR,I$MDSL       LINK/MODE
001010  610000000201   ..                OCT     610000000201      IOCPC
001011  002663 000000  R.                ZERO    I$MPSSR           IOPSS/IOCIO
001012  002667 000000  R.                ZERO    I$MPCSR           IOPCS
001013  005063 000002  R.                ZERO    I$MT9L1,2         IOSTS,IOTMO
001014  000003 000000  ..                ZERO    3,                IORTM,IORTY
001015  004247 000000  R.                ZERO    I$FINO            IONXT
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                                  764                TTLS    PHYSICAL I/O -- MAIN DRIVER TABLES -- CARD READER                [09DEC79]
                                  765     *                                                                                   [09DEC79]
                                  766     *
                                  767     *          CARD READER TABLES
                                  768     *
                        001016    769                IT      CRRD,CRMR,RD,010000000000,,(CKMD,CRRDA),,CRRD1,2,3,,FIN1
001016  001034 400000   R.                 CRRD    ZERO    CRMR,I$MDRD       LINK/MODE
001017  010000000000    ..                         OCT     010000000000      IOCPC
001020  002663 000000   R.                         ZERO    I$MPSSR           IOPSS/IOCIO
001021  002236 001025   RR                         ZERO    I$CKMD,CRRDA      IOPCS
001022  005144 000002   R.                         ZERO    I$CRRD1,2         IOSTS,IOTMO
001023  000003 000000   ..                         ZERO    3,                IORTM,IORTY
001024  004252 000000   R.                         ZERO    I$FIN1            IONXT
                        001025    770                IT      CRRDA,0,DG,030000000000,,,,CRRD1,2,3,,FIN1
001025  000000 700000   ..                 CRRDA   ZERO    0,I$MDDG          LINK/MODE
001026  030000000000    ..                         OCT     030000000000      IOCPC
001027  002663 000000   R.                         ZERO    I$MPSSR           IOPSS/IOCIO
001030  002667 000000   R.                         ZERO    I$MPCSR           IOPCS
001031  005144 000002   R.                         ZERO    I$CRRD1,2         IOSTS,IOTMO
001032  000003 000000   ..                         ZERO    3,                IORTM,IORTY
001033  004252 000000   R.                         ZERO    I$FIN1            IONXT
                                  771     *
                        001034    772                IFIOM                                                                    [09DEC79]
                                  773     *
                        001034    774                IT      CRMR,CRSB,MR,010000000600,,(CKMD,CRMRA),CIOMR,CRRD1,3,0,,
                                  775                ETC     FIN1
001034  000645 410000   R.                 CRMR    ZERO    CRSB,I$MDMR       LINK/MODE
001035  010000000600    ..                         OCT     010000000600      IOCPC
001036  002663 003066   RR                         ZERO    I$MPSSR,I$CIOMR   IOPSS/IOCIO
001037  002236 001043   RR                         ZERO    I$CKMD,CRMRA      IOPCS
001040  005144 000003   R.                         ZERO    I$CRRD1,3         IOSTS,IOTMO
001041  000000 000000   ..                         ZERO    0,                IORTM,IORTY
001042  004252 000000   R.                         ZERO    I$FIN1            IONXT
                        001043    776                IT      CRMRA,0,DG,030000000600,,,CIOMR,CRRD1,3,0,,FIN1
001043  000000 700000   ..                 CRMRA   ZERO    0,I$MDDG          LINK/MODE
001044  030000000600    ..                         OCT     030000000600      IOCPC
001045  002663 003066   RR                         ZERO    I$MPSSR,I$CIOMR   IOPSS/IOCIO
001046  002667 000000   R.                         ZERO    I$MPCSR           IOPCS
001047  005144 000003   R.                         ZERO    I$CRRD1,3         IOSTS,IOTMO
001050  000000 000000   ..                         ZERO    0,                IORTM,IORTY
001051  004252 000000   R.                         ZERO    I$FIN1            IONXT
                        000645    777        CRSB    EQU     MTSB              OTHER ROUTINES LIKE MAG TAPE
                                  778     *
                                  779        ENDIOM  MARK                                                                     [09DEC79]
                        001052    780                IFIOC                                                                    [09DEC79]
                                  781                IT      CRMR,CRSB,MR,010000060000,,(CKMD,CRMRA),CIOMR,CRRD1,3,0,,      [09DEC79]
                                  782                ETC     FIN1                                                             [09DEC79]
                                  783                IT      CRMRA,0,DG,030000060000,,,CIOMR,CRRD1,3,0,,FIN1                  [09DEC79]
                                  784        CRSB    EQU     MTSB              OTHER ROUTINES LIKE MAG TAPE                   [09DEC79]
                                  785        ENDIOC  MARK                                                                     [09DEC79]
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                                    786             TTLS    PHYSICAL I/O -- MAIN DRIVER TABLES -- CARD PUNCH                [09DEC79]
                                    787     *                                                                               [09DEC79]
                                    788     *       CARD PUNCH TABLES                                                       [09DEC79]
                                    789     *                                                                               [09DEC79]
                          001052    790             IFIOM                                                                   [09DEC79]
                                    791     *
                          001052    792             IT      CPWT,CPSB,WR,110000000614,,(CKMD,CPWTA),CIOCP,CPWT1,7,3,,
                                    793             ETC     FIN1
001052  000645 600000  R.          CPWT    ZERO    CPSB,I$MDWR     LINK/MODE
001053  110000000614   ..                  OCT     110000000614    IOCPC
001054  002663 003063  RR                  ZERO    I$MPSSR,I$CIOCP IOPSS/IOCIO
001055  002236 001061  RR                  ZERO    I$CKMD,CPWTA    IOPCS
001056  005173 000007  R.                  ZERO    I$CPWT1,7       IOSTS,IOTMO
001057  000003 000000  ..                  ZERO    3,              IORTM,IORTY
001060  004252 000000  R.                  ZERO    I$FIN1          IONXT
                          001061    794             IT      CPWTA,0,DG,120000000614,,,CIOCP,CPWT1,7,3,,FIN1
001061  000000 700000  ..          CPWTA   ZERO    0,I$MDDG        LINK/MODE
001062  120000000614   ..                  OCT     120000000614    IOCPC
001063  002663 003063  RR                  ZERO    I$MPSSR,I$CIOCP IOPSS/IOCIO
001064  002667 000000  R.                  ZERO    I$MPCSR         IOPCS
001065  005173 000007  R.                  ZERO    I$CPWT1,7       IOSTS,IOTMO
001066  000003 000000  ..                  ZERO    3,              IORTM,IORTY
001067  004252 000000  R.                  ZERO    I$FIN1          IONXT
                                    795     *
                                    796     ENDIOM  MARK                                                                    [09DEC79]
                          001070    797             IFIOC                                                                   [09DEC79]
                                    798     *
                                    799             IT      CPWT,CPSB,WR,110000040014,,(CKMD,CPWTA),CIOCP,CPWT1,7,3,,
                                    800             ETC     FIN1
                                    801             IT      CPWTA,0,DG,120000040014,,,CIOCP,CPWT1,7,3,,FIN1
                                    802     *
                                    803     ENDIOC  MARK                                                                    [09DEC79]
                                    804     *                                                                               [09DEC79]
                                    805     *
                          001070    806             IT      BPWT,CPSB,WR,110000000000,,(CKMD,BPWTA),,CPWT1,7,3,,FIN1
001070  000645 600000  R.          BPWT    ZERO    CPSB,I$MDWR     LINK/MODE
001071  110000000000   ..                  OCT     110000000000    IOCPC
001072  002663 000000  R.                  ZERO    I$MPSSR         IOPSS/IOCIO
001073  002236 001077  RR                  ZERO    I$CKMD,BPWTA    IOPCS
001074  005173 000007  R.                  ZERO    I$CPWT1,7       IOSTS,IOTMO
001075  000003 000000  ..                  ZERO    3,              IORTM,IORTY
001076  004252 000000  R.                  ZERO    I$FIN1          IONXT
                          001077    807             IT      BPWTA,0,DG,120000000000,,,,CPWT1,7,3,,FIN1
001077  000000 700000  ..          BPWTA   ZERO    0,I$MDDG        LINK/MODE
001100  120000000000   ..                  OCT     120000000000    IOCPC
001101  002663 000000  R.                  ZERO    I$MPSSR         IOPSS/IOCIO
001102  002667 000000  R.                  ZERO    I$MPCSR         IOPCS
001103  005173 000007  R.                  ZERO    I$CPWT1,7       IOSTS,IOTMO
001104  000003 000000  ..                  ZERO    3,              IORTM,IORTY
001105  004252 000000  R.                  ZERO    I$FIN1          IONXT
                          000645    808     CPSB    EQU     MTSB            LIKE TAPE AND CARD READER
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T PHYSICAL I/O -- MAIN DRIVER TABLES -- PRINTER RELEASED 01DEC80

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                                  809             TTLS    PHYSICAL I/O -- MAIN DRIVER TABLES -- PRINTER                    [09DEC79]
                                  810     *                                                                                [09DEC79]
                                  811     *
                                  812     *       PRINTER TABLES
                                  813     *
                        001106    814             IT      PRWT,PRMW,WR,310000000000,PRPS1,,,PRWT1,2,3,,FIN1
001106  001115 600000  R.                PRWT    ZERO    PRMW,I$MDWR       LINK/MODE
001107  310000000000   ..                        OCT     310000000000      IOCPC
001110  002343 000000  R.                        ZERO    I$PRPS1           IOPSS/IOCIO
001111  002667 000000  R.                        ZERO    I$MPCSR           IOPCS
001112  005220 000002  R.                        ZERO    I$PRWT1,2         IOSTS,IOTMO
001113  000003 000000  ..                        ZERO    3,                IORTM,IORTY
001114  004252 000000  R.                        ZERO    I$FIN1            IONXT
                                  815     *
                        001115    816             IFIOM                                                                    [09DEC79]
                                  817     *
                        001115    818             IT      PRMW,PRAR,MW,310000000600,PRPS1,,CIOMR,PRWT1,3,0,,FIN1
001115  001133 610000  R.                PRMW    ZERO    PRAR,I$MDMW       LINK/MODE
001116  310000000600   ..                        OCT     310000000600      IOCPC
001117  002343 003066  RR                        ZERO    I$PRPS1,I$CIOMR   IOPSS,IOCIO
001120  002667 000000  R.                        ZERO    I$MPCSR           IOPCS
001121  005220 000003  R.                        ZERO    I$PRWT1,3         IOSTS,IOTMO
001122  000000 000000  ..                        ZERO    0,                IORTM,IORTY
001123  004252 000000  R.                        ZERO    I$FIN1            IONXT
                        001124          819             IT      PRAS,PRS6,AS,000000000201,SWAIT,,CIOCP,PRRQ2,2,3,,FIN0
001124  001142 110000  R.                PRAS    ZERO    PRS6,I$MDAS       LINK/MODE
001125  000000000201   ..                        OCT     000000000201      IOCPC
001126  002175 003063  RR                        ZERO    I$SWAIT,I$CIOCP   IOPSS,IOCIO
001127  002667 000000  R.                        ZERO    I$MPCSR           IOPCS
001130  005253 000002  R.                        ZERO    I$PRRQ2,2         IOSTS,IOTMO
001131  000003 000000  ..                        ZERO    3,                IORTM,IORTY
001132  004247 000000  R.                        ZERO    I$FIN0            IONXT
                        001133          820             IT      PRAR,PRAS,AR,000000000201,SWAIT,,CIOCP,PRRQ1,2,3,,FIN0   16AUG74
001133  001124 100000  R.                PRAR    ZERO    PRAS,I$MDAR       LINK/MODE
001134  000000000201   ..                        OCT     000000000201      IOCPC
001135  002175 003063  RR                        ZERO    I$SWAIT,I$CIOCP   IOPSS,IOCIO
001136  002667 000000  R.                        ZERO    I$MPCSR           IOPCS
001137  005266 000002  R.                        ZERO    I$PRRQ1,2         IOSTS,IOTMO
001140  000003 000000  ..                        ZERO    3,                IORTM,IORTY
001141  004247 000000  R.                        ZERO    I$FIN0            IONXT
                        001142          821             IT      PRS6,PRS9,SD,0,PRS61,,,ERROR,,,,ERROR
001142  001151 210000  R.                PRS6    ZERO    PRS9,I$MDSD       LINK/MODE
001143  000000000000   ..                        OCT     0                 IOCPC
001144  002330 000000  R.                        ZERO    I$PRS61           IOPSS/IOCIO
001145  002667 000000  R.                        ZERO    I$MPCSR           IOPCS
001146  002577 000000  R.                        ZERO    I$ERROR,          IOSTS,IOTMO
001147  000000 000000  ..                        ZERO    ,                 IORTM,IORTY
001150  002577 000000  R.                        ZERO    I$ERROR           IONXT
                        001151          822             IT      PRS9,PRWI,SA,0,PRS91,,,ERROR,,,,ERROR
001151  001160 260000  R.                PRS9    ZERO    PRWI,I$MDSA       LINK/MODE
001152  000000000000   ..                        OCT     0                 IOCPC
001153  002333 000000  R.                        ZERO    I$PRS91           IOPSS/IOCIO
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001154  002667 000000  R.                      ZERO    I$MPCSR          IOPCS
001155  002577 000000  R.                      ZERO    I$ERROR,         IOSTS,IOTMO
001156  000000 000000  ..                      ZERO    ,                IORTM,IORTY
001157  002577 000000  R.                      ZERO    I$ERROR          IONXT
                001160          823             IT      PRWI,PRRV,WI,140000000000,PRPS2,,,PRWT1,3,0,,FIN1
001160  000701 620000  R.              PRWI    ZERO    PRRV,I$MDWI      LINK/MODE
001161  140000000000   ..                      OCT     140000000000     IOCPC
001162  002341 000000  R.                      ZERO    I$PRPS2          IOPSS/IOCIO
001163  002667 000000  R.                      ZERO    I$MPCSR          IOPCS
001164  005220 000003  R.                      ZERO    I$PRWT1,3        IOSTS,IOTMO
001165  000000 000000  ..                      ZERO    0,               IORTM,IORTY
001166  004252 000000  R.                      ZERO    I$FIN1           IONXT
                                824     *
                                825     ENDIOM  MARK                                                    [09DEC79]
                001167          826             IFIOC                                                   [09DEC79]
                                827     *
                                828             IT      PRMW,PRAR,MW,310000060000,PRPS1,,CIOMR,PRWT1,3,0,,FIN1
                                829             IT      PRAR,PRAS,AR,000000020001,SWAIT,,CIOCP,PRRQ1,2,3,,FINO
                                830             IT      PRAS,PRRV,AS,000000020001,SWAIT,,,PRRQ2,2,3,,FINO
                                831     *
                                832     ENDIOC  MARK                                                    [09DEC79]
                001167          833             IFIOM                                                   [09DEC79]
                                834     *                                                               [09DEC79]
                001167          835             IT      P4WT,P4MW,WR,350000000000,PRPS1,(CKMD,P4WTD),,PRWT1,2,3,,  [22JUN76]
                                836             ETC     FIN1
001167  001205 600000  R.              P4WT    ZERO    P4MW,I$MDWR      LINK/MODE
001170  350000000000   ..                      OCT     350000000000     IOCPC
001171  002343 000000  R.                      ZERO    I$PRPS1          IOPSS/IOCIO
001172  002236 001176  RR                      ZERO    I$CKMD,P4WTD     IOPCS
001173  005220 000002  R.                      ZERO    I$PRWT1,2        IOSTS,IOTMO
001174  000003 000000  ..                      ZERO    3,               IORTM,IORTY
001175  004252 000000  R.                      ZERO    I$FIN1           IONXT
                001176          837             IT      P4WTD,0,DG,310000000000,PRPS1,,,PRWT1,2,3,,FIN1
001176  000000 700000  ..              P4WTD   ZERO    0,I$MDDG         LINK/MODE
001177  310000000000   ..                      OCT     310000000000     IOCPC
001200  002343 000000  R.                      ZERO    I$PRPS1          IOPSS/IOCIO
001201  002667 000000  R.                      ZERO    I$MPCSR          IOPCS
001202  005220 000002  R.                      ZERO    I$PRWT1,2        IOSTS,IOTMO
001203  000003 000000  ..                      ZERO    3,               IORTM,IORTY
001204  004252 000000  R.                      ZERO    I$FIN1           IONXT
                001205          838             IT      P4MW,P4AR,MW,350000000600,PRPS1,(CKMD,P4MWD),CIOMR,PRWT1,
                                839             ETC     3,0,,FIN1
001205  001223 610000  R.              P4MW    ZERO    P4AR,I$MDMW      LINK/MODE
001206  350000000600   ..                      OCT     350000000600     IOCPC
001207  002343 003066  RR                      ZERO    I$PRPS1,I$CIOMR  IOPSS,IOCIO
001210  002236 001214  RR                      ZERO    I$CKMD,P4MWD     IOPCS
001211  005220 000003  R.                      ZERO    I$PRWT1,3        IOSTS,IOTMO
001212  000000 000000  ..                      ZERO    0,               IORTM,IORTY
001213  004252 000000  R.                      ZERO    I$FIN1           IONXT
                001214          840             IT      P4MWD,0,DG,310000000600,PRPS1,,CIOMR,PRWT1,3,0,,FIN1
001214  000000 700000  ..              P4MWD   ZERO    0,I$MDDG         LINK/MODE
001215  310000000600   ..                      OCT     310000000600     IOCPC
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001216  002343 003066  RR                    ZERO    I$PRPS1,I$CIOMR IOPSS,IOCIO
001217  002667 000000  R.                    ZERO    I$MPCSR         IOPCS
001220  005220 000003  R.                    ZERO    I$PRWT1,3       IOSTS,IOTMO
001221  000000 000000  ..                    ZERO    0,              IORTM,IORTY
001222  004252 000000  R.                    ZERO    I$FIN1          IONXT
                001223        841           IT      P4AR,P4AS,AR,000000000201,SWAIT,,,PRRQ1,2,3,,FINO
001223  001232 100000  R.           P4AR     ZERO    P4AS,I$MDAR     LINK/MODE
001224  000000000201   ..                    OCT     000000000201    IOCPC
001225  002175 000000  R.                    ZERO    I$SWAIT         IOPSS/IOCIO
001226  002667 000000  R.                    ZERO    I$MPCSR         IOPCS
001227  005266 000002  R.                    ZERO    I$PRRQ1,2       IOSTS,IOTMO
001230  000003 000000  ..                    ZERO    3,              IORTM,IORTY
001231  004247 000000  R.                    ZERO    I$FINO          IONXT
                001232        842           IT      P4AS,P4S6,AS,000000000201,SWAIT,,,PRRQ2,2,3,,FINO
001232  001241 110000  R.           P4AS     ZERO    P4S6,I$MDAS     LINK/MODE
001233  000000000201   ..                    OCT     000000000201    IOCPC
001234  002175 000000  R.                    ZERO    I$SWAIT         IOPSS/IOCIO
001235  002667 000000  R.                    ZERO    I$MPCSR         IOPCS
001236  005253 000002  R.                    ZERO    I$PRRQ2,2       IOSTS,IOTMO
001237  000003 000000  ..                    ZERO    3,              IORTM,IORTY
001240  004247 000000  R.                    ZERO    I$FINO          IONXT
                001241        843           IT      P4S6,P4S9,SD,0,P4S61,,,ERROR,,,,ERROR
001241  001250 210000  R.           P4S6     ZERO    P4S9,I$MDSD     LINK/MODE
001242  000000000000   ..                    OCT     0               IOCPC
001243  002301 000000  R.                    ZERO    I$P4S61         IOPSS/IOCIO
001244  002667 000000  R.                    ZERO    I$MPCSR         IOPCS
001245  002577 000000  R.                    ZERO    I$ERROR,        IOSTS,IOTMO
001246  000000 000000  ..                    ZERO    ,               IORTM,IORTY
001247  002577 000000  R.                    ZERO    I$ERROR         IONXT
                001250        844           IT      P4S9,P4WI,SA,0,P4S91,,,ERROR,,,,ERROR
001250  001257 260000  R.           P4S9     ZERO    P4WI,I$MDSA     LINK/MODE
001251  000000000000   ..                    OCT     0               IOCPC
001252  002314 000000  R.                    ZERO    I$P4S91         IOPSS/IOCIO
001253  002667 000000  R.                    ZERO    I$MPCSR         IOPCS
001254  002577 000000  R.                    ZERO    I$ERROR,        IOSTS,IOTMO
001255  000000 000000  ..                    ZERO    ,               IORTM,IORTY
001256  002577 000000  R.                    ZERO    I$ERROR         IONXT
                001257        845           IT      P4WI,P4WV,WI,010000000000,PRPS1,,,PRWT1,3,0,,FIN1
001257  001266 620000  R.           P4WI     ZERO    P4WV,I$MDWI     LINK/MODE
001260  010000000000   ..                    OCT     010000000000    IOCPC
001261  002343 000000  R.                    ZERO    I$PRPS1         IOPSS/IOCIO
001262  002667 000000  R.                    ZERO    I$MPCSR         IOPCS
001263  005220 000003  R.                    ZERO    I$PRWT1,3       IOSTS,IOTMO
001264  000000 000000  ..                    ZERO    0,              IORTM,IORTY
001265  004252 000000  R.                    ZERO    I$FIN1          IONXT
                001266        846           IT      P4WV,PRRV,WV,050000000000,PRPS1,,,PRWT1,3,0,,FIN1
001266  000701 630000  R.           P4WV     ZERO    PRRV,I$MDWV     LINK/MODE
001267  050000000000   ..                    OCT     050000000000    IOCPC
001270  002343 000000  R.                    ZERO    I$PRPS1         IOPSS/IOCIO
001271  002667 000000  R.                    ZERO    I$MPCSR         IOPCS
001272  005220 000003  R.                    ZERO    I$PRWT1,3       IOSTS,IOTMO
001273  000000 000000  ..                    ZERO    0,              IORTM,IORTY
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001274 004252 000000 R.                ZERO    I$FIN1          IONXT
                              847      *                                          [09DEC79]
                              848      ENDIOM   MARK                             [09DEC79]
                     001275   849               IFIOC                            [09DEC79]
                              850      P4WT     EQU     BDAD    NO URMPC PRINTERS FOR 600  [09DEC79]
                              851      ENDIOC   MARK                             [09DEC79]
                              852      *                                          [09DEC79]
                     000701   853      PRRV     EQU     MTRV                     [09DEC79]
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                                  854                TTLS    PHYSICAL I/O -- MAIN DRIVER TABLES -- FRONT END                    [09DEC79]
                                  855      *                                                                                    [09DEC79]
                                  856      *                                                                                    [09DEC79]
                                  857      *          DN-30 TABLES                                                              [09DEC79]
                                  858      *                                                                                    [09DEC79]
                                  859      *                                                                                    [09DEC79]
                        001275    860                IFIOM                                                                      [09DEC79]
                                  861      *                                                                                    [09DEC79]
                        001275    862                IT      DNRD,DNWT,RD,010000000000,,DNPC1,CIODN,DNRD1,2,7,,(CLINK,DNRDA)    [09DEC79]
001275  001313 400000  R.                  DNRD     ZERO    DNWT,I$MDRD       LINK/MODE
001276  010000000000   ..                           OCT     010000000000      IOCPC
001277  002663 003051  RR                           ZERO    I$MPSSR,I$CIODN   IOPSS/IOCIO
001300  002224 000000  R.                           ZERO    I$DNPC1           IOPCS
001301  004475 000002  R.                           ZERO    I$DNRD1,2         IOSTS,IOTMO
001302  000007 000000  ..                           ZERO    7,                IORTM,IORTY
001303  004016 001304  RR                           ZERO    I$CLINK,DNRDA     IONXT
                        001304    863                IT      DNRDA,0,DG,010000000000,,,,DNRD2,2,7,,FIN1                 [09DEC79]
001304  000000 700000  ..                  DNRDA    ZERO    0,I$MDDG          LINK/MODE
001305  010000000000   ..                           OCT     010000000000      IOCPC
001306  002663 000000  R.                           ZERO    I$MPSSR           IOPSS/IOCIO
001307  002667 000000  R.                           ZERO    I$MPCSR           IOPCS
001310  004514 000002  R.                           ZERO    I$DNRD2,2         IOSTS,IOTMO
001311  000007 000000  ..                           ZERO    7,                IORTM,IORTY
001312  004252 000000  R.                           ZERO    I$FIN1            IONXT
                                  864      *                                                                                    [09DEC79]
                                  865      ENDIOM   MARK                                                                       [09DEC79]
                        001313    866                IFIOC                                                                      [09DEC79]
                                  867      *                                                                                    [09DEC79]
                                  868                IT      DNRD,DNWT,RD,010000240002,,DNPC1,CIODR,DNRD1,2,7,,FIN1             [09DEC79]
                                  869      *                                                                                    [09DEC79]
                                  870      ENDIOC   MARK                                                                       [09DEC79]
                        001313    871                IFIOM                                                                      [09DEC79]
                                  872      *                                                                                    [09DEC79]
                        001313    873                IT      DNWT,MTRV,WR,100000000000,,,CIODN,DNWT1,2,3,,(CLINK,DNWTA)          [09DEC79]
001313  000701 600000  R.                  DNWT     ZERO    MTRV,I$MDWR       LINK/MODE
001314  100000000000   ..                           OCT     100000000000      IOCPC
001315  002663 003051  RR                           ZERO    I$MPSSR,I$CIODN   IOPSS/IOCIO
001316  002667 000000  R.                           ZERO    I$MPCSR           IOPCS
001317  004475 000002  R.                           ZERO    I$DNWT1,2         IOSTS,IOTMO
001320  000003 000000  ..                           ZERO    3,                IORTM,IORTY
001321  004016 001322  RR                           ZERO    I$CLINK,DNWTA     IONXT
                        001322    874                IT      DNWTA,0,DG,100000000000,,,,DNWT2,2,3,,FIN1                 [09DEC79]
001322  000000 700000  ..                  DNWTA    ZERO    0,I$MDDG          LINK/MODE
001323  100000000000   ..                           OCT     100000000000      IOCPC
001324  002663 000000  R.                           ZERO    I$MPSSR           IOPSS/IOCIO
001325  002667 000000  R.                           ZERO    I$MPCSR           IOPCS
001326  004514 000002  R.                           ZERO    I$DNWT2,2         IOSTS,IOTMO
001327  000003 000000  ..                           ZERO    3,                IORTM,IORTY
001330  004252 000000  R.                           ZERO    I$FIN1            IONXT
                                  875      *                                                                                    [09DEC79]
                                  876      ENDIOM   MARK                                                                       [09DEC79]
                                  877      *                                                                                    [09DEC79]
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                                    878      *
                                    879      *       716 TABLES
                                    880      *
                        001331      881              IT      H7RD,H7WT,RD,010000000000,,(CKMD,H7RDA),,H7RD1,2,2,,FIN1
001331  001347 400000   R.                   H7RD    ZERO    H7WT,I$MDRD       LINK/MODE
001332  010000000000    ..                           OCT     010000000000      IOCPC
001333  002663 000000   R.                           ZERO    I$MPSSR           IOPSS/IOCIO
001334  002236 001340   RR                           ZERO    I$CKMD,H7RDA      IOPCS
001335  004462 000002   R.                           ZERO    I$H7RD1,2         IOSTS,IOTMO
001336  000002 000000   ..                           ZERO    2,                IORTM,IORTY
001337  004252 000000   R.                           ZERO    I$FIN1            IONXT
                        001340      882              IT      H7RDA,0,DG,030000000000,,,,H7RD1,2,2,,FIN1
001340  000000 700000   ..                   H7RDA   ZERO    0,I$MDDG          LINK/MODE
001341  030000000000    ..                           OCT     030000000000      IOCPC
001342  002663 000000   R.                           ZERO    I$MPSSR           IOPSS/IOCIO
001343  002667 000000   R.                           ZERO    I$MPCSR           IOPCS
001344  004462 000002   R.                           ZERO    I$H7RD1,2         IOSTS,IOTMO
001345  000002 000000   ..                           ZERO    2,                IORTM,IORTY
001346  004252 000000   R.                           ZERO    I$FIN1            IONXT
                        001347      883              IT      H7WT,H7SM,WR,110000000000,,(CKMD,H7WTA),,H7WT1,2,2,,FIN1
001347  000645 600000   R.                   H7WT    ZERO    H7SM,I$MDWR       LINK/MODE
001350  110000000000    ..                           OCT     110000000000      IOCPC
001351  002663 000000   R.                           ZERO    I$MPSSR           IOPSS/IOCIO
001352  002236 001356   RR                           ZERO    I$CKMD,H7WTA      IOPCS
001353  004462 000002   R.                           ZERO    I$H7WT1,2         IOSTS,IOTMO
001354  000002 000000   ..                           ZERO    2,                IORTM,IORTY
001355  004252 000000   R.                           ZERO    I$FIN1            IONXT
                        001356      884              IT      H7WTA,0,DG,130000000000,,,,H7WT1,2,2,,FIN1
001356  000000 700000   ..                   H7WTA   ZERO    0,I$MDDG          LINK/MODE
001357  130000000000    ..                           OCT     130000000000      IOCPC
001360  002663 000000   R.                           ZERO    I$MPSSR           IOPSS/IOCIO
001361  002667 000000   R.                           ZERO    I$MPCSR           IOPCS
001362  004462 000002   R.                           ZERO    I$H7WT1,2         IOSTS,IOTMO
001363  000002 000000   ..                           ZERO    2,                IORTM,IORTY
001364  004252 000000   R.                           ZERO    I$FIN1            IONXT
                        000645      885      H7SM    EQU     MTSB              SET MODE AS MAG TAPE
                                    886      *                                                          [18AUG76]
                                    887      *       LEVEL 6 TABLES                                     [09DEC79]
                                    888      *                                                          [09DEC79]
                        001365      889              IFIOC                                              [09DEC79]
                                    890      L6RD    EQU     BDAD              NO LEVEL 6S ON IOC       [09DEC79]
                                    891      ENDIOC  MARK                                               [09DEC79]
                                    892      *                                                          [09DEC79]
                        001365      893              IFIOM                                              [09DEC79]
                                    894      *                                                          [09DEC79]
                                   -+895     *                                                          [01DEC80]
                                    +896     *       LEVEL 6 TABLES                                     [01DEC80]
                                    +897     *                                                          [01DEC80]
                        001365      +898             IT      L6RD,L6WT,RD,710000000000,,(CKMD,L6RDA),L6CIO,L6CHK,2,2,,FIN1  [01DEC80]
001365  001403 400000   R.                   L6RD    ZERO    L6WT,I$MDRD       LINK/MODE
001366  710000000000    ..                           OCT     710000000000      IOCPC
001367  002663 003060   RR                           ZERO    I$MPSSR,I$L6CIO   IOPSS/IOCIO
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001370  002236 001374  RR                    ZERO    I$CKMD,L6RDA      IOPCS
001371  004462 000002  R.                    ZERO    I$L6CHK,2         IOSTS,IOTMO
001372  000002 000000  ..                    ZERO    2,                IORTM,IORTY
001373  004252 000000  R.                    ZERO    I$FIN1            IONXT
                001374      +899            IT      L6RDA,0,DG,750000000000,,,L6CIO,L6CHK,2,2,,FIN1          [01DEC80]
001374  000000 700000  ..           L6RDA    ZERO    0,I$MDDG          LINK/MODE
001375  750000000000   ..                    OCT     750000000000      IOCPC
001376  002663 003060  RR                    ZERO    I$MPSSR,I$L6CIO   IOPSS/IOCIO
001377  002667 000000  R.                    ZERO    I$MPCSR           IOPCS
001400  004462 000002  R.                    ZERO    I$L6CHK,2         IOSTS,IOTMO
001401  000002 000000  ..                    ZERO    2,                IORTM,IORTY
001402  004252 000000  R.                    ZERO    I$FIN1            IONXT
                001403      +900            IT      L6WT,L6AR,WR,710000000000,,(CKML6,L6WTA),L6CIO,L6CHK,2,2,,FIN1   [01DEC80]
001403  001430 600000  R.           L6WT     ZERO    L6AR,I$MDWR       LINK/MODE
001404  710000000000   ..                    OCT     710000000000      IOCPC
001405  002663 003060  RR                    ZERO    I$MPSSR,I$L6CIO   IOPSS/IOCIO
001406  002231 001412  RR                    ZERO    I$CKML6,L6WTA     IOPCS
001407  004462 000002  R.                    ZERO    I$L6CHK,2         IOSTS,IOTMO
001410  000002 000000  ..                    ZERO    2,                IORTM,IORTY
001411  004252 000000  R.                    ZERO    I$FIN1            IONXT
                001412      +901            IT      L6WTA,0,DG,760000000000,,(CKMD,L6WTB),L6CIO,L6CHK,2,2,,FIN1   [01DEC80]
001412  000000 700000  ..           L6WTA    ZERO    0,I$MDDG          LINK/MODE
001413  760000000000   ..                    OCT     760000000000      IOCPC
001414  002663 003060  RR                    ZERO    I$MPSSR,I$L6CIO   IOPSS/IOCIO
001415  002236 001421  RR                    ZERO    I$CKMD,L6WTB      IOPCS
001416  004462 000002  R.                    ZERO    I$L6CHK,2         IOSTS,IOTMO
001417  000002 000000  ..                    ZERO    2,                IORTM,IORTY
001420  004252 000000  R.                    ZERO    I$FIN1            IONXT
                001421      +902            IT      L6WTB,0,DG,720000000000,,,L6CIO,L6CHK,5,1,,FIN1          [01DEC80]
001421  000000 700000  ..           L6WTB    ZERO    0,I$MDDG          LINK/MODE
001422  720000000000   ..                    OCT     720000000000      IOCPC
001423  002663 003060  RR                    ZERO    I$MPSSR,I$L6CIO   IOPSS/IOCIO
001424  002667 000000  R.                    ZERO    I$MPCSR           IOPCS
001425  004462 000005  R.                    ZERO    I$L6CHK,5         IOSTS,IOTMO
001426  000001 000000  ..                    ZERO    1,                IORTM,IORTY
001427  004252 000000  R.                    ZERO    I$FIN1            IONXT
                001430      +903            IT      L6AR,L6SA,AR,730000000000,,,L6CIO,MTAR1,2,2,,FINO        [01DEC80]
001430  001437 100000  R.           L6AR     ZERO    L6SA,I$MDAR       LINK/MODE
001431  730000000000   ..                    OCT     730000000000      IOCPC
001432  002663 003060  RR                    ZERO    I$MPSSR,I$L6CIO   IOPSS/IOCIO
001433  002667 000000  R.                    ZERO    I$MPCSR           IOPCS
001434  005117 000002  R.                    ZERO    I$MTAR1,2         IOSTS,IOTMO
001435  000002 000000  ..                    ZERO    2,                IORTM,IORTY
001436  004247 000000  R.                    ZERO    I$FINO            IONXT
                001437      +904            IT      L6SA,L6SM,SA,000,MTSA1,,,ERROR,,,,ERROR                  [01DEC80]
001437  000645 260000  R.           L6SA     ZERO    L6SM,I$MDSA       LINK/MODE
001440  000000000000   ..                    OCT     000               IOCPC
001441  002314 000000  R.                    ZERO    I$MTSA1           IOPSS/IOCIO
001442  002667 000000  R.                    ZERO    I$MPCSR           IOPCS
001443  002577 000000  R.                    ZERO    I$ERROR,          IOSTS,IOTMO
001444  000000 000000  ..                    ZERO    ,                 IORTM,IORTY
001445  002577 000000  R.                    ZERO    I$ERROR           IONXT
```

```
                000645    +905    L6SM    EQU     MTSB            SET MODE AS MAG TAPE                [01DEC80]
                           906    *                                                                   [09DEC79]
                           907    ENDIOM  MARK                                                        [09DEC79]
```

T PHYSICAL I/O -- MAIN DRIVER TABLES -- MPC RELEASED 01DEC80

```
                                908                 TTLS    PHYSICAL I/O -- MAIN DRIVER TABLES -- MPC                    [09DEC79]
                                909          *                                                                           [09DEC79]
                                910          *                                                                           [09DEC79]
                                911          *      MPC DRIVER TABLES                                                    [09DEC79]
                                912          *                                                                           [09DEC79]
                     001446     913                 IFIOM                                                                [09DEC79]
                                914          *                                                                           [18AUG76]
                     001446     915                 IT      MPRD,MPWT,RD,060000004000,MPPS1,MPPC1,,MPCS1,2,2,,FIN1       [17OCT76]
001446  001455 400000  R.                  MPRD    ZERO    MPWT,I$MDRD       LINK/MODE
001447  060000004000   ..                          OCT     060000004000      IOCPC
001450  002403 000000  R.                          ZERO    I$MPPS1           IOPSS/IOCIO
001451  002420 000000  R.                          ZERO    I$MPPC1           IOPCS
001452  005301 000002  R.                          ZERO    I$MPCS1,2         IOSTS,IOTMO
001453  000002 000000  ..                          ZERO    2,                IORTM,IORTY
001454  004252 000000  R.                          ZERO    I$FIN1            IONXT
                     001455     916                 IT      MPWT,MPRS,WR,000,RJCT,ERROR,ERROR,ERROR,,,,ERROR             [18AUG76]
001455  001464 600000  R.                  MPWT    ZERO    MPRS,I$MDWR       LINK/MODE
001456  000000000000   ..                          OCT     000               IOCPC
001457  004325 002577  RR                          ZERO    I$RJCT,I$ERROR    IOPSS,IOCIO
001460  002577 000000  R.                          ZERO    I$ERROR           IOPCS
001461  002577 000000  R.                          ZERO    I$ERROR,          IOSTS,IOTMO
001462  000000 000000  ..                          ZERO    ,                 IORTM,IORTY
001463  002577 000000  R.                          ZERO    I$ERROR           IONXT
                     001464     917                 IT      MPRS,MPLC,RS,400000070201,MPPS1,MPPC2,,MPCS5,2,2,,FIN0       [18AUG76]
001464  001473 070000  R.                  MPRS    ZERO    MPLC,I$MDRS       LINK/MODE
001465  400000070201   ..                          OCT     400000070201      IOCPC
001466  002403 000000  R.                          ZERO    I$MPPS1           IOPSS/IOCIO
001467  002433 000000  R.                          ZERO    I$MPPC2           IOPCS
001470  005314 000002  R.                          ZERO    I$MPCS5,2         IOSTS,IOTMO
001471  000002 000000  ..                          ZERO    2,                IORTM,IORTY
001472  004247 000000  R.                          ZERO    I$FIN0            IONXT
                     001473     918                 IT      MPLC,MPLM,LC,100000000000,MPPS1,,,MPCS2,2,2,,FIN1            [18AUG76]
001473  001502 640000  R.                  MPLC    ZERO    MPLM,I$MDLC       LINK/MODE
001474  100000000000   ..                          OCT     100000000000      IOCPC
001475  002403 000000  R.                          ZERO    I$MPPS1           IOPSS/IOCIO
001476  002667 000000  R.                          ZERO    I$MPCSR           IOPCS
001477  005301 000002  R.                          ZERO    I$MPCS2,2         IOSTS,IOTMO
001500  000002 000000  ..                          ZERO    2,                IORTM,IORTY
001501  004252 000000  R.                          ZERO    I$FIN1            IONXT
                     001502     919                 IT      MPLM,MPLP,LM,110000000000,MPPS1,,,MPCS3,2,2,,FIN1            [18AUG76]
001502  001511 650000  R.                  MPLM    ZERO    MPLP,I$MDLM       LINK/MODE
001503  110000000000   ..                          OCT     110000000000      IOCPC
001504  002403 000000  R.                          ZERO    I$MPPS1           IOPSS/IOCIO
001505  002667 000000  R.                          ZERO    I$MPCSR           IOPCS
001506  005301 000002  R.                          ZERO    I$MPCS3,2         IOSTS,IOTMO
001507  000002 000000  ..                          ZERO    2,                IORTM,IORTY
001510  004252 000000  R.                          ZERO    I$FIN1            IONXT
                     001511     920                 IT      MPLP,MTAS,LP,360100004000,MPPS1,,,MPCS4,2,2,,FIN1            [18AUG76]
001511  000672 660000  R.                  MPLP    ZERO    MTAS,I$MDLP       LINK/MODE
001512  360100004000   ..                          OCT     360100004000      IOCPC
001513  002403 000000  R.                          ZERO    I$MPPS1           IOPSS/IOCIO
001514  002667 000000  R.                          ZERO    I$MPCSR           IOPCS
```

```
001515  005301 000002  R.                ZERO    I$MPCS4,2       IOSTS,IOTMO
001516  000002 000000  ..                ZERO    2,              IORTM,IORTY
001517  004252 000000  R.                ZERO    I$FIN1          IONXT
                              921     *                                              [18AUG76]
                              922     ENDIOM  MARK                                   [09DEC79]
                    001520    923             IFIOC                                  [09DEC79]
                              924     MPRD    EQU     BDAD            NO MPCS ON IOC [09DEC79]
                              925     ENDIOC  MARK                                   [09DEC79]
```

```
                926           TTLS    PHYSICAL I/O -- USAGE
                927           HEAD    I
                928     *
                929     *     CALLING SEQUENCE IS  TSXO I$IO.  CONTROL IS RETURNED TO THE
                930     *     INSTRUCTION FOLLOWING THE TSX AS SOON AS THE OPERATION IS COMPLETED.      [01MAY79]
                931     *     THE REGISTER USAGE IS
                932     *
                933     *     REG     USAGE
                934     *
                935     *     0       CALLING REGISTER
                936     *     T       POINTER TO LIST ELEMENT CONTAINING I/O REQUEST
                937     *     S       DEVICE NUMBER (0-63)
                938     *     P       PUB NUMBER (0-15)
                939     *     Z       POINTER TO ENTRY IN IT TABLE                                      [01MAY79]
                940     *
                941     *     THE LIST ELEMENT HAS THE FOLLOWING STRUCTURE
                942     *
                943     *     WORD    USE
                944     *
                945     *     -1      T$LINK          T$LEN
                946     *     0       Q$LINK          Q$RUN
                947     *     1       DEV             TYPE
                948     *     2       CMD             SAVED CMD
                949     *     3       PUB             SPRET
                950     *     4       PMBXI           (FULL WORD)
                951     *     5       SEKAD           (FULL WORD)
                952     *     6       QWORD           (FULL WORD)
                953     *     7       URET            ADEXT                                             [05NOV77]
                954     *     10      MODE            (NOT ALTERED BY PHYSICAL I/O)
                955     *     11      DAC (FULL WORD)
                956     *     12      QUEWD (FULL WORD)
                957     *     13      DCWWD (FULL WORD)
                958     *     14 SEQ  DCW   (FULL WORDS)
                959     *
                960     *     THE FOLLOWING PARAMETERS MUST BE INITIALIZED BY
                961     *     THE CALLING ROUTINE, AND ARE NOT CHANGED BY PIO.
                962     *
                963     *     I$MODE--MODE OF OPERATION
                964     *
                965     *     NOTE:THE POSSIBLE VALUES FOR I$MODE ARE IN THE INSERT FILE
                966     *
                967     *     I$DAC--DEVICE ADDRESS CODE
                968     *
                969     *     THE LOWER HALF OF THIS WORD CONTAINS THE ADDRESS OF THE RECORD
                970     *     ON THE DEVICE WHICH IS TO BE ACCESSED.  THIS IS A NUMBER WHICH
                971     *     RANGES CONSECUTIVELY FROM 0.  THE LOW ORDER SIX BITS OF THE
                972     *     UPPER HALF CONTAIN THE DEVICE CODE.  THE REST OF THIS HALF-WORD
                973     *     IS NOT USED.
                974     *
                975     *     I$DCW--DATA CONTROL WORD LIST
                976     *
                977     *     THIS LIST IS MADE AVAILABLE TO THE IOC TO CONTROL THE TRANSFER
```

```
978     *       OF DATA TO OR FROM CORE STORAGE.  THE FORMAT IS (0-17) DATA
979     *       ADDRESS, (21-22) ACTION CODE, (24-35) WORD COUNT.
980     *
981     *       I$ADEXT - ADDRESS EXTENSION FOR I/O                          [05NOV77]
982     *                                                                    [05NOV77]
983     *          THIS SHOULD BE SET BY THE CALLING ROUTINE TO BE THE HIGH-ORDER [05NOV77]
984     *       SIX BITS OF THE 24 BIT ADDRESSES OF THE DATA. (REST OF BITS ARE [05NOV77]
985     *       SPECIFIED BY THE DCW ADDRESS.)                               [05NOV77]
986     *                                                                    [05NOV77]
987     *       THE FOLLOWING WORDS ARE SET BY PHYSICAL I/O AS STATUS RETURNS
988     *       FOR THE CALLING ROUTINE.
989     *
990     *       I$QUEWD--QUEWD--QUEUE WORD
991     *
992     *       THIS IS THE QUEUE-WORD STORED BY THE IOC UPON COMPLETION OF THE
993     *       OPERATION  THE FORMAT IS (0-5) MAJOR STATUS, (6-11) MINOR STATUS,
994     *       (12-17) QUEUE-WORD-ADDRESS LOW ORDER BITS, (18-23) IOC/MEM
995     *       STATUS, (24-29) RETURN CODE, (30-35) PUB.  THE RETURN STATUS
996     *       CODES ARE (0) ALL DATA CORRECTLY TRANSFERRED, (1) NOT ALL DATA
997     *       TRANSFERRED BUT CORRECT, (2) EOF ENCOUNTERED ON TAPE, ETC.,
998     *       (3) RECOVERABLE ERROR--SOME DATA MAY BE INCORRECT, (4) UNRECOVER-
999     *       ABLE ERROR--DO NOT REISSUE COMMAND, (5) TIMEOUT.
1000    *
1001    *       I$DCWWD--DATA CONTROL WORD
1002    *
1003    *       THIS IS AN IMAGE OF SMBX UPON TERMINATION. THE ADDRESS FIELD
1004    *       IS THE NEXT WORD TO BE TRANSFERRED.
```

```
                                1005            TTLS    PHYSICAL I/O -- MACROS AND SUBROUTINES
                                1006            HEAD    I               I FOR I/O
                                1007    *
                                1008    *
                                1009    *                                 RREG
                                1010    *
                                1011    *       THIS MACRO RESTORES REGISTERS AFTER QUEUEING OR OTHER
                                1012    *       OPERATIONS WHICH MAY DESTROY THEM
                                1013    *
                                1014    RREG    MACRO                                                   [09DEC79]
                                1015            TSX0    RREG            CALL SUBROUTINE
                                1016            ENDM    RREG
                                1017    *
                                1018    *       SUBROUTINE
                                1019    *
                      001520    1020    RREG    NULL
001520  000003 2260 14 ..       1021            LDX     P,PUB,T         PUB NUMBER TO XR-P
001521  000001 2270 14 ..       1022            LDX     S,DEV,T         DEVICE NUMBER TO XR-S
001522  000002 2230 14 ..       1023            LDX     Z,CMD,T         COMMAND TABLE POINTER TO XR-Z
001523  000000 7100 10 ..       1024            TRA     0,0             RETURN TO CALLER
```

```
                                  +1025           EJECT                                                                  [01DEC80]
                                  +1026     *                                                                            [01DEC80]
                                  +1027     *                                CHLOC                                       [01DEC80]
                                  +1028     *                                                                            [01DEC80]
                                  +1029     *       THIS SUBROUTINE IS CALLED WTITH IOM# AND CHANNEL IN THE FORMAT       [01DEC80]
                                  +1030     *       XIXXPP IN AU ; IT RETURNS THE LOC IN P$CHAN TABLE OF                 [01DEC80]
                                  +1031     *       THE ENTRY = 4*CHANNEL+IOM#*CHTLEN IN AU AND IOM# IN AL               [01DEC80]
                                  +1032     *                                                                            [01DEC80]
                        001524    +1033     CHLOC   NULL                    *OTIS                                        [01DEC80]
001524  001544 7570 00 R.         +1034             STAQ    TABLOC          SAVE AU & Q *OTIS                            [01DEC80]
001525  000102 7330 00 ..         +1035             LRS     12+18+36        GET IOM# TO QL *OTIS                         [01DEC80]
001526  000003 3760 07 ..         +1036             ANQ     3,DL            MASK OFF *OTIS                               [01DEC80]
001527  000002 1160 07 ..         +1037             CMPQ    $NIOMS,DL       CHECK FOR OK CALLING FORMAT *OTIS            [01DEC80]
001530  000000 6030 20 X.         +1038             TRC     $ZOPF,*         OOPS *OTIS                                   [01DEC80]
001531  001544 7520 07 R.         +1039             STCQ    TABLOC,07       SAVE IT IN BOTTOM *OTIS                      [01DEC80]
001532  000340 4020 07 ..         +1040             MPY     CHTLEN,DL       P$CHAN OFFSET *OTIS                          [01DEC80]
001533  000022 7360 00 ..         +1041             QLS     18              MOVE TO UPPER *OTIS                          [01DEC80]
001534  001544 2350 00 R.         +1042             LDA     TABLOC          RETREIVE CHANNEL *OTIS                       [01DEC80]
001535  000077 3750 03 ..         +1043             ANA     =077,DU         MASK OFF *OTIS                               [01DEC80]
001536  000002 7350 00 ..         +1044             ALS     2               MUTIPLY BY 4 *OTIS                           [01DEC80]
001537  001544 7510 70 R.         +1045             STCA    TABLOC,70       SAVE IT IN TOP *OTIS                         [01DEC80]
001540  000000 6350 02 ..         +1046             EAA     0,QU            TABLE OFFSET TO AU *OTIS                     [01DEC80]
001541  001544 0750 00 R.         +1047             ADA     TABLOC          ADD IN CHANNEL LOC AND IOM# *OTIS            [01DEC80]
001542  001545 2360 00 R.         +1048             LDQ     TABLOC+1        RETREIVE Q *OTIS                             [01DEC80]
001543  000000 7100 10 ..         +1049             TRA     0,0             RETURN *OTIS                                 [01DEC80]
                                  +1050     *                                                                            [01DEC80]
                        001544    +1051             EVEN                    *OTIS                                        [01DEC80]
                        001544    +1052     TABLOC  BSS     2               TEMP STORAGE                                 [01DEC80]
                                  +1053     *                                                                            [01DEC80]
                                  +1054     *                                                                            [01DEC80]
                                  +1055     *          IOMS                                                              [01DEC80]
                                  +1056     *     CALLED WITH LOC IN P$CHAN TABLE IN P                                   [01DEC80]
                                  +1057     *     RETURNS IOM# IN AL ; 4*CHANNEL IN YR *OTIS                             [01DEC80]
                                  +1058     *                                                                            [01DEC80]
                        001546    +1059     IOMS    NULL                    *OTIS                                        [01DEC80]
001546  000000 6220 16 ..         +1060             EAX     Y,0,P           PUT LOC OF ENTRY IN YR *OTIS                 [01DEC80]
001547  000000 2350 07 ..         +1061             LDA     0,DL            SET IOM# = 0 *OTIS                           [01DEC80]
001550  000400 1020 03 ..         +1062             CMPX    Y,CHTLEN+4*$FPCHN,DU  SEE IF ENTRY IS FOR NEXT IOM *OTIS     [01DEC80]
001551  000000 6040 10 ..         +1063             TMI     0,0             YES;RETURN WITH IT *OTIS                     [01DEC80]
001552  000340 1620 03 ..         +1064             SBX     Y,CHTLEN,DU     STEP BASE TO NEXT SET OF CHANNELS *OTIS      [01DEC80]
001553  000001 0750 07 ..         +1065             ADA     1,DL            STEP IOM# *OTIS                              [01DEC80]
001554  001550 7100 00 R.         +1066             TRA     *-4             RETRY *OTIS                                  [01DEC80]
                                  +1067     *                                                                            [01DEC80]
                                  +1068     *          IOCHK                                                             [01DEC80]
                                  +1069     *          CHECKS X$IOM TABLE FOR A GOOD IOM                                 [01DEC80]
                                  +1070     *     CALLED WITH IOM# IN AL                                                 [01DEC80]
                                  +1071     *                                                                            [01DEC80]
                        001555    +1072     IOCHK   NULL                    *OTIS                                        [01DEC80]
001555  000000 2360 05 X.         +1073             LDQ     X$IOM,AL        GET HIS PORT ENTRY *OTIS                     [01DEC80]
001556  000000 6040 10 ..         +1074             TMI     0,0             NEVER CONNECTED *OTIS                        [01DEC80]
001557  400000 3760 07 ..         +1075             ANQ     X$RFLAG,DL      CHECK RELEASE FLAG *OTIS                     [01DEC80]
001560  000000 7100 10 ..         +1076             TRA     0,0             THE TNZ INDICATOR WILL INDICATE A BAD IOM# *OTIS [01DEC80]
```

```
+1077     *
```

```
                                1078          EJECT
                                1079    *
                                1080    *                              SIEZE
                                1081    *
                                1082    *     THIS MACRO QUEUES FOR A CHANNEL. REGISTERS ARE DESTROYED
                                1083    *
                                1084    SIEZE MACRO   'PUB',PRIORITY
                                1085          INE     'A#2','AZ',4      USE PRIORITY IF ALREADY IN Z
                                1086          INE     'A#2','A',2       IF SECOND ARGUMENT IS NOT NULL,
                                1087          EAX     Z,#2              GET PRIORITY FOR ENQUEUEING
                                1088          IFE     1,2,1             AND SKIP OTHER ENTRY
                                1089          EAX     Z,2               ASSUME DEFAULT PRIORITY
                                1090          TSX0    SIEZE             CALL SUBROUTINE TO QUEUE
                                1091          ENDM    SIEZE
                                1092    *
                                1093    *     SUBROUTINE
                                1094    *
                                1095    *
                     001561     1096    SIEZE NULL                      ENTER VIA TSX0
001561 000000 4400 14 ..        1097          SXL0    Q$RUN,T           SAVE RESTART ADDRESS
001562 000001 2270 14 ..        1098          LDX     S,DEV,T           GET DEVICE NUMBER
001563 000000 2350 17 X.        1099          LDA     U$PDA,S           GET PRIMARY PUB
001564 004335 6040 00 R.        1100          TMI     POFF              FAKE POWER OFF IF NONE SUCH
001565 010000 2360 07 ..       -1101          LDQ     B$IORCH,DL        LOAD BIT THAT SAYS 'CHANNEL RELEASED'   [04JUL77]
001566 001617 7560 00 R.        1102          STQ     SIEZT             SAVE FOR CHANNELS BUSY CHECK            [04JUL77]
                                1103    *
                                1104    *     CHECK EACH POSSIBLE CHANNEL
                                1105    *
                     001567     1106    SIEZ1 NULL                                                            [04JUL77]
001567 001524 7000 00 R.       -+1107          TSX0    CHLOC             GET LOC OF P$CHAN ENTRY *OTIS           [01DEC80]
001570 000000 6260 01 ..        +1108          EAX     P,0,AU            SAVE IN P *OTIS                         [01DEC80]
001571 001555 7000 00 R.        +1109          TSX0    IOCHK             CHECK FOR GOOD IOM # *OTIS              [01DEC80]
001572 001575 6010 00 R.        +1110          TNZ     *+3               BAD;SKIP THIS CHANNEL *OTIS             [01DEC80]
001573 777777 7200 16 X.        1111          LXL0    Q$BUSY+P$Q,P      IS IT FREE?
001574 001610 6000 00 R.        1112          TZE     SIEZ3             YES-- GRAB IT
001575 000000 2360 16 X.        1113          LDQ     P$STAT,P          LOAD CHANNEL STATUS BITS                [04JUL77]
001576 001617 3560 00 R.        1114          ANSQ    SIEZT             ACCUMULATE RELEASED CHANNEL BITS        [04JUL77]
001577 000000 2350 16 X.        1115          LDA     P$CHAN,P          CHECK FOR CROSSBARRING                  [04JUL77]
001600 001567 6040 00 R.        1116          TMI     SIEZ1             YES-- CHECK ALTERNATE CHANNEL           [04JUL77]
001601 001617 2340 00 R.        1117          SZN     SIEZT             HAVE ALL CHANNELS TO THIS DEVICE BEEN RELEASED??  [04JUL77]
001602 004337 6010 00 R.        1118          TNZ     CBUSY             YES, RETURN CHANNEL BUSY STATUS         [04JUL77]
                                1119    *
                                1120    *     QUEUE TO LAST ALTERNATE CHANNEL
                                1121    *
                     001603     1122          ENQ     T,(P$Q,P),Z       ENQUEUE WITH PROPER PRIORITY
001603 000000 6210 14 ..                      EAX     X,0,T             PUT IT THERE
001604 000000 6220 16 X.                      EAX     Y,P$Q,P           QUEUE-DESCRIPTOR VECTER
001605 000000 7000 00 X.                      TSX0    Q$ENQ             GO TO ENQUEUE CODE
001606 000021 0540 00 X.        1123          AOS     X$SWPCT+17        INCREMENT TOTAL PUB QUEUE LENGTHS       [01FEB77]
001607 000000 7100 00 X.        1124          TRA     $EXIT             WAIT FOR A PUB TO BE FREE
                                1125    *
                                1126    *     PUB IS FREE NOW - TAKE IT
```

```
                                    1127     *
                          001610    1128     SIEZ3   NULL
001610  000003 7460 14 ..  1129              STX     P,PUB,T          NOTE WHICH PUB WE HAVE
001611  777777 4440 16 X.  1130              SXL     T,Q$BUSY+P$Q,P   NOTE WHO HAS THIS PUB
                          001612    1131              GTIM                             TIME SINCE BOOTLOAD                    16AUG74
001612  000000 7000 00 X.                   TSX0    X$GTIM           RETURN TIMER UNITS IN A
001613  000000 7550 16 X.  1132              STA     X$IOQTB,P        TIME DEVICE BECAME 'BUSY'              16AUG74
001614  000000 2350 14 ..  1133     EXIT1    LDA     Q$RUN,T          GET RESTART ADDRESS
                          001615    1134              RREG                             RESTORE I/O REGISTERS
001615  001520 7000 00 R.                   TSX0    RREG             CALL SUBROUTINE
001616  000000 7100 05 ..  1135              TRA     0,AL             AND EXIT
                                    1136                                                                          [04JUL77]
                          001617    1137     SIEZT   BSS     1                TEMP FOR SIEZE ROUTINE                [04JUL77]
```

```
                                1138            EJECT
                                1139    *
                                1140    *
                                1141    *                               FREE
                                1142    *
                                1143    *       THIS MACRO AND SUBROUTINE RELEASES A CHANNEL WHICH
                                1144    *       WAS SIEZED VIA THE SIEZE MACRO. REGISTERS WILL BE DESTROYED
                                1145    *       ON EXIT, AND EXIT IS NOT GUARANTEED TO BE IMMEDIATE.
                                1146    *
                                1147    *       MACRO MOVED TO INSERT FILE
                                1148    *
                                1149    *       SUBROUTINE
                                1150    *
                      001620    1151    FREE    NULL
001620  000000 4400 14 ..       1152            SXLO    Q$RUN,T         SAVE RETURN
                                1153    *
                                1154    *       CONSISTENCY CHECK
                                1155    *
001621  001623 7440 00 R.       1156            STX     T,*+2           SAVE T FOR CHECK
001622  777777 7210 16 X.       1157            LXL     X,Q$BUSY+P$Q,P  WHO HAS THIS PUB?
001623  000000 1010 03 ..       1158            CMPX    X,...,DU        IS IT US?                               [170CT76]
001624  000000 6010 20 X.       1159            TNZ     $ZOPF,*         NO - THEN WE SHOULDN'T FREE IT
001625  000000 7210 16 X.       1160            LXL     X,P$STAT,P      PICK UP PUB BITS                        [170CT76]
001626  010000 3010 03 ..       1161            CANX    X,B$IORCH,DU    RELEASED?                               [170CT76]
001627  001632 6000 00 R.       1162            TZE     *+3             SKIP IF NOT                             [170CT76]
001630  777777 4460 16 X.       1163            SXL     P,Q$BUSY+P$Q,P  YES, SO RELEASE                         [170CT76]
001631  000000 7100 10 ..       1164            TRA     0,0             AND RETURN                              [170CT76]
                      001632    1165            DEQ     Y,(P$Q,P)       IS THERE SOMEBODY WAITING FOR THIS ONE? [18AUG76]
001632  000000 6210 16 X.                       EAX     X,P$Q,P         LOAD QUEUE NAME
001633  000000 7000 00 X.                       TSX0    Q$DEQ           EXECUTE NECESSARY CODE
001634  000000 6220 12 ..                       EAX     Y,0,Y           LOAD REGISTER WITH LIST ELEMENT ADDRESS
001635  001677 6010 00 R.       1166            TNZ     FREE7           SKIP IF SO                              [18AUG76]
001636  000000 6350 16 ..       1167            EAA     0,P             GET COPY OF PUB NUMBER
001637  000000 6210 16 ..       1168            EAX     X,0,P           TWICE
                                1169    *
                                1170    *       FIND LAST ALTERNATE CHANNEL
                                1171    *
001640  000000 2350 01 X.       1172    FREE1   LDA     P$CHAN,AU       IS THIS THE LAST CHANNEL
001641  001645 6050 00 R.       1173            TPL     FREE2           YES
001642  001524 7000 00 R.  -+1174              TSX0    CHLOC           NO;GET LOC OF NEXT ENTRY *OTIS          [01DEC80]
001643  000000 6210 01 ..       1175            EAX     X,0,AU          SAVE IN XR-X
001644  001640 7100 00 R.       1176            TRA     FREE1           AND CONTINUE SEARCH
001645  001661 7410 00 R.       1177    FREE2   STX     X,FREX          SAVE POINTER TO LAST CHANNEL            [18AUG76]
                      001646    1178            DEQ     Y,(P$Q,X)       ANYONE WAITING ON A CHANNEL?            [18AUG76]
001646  000000 6210 11 X.                       EAX     X,P$Q,X         LOAD QUEUE NAME
001647  000000 7000 00 X.                       TSX0    Q$DEQ           EXECUTE NECESSARY CODE
001650  000000 6220 12 ..                       EAX     Y,0,Y           LOAD REGISTER WITH LIST ELEMENT ADDRESS
001651  001663 6000 00 R.       1179            TZE     FREE4           NO ONE ELSE WAITS                       [18AUG76]
001652  777777 7230 12 ..       1180            LXL     Z,T$LEN,Y       GET THE LENGTH OF THIS WAITER           [18AUG76]
001653  000004 1030 03 ..       1181            CMPX    Z,PUB+1,DU      WAITING FOR SPECIFIC PUB?   *** KLUDGE *** [18AUG76]
001654  001663 6010 00 R.       1182            TNZ     FREE4           NO, SO CAN USE THIS                     [18AUG76]
                      001655    1183            ENQ     Y,FREQ,1        YES, AND THIS ISN'T IT                  [18AUG76]
```

```
001655  000000 6210 12 ..                    EAX     X,0,Y           PUT IT THERE
001656  001715 6220 00 R.                    EAX     Y,FREQ          QUEUE-DESCRIPTOR VECTER
                000002              QSET    SET     2               ASSUME NO PRIORITY SPECIFIED
                000001              QSET    SET     1               SET IT TO SPECIFIED LEVEL
001657  000001 6230 00 ..                    EAX     Z,QSET          PRIORITY
001660  000000 7000 00 X.                    TSX0    Q$ENQ           GO TO ENQUEUE CODE
001661  000000 2210 03 ..    1184    FREX    LDX     X,...,DU        RESTORE POINTER TO LAST QUEUE           [18AUG76]
001662  001645 7100 00 R.    1185            TRA     FREE2           AND LOOK FOR SOMEONE WHO CAN            [18AUG76]
001663  001714 4420 00 R.    1186    FREE4   SXL     Y,Q$BUSY+FREQ   SAVE OUR PROSPECT                    [18AUG76]
                001664       1187    FREE5   DEQ     Y,FREQ          PULL OFF A PICKY ONE                    [18AUG76]
001664  001715 6210 00 R.                    EAX     X,FREQ          LOAD QUEUE NAME
001665  000000 7000 00 X.                    TSX0    Q$DEQ           EXECUTE NECESSARY CODE
001666  000000 6220 12 ..                    EAX     Y,0,Y           LOAD REGISTER WITH LIST ELEMENT ADDRESS
001667  001676 6000 00 R.    1188            TZE     FREE6           SKIP IF NO MORE                         [18AUG76]
001670  001661 2210 00 R.    1189            LDX     X,FREX          POINT TO LAST QUEUE                     [18AUG76]
                001671       1190            ENQ     Y,(P$Q,X),1     RE-QUEUE                                [18AUG76]
001671  000000 6210 12 ..                    EAX     X,0,Y           PUT IT THERE
001672  000000 6220 11 X.                    EAX     Y,P$Q,X         QUEUE-DESCRIPTOR VECTER
                000002              QSET    SET     2               ASSUME NO PRIORITY SPECIFIED
                000001              QSET    SET     1               SET IT TO SPECIFIED LEVEL
001673  000001 6230 00 ..                    EAX     Z,QSET          PRIORITY
001674  000000 7000 00 X.                    TSX0    Q$ENQ           GO TO ENQUEUE CODE
001675  001664 7100 00 R.    1191            TRA     FREE5                                                   [18AUG76]
001676  001714 7220 00 R.    1192    FREE6   LXL     Y,Q$BUSY+FREQ   RESTORE OUR PROSPECT'S LIST ELEMENT   [18AUG76]
001677  777777 4420 16 X.    1193    FREE7   SXL     Y,Q$BUSY+P$Q,P  SET NEW TASK IN BUSY FLAG             [18AUG76]
001700  001707 6000 00 R.    1194            TZE     FREE3           NOTHING LEFT ON QUE             16AUG74
001701  000003 7460 12 ..    1195            STX     P,PUB,Y         SET PUB NUMBER FOR NEW TASK
                001702       1196            MTQ                     QUEUE OLD TASK FOR LATER RESTART
001702  000000 7000 00 X.                    TSX0    Q$MTQ           GO QUEUE THE TASK
001703  777777 7240 16 X.    1197            LXL     T,Q$BUSY+P$Q,P  RESTORE NEW TASK POINTER
001704  000001 3360 07 ..    1198            LCQ     1,DL            DECREMENT TOTAL PUB QUEUE LENGTHS       [01FEB77]
001705  000021 0560 00 X.    1199            ASQ     X$SWPCT+17      LIKE SO                                 [01FEB77]
001706  001614 7100 00 R.    1200            TRA     EXIT1           START NEW TASK
                           1201    *                                                               16AUG74
                           1202    *       QUE IS FREE:                                            16AUG74
                           1203    *                                                               16AUG74
                001707     1204    FREE3   GTIM                    TIME SINCE BOOTLOAD             16AUG74
001707  000000 7000 00 X.                    TSX0    X$GTIM          RETURN TIMER UNITS IN A
001710  000000 1750 16 X.    1205            SBA     X$IOQTB,P       GIVES REAL TIME FOR WHICH DEVICE QUEUED 16AUG74
001711  000000 0550 16 X.    1206            ASA     X$IODTB,P       TOTAL REAL TIME DEVICE WAS 'BUSY' TODAY 16AUG74
001712  000000 4500 16 X.    1207            STZ     X$IOQTB,P       CLEAN UP SO CSTAT WILL WORK             16AUG74
001713  001614 7100 00 R.    1208            TRA     EXIT1           START NEW TASK                  22AUG74
                001714       1209            QUEUE   FREQ,1          TEMP QUEUE FOR PICKY PUBBERS            [18AUG76]
                000002              QSET    SET     2               ASSUME 2-LEVEL QUEUE
                000001              QSET    SET     1               WHICH CASE USE THE SPECIFICATION
001714  000001 000000 ..                     ZERO    QSET,0          INITIALLY NOT BUSY
001715  000000 0000 00 ..            FREQ    ARG     0               LAST ELEMENT POINTER
001716  000000 0000 00 ..                    ARG     0               PRIORITY 1 INDEX
```

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                                1210          EJECT                                                                  [18AUG76]
                                1211    *                                                                            [18AUG76]
                                1212    *     MACRO TO SIEZE A SPECIFIC CHANNEL.  RETURNS TO                         [18AUG76]
                                1213    *          CALL+1    ILLEGAL CHANNEL                                         [18AUG76]
                                1214    *          CALL+2    XRP CONTAINS PUB INDEX                                  [18AUG76]
                                1215    *          CALL+3    XRP CONTAINS PUB INDEX OF RELEASED CHANNEL              [17OCT76]
                                1216    *                                                                            [18AUG76]
                                1217    *     NOTE THAT A VALID LIST ELEMENT POINTER MUST BE STORED IN               [18AUG76]
                                1218    *     Q$BUSY+P$Q,P AND THE FREE MACRO INVOKED UNDER THE CONTROL              [18AUG76]
                                1219    *     OF THAT LIST ELEMENT IN ORDER TO RELEASE A CHANNEL SIEZED BY           [18AUG76]
                                1220    *     THIS MACRO.                                                            [18AUG76]
                                1221    *                                                                            [18AUG76]
                                1222    *     MAY DESTROY ANY REGISTER BUT XRT.                                      [18AUG76]
                                1223    *                                                                            [18AUG76]
                                1224    *     MACRO MOVED TO INSERT FILE
                                1225    *                                                                            [18AUG76]
                    001717      1226    CHAN  NULL                                                                   [18AUG76]
                    001717      1227          IFIOC                                                                  [09DEC79]
                                1228          CANA    3,DU          CHECK FOR MULT OF 4 ON IOC                       [09DEC79]
                                1229          TNZ     0,0                                                            [09DEC79]
                                1230          ARS     2             CHANGE TO PUB NUMBER                             [09DEC79]
                                1231    ENDIOC MARK                                                                  [09DEC79]
001717  001740 7400 00 R.  -+1232           STXO    CHANO         SAVE RETURN *OTIS                                  [01DEC80]
001720  001524 7000 00 R.   +1233           TSXO    CHLOC         GET IOM# OF THIS CHANNEL IN AL *OTIS               [01DEC80]
001721  000000 6260 01 ..   +1234           EAX     P,0,AU        SAVE CHANNEL LOC *OTIS                             [01DEC80]
001722  001555 7000 00 R.   +1235           TSXO    IOCHK         CHECK FOR GOOD IOM *OTIS                           [01DEC80]
001723  001726 6000 00 R.   +1236           TZE     *+3           OK TO PROCEED *OTIS                                [01DEC80]
001724  001740 2200 00 R.   +1237           LDXO    CHANO         NOT OK;GET RETURN AND *OTIS                        [01DEC80]
001725  000002 7100 10 ..   +1238           TRA     2,0           RETURN AS CHANNEL RELEASED *OTIS                   [01DEC80]
001726  001740 2200 00 R.   +1239           LDXO    CHANO         RESTORE RETURN *OTIS                               [01DEC80]
001727  000000 2210 01 X.    1240           LDX     X,P$CHAN,AU   ANYTHING HERE?                                     [18AUG76]
001730  000000 6000 10 ..    1241           TZE     0,0           REJECT IF NOT                                      [18AUG76]
001731  000000 7210 16 X.   -1242           LXL     X,P$STAT,P    PICK UP PUB BITS                                   [17OCT76]
001732  010000 3010 03 ..    1243           CANX    X,B$IORCH,DU  ALREADY HELD?                                      [17OCT76]
001733  000002 6010 10 ..    1244           TNZ     2,0           IF SO, RETURN APPROPRIATELY                        [17OCT76]
001734  777777 7210 16 X.   -1245           LXL     X,Q$BUSY+P$Q,P IN USE?                                           [18AUG76]
001735  001761 6000 00 R.    1246           TZE     CHAN3         NO, GRAB IT                                        [18AUG76]
                    001736      1247           GETD    PUB+1         *** LENGTH IS SIGNIFICANT ***                    [18AUG76]
001736  000004 2350 03 ..                   LDA     PUB+1,DU
001737  000000 7000 00 X.                   TSXO    A$GET
001740  000000 2200 03 ..    1248    CHANO  LDXO    ...,DU        RESTORE XR0                                        [18AUG76]
001741  000003 4400 14 ..    1249           SXLO    PUBL,T        SAVE FOR LATER                                     [09DEC79]
001742  001752 6200 00 R.    1250           EAXO    CHAN1         RETURN AFTER QUEUING                               [18AUG76]
001743  000000 4400 14 ..    1251           SXLO    Q$RUN,T                                                          [18AUG76]
                    001744      1252           ENQ     T,(P$Q,P),1   QUEUE WITH HIGH PRIORITY                        [18AUG76]
001744  000000 6210 14 ..                   EAX     X,0,T         PUT IT THERE
001745  000000 6220 16 X.                   EAX     Y,P$Q,P       QUEUE-DESCRIPTOR VECTER
                    000002          QSET   SET     2             ASSUME NO PRIORITY SPECIFIED
                    000001          QSET   SET     1             SET IT TO SPECIFIED LEVEL
001746  000001 6230 00 ..                   EAX     Z,QSET        PRIORITY
001747  000000 7000 00 X.                   TSXO    Q$ENQ         GO TO ENQUEUE CODE
001750  000021 0540 00 X.    1253           AOS     X$SWPCT+17    INCREMENT TOTAL PUB QUEUE LENGTHS                  [01FEB77]
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I PHYSICAL I/O -- MACROS AND SUBROUTINES RELEASED 01DEC80

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001751  000000 7100 00 X.   1254          TRA     $EXIT             WAIT FOR THE COMING          [18AUG76]
001752  000003 2260 14 ..   1255  CHAN1   LDX     P,PUB,T           RESTORE PUB POINTER          [18AUG76]
001753  000003 7200 14 ..   1256          LXLO    PUBL,T            ... AND RETURN               [09DEC79]
001754  001740 7400 00 R.   1257          STXO    CHAN0             SAVE RETURN                  [18AUG76]
                001755      1258          REL                       RELEASE LIST                 [18AUG76]
001755  000000 7000 00 X.                 TSXO    A$REL
001756  001740 2200 00 R.   1259  CHAN2   LDXO    CHAN0             RESTORE RETURN (SIGH)        [18AUG76]
001757  777777 4460 16 X.   1260          SXL     P,Q$BUSY+P$Q,P    MAKE CHANNEL BUSY            [18AUG76]
001760  000001 7100 10 ..   1261          TRA     1,0               RETURN TRIUMPHANT            [18AUG76]
                001761      1262  CHAN3   GTIM                                                   [18AUG76]
001761  000000 7000 00 X.                 TSXO    X$GTIM            RETURN TIMER UNITS IN A
001762  000000 7550 16 X.   1263          STA     X$IOQTB,P         SAVE TIME PUB SIEZED         [01FEB77]
001763  001756 7100 00 R.   1264          TRA     CHAN2                                          [18AUG76]
```

```
                                1265            EJECT
                                1266    *
                                1267    *
                                1268    *                               CONV
                                1269    *
                                1270    *       THIS SUBROUTINE TAKES THE LOGICAL DA IN THE A-REGISTER AND
                                1271    *       GENERATES THE PHYSICAL SEEK ADDRESS, DEVICE NUMBER, DEVICE
                                1272    *       TYPE, ETC. REGISTER X MUST BE PRESERVED. RETURNS TYPE IN Z,
                                1273    *       DEV (UNIT) NUMBER IN S, AND SEEK ADDRESS (IF ANY) IN A.
                                1274    *
                     001764     1275    CONV    NULL                    ENTRY VIA TSX0
001764  000000 1150 07 ..       1276            CMPA    0,DL            POSITIVE?                                       [15DEC76]
001765  002000 6050 00 R.       1277            TPL     CONVA           YES, SO SKIP                                    [15DEC76]
001766  002116 7550 00 R.       1278            STA     CONVT           SAVE FOR AWHILE                                 [15DEC76]
001767  000033 7310 00 ..       1279            ARS     36-9            POSITION ALTERNATE ALLOC TYPE                   [15DEC76]
001770  000000 5310 00 ..       1280            NEG                     MAKE POSITIVE                                   [15DEC76]
001771  000016 1150 07 ..       1281            CMPA    D$ATYMX,DL      GREATER THAN MAXIMUM ALLOCATION TYPE?           [21APR77]
001772  000000 6030 20 X.       1282            TRC     $ZOPF,*         YES, A BAD DA                                   [21APR77]
001773  000000 6230 05 ..       1283            EAX     Z,0,AL          SAVE                                            [15DEC76]
001774  002116 2350 00 R.       1284            LDA     CONVT           RESTORE DA                                      [15DEC76]
001775  002004 3750 00 R.       1285            ANA     DAMSK           ONLY                                            [15DEC76]
001776  000055 7220 13 R.       1286            LXL     Y,T$CONV,Z      GET BRANCH ADDRESS                              [15DEC76]
001777  000000 7100 12 ..       1287            TRA     0,Y             AND GO                                          [15DEC76]
                     002000     1288    CONVA   NULL                                                                    [15DEC76]
002000  002004 3750 00 R.       1289            ANA     DAMSK           MASK OFF IRRELEVANT BITS
002001  000000 7230 01 X.       1290            LXL     Z,D$ATYPE,AU    GET ALLOCATION TYPE
002002  000055 7220 13 R.       1291            LXL     Y,T$CONV,Z      GET BRANCH ADDRESS FOR CONVERSION
002003  000000 7100 12 ..       1292            TRA     0,Y             BRANCH TO CONVERTOR ROUTINE
                                1293
002004  000377777777    .. -+1294      DAMSK   OCT     000377777777    MASK FOR LOGICAL DA *OTIS                       [01DEC80]
                                1295
                                1296    *
                                1297    *       NON-EXISTANT DEVICE
                                1298    *
                     002005     1299    CONV0   NULL
002005  000000 2350 07 ..       1300            LDA     0,DL            CLEAR DEVICE ADDRESS
002006  000000 2230 03 ..       1301            LDX     Z,0,DU          SET TYPE ZERO FOR CONVERSION ERROR
                                1302    *
                                1303    *       NON-ALLOCATABLE DEVICES
                                1304    *       UNIVAC DRUM
                                1305    *
                     002007     1306    CONV1   NULL
                     002007     1307    CONV2   NULL
002007  000000 6270 01 ..       1308            EAX     S,0,AU          PHYSICAL DEVICE = LOGICAL DEVICE
002010  777777 3750 07 ..       1309            ANA     -1,DL           SEEK ADDRESS IS RECORD NUMBER
002011  000000 7100 10 ..       1310            TRA     0,0             RETURN TO CALLER
                                1311    *
                                1312    *       2314 DISKS (FILE PREFERENCE)
                                1313    *
                     002012     1314    CONV3   NULL
002012  002114 6220 00 R.       1315            EAX     Y,L2314         CATALOG TRACK LIMITS FOR IBM 2314
002013  002044 7100 00 R.       1316            TRA     CONVF           CONVERT FILE ADDRESSES
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                                1317    *
                                1318    *       2314 DISCS (CATALOG PREFERENCE)
                                1319    *
                     002014     1320    CONV4   NULL
002014  002114 6220 00 R.       1321            EAX     Y,L2314         POINTER TO IBM 2314 CATALOG ADR LIMITS
002015  002057 7100 00 R.       1322            TRA     CONVC           CONVERT CATALOG ADDRESSES
                                1323    *
                                1324    *       DSS167 DISK PACK
                                1325    *
                     002016     1326    CONV5   NULL
002016  000000 6270 01 ..       1327            EAX     S,0,AU          LOGICAL DEVICE NUMBER IS PHYSICAL DEVICE NUMBER
002017  777777 3750 07 ..       1328            ANA     -1,DL           ISOLATE RECORD NUMBER
002020  000001 7350 00 ..       1329            ALS     1               DOUBLE TO GET PHYSICAL RECORD NUMBER
002021  117230 1150 07 ..       1330            CMPA    20*203*10,DL    CHECK FOR VALID RECORD NUMBER
002022  002005 6030 00 R.       1331            TRC     CONV0           TOO BIG - INVALID ADDRESS
002023  000000 7100 10 ..       1332            TRA     0,0             RETURN TO CALLER
                                1333    *
                                1334    *       2314 DISCS (ENTIRE PACK)
                                1335    *       DSS191 DISCS (ENTIRE PACK)                                      [170CT76]
                                1336    *       MSU451 DISCS (ENTIRE PACK)                                      [170CT76]
                                1337    *                                                                       [170CT76]
                     002024     1338    CONV7   NULL                                                            [170CT76]
                     002024     1339    CONV8   NULL                                                            [170CT76]
                     002024     1340    CNV11   NULL                                                            [170CT76]
002024  000000 6270 01 ..       1341            EAX     S,0,AU          LOGICAL DEVICE IS PHYSICAL DEVICE
002025  777777 3750 07 ..       1342            ANA     -1,DL           ISOLATE LOGICAL RECORD NUMBER
002026  002116 7550 00 R.       1343            STA     CONVT           SAVE LOGICAL RECORD ADDRESS             [170CT76]
002027  000000 2360 13 R.       1344            LDQ     T$REC,Z         LOAD LOGICAL RECORD SIZE IN WORDS       [170CT76]
002030  000006 7720 00 ..       1345            QRL     6               DIVIDE BY 64 (SIZE OF A PHYSICAL BLOCK) [170CT76]
002031  002116 4020 00 R.       1346            MPY     CONVT           COMPUTE PHYSICAL SEEK ADDRESS           [170CT76]
002032  000044 7370 00 ..       1347            LLS     36              MOVE TO A                               [170CT76]
002033  000000 7100 10 ..       1348            TRA     0,0             EXIT
                                1349
                                1350    *
                                1351    *       DSS190 CATALOGS
                                1352    *
                     002034     1353    CONV9   NULL
002034  002112 6220 00 R.       1354            EAX     Y,LM190         DSS 190 CATALOG TRACK LIMITS
002035  002057 7100 00 R.       1355            TRA     CONVC           CONVERT CATALOG ADDRESSES
                                1356    *
                                1357    *       DSS190 FILE TRACKS
                                1358    *
                     002036     1359    CNV10   NULL
002036  002112 6220 00 R.       1360            EAX     Y,LM190         DSS 190 CATALOG ADDRESS TRACKS
002037  002044 7100 00 R.       1361            TRA     CONVF           CONVERT FOR FILE ADDRESSES
                                1362    *                                                                       [170CT76]
                                1363    *       MSU451 CATALOG TRACKS                                           [170CT76]
                                1364    *                                                                       [170CT76]
                     002040     1365    CNV12   NULL                                                            [170CT76]
002040  002110 6220 00 R.       1366            EAX     Y,LM451         POINT TO MSU451 CATALOG TRACK LIMITS    [170CT76]
002041  002057 7100 00 R.       1367            TRA     CONVC           AND BRANCH TO CATALOG TRACKS ROUTINE    [170CT76]
                                1368    *                                                                       [170CT76]
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                                1369     *       MSU451 FILE TRACKS                                                      [170CT76]
                                1370     *                                                                               [170CT76]
                     002042     1371     CNV13   NULL                                                                    [170CT76]
002042  002110 6220 00 R.       1372             EAX     Y,LM451         POINT TO MSU451 CATALOG TRACK LIMITS            [170CT76]
002043  002044 7100 00 R.       1373             TRA     CONVF           AND BRANCH TO FILE TRACKS ROUTINE               [170CT76]
                                1374     *
                                1375     *
                                1376     *       SUBROUTINE TO CONVERT LOGICAL ADDRESSES TO PHYSICAL ADDRESSES
                                1377     *       FOR DEVICES THAT HAVE THE CENTER TRACKS DEDICATED TO CATALOG
                                1378     *       STORAGE.  THIS ROUTINE CONVERTS NORMAL FILE ADDRESSES.
                                1379     *               C(Y) = POINTER TO APPROPRIATE LIMITS
                                1380     *               C(A) = DEVICE ADDRESS
                                1381     *               C(0) = ORIGINAL CALLER'S RETURN ADDRESS
                                1382     *
                     002044     1383     CONVF   NULL
002044  000000 6270 01 ..       1384             EAX     S,0,AU          PHYSICAL DEVICE IS LOGICAL DEVICE NUMBER
002045  777777 3750 07 ..       1385             ANA     -1,DL           ISOLATE RECORD NUMBER
002046  002116 7550 00 R.       1386             STA     CONVT           SAVE LOGICAL RECORD ADDRESS                     [170CT76]
002047  000000 2360 13 R.       1387             LDQ     T$REC,Z         LOAD LOGICAL RECORD SIZE IN WORDS               [170CT76]
002050  000006 7720 00 ..       1388             QRL     6               DIVIDE BY 64 (SIZE OF A PHYSICAL BLOCK)         [170CT76]
002051  002116 4020 00 R.       1389             MPY     CONVT           COMPUTE PHYSICAL SEEK ADDRESS                   [170CT76]
002052  000044 7370 00 ..       1390             LLS     36              MOVE TO A                                       [170CT76]
002053  000000 1150 12 ..       1391             CMPA    CNLOW,Y         IS IT UPPER OR LOWER HALF?
002054  002056 6020 00 R.       1392             TNC     *+2             LOWER, MAPPING IS COMPLETE
002055  000001 0750 12 ..       1393             ADA     CNUPR,Y         UPPER, SKIP CATALOG TRACKS
002056  000000 7100 10 ..       1394             TRA     0,0             RETURN TO ORIGINAL CALLER
                                1395     *
                                1396     *
                                1397     *       SUBROUTINE TO CONVERT LOGICAL TO PHYSICAL DEVICE ADDRESSES
                                1398     *       FOR DEVICES THAT HAVE THE CENTER TRACKS DEDICATED TO CATALOG
                                1399     *       STORAGE.  THIS ROUTINE CONVERTS CATALOG ADDRESSES.
                                1400     *               C(Y) = POINTER INTO APPROPRIATE LIMITS TABLE
                                1401     *               C(A) = LOGICAL DEVICE ADDRESS
                                1402     *               C(0) = ORIGINAL CALLER'S RETURN ADDRESS
                                1403     *
                     002057     1404     CONVC   NULL
002057  000000 6270 01 ..       1405             EAX     S,0,AU          HOLD ONTO LOGICAL DEVICE NUMBER
002060  777777 3750 07 ..       1406             ANA     -1,DL           ISOLATE RECORD NUMBER
002061  000044 7730 00 ..       1407             LRL     36              MOVE TO Q FOR DIVISION
002062  000017 5060 13 R.       1408             DIV     T$FILE,Z        CONVERT TO CYLINDER NUMBER/OFFSET
002063  002116 7550 00 R.       1409             STA     CONVT           STORE OFFSET
002064  000074 5060 00 R.       1410             DIV     T$CATSZ         CONVERT TO PACK #/CYLINDER ON PACK
002065  002117 7550 00 R.       1411             STA     CONVT+1         STORE PACK NUMBER
002066  000017 4020 13 R.       1412             MPY     T$FILE,Z        COMPUTE ADDRESS OF TOP OF CYLINDER
002067  000044 7370 00 ..       1413             LLS     36              MOVE BACK TO 'A' REGISTER
002070  002116 0750 00 R.       1414             ADA     CONVT           ADD OFFSET TO GET LOGICAL ADDRESS
002071  002116 7550 00 R.       1415             STA     CONVT           SAVE LOGICAL RECORD ADDRESS                     [170CT76]
002072  000000 2360 13 R.       1416             LDQ     T$REC,Z         LOAD LOGICAL RECORD SIZE IN WORDS               [170CT76]
002073  000006 7720 00 ..       1417             QRL     6               DIVIDE BY 64 (SIZE OF A PHYSICAL BLOCK)         [170CT76]
002074  002116 4020 00 R.       1418             MPY     CONVT           COMPUTE PHYSICAL ADDRESS                        [170CT76]
002075  000044 7370 00 ..       1419             LLS     36              MOVE TO A                                       [170CT76]
002076  002117 2360 00 R.       1420             LDQ     CONVT+1         LOAD PACK NUMBER (OFFSET FROM BASE)
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002077  000000 0750 12 ..   1421            ADA     CNLOW,Y         RECORD NUMBER NOW IN A
002100  000010 1160 07 ..   1422            CMPQ    8,DL            CHECK FOR VALID PACK NUMBER
002101  002005 6030 00 R.   1423            TRC     CONVO           NO - BAD ADDRESS
002102  010000 6360 06 ..   1424            EAQ     64*64,QL        DEVICE NUMBER PLUS FUDGE FACTOR
002103  000000 0760 17 X.   1425            ADQ     U$PDA,S         ADD PROPER BASE DEVICE
002104  000400 1160 03 .. -+1426            CMPQ    DEVMAX,DU       CHECK FOR LEGAL DEVICE *OTIS                [01DEC80]
002105  000000 6030 20 X.   1427            TRC     $ZOPF,*         NO -- WE BLEW IT
002106  000000 6270 02 ..   1428            EAX     S,0,QU          DEVICE NUMBER IN S
002107  000000 7100 10 ..   1429            TRA     0,0             RETURN TO ORIGINAL CALLER                   [21APR77]
                            1430  *                                                                           [21APR77]
                            1431  ***   THE FOLLOWING VALUES ARE ACTUALLY COMPUTED IN TSTART.  THE NUMBERS     [21APR77]
                            1432  ***   BELOW WILL RESULT IS THE DEFAULT VALUES OF T$RANGE ARE USED.           [21APR77]
                002110      1433            EVEN                                                              [21APR77]
                            1434                                                                              [21APR77]
002110  000001072000    ..  1435  LM451      VFD     36/40*19*384    CATALOG TRACK LIMITS FOR MSU451             [21APR77]
002111  000000073300    ..  1436            VFD     36/40*19*40                                                 [21APR77]
                            1437                                                                              [21APR77]
002112  000000421100    ..  1438  LM190      VFD     36/40*19*184    CATALOG TRACK LIMITS FOR DSS191,MSS400      [21APR77]
002113  000000073300    ..  1439            VFD     36/40*19*40                                                 [21APR77]
                            1440                                                                              [21APR77]
002114  000000077220    ..  1441  L2314      VFD     36/18*20*90     CATALOG TRACK LIMITS FOR DSS170 & DSS180    [21APR77]
002115  000000016040    ..  1442            VFD     36/18*20*20                                                 [21APR77]
                            1443
                002116      1444  CONVT     BSS     2               TEMP STORAGE FOR SEEK ADDRESS MAPPING
```

```
                                1445            TTLS    DEVICE ERROR LOGGING ROUTINES
                                1446    *
                                1447    *
                                1448    *       THESE MACROS ARE USED TO PRINT ERROR MESSAGES FOR DEVICES.
                                1449    *
                                1450    *       DLOG TAKES ONE WORD OF TEXT (USUALLY 'ERROR' OR 'FAIL') AND PREFIXES
                                1451    *       IT WITH THE DEVICE NAME.
                                1452    *
                                1453    *       ELOG TAKES TWO WORDS OF TEXT.
                                1454    *
                                1455    DLOG    MACRO   (ONE            WORD OF TEXT)
                                1456            STZ     FLOG            DON'T INHIBIT DEVICE OUTPUT
                                1457            TSX0    DLOG            CALL SUBROUTINE
                                1458            BCI     1,#1             TEXT TO LOG
                                1459            ENDM    DLOG
                                1460    *
                                1461    *
                                1462    ELOG    MACRO   (TWO            WORDS OF TEXT)
                                1463            STZ     FLOG            DON'T INHIBIT DEVICE OUTPUT
                                1464            TSX0    ELOG            CALL SUBROUTINE
                                1465            BCI     2,#1             TEXT TO LOG
                                1466            ENDM    ELOG
                                1467    *
                                1468    *       SAME AS ABOVE BUT SUPRESS LOGGING TO CONSOLE
                                1469    *
                                1470    DLOGF   MACRO
                                1471            STZ     FLOG                                    [22JUN76]
                                1472            STC2    FLOG                                    [22JUN76]
                                1473            TSX0    DLOG
                                1474            BCI     1,#1
                                1475            ENDM    DLOGF
                                1476
                                1477    ELOGF   MACRO
                                1478            STZ     FLOG                                    [22JUN76]
                                1479            STC2    FLOG                                    [22JUN76]
                                1480            TSX0    ELOG
                                1481            BCI     2,#1
                                1482            ENDM    ELOGF
                                1483    *
                                1484    *
                                1485    *       LOGGING SUBROUTINES
                                1486    *
                      002120    1487    DLOG    NULL                    LOG WITH DEVICE NAME
002120  000001 6200 10 ..     1488            EAX0    1,0             RESTART ADDRESS
002121  777777 2360 10 ..     1489            LDQ     -1,0            GET WORD TO LOG
002122  000000 2210 17 X.     1490            LDX     X,U$PTYPE,S     GET DEVICE TYPE                 [22JUN76]
002123  000123 2350 11 R.     1491            LDA     T$DNAME,X       NAME OF THIS DEVICE             [22JUN76]
002124  575700 3150 03 ..     1492            CANA    =0575700,DU     ROOM FOR NUMBER?                [21APR77]
002125  002141 6010 00 R.     1493            TNZ     ELOGA           NO, JOIN MAIN ROUTINE           [21APR77]
002126  000000 2360 17 X.     1494            LDQ     U$PDA,S         GET DEVICE ADDRESS              [21APR77]
002127  007700 3760 03 ..     1495            ANQ     =0007700,DU     EXTRACT DEVICE NUMBER           [21APR77]
002130  000003 7360 00 ..     1496            QLS     3               FORM FIRST BCD DIGIT IN QU
```

I DEVICE ERROR LOGGING ROUTINES RELEASED 01DEC80

```
002131  000006 7370 00 ..   1497            LLS     6               SHIFT INTO A
002132  000003 7350 00 ..   1498            ALS     3               MOVE IN FIRST HALF OF SECOND DIGIT (000)
002133  000003 7370 00 ..   1499            LLS     3               AND MOVE IN LAST DIGIT
002134  777777 2360 10 ..   1500            LDQ     -1,0            RESTORE Q
002135  002141 7100 00 R.   1501            TRA     ELOGA           JOIN MAIN LOG ROUTINE
                            1502    *
                            1503    *
                 002136     1504    ELOG    NULL                    LOG WITHOUT DEVICE CODE
002136  000002 6200 10 ..   1505            EAXO    2,0             POINT TO RESTART ADDRESS
002137  777776 2350 10 ..   1506            LDA     -2,0            GET FIRST WORD TO LOG
002140  777777 2360 10 ..   1507            LDQ     -1,0            SECOND WORD TO LOG
                            1508                                                                    [22JUN76]
                            1509    *       WEED OUT LOGS FOR LOGGING DEVICE                        [22JUN76]
                            1510                                                                    [22JUN76]
                 002141     1511    ELOGA   NULL                    JOINED HERE FROM DLOG
002141  000000 1060 00 X.   1512            CMPX    P,LOGPB         SEE IF LOG DEVICE ON THIS PUB   [22JUN76]
002142  000000 6000 10 ..   1513            TZE     0,0             DON'T LOG IF SO                 [22JUN76]
002143  002164 7570 00 R.   1514            STAQ    ELOG1           SAVE DATA
002144  000000 4400 14 ..   1515            SXLO    Q$RUN,T         SAVE RETURN ADDRESS IN LIST ELEMENT
002145  000002 2350 14 ..   1516            LDA     CMD,T           ***
002146  000022 7710 00 ..   1517            ARL     18              * LOG COMMAND TABLE ADDRESS IN WORD 2L
002147  002374 7550 00 R.   1518            STA     TEMP            ***
002150  000001 2350 14 ..   1519            LDA     DEV,T           ***
002151  000000 2350 01 X.   1520            LDA     U$PDA,AU        * DEVICE NUMBER IN BITS 6-11
002152  002374 7510 20 R.   1521            STCA    TEMP,20         ***
002153  000003 2350 14 ..   1522            LDA     PUB,T           ***
002154  001401 7200 01 ..   1523            LXLO    X$MBX+X$LPWX,AU PICK UP POINTER TO LAST COMMAND ISSUED  16AUG74
002155  002160 6000 00 R.   1524            TZE     **3             SKIP IF POINTER NO LONGER VALID         16AUG74
002156  000000 2360 10 ..   1525            LDQ     0,0             PICK UP THE IDCW                        16AUG74
002157  002374 7520 40 R.   1526            STCQ    TEMP,40         AND SAVE THE COMMAND                    16AUG74
002160  000002 7710 00 ..   1527            ARL     2               * REAL PUB NUMBER IN BITS 12-17
002161  002374 7510 10 R.   1528            STCA    TEMP,10         ***
002162  000000011007
                 002163     1529            ODD                     FORCE ELOG1 EVEN
002163  000000 7000 00 X.   1530            TSXO    LOG             SIMULATE LOG MACRO
002164  434627202646 ..     1531    ELOG1   BCI     2,LOG FOULUP     INFO FOR LOG STORED HERE
002165  644364472020
002166  000005 0000 14 ..   1532            ARG     QWORD,T         QUEUE WORD FROM INTERRUPT
002167  002374 0000 00 R.   1533            ARG     TEMP            COMPOSITE WORD                          [05NOV77]
002170  003133 0000 17 R.   1534            ARG     RSEEK,S         COMPUTED SEEK ADDRESS OF ERROR          [05NOV77]
002171  000012 0000 14 ..   1535            ARG     DCWWD,T         LOG DCW RESIDUE                         [05NOV77]
                 002172     1536            RREG                    RESTORE REGISTERS AFTER ROADBLOCK
002172  001520 7000 00 R.                   TSXO    RREG            CALL SUBROUTINE
002173  000000 7200 14 ..   1537            LXLO    Q$RUN,T         GET RESTART ADDRESS
002174  000000 7100 10 ..   1538            TRA     0,0             RETURN TO CALLER
```

```
                                1539            TTLS    PHYSICAL I/O -- AWAIT SPECIAL INTERRUPT
                                1540            HEAD    I               I FOR I/O
                                1541    *
                                1542    *
                                1543    *       THIS MACRO AWAITS A SPECIAL INTERRUPT ON THE PUB THAT THE CURRENT
                                1544    *       DEVICE IS ON.  REGISTERS ARE ASSUMED INVALID AT ENTRY, AND
                                1545    *       ARE DESTROYED ON EXIT.
                                1546    *
                                1547    SWAIT   MACRO
                                1548            CRSM    SAVE,OFF
                                1549            INE     '#1','RETURN'
                                1550            TSX0    SWAIT
                                1551            IFE     '#1','RETURN'
                                1552            TSX0    SWAIR
                                1553            CRSM    RESTORE
                                1554            ENDM    SWAIT
                                1555    *
                                1556    *       SUBROUTINE TO AWAIT SPECIAL
                                1557    *
                      002175    1558    SWAIT   NULL
002175  002573 6210 00 R.       1559            EAX     X,SPTMO         POINT TO STANDARD TIMEOUT ROUTINE
002176  002200 7100 00 R.       1560            TRA     *+2             SKIP ENTRANCE FOR NON-STANDARD TIMEOUT RETURN
002177  000000 6210 10 ..       1561    SWAIR   EAX     X,0,0           POINT TO TIMEOUT RETURN
002200  000003 4410 14 ..       1562            SXL     X,SPRET,T       SAVE RETURN
002201  000000 4400 14 ..       1563            SXLO    Q$RUN,T         SAVE RETURN
002202  000001 2270 14 ..       1564            LDX     S,DEV,T         GET UNIT NUMBER ON WHICH TO AWAIT SPECIAL
                                1565            IFG     $DEBUG,0,2      IF WE ARE DEBUGGING
002203  000000 2200 17 X.       1566            LDXO    U$SPEC,S        SEE IF ANOTHER TASK IS WAITING FOR A SPEC
002204  000000 6010 20 X.       1567            TNZ     $ZOPF,*         DEVICE QUEUEING FAILURE
                                1568    *
                                1569    *       SEE IF A SPECIAL HAS ALREADY ARRIVED
                                1570    *
002205  400000 2210 03 ..       1571            LDX     X,B$IOSPC,DU    GET BIT SAYING SPECIAL ARRIVED
002206  000000 3010 17 X.       1572            CANX    X,U$STAT,S      IS IT ON?
002207  002212 6000 00 R.       1573            TZE     SWAI1           NO - MUST WAIT
                      002210    1574    SWAIO   NULL
002210  000000 6410 17 X.       1575            ERSX    X,U$STAT,S      TURN BIT OFF
002211  001614 7100 00 R.       1576            TRA     EXIT1           EXECUTE CURRENT TASK (RETURN)
                                1577    *
                                1578    *       WE MUST WAIT
                                1579    *
                      002212    1580    SWAI1   NULL
002212  000000 7440 17 X.       1581            STX     T,U$SPEC,S      MAKE US THE WAITING TASK
002213  000000 2230 17 X.       1582            LDX     Z,U$PTYPE,S     GET UNIT TYPE
002214  000075 3350 13 R.       1583            LCA     T$SWAIT,Z       GET COUNT UNTIL TIMEOUT
002215  777777 2750 03 ..       1584            ORA     -1,DU           MASK UPPER HALF
002216  000000 7550 17 X.       1585            STA     U$TICK,S        INTO TICKER
002217  000000 7100 00 X.       1586            TRA     $EXIT           AND GO AWAY
```

```
                    1587            TTLS    PHYSICAL I/O -- SUBROUTINES
                    1588            HEAD    I               I FOR I/O
                    1589    *
                002220  1590            IFIOC                                                   [09DEC79]
                    1591    *                                                               [21APR77]
                    1592    *
                    1593    *       2314 PRE-SIEZE
                    1594    *
                    1595    DKPS1   NULL                    PRE-SIEZE SUBROUTINE FOR SEEKS
                    1596    DPPS1   NULL
                    1597            LDX     X,U$STAT,S      GET DEVICE STATUS BITS
                    1598            CANX    X,B$IONSK,DU    CHECK FOR DSS180
                    1599            TNZ     DPWX5           YES, SKIP PRE SEEK
                    1600            SIEZE   PUB,1           SIEZE PUB AT HIGH PRIORITY
                    1601            TRA     DPS1R           RETURN AFTER NORMAL SIEZE
                    1602            REM                     NOTE THAT THIS SUBROUTINE MAY BE CALLED
                    1603            REM                     FROM OTHER COMMANDS WHICH HAVE HIGH
                    1604            REM                     PRIORITY.
                    1605    *
                    1606    *       TASK TO LINK FROM SEEK TO R/W
                    1607    *
                    1608    DKWTX   NULL                    ENTER HERE WHEN SEEK HAS BEEN ISSUED
                    1609            LXL     Z,T$IONXT,Z     GET POINTER TO R/W COMMAND
                    1610            SXL     Z,CMD,T         PUT IN SAVED COMMAND LOC
                    1611    DKWT2   NULL                    REENTRY IF DISC NOT READY
                    1612            FREE    PUB             RELEASE THE CHANNEL UNTIL SEEK COMPLETES
                    1613            SWAIT   RETURN          WAIT FOR SPECIAL INTERRUPT
                    1614            LDX     S,DEV,T         RESTORE UNIT NUMBER AFTER ROADBLOCK
                    1615            LDX     Z,T$DKREQ,DU    POINT TO REQUEST STATUS COMMAND FOR DISC
                    1616            TRA     DPWX4           ISSUE COMMAND
                    1617    *
                    1618    *       NEXT TASK TASK AFTER REQUEST STATUS
                    1619    *       AND AFTER 2314 RESTORE (RECALIBRATE)
                    1620    *
                    1621    DKRQX   NULL                    HERE WHEN SEEK COMPLETE
                    1622    DPRSX   NULL                    HERE AFTER RESTORE (RECALIBRATE)
                    1623            LDX     X,U$STAT,S      GET DEVICE STATUS BITS
                    1624            CANX    X,B$IONSK,DU    CHECK FOR DSS180
                    1625            TNZ     MTBSX           YES, DON'T RELEASE THE PUB
                    1626            FREE    PUB             RELEASE THE CHANNEL SO SEEKS CAN SNEAK IN
                    1627            LDX     S,DEV,T         RESTORE UNIT NUMBER TO S
                    1628            TRA     DPWX3           CONTINUE
                    1629            TTLS    PHYSICAL        I/O -- SUBROUTINES                  [01MAY79]
                    1630    *
                    1631    *
                    1632    *       2314/HSFC SUBROUTINES
                    1633    *
                    1634    *
                    1635    *       TASK TO LINK FROM SEEK TO R/W
                    1636    *
                    1637    DPWTX   NULL
                    1638            LXL     Z,T$IONXT,Z     POINT TO R/W COMMAND
```

```
1639            SXL     Z,CMD,T         SAVE FOR LATER USE
1640            FREE    PUB             RELEASE THE CHANNEL
1641    *
1642    *       WAIT FOR SPECIAL INTERRUPT
1643    *
1644    DPWX1   NULL
1645            SWAIT   RETURN          AWAIT SPECIAL INTERRUPT
1646            LDX     S,DEV,T         RESTORE UNIT NUMBER
1647            LDX     X,B$IOSKC,DU    GET 'SEEK-COMPLETE' BIT
1648            CANX    X,U$STAT,S      SEE IF SEEK IS COMPLETE
1649            TNZ     DPWX2           YES- CONTINUE WITH R/W
1650            LDX     Z,T$DPRR,DU     SET UP FOR READ-REGISTER COMMAND
1651            TRA     DPWX4           AND ISSUE IT
1652    DPRQX   NULL                    REENTRY AFTER SUCCESSFUL READ-REGISTER
1653            FREE    PUB             RELEASE THE CHANNEL AGAIN
1654            LDX     S,DEV,T         GET UNIT (PHYSICAL DEVICE) NUMBER
1655            LDX     X,B$IOSKC,DU    GET SEEK-COMPLETE BIT AGAIN
1656            CANX    X,U$STAT,S      IS SEEK COMPLETE NOW?
1657    **********FUDGE FOR ASD**********
1658            TNZ     DPWX2           YES READ NOW
1659            LDA     DPWX1+1,DL      POINT TO RESTART ADDRESS
1660            STA     Q$RUN,T         SAVE IT
1661            LDX     X,B$IOSPC,DU    GET BIT SAYING SPECIAL ARRIVED
1662            CANX    X,U$STAT,S      IS IT ON?
1663            TNZ     SWAIO           YES -- TURN IT OFF AND CONTINUE
1664            STX     T,U$SPEC,S      WAIT FOR SPECIAL WITHOUT RESETING TIMER********
1665            TRA     $EXIT
1666    DPWX2   NULL                    SEEK HAS COMPLETED
1667            ERSX    X,U$STAT,S      TURN OFF BIT
1668    DPWX3   LXL     Z,CMD,T         GET SAVED COMMAND POINTER
1669    DPWX4   STX     Z,CMD,T         SAVE AS CURRENT COMMAND POINTER
1670            TRA     MAINA           ISSUE NEXT COMMAND
1671    DPWX5   LXL     Z,T$IONXT,Z     GET NEXT COMMAND
1672            TRA     DPWX4
1673    *                                                       [21APR77]
1674    ENDIOC  MARK                                            [09DEC79]
```

```
                                1675            TTLS    PHYSICAL I/O -- SUBROUTINES                              [01MAY79]
                                1676    *
                                1677    *
                                1678    *       MISCELLANEOUS SUBROUTINES
                                1679    *
                                1680    *
                                1681    *       D190B (AKA D191, D190 ICF) SET TI BITS IN SEEK WHEN       [01MAY79]
                                1682    *       FORMATTING.                                              [01MAY79]
                                1683    *                                                                [01MAY79]
                     002220     1684    TIBIT   NULL                    CALLED AS I$IOPCS                [01MAY79]
002220  000003 2350 13 ..       1685            LDA     T$IOPCS,Z       GET TI BITS TO USE               [01MAY79]
002221  000026 7350 00 ..       1686            ALS     18+4            POSITION FOR SEEK                [01MAY79]
002222  000004 2550 14 ..       1687            ORSA    SEKAD,T         PATCH INTO SEEK ADDR.            [01MAY79]
002223  000000 7100 10 ..       1688            TRA     0,0             & MERGE                          [01MAY79]
                                1689    *                                                                [01MAY79]
                                1690    *                                                                [01MAY79]
                                1691    *       DN30 - READ PRE-CONNECT (WAIT FOR SPECIAL)
                                1692    *
                     002224     1693    DNPC1   NULL
002224  377777 2210 03 ..       1694            LDX     X,-1-B$IOSPC,DU MASK FOR SPECIAL PENDING BIT
002225  000000 3410 17 X.       1695            ANSX    X,U$STAT,S      IGNORE PENDING SPECIALS FOE D-30
                     002226     1696            SWAIT                   WAIT FOR SPECIAL INTERRUPT
002226  002175 7000 00 R.                       TSX0    SWAIT
                     002227     1697            RREG                    RESTORE REGISTERS
002227  001520 7000 00 R.                       TSX0    RREG            CALL SUBROUTINE
002230  002667 7100 00 R.       1698            TRA     MPCSR           RETURN TO MAIN ROUTINE
                               +1699    *                                                                [01DEC80]
                               +1700    *       SPECIAL LEVEL6 CHECKING                                  [01DEC80]
                               +1701    *           (IF ASCII THEN USE BOOTLOAD...IT IS POINTED TO BY    [01DEC80]
                               +1702    *            THE TEST WRITE COMMAND WHICH IS THE NEXT LINK)      [01DEC80]
                               +1703    *                                                                [01DEC80]
                     002231    +1704    CKML6   NULL                                                     [01DEC80]
002231  000000 2210 17 X.      +1705            LDX     X,U$STAT,S      SPECIAL MODE CHECK               [01DEC80]
002232  040000 3010 03 ..      +1706            CANX    X,B$IOMDA,DU    IF ASCII                         [01DEC80]
002233  002236 6000 00 R.      +1707            TZE     CKMD                                             [01DEC80]
002234  000003 7230 13 ..      +1708            LXL     Z,T$IOPCS,Z     POINT TO ALTERNATE COMMAND       [01DEC80]
002235  002241 7100 00 R.      +1709            TRA     CKMDX           AND THEN TRANSFER AGAIN          [01DEC80]
                                1710    *
                                1711    *       MODE CHECKING SUBROUTINE FOR DUAL MODE DEVICES.          [04JUL77]
                                1712    *       (7 TRACK TAPE, READER, PUNCH, H716, PRT300, PRT400)      [04JUL77]
                                1713    *                                                                [04JUL77]
                     002236     1714    CKMD    NULL
002236  000000 2210 17 X.       1715            LDX     X,U$STAT,S      GET UNIT STATUS
002237  100000 3010 03 ..       1716            CANX    X,B$IOMDD,DU    CHECK FOR DECIMAL MODE
002240  000000 6000 10 ..       1717            TZE     0,0             RETURN IF NOT IN DECIMAL MODE
                     002241    +1718    CKMDX   NULL                                                     [01DEC80]
002241  000003 7230 13 ..       1719            LXL     Z,T$IOPCS,Z     POINT TO ALTERNATE COMMAND
002242  000002 7430 14 ..       1720            STX     Z,CMD,T         SAVE IN COMMAND POINTER
002243  000000 7100 10 ..       1721            TRA     0,0             AND RETURN
                                1722    *
                                1723    *       SUBROUTINE FOR MODE CHECKING ON 9 TRACK TAPES            [04JUL77]
                                1724    *       THERE ARE FOUR MODES THAT A 9 TRACK TAPE CAN BE IN.      [04JUL77]
```

```
                                1725     *       THEY ARE:                                                                  [04JUL77]
                                1726     *         1) BINARY MODE                                                           [04JUL77]
                                1727     *         2) ASCII (TAPE9) MODE                                                    [04JUL77]
                                1728     *         3) BCD MODE (THIS IS WORTHLESS BUT KEPT FOR COMPATABILITY)               [04JUL77]
                                1729     *         4) ASCII <--> EBCDIC MODE                                                [04JUL77]
                                1730     *                                                                                  [04JUL77]
002244  002261 6210 00 R.      1731     CKM9R   EAX     X,R9TAB         POINT TO READ MODE TABLE                           [04JUL77]
002245  002247 7100 00 R.      1732             TRA     CKM9                                                               [04JUL77]
002246  002265 6210 00 R.      1733     CKM9W   EAX     X,W9TAB         POINT TO WRITE MODE TABLE                          [04JUL77]
                                1734                                                                                       [04JUL77]
                    002247      1735     CKM9    NULL                                                                       [04JUL77]
002247  002260 7410 00 R.      1736             STX     X,CKM9T         SAVE POINTER TO TABLE                              [04JUL77]
002250  000000 2360 17 X.      1737             LDQ     U$STAT,S        LOAD DEVICE STATUS BITS                            [04JUL77]
002251  140000 3760 03 ..      1738             ANQ     B$IOMDD+B$IOMDA,DU  MASK TO MODE BITS                              [04JUL77]
002252  040000 5060 03 ..      1739             DIV     B$IOMDA,DU      MOVE THE TWO BITS TO QL                            [04JUL77]
002253  000004 1160 07 ..      1740             CMPQ    4,DL            CONSISTANCY CHECK                                  [04JUL77]
002254  000000 6030 20 X.      1741             TRC     $ZOPF,*         SOMEONE CHANGED DEFINITIONS OF THE BITS            [04JUL77]
002255  002260 2230 66 R.      1742             LDX     Z,CKM9T,*QL     LOAD ADDRESS OF CORRECT TABLE ENTRY                [04JUL77]
002256  000002 7430 14 ..      1743             STX     Z,CMD,T         SAVE AS COMMAND TABLE POINTER                      [04JUL77]
002257  000000 7100 10 ..      1744             TRA     0,0             AND RETURN                                         [04JUL77]
                                1745                                                                                       [04JUL77]
002260  000000 000000  ..      1746     CKM9T   ZERO    ...,0           POINTER TO READ OR WRITE TABLE                     [04JUL77]
                                1747                                                                                       [04JUL77]
002261  000366 000000  R.      1748     R9TAB   ZERO    T$MTRD          READ BINARY                                        [04JUL77]
002262  000726 000000  R.      1749             ZERO    T$MTR9          READ ASCII                                         [04JUL77]
002263  000375 000000  R.      1750             ZERO    T$MTRDA         READ BCD                                           [04JUL77]
002264  000735 000000  R.      1751             ZERO    T$MTR9E         READ EBCDIC -> ASCII                               [04JUL77]
                                1752                                                                                       [04JUL77]
002265  000404 000000  R.      1753     W9TAB   ZERO    T$MTWT          WRITE BINARY                                       [04JUL77]
002266  000744 000000  R.      1754             ZERO    T$MTW9          WRITE ASCII                                        [04JUL77]
002267  000413 000000  R.      1755             ZERO    T$MTWTA         WRITE BCD                                          [04JUL77]
002270  000753 000000  R.      1756             ZERO    T$MTW9E         WRITE ASCII -> EBCDIC                              [04JUL77]
                                1757     *                                                                                 [04JUL77]
                                1758     *
                                1759     *       MAG TAPE - WRITE SINGLE CHARACTER
                                1760     *       PRE-CONNECT SUBROUTINE (DETERMINE CHARACTER)
                                1761     *
                    002271      1762     MTPC0   NULL
002271  000007 2350 14 ..      1763             LDA     MODE,T          GET USER COMMAND
002272  000077 3750 03 ..      1764             ANA     =077,DU         ISOLATE SINGLE CHARACTER                           [21APR77]
002273  000014 7350 00 ..      1765             ALS     12              LEFT JUSTIFY
002274  000004 7550 14 ..      1766             STA     SEKAD,T         SAVE FOR LATER PICKUP
002275  002236 7100 00 R.      1767             TRA     CKMD            CHECK MODE OF UNIT
```

```
                                1768            TTLS    PHYSICAL I/O -- SUBROUTINES                                     [01MAY79]
                                1769    *
                                1770    *       SET BINARY MODE (TAPE,PUNCH,READER)
                                1771    *
                     002276     1772            EVEN                    FOLLOWING 2 INSTRUCTIONS XED'D
                     002276     1773    MTSB1   NULL
002276  637777 2210 03 ..      1774            LDX     X,-1-B$IOMDD-B$IOMDA,DU GET MASK FOR BITS
                     002277     1775    MTSB2   NULL                    JOINED HERE BY SET NORMAL RECOVERY DRIVE
002277  000000 3410 17 X.      1776            ANSX    X,U$STAT,S      TURN OFF DECIMAL MODE
002300  004323 7100 00 R.      1777            TRA     FAKEO           FAKE NORMAL RETURN
                                1778    *
                                1779    *       SET DECIMAL (MIXED) MODE
                                1780    *
                     002301     1781    P4S61   NULL                    BCD MODE FOR PRT400
                     002301     1782    MTSD1   NULL
002301  002276 7170 00 R.      1783            XED     MTSB1           RESET MISCELLANEOUS BITS
002302  100000 2210 03 ..      1784            LDX     X,B$IOMDD,DU    GET BIT
                     002303     1785    MTSD2   NULL                    JOINED HERE BY SUPRESS ERROR RECOV DRIVE
002303  000000 2410 17 X.      1786            ORSX    X,U$STAT,S      SET DECIMAL MODE
002304  004323 7100 00 R.      1787            TRA     FAKEO           NORMAL RETURN
                                1788    *
                                1789    *       SET ASCII <--> EBCDIC MODE FOR 9 TRACK TAPE                     [04JUL77]
                                1790    *                                                                       [04JUL77]
                     002305     1791    MTSE1   NULL                                                            [04JUL77]
002305  002276 7170 00 R.      1792            XED     MTSB1           RESET EXISTING MODE                     [04JUL77]
002306  140000 2210 03 ..      1793            LDX     X,B$IOMDD+B$IOMDA,DU  LOAD BITS FOR ASCII/EBCDIC MODE   [04JUL77]
002307  002303 7100 00 R.      1794            TRA     MTSD2           AND EXIT                                [04JUL77]
```

```
                                1795            EJECT
                                1796    *
                                1797    *       SUPRESS ERROR RECOVERY
                                1798    *       (FOR ALL DEVICES)
                                1799    *
                     002310     1800    MTNR1   NULL
002310  000002 2210 03 ..       1801            LDX     X,B$IONRV,DU    GET BIT
002311  002303 7100 00 R.       1802            TRA     MTSD2           SET IT
                                1803    *
                                1804    *       RESTORE NORMAL ERROR RECOVERY
                                1805    *       (FOR ALL DEVICES)
                                1806    *
                     002312     1807    MTRV1   NULL
002312  777775 2210 03 ..       1808            LDX     X,-1-B$IONRV,DU GET MASK
002313  002277 7100 00 R.       1809            TRA     MTSB2           UNSET BIT
                     002314     1810    P4S91   NULL                    ASCII MODE FOR PRT400
                     002314     1811    MTSA1   NULL                    SET ASCII MODE
002314  002276 7170 00 R.       1812            XED     MTSB1           UNSET SOME BITS
002315  040000 2210 03 ..       1813            LDX     X,B$IOMDA,DU    GET ASCII MODE BIT
002316  002303 7100 00 R.       1814            TRA     MTSD2           SET IT
                                1815    *
                                1816    *       AWAIT SPECIAL INTERRUPT
                                1817    *       (TAPE, PUNCH, READER)
                                1818    *
                     002317     1819    MTAS1   NULL
                     002317     1820            SWAIT                   WAIT FOR SPECIAL
002317  002175 7000 00 R.                       TSX0    SWAIT
                     002320     1821            RREG                    RESTORE REGISTERS
002320  001520 7000 00 R.                       TSX0    RREG            CALL SUBROUTINE
002321  004323 7100 00 R.       1822            TRA     FAKE0           FAKE NORMAL RETURN
                                1823    *                                                       [01DEC80]
                                1824    *       AWAIT READY ON LEVEL 6 (CAN'T GET STATUS)       [01DEC80]
                                1825    *                                                       [01DEC80]
                     002322     1826    L6AR1   NULL                    CAN'T DO ANYTHING       [01DEC80]
002322  004323 7100 00 R.       1827            TRA     FAKE0           MAKE IT GOOD            [01DEC80]
                                1828    *
                                1829    *       SET MODE ON 301 PRINTER (6-BIT, 9-BIT)
                                1830    *
002323  000000011007
                     002324     1831    S69CK   EVEN
002324  010000 2210 03 ..       1832            LDX     X,B$I0301,DU    GET BIT THAT SAYS 301
002325  002326 7170 00 R.       1833            XED     *+1             CONTINUE
002326  000000 3010 17 X.       1834            CANX    X,U$STAT,S      MAKE SURE THIS IS ONE
002327  004325 6000 00 R.       1835            TZE     RJCT            REJECT SETMODE IF NOT
                                1836    *
                     002330     1837    PRS61   NULL
002330  002324 7170 00 R.       1838            XED     S69CK           MAKE SURE WE CAN
002331  000000 2350 03 ..       1839            LDA     0,DU            GET DEVICE NUMBER FOR 6-BIT
002332  002335 7100 00 R.       1840            TRA     PRS92           SKIP
                                1841    *
                     002333     1842    PRS91   NULL
002333  002324 7170 00 R.       1843            XED     S69CK           MAKE SURE WE CAN
```

I PHYSICAL I/O -- SUBROUTINES

```
002334  000100 2350 03 ..   1844           LDA     =0100,DU        GET DEVICE NUMBER FOR 9-BIT
002335  000000 6210 17 X.   1845  PRS92    EAX     X,U$PDA,S       POINT TO DEVICE ADDRESS
002336  002337 7410 00 R.   1846           STX     X,*+1
002337  000000 7510 20 ..   1847           STCA    ...,20          CHANGE PDA
002340  004323 7100 00 R.   1848           TRA     FAKE0           EXIT
                            1849  *
                            1850  *        CHECK FOR LOAD IMAGE COMMAND ALLOWED
                            1851  *
                 002341     1852  PRPS2    NULL
002341  002324 7170 00 R.   1853           XED     S69CK           CHECK IT
002342  000000 7100 10 ..   1854           TRA     0,0             IF WE'RE BACK, WE CAN
                            1855  *
                            1856  *        CHECK PRINTER BUTTONS BEFORE WRITE
                            1857  *
                 002343     1858  PRPS1    NULL
002343  000000 2350 17 X.   1859           LDA     U$STAT,S        GET UNIT STATUS
002344  007700 3750 03 ..   1860           ANA     =0007700,DU     ISOLATE BUTTON STATUS                [21APR77]
002345  000000 6000 10 ..   1861           TZE     0,0             NORMAL
002346  000000 6550 17 X.   1862           ERSA    U$STAT,S        TURN OFF STATUS
002347  000300 2750 07 ..   1863           ORA     3*B$IORET,DL    RECOVERABLE ERROR
002350  004326 7100 00 R.   1864           TRA     FAKE1           RETURN TO USER
```

```
                                    1865            TTLS    PHYSICAL I/O -- SUBROUTINES                                    [01MAY79]
                                    1866    *
                                    1867    *       FIX DCW RESIDUE FOR TAPES                                              [05NOV77]
                                    1868    *                                                                              [05NOV77]
                          002351    1869    MTR9X   NULL                                                                   [05NOV77]
002351  000012 2360 14 ..   1870            LDQ     DCWWD,T         GET LAST DCW IMAGE                                     [21APR77]
002352  700000 3760 07 ..   1871            ANQ     =0700000,DL     ISOLATE CHARACTER DOUNT                                [21APR77]
002353  100000 1160 07 ..   1872            CMPQ    =0100000,DL     DID WE GET EXACTLY ONE EXTRA?                          [21APR77]
002354  004252 6010 00 R.   1873            TNZ     FIN1            NO, LET USER WORRY                                     [21APR77]
002355  000012 2360 14 ..   1874            LDQ     DCWWD,T         RELOAD DCW IMAGE                                       [21APR77]
002356  100000 6760 07 ..   1875            ERQ     =0100000,DL     YES, IT'S GARBAGE                                      [21APR77]
002357  777777 1760 07 ..   1876            SBQ     -1,DL           DECREMENT ADDRESS, INCREMENT RESIDUE
002360  000012 7560 14 ..   1877            STQ     DCWWD,T         AND REPLACE IT
002361  004252 7100 00 R.   1878            TRA     FIN1
```

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                    1879            TTLS    PHYSICAL I/O -- SUBROUTINES                                          [01MAY79]
                    1880    *
                    1881    *       SPLIT DEVICE PRE-SIEZE ROUTINE
                    1882    *
                002362      1883            IFIOC                                                                [09DEC79]
                    1884    *                                                                                    [21APR77]
                    1885    D2PSS   NULL                                                                 22AUG74
                    1886            STX     S,D2DEV         SAVE LOG DEV NO FOR STATUS                   22AUG74
                    1887            LDX     X,URET,T        GET USER'S RETURN                            22AUG74
                    1888            SXL     X,UST           SAVE IT                                      22AUG74
                    1889            LDQ     DAC,T           GET LOGICAL RECNO                            22AUG74
                    1890            ANQ     -1,DL           ONLY                                         22AUG74
                    1891            DIV     ROTAT           REMAINDER IS OFFSET FROM ROTATION BOUND      22AUG74
                    1892            STAQ    QUOT            SAVE                                         22AUG74
                    1893            LDA     U$PDA,S         GET DUAL DEVICES                             22AUG74
                    1894            TMI     POFF            WASTED ERRORT                                22AUG74
                    1895            CANQ    1,DL            IS THIS FOR SECOND DEVICE                    22AUG74
                    1896            TZE     *+2             SKIP IF NOT                                  22AUG74
                    1897            ALR     18              NOTE THE FACT                                22AUG74
                    1898            STA     TEMP            SAVE ORDERED DEVICE NOS                      22AUG74
                    1899            QRS     1               SECTORS/2 = SECTOR IN FIRST DEVICE           22AUG74
                    1900            MPY     ROTAT           CONVERT TO RECORDS                           22AUG74
                    1901            ADQ     QUOT            ADD IN OFFSET                                22AUG74
                    1902            STQ     DAC,T           SAVE AS PARTIAL DAC                          22AUG74
                    1903            LDX     X,TEMP          COMPLETE DAC                                         [29JAN77]
                    1904            STX     X,DAC,T          .                                                   [29JAN77]
                    1905            LDQ     QUOT+1          RESTORE SECTOR NUMBER                        22AUG74
                    1906            ADQ     1,DL            ROUND UP TO NEXT SECTOR                      22AUG74
                    1907            QRS     1               SECTORS/2 = SECTOR IN 2ND DEVICE             22AUG74
                    1908            MPY     ROTAT           CONVERT TO SEKAD                             22AUG74
                    1909            STQ     D2STA           SAVE PARTIAL DAC                             22AUG74
                    1910            LXL     X,TEMP          COMPLETE THE DAC                                     [29JAN77]
                    1911            STX     X,D2STA          .                                                   [29JAN77]
                    1912            LDQ     QUOT            GET RECORDS OFFSET                           22AUG74
                    1913            SBQ     ROTAT           C(Q) = -RECORDS LEFT TO WRITE HERE           22AUG74
                    1914            LXL     S,D$ATYPE,S     GET ALLOCATION TYPE                          22AUG74
                    1915            MPY     T$REC,S         CONVERT TO WORDS                             22AUG74
                    1916            STQ     NWRDS           SAVE                                         22AUG74
                    1917            LXL     X,T$LEN,T       GET LENGTH OF PIO LIST EL                    22AUG74
                    1918            STZ     QUOT            CLEAR SONE SPACE                             22AUG74
                    1919            STX     X,QUOT          SAVE FOR LATER                               22AUG74
                    1920            EAX     X,-DCW,X        CONVERTO TO NUMBER OF DCWS                   22AUG74
                    1921            TZE     $ZOPF,*         NONE?                                        22AUG74
                    1922            TMI     $ZOPF,*         LESS THAN NONE???                            22AUG74
                    1923            SXL     X,QUOT+1        SAVE FOR LATER                               22AUG74
                    1924            LDQ     ROTA1           GET ROTATION SIZE IN WORDS                   22AUG74
                    1925            CMPQ    4096,DL         MIGHT WE HAVE TO EXPAND?                     22AUG74
                    1926            TPL     D2PS1           NO, SINCE A ROTATION WON'T FIT IN DCW        22AUG74
                    1927            EAX     Y,DCW,T         POINT TO DCWS                                22AUG74
                    1928            STZ     TEMP            CLEAR SONE SPACE                             22AUG74
                    1929    D2PS3   LDA     0,Y             GET A DCW                                    22AUG74
                    1930            ANA     4095,DL         JUST WORD COUNT                              22AUG74
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1931            TNZ     *+2             SKIP IF NOT ZERO                22AUG74
1932            LDA     4096,DL         WHICH WOULD MEAN 4096           22AUG74
1933            ASA     TEMP            ADD TO TOTAL WORDS              22AUG74
1934            SBX     X,1,DU          COUNT DOWN                      22AUG74
1935            TZE     D2PS2           WE'RE DONE                      22AUG74
1936            ADX     Y,1,DU          POINT TO NEXT DCW               22AUG74
1937            TRA     D2PS3           LOOP                            22AUG74
1938    D2PS2   LDQ     TEMP            GET TOTAL WORDS                 22AUG74
1939            DIV     ROTA1           CONVERT TO DCWS                 22AUG74
1940            QRL     1               WE WILL USE TWO LIST ELS        22AUG74
1941            EAA     1+DCW,QL        ROUND UP FOR IONTPS             22AUG74
1942            CMPA    QUOT            COMPARE WITH WHAT WE HAVE       22AUG74
1943            TZE     D2PS1           EQUAL IS OK                     22AUG74
1944            TMI     D2PS1           LESS IS GREAT                   22AUG74
1945            STX     T,TEMP          WE NEED MORE                    22AUG74
1946            EAX     X,TEMP-T$LEN    POINT TO FAKE ELEMENT           22AUG74
1947            EXPAND  AU,X            EXPAND THE ONE LINKED TO IT     22AUG74
1948            LDX     T,TEMP          GET NEW LIST POINTER            22AUG74
1949    D2PS1   LDA     QUOT+1          GET NUMBER OF DCWS              22AUG74
1950            GET     AL,NBUG         GET A BLOCK TO SAVE THEM                [17OCT76]
1951            LDX     Y,T$LINK,T      POINT TO THE PIO ELEMENT        22AUG74
1952            STX     Y,UST           SAVE USER'S XT                  22AUG74
1953            EAX     Y,DCW,Y         POINT TO WHERE DCWS GO          22AUG74
1954            STZ     TAL1            CLEAR TALLY TO IT               22AUG74
1955            STX     Y,TAL1          AND CREATE NEW ONE              22AUG74
1956            EAX     Z,0,T           POINT TO WHERE TO SAVE DCWS     22AUG74
1957            EAX     S,0,T           AND WHERE TO PICK THEM UP LATER 22AUG74
1958            LDA     QUOT+1          GET NUMBER OF DCWS              22AUG74
1959            ALS     10              JUSTIFY COUNT FOR REPEAT                [29JAN77]
1960            EAXO    M$ABIT+M$BBIT,AL  SET COUNT
1961            RPDX    ,1
1962            LDA     0,Y
1963            STA     0,Z                                                     [29JAN77]
1964            STX     T,QUOT          SAVE POINTER TO LIST EL         22AUG74
1965            STZ     NEWT            WE HAVEN'T GOTTEN ANOTHER YET   22AUG74
1966            STZ     TAL2            SO WE CAN'T POINT TO IT         22AUG74
1967            EAX     X,TAL1          BUT WE CAN POINT TO THE FIRST   22AUG74
1968            STX     X,TALP          THUSLY                          22AUG74
1969    *
1970    *       LOOP TO CREATE 2 DCW LISTS
1971    *
1972    DCWL    LDA     0,S             GET NEXT DCW
1973            ANA     4095,DL         GET JUST THE COUNT
1974            TNZ     *+2             IF NON-ZERO, COUNT IS RIGHT
1975            LDA     4096,DL         FULL COUNT OF 4096 IF ZERO
1976            ASA     NWRDS           ADD INTO WORDS LEFT TO GO IN THIS CHUNK
1977            TZE     FIT             JUST FIT
1978            TMI     FIT             FIT WITH LEFTOVER WORDS
1979            LDQ     NWRDS           GET WORDS LEFT OVER
1980            STQ     TEMP            SAVE THEM
1981            SSA     NWRDS           GENERATE AMOUNT LEFT ON THIS DEVICE
1982            TZE     DV20            NOTHING HERE
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1983            LCA     4096,DL         GET MASK FOR EVERYTHING BUT THE COUNT
1984            ANA     0,S             GENERATE IT
1985            CANA    -1,DL           IS THIS AN IOTD?                        22AUG74
1986            TNZ     *+2             NOPE                                    22AUG74
1987            ORA     M$IOTP,DL       MAY NOT BE THE LAST                     22AUG74
1988            ADA     NWRDS           GET PROPPER COUNT
1989            STA     TALP,*          SAVE IT
1990            LCA     4096,DL         GET THE BIG DCW                         22AUG74
1991            ANA     0,S             BUT NOT ITS COUNT                       22AUG74
1992            ADA     TEMP            MAKE COUNT WHAT WOULDN'T FIT            22AUG74
1993            ALR     18              SWAP HALVES                             22AUG74
1994            ADA     NWRDS           UPDATE ADDRESS BY WHAT WE WROTE         22AUG74
1995            ALR     18              RESTORE SWAPPED HALVES                  22AUG74
1996            STA     0,S             SAVE FUDGED DCW                         22AUG74
1997    *
1998    *       OLD DEVICE IS FULL, GET LIST ELEMENT FOR NEW OPERATION
1999    *
2000    DV20    NULL
2001            LDX     T,NEWT          DO WE HAVE A SECOND DEVICE?
2002            TNZ     DV21            YES
2003            LDX     X,UST           GET USER'S LIST ELEMENT
2004            TSX0    E$PROTO         DUPLICATE IT
2005            LDA     D2STA           GET NEW I$DAC
2006            STA     DAC,T           SAVE IT
2007            EAX     X,DCW,T         POINT TO DCW SPACE
2008            STX     X,TAL2          SAVE IT
2009            LDA     DV2IO,DL        GET ADDRESS OF ROUTINE TO START I/O
2010            MTQA                    QUEUE IT
2011            STX     T,NEWT          SAVE NEW REGISTER
2012    *
2013    *       SWITCH DEVICES
2014    *
2015    DV21    LCA     ROTA1           RESET AMOUNT TO WRITE                   22AUG74
2016            STA     NWRDS           BEFORE ROTATION                         22AUG74
2017            LDA     1,DU            SWITCH POINTERS                         22AUG74
2018            ERSA    TALP                                                    22AUG74
2019            TRA     DCWL            LOOP                                    22AUG74
2020    *
2021    *       STEP TO NEXT DCW
2022    *
2023    DV22    LDA     0,S             GET CURRENT DCW
2024            ADX     S,1,DU          STEP REGISTER S
2025            ANA     3*4096,DL       GET THE DCW TYPE
2026            TNZ     DCWL            LOOP IF NOT IOTD
2027            LDX     T,QUOT          RELEASE DCW BLOCK                       22AUG74
2028            REL                                                             22AUG74
2029            EAX     X,TAL1          POINT TO TALLY
2030            LDX     T,UST           GET USER'S T REGISTER
2031            TSX0    DCWCK           CHECK FOR TRAILING IONTP'S OR IOTP'S
2032            STZ     D2STA           CLEAR STATUS OF SECOND OPERATION, JUST IN CASE
2033            TSX0    IO              DO THE I/O
2034            STZ     TAL1            CLEAR TALLY POINTER FOR FIRST LIST ELEMENT
```

```
2035                TRA     DV25            CONTINUE
2036    *
2037    *       LAST DCW FITS INTO THE CURRENT DEVICE
2038    *
2039    FIT     LDA     0,S             GET IT
2040    TALP    STA     ...,ID          SAVE IT
2041            TRA      DV22           CONTINUE
2042    *
2043    *       INITIATE I/O ON SECOND DEVICE IF NECESSARY
2044    *
2045    DV2IO   EAX     X,TAL2          POINT TO TALLY WORD
2046            TSX0     DCWCK          CHECK THE DCW LIST
2047            TSX0     IO             DO THE IO
2048            STZ      TAL2           CLEAR TALLY WORD
2049            LDA      QUEWD,T        GET THE QUEWORD FROM THE OPERATION
2050            LDQ      DCWWD,T        GET THE DCW RESIDUE
2051            STAQ     D2STA          SAVE THE DEVICE STATUS
2052            REL                     RELEASE THE EXTRA LIST ELEMENT
2053            LDX      T,UST          RESTORE USER'S T
2054    *
2055    *       NOW FIGURE OUT WHICH STATUS TO RETURN
2056    *
2057    DV25    LDA      TAL1           GET OPERATION COMPLETE FLAG
2058            ORA      TAL2
2059            TNZ      $EXIT          OPERATION IS NOT YET DONE
2060            LDA      D2STA          GET THE STATUS WORD
2061            TZE      DV26           NONE, DON'T UPDATE OURS
2062            CMPA     BDADS          CHECK FOR FAKED BAD DA
2063            TZE      DV26           YES -- DON'T UPDATE
2064            ANA      7*64,DL        CHECK FOR GOOD STATUS
2065            TZE      DV26           YES -- DON'T UPDATE STATUS
2066            LDAQ     D2STA          GET THE STATUS WORDS
2067            STA      QUEWD,T        SAVE THE QUEUE WORD
2068            STQ      DCWWD,T        SAVE THE DCW WORD
2069    *
2070    *       RETURN TO USER
2071    *
2072    DV26    LXL     X,UST           SET UP RETURN                          [29JAN77]
2073            SXL      X,Q$RUN,T      .                                      [29JAN77]
2074            MTQ                     QUEUE IT
2075    D2DEV   LDX     S,...,DU        GET DEVICCE NUMBER
2076            STX      S,DAC,T        RESTORE DEVICE NUMBER FOR LOGS
2077            TRA      RETR           GET NEXT OPERATION FOR THIS DEVICE
2078    *
2079    *       SUBROUTINE TO CHECK FOR TRAILING IONTP OR IOTP DCW'S
2080    *
2081    *
2082    DCWCK   STX     X,DCWCL         SAVE TALLY POINTER
2083    DCWCL   LDA     ...,DI          GET NEXT DCW
2084            ANA      M$IOTP+M$IONPB,DL AND IT                      16AUG74
2085            TZE      0,0            AN IOTD, WE'RE IN LUCK
2086            CMPA     M$IOTP,DL      CHECK FOR IOTP                 16AUG74
```

```
                                2087              TZE     *+4             YES
                                2088              TTF     DCWCL           IONTP, IGNORE
                                2089              STZ     DAC,T           WIPE OUT CALL IF ALL IONTP
                                2090              TRA     0,0
                                2091              LDA     M$IOTP,DL       CHANGE IOTP TO IOTD                    16AUG74
                                2092              ERSA    0,X*
                                2093              TRA     0,0             RETURN
                                2094    *
                                2095    ENDIOC    MARK                                                           [09DEC79]
                                2096    *                                                                      [21APR77]
                                2097    *         CONSTANTS AND STORAGE
                                2098    *
                      002362    2099              EVEN
                      002362    2100    D2STA     BSS     2               STATUS RETURN FOR SECOND OPERATION
                      002364    2101    QUOT      BSS     2                                                      22AUG74
002366  000000000100  ..        2102    ROTAT     DEC     64                                                     22AUG74
002367  000000010000  ..        2103    ROTA1     DEC     4096                                                   22AUG74
                      002370    2104    TAL1      BSS     1               TALLY FOR OPERATION 1
                      002371    2105    TAL2      BSS     1               TALLY FOR OPERATION 2
                      002372    2106    UST       BSS     1               STORAGE FOR USERS T AND XO
                      002373    2107    NWRDS     BSS     1               COUNT OF WORDS LEFT IN THE CURRENT DEVICE BLOCK
                      002374    2108    TEMP      BSS     1               TEMPORARY
                      002375    2109    NEWT      BSS     1               T FOR NEW OPERATION
002376  777777770000  ..        2110    DCWMK     OCT     777777770000    MASK FOR ALL BUT COUNT FIELD OF THE DCW
                      002377    2111              QUEUE   D2Q             QUEUE FOR THE DEVICE
                      000002            QSET      SET     2               ASSUME 2-LEVEL QUEUE
002377  000002 000000 ..                          ZERO    QSET,0          INITIALLY NOT BUSY
002400  000000 0000 00 ..         D2Q             ARG     0               LAST ELEMENT POINTER
002401  000000 0000 00 ..                         ARG     0               PRIORITY 1 INDEX
                                                  DUP     1,QSET-1        DEVELOP REST OF QUEUE
002402  002401 0000 20 R.                         ARG     *-1,N*          INDIRECTION
```

I PHYSICAL I/O -- SUBROUTINES RELEASED 01DEC80

```
                                2112            EJECT                                                   [18AUG76]
                                2113    *                                                               [18AUG76]
                                2114    *       MPC PRE-SIEZE ROUTINES                                  [01MAY79]
                                2115    *                                                               [18AUG76]
                      002403    2116    MPPS1   NULL                                                    [18AUG76]
002403  000000 2350 17 X.       2117            LDA     U$PDA,S         WE WANT THIS PUB                [18AUG76]
                      002404    2118            CHAN    (0,AU)                                          [18AUG76]
002404  000000 6350 01 ..                       EAA     0,AU
002405  001717 7000 00 R.                       TSX0    I$CHAN
002406  000000 7100 20 X.       2119            TRA     $ZOPF,*         ILLEGAL CHANNEL?                [17OCT76]
002407  002414 7100 00 R.       2120            TRA     MPPS2           GOT IT                          [17OCT76]
                                2121    *                                                               [17OCT76]
                                2122    *       CHANNEL HAS BEEN RELEASED                               [17OCT76]
                                2123    *                                                               [17OCT76]
002410  777777 7210 16 X.       2124            LXL     X,Q$BUSY+P$Q,P  GET BUSY FLAG                   [17OCT76]
002411  002412 7410 00 R.       2125            STX     X,*+1           MODIFY NEXT INSTRUCTION         [17OCT76]
002412  000000 1060 03 ..       2126            CMPX    P,...,DU        IDLE?                           [17OCT76]
002413  004337 6010 00 R.       2127            TNZ     CBUSY           REJECT IF NOT                   [17OCT76]
                      002414    2128    MPPS2   NULL                                                    [17OCT76]
002414  000003 7460 14 ..       2129            STX     P,PUB,T         MAKE PUB COME BACK              [18AUG76]
                      002415    2130            RREG                    RESTORE I/O REGISTERS           [18AUG76]
002415  001520 7000 00 R.                       TSX0    RREG            CALL SUBROUTINE
002416  777777 4440 16 X.       2131            SXL     T,Q$BUSY+P$Q,P  USE THIS PUB                    [18AUG76]
002417  002665 7100 00 R.       2132            TRA     DPS1R                                           [18AUG76]
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I PHYSICAL I/O -- SUBROUTINES RELEASED 01DEC80

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                                2133            TTLS    PHYSICAL I/O -- SUBROUTINES                          [01MAY79]
                                2134    *                                                                    [01MAY79]
                                2135    *       MPC PRE-CONNECT ROUTINES                                     [01MAY79]
                                2136    *                                                                    [18AUG76]
002420  002440 2360 00 R.       2137    MPPC1   LDQ     MPRC            SET READ ASCII                       [29JAN77]
002421  000013 7560 14 ..       2138            STQ     SIDCW,T          .                                   [29JAN77]
002422  000004 6350 14 ..       2139            EAA     SEKAD,T         FORM ADDRESS DCW                     [18AUG76]
002423  000001 2750 07 ..       2140            ORA     1,DL                                                 [18AUG76]
002424  000014 7550 14 ..       2141            STA     SKDCW,T         STUFF IT                             [18AUG76]
002425  000004 2350 14 ..       2142            LDA     SEKAD,T         FIX START ADDRESS                    [18AUG76]
002426  000024 7350 00 ..       2143            ALS     36-16           MPC'S USE 16-BIT WORDS               [18AUG76]
002427  000004 7550 14 ..       2144            STA     SEKAD,T                                              [18AUG76]
002430  100000 2350 07 ..       2145            LDA     B$IOCDM,DL      SET DRUM CONNECT MODE                [18AUG76]
002431  000000 2550 16 X.       2146            ORSA    P$STAT,P                                             [18AUG76]
002432  000000 7100 10 ..       2147            TRA     0,0             RETURN                               [18AUG76]
                                2148    *                                                                    [18AUG76]
002433  002441 2360 00 R.       2149    MPPC2   LDQ     MPRS            SET CORRECT IDCW                     [29JAN77]
002434  000015 7560 14 ..       2150            STQ     IDCW,T           .                                   [29JAN77]
002435  020002 2350 07 ..       2151            LDA     B$IOCDN+B$SPIOP,DL  AND CONNECT BITS                 [18AUG76]
002436  000000 2550 16 X.       2152            ORSA    P$STAT,P                                             [18AUG76]
002437  000000 7100 10 ..       2153            TRA     0,0                                                  [18AUG76]
                                2154    *                                                                    [18AUG76]
002440  020000724000    ..      2155    MPRC    OCT     020000724000                                         [18AUG76]
002441  400000700201    ..      2156    MPRS    OCT     400000700201                                         [18AUG76]
```

```
                                    2157            TTLS    PHYSICAL I/O -- SPECIAL INTERRUPT HANDLERS
                                    2158            HEAD    I
                                    2159    *
                                    2160    *       THESE ROUTINES ARE ENTERED FROM $MTASK WHEN
                                    2161    *       A SPECIAL INTERRUPT OCCURS ON CERTAIN DEVICES
                                    2162    *
                                    2163    *       CARD READER, CONSOLE
                                    2164    *
                          002442    2165    CRSP    NULL                    SPECIAL ON CARD READER
                          002442    2166    CNSP    NULL                    SPECIAL ON CONSOLE TYPEWRITER
002442  000001 2270 14 ..   2167            LDX     S,DEV,T         GET PHYSICAL DEVICE NUMBER
002443  000000 7470 00 X.   2168            STX     S,H$COMRD       WHICH IS LOGICAL DEVICE NUMBER FOR THESE
                          002444    2169            REL                     RELEASE LIST ELEMENT
002444  000000 7000 00 X.                   TSX0    A$REL
002445  000000 2270 00 X.   2170            LDX     S,H$COMRD       GET THE DEVICE NUMBER
002446  000000 2230 17 X.   2171            LDX     Z,U$PTYPE,S     GET PHYSICAL TYPE
002447  000011 1030 03 ..   2172            CMPX    Z,U$CON,DU      CONSOLE?                                [05NOV77]
002450  002454 6000 00 R.   2173            TZE     CNSP1           YES, CHECK FOR USER READ                [05NOV77]
                            2174                                                                            [05NOV77]
002451  100000 2210 03 ..   2175            LDX     X,B$IOMDD,DU    SPECIAL IS FROM READER, LOAD DECIMAL BIT [05NOV77]
002452  000000 2410 17 X.   2176            ORSX    X,U$STAT,S      SET ON TO FORCE READ IN MIXED MODE      [05NOV77]
002453  000000 7100 00 X.   2177            TRA     H$COM           ENTER CONSOLE INTERFACE                 [05NOV77]
                            2178    *                                                                       [05NOV77]
                            2179    *       SPECIAL IS FROM CONSOLE, CHECK FOR USER READ                    [05NOV77]
                            2180    *                                                                       [05NOV77]
                          002454    2181    CNSP1   NULL                                                    [05NOV77]
002454  000000 2350 17 X.   2182            LDA     U$PDA,S         GET THE PDA
002455  001524 7000 00 R. -+2183            TSX0    CHLOC           GET ENTRY LOCATION *OTIS                [01DEC80]
                            2184    ENDIOM  MARK                                                            [09DEC79]
002456  000000 2270 01 X.   2185            LDX     S,P$TEMP,AU     POINT TO USER TASK
002457  000000 6000 00 X.   2186            TZE     H$COM           NONE, SO WE'LL READ IT
002460  000000 4500 01 X.   2187            STZ     P$TEMP,AU       CLEAR TASK
002461  000000 7100 00 X.   2188            TRA     C$UR4B          AND REJOIN COPY SUBROUTINE
                            2189    *
                            2190    *       PRINTER
                            2191    *       (CHECK BUTTONS VIA REQUEST STATUS)
                            2192    *
                          002462    2193    PRSP    NULL
002462  000001 2350 14 ..   2194            LDA     DEV,T           GET THE DEVICE NUMBER
002463  000000 6350 01 ..   2195            EAA     0,AU            ONLY
002464  000010 7550 14 ..   2196            STA     DAC,T           SAVE IN LIST ELEMENT
002465  710000 2350 03 ..   2197            LDA     MDDG+8*512,DU   DIAGNOSTIC, NON-DATA, REQS
002466  000007 7550 14 ..   2198            STA     MODE,T          IN LIST ELEMENT
002467  000000 2200 03 ..   2199            LDX0    0,DU            SET ADDRESS EXTENSION TO FIRST 256K     [05NOV77]
002470  000006 4400 14 ..   2200            SXL0    ADEXT,T                                                 [05NOV77]
002471  002600 7000 00 R.   2201            TSX0    IO              START IO
002472  000011 2350 14 ..   2202            LDA     QUEWD,T         GET STATUS
002473  002501 6050 00 R.   2203            TPL     PRSPX           FAKE STATUS - IGNORE
002474  002503 3150 00 R.   2204            CANA    PRSPS           CHECK FOR BAD STATUS
002475  002501 6010 00 R.   2205            TNZ     PRSPX           IGNORE SPECIAL IF SO
002476  000001 2270 14 ..   2206            LDX     S,DEV,T         GET PHYSICAL UNIT NUMBER
002477  007700 3750 03 ..   2207            ANA     B$BUTON,DU      ISOLATE BUTTON BITS
```

I PHYSICAL I/O -- SPECIAL INTERRUPT HANDLERS

```
002500  000000 2550 17 X.    2208            ORSA    U$STAT,S        SET THEN IN STATUS TABLE
                  002501     2209    PRSPX   NULL
                  002501     2210            REL                     RELEASE IO LIST ELEMENT
002501  000000 7000 00 X.                    TSXO    A$REL
002502  000000 7100 00 X.    2211            TRA     $EXIT           EVAPORATE
                              2212
002503  370000770700   ..    2213    PRSPS   OCT     370000770700    BAD STATUS BITS
```

I PHYSICAL I/O -- TICK/TOCK TIMEOUT MECHANISM RELEASED 01DEC80

```
                                2214              TTLS    PHYSICAL I/O -- TICK/TOCK TIMEOUT MECHANISM
                                2215              HEAD    I                I FOR I/O
                                2216     *
                                2217     *
                                2218     *                TICK/TOCK
                                2219     *
                                2220     *        THIS ROUTINE GENERATES TICKS AT EVEN INTERVALS, REGENERATING
                                2221     *        ITSELF EACH TIME IT IS CALLED.  IT WATCHES OPERATIONS WAITING
                                2222     *        FOR INTERRUPTS, TO BE SURE NO INTERRUPTS HAVE BEEN LOST.  IT
                                2223     *        ALSO WATCHES TASKS WAITING FOR SPECIAL INTERRUPTS, TO AVOID
                                2224     *        INFINITE WAITS.
                                2225     *
                      002504    2226     TICK    NULL                     ENTRY POINT FROM $MTASK
                      002504    2227              GTIM                     GET THE TIME NOW
002504  000000 7000 00 X.                         TSX0    X$GTIM           RETURN TIMER UNITS IN A
002505  000002 0350 03 ..         2228            ADLA    2,DU             SET 8K MS.
002506  000001 7550 14 ..         2229            STA     X$TIM,T          SAVE TIME UNTIL NEXT TICK
002507  000000 7000 00 X.         2230            TSX     0,X$STIM         SET NEW TIMER TRAP
002510  000734 2260 03 ..        -+2231            LDX     P,$NIOMS*CHTLEN+4*$FPCHN-4,DU  START AT END OF TABLE *OTIS   [01DEC80]
                      002511    2232     TICK1   NULL                     LOOP POINT FOR PUBS
002511  000000 0540 16 X.         2233            AOS     P$TICK,P         INCREMENT PUB TICKER
002512  002515 6040 00 R.         2234            TMI     TICK2            IF NEGATIVE, OK
002513  002555 6000 00 R.         2235            TZE     TICK3            WENT FROM NEGATIVE TO ZERO - RUNOUT
002514  000000 4500 16 X.         2236            STZ     P$TICK,P         WAS ZERO BEFORE - RESET
                      002515    2237     TICK2   NULL                     NEXT PUB
002515  000004 1660 03 ..         2238            SBX     P,4,DU           STEP TO NEXT PUB
002516  000040 1060 03 ..         2239            CMPX    P,M$PBPAY,DU     FINISHED WITH PAYLOAD CHANNELS?   [05NOV77]
002517  002511 6050 00 R.         2240            TPL     TICK1            CONTINUE IF MORE
                                2241     *
                                2242     *        NOW CHECK FOR SPECIAL INTERRUPT TIMEOUTS
                                2243     *
002520  000400 2270 03 ..        -+2244            LDX     S,DEVMAX,DU      END OF DEVICE #'S *OTIS           [01DEC80]
                      002521    2245     TICK4   NULL                     LOOP POINT FOR DEVICES
002521  000001 1670 03 ..         2246            SBX     S,1,DU           STEP DOWN DEVICES
002522  000000 6040 00 X.         2247            TMI     $EXIT            WE'RE DONE
002523  000000 2240 17 X.         2248            LDX     T,U$SPEC,S       SEE IF WE AWAIT A SPECIAL INTERRUPT
002524  002521 6000 00 R.         2249            TZE     TICK4            NO - NEXT DEVICE
002525  000000 0540 17 X.         2250            AOS     U$TICK,S         INCREMENT THIS TICKER
002526  002521 6040 00 R.         2251            TMI     TICK4            HAS NOT RUN DOWN YET
                                2252     *
                                2253     *        SPECIAL INTERRUPT TIMEOUT
                                2254     *        WE HAVE WAITED LONG ENOUGH
                                2255     *
                                2256              INE     $DEBUG,0,2       ASSEMBLE IF WE ARE DEBUGGING
002527  000001 1070 14 ..         2257            CMPX    S,DEV,T          MAKE SURE DEVICE NUMBER IS CORRECT
002530  000000 6010 20 X.         2258            TNZ     $ZOPF,*          FUNNY LIST ELEMENT IN TABLE
002531  000003 2260 14 ..         2259            LDX     P,PUB,T          GET PUB NUMBER IF ANY
002532  777777 7220 16 X.        -2260            LXL     Y,Q$BUSY+P$Q,P   IS THIS PUB BUSY,
002533  000000 1020 17 X.         2261            CMPX    Y,U$SPEC,S       AND BY US?
002534  002537 6010 00 R.         2262            TNZ     TICK6            NO, SO DON'T FREE IT
                      002535    2263              FREE    PUB              RELEASE PUB WE WON'T BE USING
002535  001620 7000 00 R.                         TSX0    I$FREE
```

I PHYSICAL I/O -- TICK/TOCK TIMEOUT MECHANISM RELEASED 01DEC80

```
002536  000001 2270 14 ..    2264            LDX     S,DEV,T         RESTORE DEVICE NUMBER
                002537       2265    TICK6   NULL
002537  000000 6440 17 X.    2266            ERSX    T,U$SPEC,S      CLEAR SPECIAL POINTER
002540  000003 7210 14 ..    2267            LXL     X,SPRET,T       GET THE RETURN FOR TIMEOUT
002541  002573 1010 03 R.    2268            CMPX    X,SPTMO,DU      STANDARD RETURN?
002542  002552 6000 00 R.    2269            TZE     TICK7           YES -- NO LOG
                002543       2270            LOG     (SPECIAL TIMO),(U$PDA,S),(SEKAD,T)
002543  000000 4500 00 X.                    STZ     I$FLOG          DON'T INHIBIT DEVICE OUTPUT
002544  000000 7000 00 X.                    TSX     0,I$LOG         CAN BE CALLED FROM THE OUTSIDE WORLD
002545  624725233121   ..                    BCI     2,SPECIAL TIMO      TEXT ARGUMENT
002546  432063314446
002547  000000 0000 17 X.                    ARG     U$PDA,S         YES, POINT TO IT
002550  000004 0000 14 ..                    ARG     SEKAD,T
                002551       2271            ALARM                   RING THE ALARM
                                             INHIB   SAVE,OFF        UNINHIBIT
002551  262334 0110 03 ..                    NOP     91356,DU        SIGNAL ALARM WANTED
                                             INHIB   RESTORE         RESTORE INHIBIT
                002552       2272    TICK7   NULL
002552  000003 2350 14 ..    2273            LDA     SPRET,T         GET TIMEOUT RETURN
                002553       2274            MTQA                    QUEUE IT
002553  000000 7000 00 X.                    TSX0    Q$MTQA          CALL SUBROUTINE TO QUEUE TASK
002554  002521 7100 00 R.    2275            TRA     TICK4           AND CHECK NEXT DEVICE
                             2276    *
                             2277    *       PUB HAS TIMED OUT - ENQ TASK
                             2278    *
                002555       2279    TICK3   NULL
002555  400000 2360 07 ..    2280            LDQ     B$IOBSY,DL      GET PUB BUSY BIT                [05NOV77]
002556  000000 3160 16 X.    2281            CANQ    P$STAT,P        SHOULD BE ON
002557  000000 6000 20 X.    2282            TZE     $ZOPF,*         WE TIMED OUT NOTHING
002560  000000 6560 16 X.    2283            ERSQ    P$STAT,P        REMOVE PUB BUSY BIT
002561  777777 7240 16 X.    2284            LXL     T,Q$BUSY+P$Q,P  GET PIO LIST ELEMENT
002562  000000 6000 20 X.    2285            TZE     $ZOPF,*         NO LIST ELEMENT
002563  000016 2350 14 ..    2286            LDA     DCW,T           SET UP FAKE DCWWD
002564  000012 7550 14 ..    2287            STA     DCWWD,T         INDICATING ZERO TRANSFER
002565  004347 2350 00 R.    2288            LDA     STIMO           FORM FAKE TIMEOUT STATUS
002566  000005 7550 14 ..    2289            STA     QWORD,T         SAVE IT
002567  003726 2350 07 R.    2290            LDA     ITERM,DL        SERVICE LIKE TERMINATE INTERRUPT
                002570       2291            MTQA                    QUEUE THE TASK
002570  000000 7000 00 X.                    TSX0    Q$MTQA          CALL SUBROUTINE TO QUEUE TASK
002571  000000 2240 03 ..    2292            LDX     T,0,DU          SPPML
002572  002515 7100 00 R.    2293            TRA     TICK2           CHECK NEXT PUB
                             2294    *
                             2295    *       TASK TO SERVICE SPECIAL TIMEOUT
                             2296    *
                002573       2297    SPTMO   NULL                    ENTER HERE FROM $MTASK
002573  004350 2350 00 R.    2298            LDA     TICKS           STATUS FOR SPECIAL TIMEOUT
002574  004326 7100 00 R.    2299            TRA     FAKE1           RETURN STATUS TO USER
                             2300    *
                             2301    *       DUMMY LIST ELEMENT FOR TICK/TOCK
                             2302    *
002575  000000 002504  .R    2303    TOCK    ZERO    0,TICK          Q$LINK/Q$RUN
002576  000000 000000  ..    2304            ZERO                    X$TIM
```

```
                                2305            TTLS    PHYSICAL I/O -- INITIATION
                                2306            HEAD    I               I FOR I/O
                                2307    *
                                2308    *
                                2309    *       I$ERROR IS POINTED TO BY THE ILLEGAL ENTRIES IN THE PIO COMMAND
                                2310    *       TABLES.  IT MAY BE TRANSFERED TO IF WE SCREW UP.
                                2311    *
002577  000000 7100 20 X.       2312    ERROR   TRA     $ZOPF,*         CAUSE A ZOP FAULT
                                2313    *
                                2314    *
                                2315    *       ENTRY IS MADE HERE FROM THE CALLING ROUTINE.  THE USER LIST
                                2316    *       ELEMENT IS POINTED TO BY XR-T.  ENTRY IS VIA A TSX0.
                                2317    *
                    002600      2318    IO      NULL                    ENTRY POINT
                    002600      2319            CKPT    12              NOTE REGISTERS AT ENTRY
002600  000000 7170 00 X.               XED     $CKPT
002601  000006 7400 14 ..       2320            STX0    URET,T          SAVE USER RETURN IN LIST ELEMENT
                                2321    **********************LOG I/O CALL FOR SYSTEM LOGGER************
002602  340000 2350 03 ..       2322            LDA     =7B21,DU        GET TYPE OF CALL (I/O START)            [21APR77]
002603  004271 0110 03 R.       2323    SYS1    NOP     IOSLG,DU        *****CHANGE TO TSX0 WHEN LOGGING*****
                                2324    ************************************************************************
                                2325    *
                                2326    *       CONVERT LOGICAL DEVICE ADDRESS TO DEVICE NUMBER
                                2327    *
002604  000010 2350 14 ..       2328            LDA     DAC,T           GET LOGICAL DEVICE ADDRESS
002605  002004 3750 00 R.       2329            ANA     DAMSK           ONLY
002606  000000 0540 01 X.       2330            AOS     D$IOCT,AU       COUNT DEVICE USAGE FOR STATISTICS
002607  000010 2350 14 ..       2331            LDA     DAC,T           RESTORE DA                              [15DEC76]
002610  001764 7000 00 R.       2332            TSX0    CONV            CONVERT TO PHYSICAL ADDRESS
002611  000001 4430 14 ..       2333            SXL     Z,TYPE,T        SAVE DEVICE TYPE
002612  000001 7470 14 ..       2334            STX     S,DEV,T         SAVE UNIT NUMBER
002613  000004 7550 14 ..       2335            STA     SEKAD,T         SAVE SEEK ADDRESS
002614  000007 2350 14 ..       2336            LDA     MODE,T          GET USER'S COMMAND
002615  700000 1150 03 ..       2337            CMPA    MDDG,DU         CHECK FOR DIAGNOSTIC COMMANDS
002616  004132 6030 00 R.       2338            TRC     DIAG            BRANCH OUT FOR DIAGNOSTIC COMMANDS
                                2339    *
                                2340    *       LOOK UP THE COMMAND IN THE MASTER TABLES
                                2341    *
002617  000000 2230 17 X.       2342            LDX     Z,U$PTYPE,S     GET THE UNIT TYPE
002620  000075 2230 13 R.       2343            LDX     Z,T$IOCMD,Z     GET POINTER TO MASTER TABLE FOR THIS DEVI
002621  002656 2360 00 R.       2344            LDQ     MMASK           MASK FOR SIGNIFICANT PART OF MODE ONLY
002622  000022 7710 00 ..       2345            ARL     18              MOVE MODE CODE TO LOWER
002623  000300 5002 00 ..       2346            RPL     0,TZE           LINK THROUGH THE TABLE
                                2347                                    NOTE THAT TABLE IS PADDED WITH RJCT
002624  000000 2110 13 ..       2348            CMK     0,Z             LOOK FOR THIS COMMAND
002625  000002 7430 14 ..       2349            STX     Z,CMD,T         SAVE POINTER TO COMMAND TABLE
                                2350    *
                                2351    *       SIEZE THE DEVICE FOR THE OPERATION
                                2352    *
002626  002657 2200 03 R.       2353            LDX0    MAIN,DU         RESTART ADDRESS AFTER QUEUEING FOR DEVICE
                    002627      2354    I02     NULL                    JOINED HERE BY DIAGNOSTIC ROUTINES
002627  000000 4400 14 ..       2355            SXL0    Q$RUN,T         SAVE IN LIST ELEMENT
```

I PHYSICAL I/O -- INITIATION RELEASED 01DEC80

```
002630  000000 2260 17 X.   2356            LDX     P,U$Q,S         POINT TO DEVICE QUEUE
002631  000000 6040 10 ..   2357            TMI     0,0             NO QUEUE - JUST DO OPERATION
002632  777777 7210 16 ..   2358            LXL     X,Q$BUSY,P      SEE IF IT IS BUSY
002633  002636 6010 00 R.   2359            TNZ     *+3             IT IS, SO QUEUE UP
002634  777777 4440 16 ..   2360            SXL     T,Q$BUSY,P      IT ISN'T, SO GRAB IT
002635  000000 7100 10 ..   2361            TRA     0,0             EXECUTE CURRENT TASK FOR DEVICE
                 002636     2362            ENQ     T,(0,P)         GET ON THE QUEUE FOR THIS DEVICE
002636  000000 6210 14 ..                   EAX     X,0,T           PUT IT THERE
002637  000000 6220 16 ..                   EAX     Y,0,P           QUEUE-DESCRIPTOR VECTER
                 000002             QSET    SET     2               ASSUME NO PRIORITY SPECIFIED
002640  000002 6230 00 ..                   EAX     Z,QSET          PRIORITY
002641  000000 7000 00 X.                   TSX0    Q$ENQ           GO TO ENQUEUE CODE
002642  000020 0540 00 X.   2363            AOS     X$SWPCT+16      INCREMENT TOTAL DEVICE QUEUE LENGTHS   [01FEB77]
002643  000000 7100 00 X.   2364            TRA     $EXIT           WAIT FOR UNIT TO BE FREE
                            2365    *
                            2366    *       THIS ROUTINE INITIATES THE NEXT OPERATION ON A GIVEN DEVICE.
                            2367    *       ENTRY IS BY A TRA, WITH THE DEVICE NUMBER IN XR-S.  REGISTER T
                            2368    *       IS NOT SIGNIFICANT ON ENTRY.
                            2369    *
                 002644     2370    NEXT    NULL                    ENTRY POINT
002644  000000 2260 17 X.   2371            LDX     P,U$Q,S         POINT TO QUEUE WITH PERMANENT REGISTER
002645  000000 6040 00 X.   2372            TMI     $EXIT           NO QUEUE - JUST EXIT
                 002646     2373            DEQ     T,(0,P)         GET NEXT REQUEST IF ANY
002646  000000 6210 16 ..                   EAX     X,0,P           LOAD QUEUE NAME
002647  000000 7000 00 X.                   TSX0    Q$DEQ           EXECUTE NECESSARY CODE
002650  000000 6240 12 ..                   EAX     T,0,Y           LOAD REGISTER WITH LIST ELEMENT ADDRESS
002651  777777 4440 16 ..   2374            SXL     T,Q$BUSY,P      SAVE BUSIER OR UNBUSY IF ZERO
002652  000000 6000 00 X.   2375            TZE     $EXIT           NO NEXT OPERATION, SO LEAVE QUEUE FREE
002653  000001 3360 07 ..   2376            LCQ     1,DL            DECREMENT TOTAL OF DEVICE QUEUE LENGTHS  [01FEB77]
002654  000020 0560 00 X.   2377            ASQ     X$SWPCT+16      LIKE SO                                  [01FEB77]
002655  001614 7100 00 R.   2378            TRA     EXIT1           GOT ONE, SO GO DO IT
                            2379    *
                            2380    *       CONSTANTS AND STORAGE FOR I/O SETUP
                            2381    *
002656  777777000077    ..  2382    MMASK   OCT     777777000077    MASK FOR SIGNIFICANT PART OF I$MODE
```

I PHYSICAL I/O -- MAIN OPERATION DRIVER RELEASED 01DEC80

```
                                2383              TTLS    PHYSICAL I/O -- MAIN OPERATION DRIVER
                                2384              HEAD    I                 I FOR I/O
                                2385    *
                                2386    *         CONTROL IS PASSED HERE VIA $EXIT WHEN THE DEVICE HAS BEEN
                                2387    *         SUCCESSFULLY SIEZED.  THE OPERATION IS SET UP AND ISSUED.
                                2388    *
                     002657     2389    MAIN      NULL
002657  000000 2210 03 ..     2390              LDX     X,0,DU            GET HALF A ZERO
002660  000000 4410 17 X.     2391              SXL     X,U$RETRY,S       INITIALIZE RETRY COUNTER
                                2392                                                                    [05NOV77]
                     002661     2393    MAINA     NULL                      HERE FOR CHAIND OPERATIONS
002661  000002 2210 13 ..     2394              LDX     X,T$IOPSS,Z       POINT TO PRE-SIEZE SUBROUTINE
002662  000000 7000 11 ..     2395              TSX0    0,X               CALL SUBROUTINE BEFORE SIEZING PUB
                     002663     2396    MPSSR     NULL                      RETURN POINT FOR SUCH SUBROUTINES
                     002663     2397              SIEZE   PUB               GET A CHANNEL FOR THE OPERATION
002663  000002 6230 00 ..              EAX     Z,2               ASSUME DEFAULT PRIORITY
002664  001561 7000 00 R.              TSX0    SIEZE             CALL SUBROUTINE TO QUEUE
                     002665     2398    DPS1R     NULL                      RETURN HERE FROM HIGH-PRIORITY SIEZE
002665  000003 2210 13 ..     2399              LDX     X,T$IOPCS,Z       ADDRESS OF PRE-CONNECT SUBROUTINE
002666  000000 7000 11 ..     2400              TSX0    0,X               CALL SUBROUTINE BEFORE ISSUING CONNECT
                     002667     2401    MPCSR     NULL                      RETURN POINT FOR SUCH SUBROUTINES
                                2402    *
                                2403    *         ISSUE CONNECT SEQUENCE
                                2404    *
                     002667     2405    RISUE     NULL                      JOIN HERE TO RETRY AN OPERATION
002667  000002 7210 13 ..     2406              LXL     X,T$IOCIO,Z       SEE IF NON-STANDARD CONNECT ROUTINE EXIST
002670  000000 6010 11 ..     2407              TNZ     0,X               YES - GO TO IT
                                2408    *
                                2409    *         NORMAL CONNECT SEQUENCE
                                2410    *
                                2411    *
                     002671     2412              IFIOM                                                 [09DEC79]
                                2413    *
                     002671     2414    CIOC      NULL
                               -+2415    *          SET UP MAILBOX BASE*OTIS                           [01DEC80]
002671  001546 7000 00 R.      +2416              TSX0    IOMS              GETS IOM# IN AL;4*CH IN YR *OTIS [01DEC80]
002672  000002 1150 07 ..      +2417              CMPA    $NIOMS,DL         CHECK IT *OTIS                   [01DEC80]
002673  000000 6030 20 X.      +2418              TRC     $ZOPF,*           SHOULD NEVER HAPPEN *OTIS        [01DEC80]
002674  003245 7550 00 R.      +2419              STA     X$CRIOM           SAVE FOR CONNECT *OTIS           [01DEC80]
002675  000000 2360 05 X.      +2420              LDQ     X$MBXP,AL         MBX BASE TO QU;SW BASE TO QL *OTIS [01DEC80]
002676  003244 7560 00 R.      +2421              STQ     X$CRBAS           SAVE FOR LATER*OTIS              [01DEC80]
002677  000000 6200 12 ..      +2422              EAX0    0,Y               4*CH TO X0 *OTIS                 [01DEC80]
002700  003244 0600 00 R.      +2423              ADX0    X$CRBAS           PAYLOAD CHANNEL MBX ADDRESS TO X0*OTIS [01DEC80]
                               +2424    *                                                                [01DEC80]
002701  000000 6350 02 ..      +2425              EAA     0,QU              MBX BASE TO AU *OTIS             [01DEC80]
002702  003240 0750 00 R.      +2426              ADA     X$LPPCW           ADD IN STANDARD LPW WORD*OTIS    [01DEC80]
002703  000010 7550 02 ..      +2427              STA     X$CONCH,QU        SAVE IN CONNECT CHANNEL MBX*OTIS [01DEC80]
002704  003241 2350 00 R.      +2428              LDA     X$LPPCW+1         STANDARD PCWA*OTIS               [01DEC80]
002705  000012 7550 02 ..      +2429              STA     X$CONCH+2,QU      SAVE IN PROPER MBX*OTIS          [01DEC80]
002706  000000 6350 12 ..      +2430              EAA     0,Y               FORM PCWB *OTIS                  [01DEC80]
002707  000007 7350 00 ..      +2431              ALS     9-2               BY PUTTING PUB IN CORRECT FIELD *OTIS [01DEC80]
002710  000013 7550 02 ..      +2432              STA     X$CONCH+3,QU      SAVE IN PROPER MBX*OTIS          [01DEC80]
```

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```
002711  000010 7710 00 ..   +2433          ARL     9-1             FORM RELATIVE SCW *OTIS                                  [01DEC80]
002712  000000 6210 06 ..   +2434          EAX     X,0,QL          PUT SW BASE IN X*OTIS                                    [01DEC80]
002713  000002 7550 10 ..   +2435          STA     X$SCW,0         SAVE SCW WORD IN CHANNEL MBX*OTIS                        [01DEC80]
002714  000002 0410 10 ..   +2436          ASX     X,X$SCW,0       MAKE SCW ADDRESS ABSOLUTE*OTIS                           [01DEC80]
002715  000001 4500 10 ..   +2437          STZ     X$LPWX,0        ZERO LPW EXTENSION WORD*OTIS                             [01DEC80]
                            2438    *
                            2439    *       FORM IDCW, SET FLAGS AND THINGS
                            2440    *
002716  000000 7210 16 X.    2441          LXL     X,P$STAT,P      GET CHANNEL FLAG BITS
002717  400000 3010 03 ..    2442          CANX    X,B$IOBSY,DU    IS IT IN USE?
002720  000000 6010 20 X.    2443          TNZ     $ZOPF,*         PUB QUEUEING FAILURE                     16AUG74
002721  400000 2610 03 ..    2444          ORX     X,B$IOBSY,DU    SHOW WE EXPECT AN INTERRUPT
002722  000000 2350 17 X.    2445          LDA     U$PDA,S         GET DEVICE ADDRESS                                       [05NOV77]
002723  007700 3750 03 ..    2446          ANA     =07700,DU       MASK TO DEVICE NUMBER                                    [21APR77]
002724  000012 2550 02 .. -+2447          ORSA    X$CONCH+2,QU    PUT DEVICE # IN PCWA*OTIS                                [01DEC80]
002725  000001 2750 13 ..    2448          ORA     T$IOCPC,Z       OR IN REST OF COMMAND
                            2449    *                                                                                        [05NOV77]
                            2450    *       SET UP ADDRESS EXTENSION FOR EXTENDED MEMORY                                     [05NOV77]
                            2451    *                                                                                        [05NOV77]
002726  000006 2360 14 ..    2452          LDQ     ADEXT,T         LOAD SPECIFIED ADDRESS EXTENSION IN QL                   [05NOV77]
002727  000022 7360 00 ..    2453          QLS     18              MOVE TO BITS 12-17                                       [05NOV77]
002730  000000 1160 00 X.    2454          CMPQ    $MSIZE          DO WE HAVE THIS MUCH MEMORY?                             [05NOV77]
002731  000000 6030 20 X.    2455          TRC     $ZOPF,*         NO, DIE NOW                                              [05NOV77]
002732  003233 7560 00 R.    2456          STQ     CTEMP           SAVE CORRECTLY POSITIONED ADDRESS EXTENSION              [05NOV77]
002733  003233 2750 00 R.    2457          ORA     CTEMP           ADD TO COMMAND                                           [05NOV77]
002734  700000 2750 07 ..    2458          ORA     M$IDCW,DL       MAKE INTO AN IDCW                                        [05NOV77]
                            2459    *                                                                                        [05NOV77]
                            2460    *       NOW FIGURE OUT WHERE TO PUT COMMAND                                              [05NOV77]
                            2461    *                                                                                        [05NOV77]
002735  000015 6360 14 ..    2462          EAQ     IDCW,T          SET UP THE DEFAULT LPW                                   [05NOV77]
002736  000015 6220 14 ..    2463          EAX     Y,IDCW,T        AND DEFAULT PLACE TO PUT COMMAND                         [05NOV77]
                            2464                                                                                             [05NOV77]
002737  100000 3010 03 ..    2465          CANX    X,B$IOCDM,DU    IS THIS A SEEK/READ OR SEEK/WRITE?                       [05NOV77]
002740  002743 6000 00 R.    2466          TZE     *+3             NO, SKIP                                                 [05NOV77]
002741  100000 6610 03 ..    2467          ERX     X,B$IOCDM,DU    TURN OFF BIT                                             [05NOV77]
002742  000013 6360 14 ..    2468          EAQ     SIDCW,T         LPW POINTS TO SEEK IDCW FOR SEEK/READ OR SEEK/WRITE      [05NOV77]
                            2469                                                                                             [05NOV77]
002743  220000 3010 03 ..    2470          CANX    X,B$IOCPM+B$IOCDN,DU  COMMON PERIPH. OR DN30/MPC RESET?                  [05NOV77]
002744  003020 6010 00 R. -+2471          TNZ     CIOCE           YES,SKIP                                                 [01DEC80]
002745  000077 3150 03 ..   +2472          CANA    =077,DU         IN FIRST 256K                                            [01DEC80]
002746  002750 6000 00 R.   +2473          TZE     *+2             YES                                                      [01DEC80]
002747  040000 2750 07 ..   +2474          ORA     M$EC,DL         NO ADD CHANGE-ADDRESS-EXTENSION BIT TO IDCW              [01DEC80]
002750  040000 3010 03 ..   +2475          CANX    X,B$IOLV6,DU    IS THIS LEVEL6 DIA                                       [01DEC80]
002751  003030 6000 00 R.   +2476          TZE     CIOC7           NO -- WERE DONE                                          [01DEC80]
                 002752     +2477                                                                                           [01DEC80]
002752  000001 7550 10 ..   +2478          STA     X$LPWX,0        SAVE IDCW ASIDE*OTIS                                     [01DEC80]
002753  000016 2360 14 ..   +2479          LDQ     DCW,T           GET ACTUAL DCW                                           [01DEC80]
002754  000003 7560 10 ..   +2480          STQ     X$DCW,0         SAVE ACTUAL DCW*OTIS                                     [01DEC80]
002755  000006 7750 00 ..   +2481          ALR     6               ISOLATE AND POSITION COMMAND                             [01DEC80]
002756  000077 3750 07 ..   +2482          ANA     =077,DL                                                                  [01DEC80]
002757  003233 7550 00 R.   +2483          STA     CTEMP           START BUILDING PCW FOR L6                                [01DEC80]
                 002760     +2484                                                                                           [01DEC80]
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002760  001365 1030 03 R.  +2485          CMPX    Z,T$L6RD,DU     READS AND WRITES ARE SPECIAL                [01DEC80]
002761  002764 6000 00 R.  +2486          TZE     CIOCA                                                       [01DEC80]
002762  001403 1030 03 R.  +2487          CMPX    Z,T$L6WT,DU                                                 [01DEC80]
002763  002774 6010 00 R.  +2488          TNZ     CIOCB                                                       [01DEC80]
                 002764    +2489                                                                            [01DEC80]
002764  000001 2350 10 ..  +2490  CIOCA   LDA     X$LPWX,0        PUT BITS 12-29 OF IDCW*OTIS                 [01DEC80]
002765  000006 7710 00 ..  +2491          ARL     6               INTO BITS 18-35 OF SCW                      [01DEC80]
002766  777777 3750 07 ..  +2492          ANA     -1,DL           SO LEVEL6 CAN FIGURE OUT WHAT TO DO         [01DEC80]
002767  000002 2550 10 ..  +2493          ORSA    X$SCW,0         SAVE IN CHANNEL MBX*OTIS                    [01DEC80]
002770  000000 2350 13 ..  +2494          LDA     0,Z             GET COMMAND PROMPT                          [01DEC80]
002771  000006 7710 00 ..  +2495          ARL     6               TURN IT INTO INTERRUPT PARAMETER            [01DEC80]
002772  007700 3750 07 ..  +2496          ANA     =07700,DL                                                   [01DEC80]
002773  003010 7100 00 R.  +2497          TRA     CIOCD           FINISH BUILDING                             [01DEC80]
                 002774    +2498                                                                            [01DEC80]
002774  400000 2350 03 ..  +2499  CIOCB   LDA     B$SIGN,DU       FAKE STATUS SINCE L6 WONT SUPPLY ONE        [01DEC80]
002775  000002 7570 30 ..  +2500          STAQ    X$SCW,0*        SAVE STATUS PAIR                            [01DEC80]
002776  001430 1030 03 R.  +2501          CMPX    Z,T$L6AR,DU     HANDLE AWAIT READY COMPLETELY DIFFERENT     [01DEC80]
002777  003007 6000 00 R.  +2502          TZE     CIOCC                                                       [01DEC80]
                 003000    +2503                                                                            [01DEC80]
003000  000006 2350 14 ..  +2504          LDA     ADEXT,T         PASS ADDRESS EXTENSION ALONG                [01DEC80]
003001  000077 3750 07 ..  +2505          ANA     =077,DL         ISOLATE                                     [01DEC80]
003002  000006 7350 00 ..  +2506          ALS     6                                                           [01DEC80]
003003  003233 2550 00 R.  +2507          ORSA    CTEMP           KEEP BUILDING                               [01DEC80]
003004  000016 2350 14 ..  +2508          LDA     DCW,T           AND ACTUAL ADDRESS                          [01DEC80]
003005  777777 3750 03 ..  +2509          ANA     -1,DU           ISOLATE                                     [01DEC80]
003006  003010 7100 00 R.  +2510          TRA     CIOCD                                                       [01DEC80]
                 003007    +2511                                                                            [01DEC80]
003007  000300 2350 07 ..  +2512  CIOCC   LDA     =0300,DL        GIVE OURSELVES A TERMINATE INTERRUPT        [01DEC80]
                 003010    +2513                                                                            [01DEC80]
003010  003233 2550 00 R.  +2514  CIOCD   ORSA    CTEMP           PCW FOR L6 NOW COMPLETE                     [01DEC80]
003011  700000 2350 07 ..  +2515          LDA     M$IDCW,DL       GET PCWA MARKER                             [01DEC80]
003012  003233 2360 00 R.  +2516          LDQ     CTEMP           PUT PCW IN CHANNEL LPW                      [01DEC80]
003013  000012 6220 00 ..  +2517          EAX     Y,X$CONCH+2     PUT IOM COMMAND IN PCWA LOCATION*OTIS       [01DEC80]
003014  003244 0620 00 R.  +2518          ADX     Y,X$CRBAS       ADD IN MBX BASE*OTIS                        [01DEC80]
003015  000001 4500 10 ..  +2519          STZ     X$LPWX,0        RESET LPWX SINCE ERR-RECOVERY CARES*OTIS    [01DEC80]
003016  737777 3610 03 ..  +2520          ANX     X,-1-B$IOLV6,DU  CLEAN UP                                   [01DEC80]
003017  003030 7100 00 R.  +2521          TRA     CIOC7                                                       [01DEC80]
                 003020    +2522                                                                            [01DEC80]
                 003020    +2523  CIOCE   NULL                                                             [01DEC80]
003020  000012 6220 00 ..  +2524          EAX     Y,X$CONCH+2     FOR BOTH CP AND DN,COMMAND GOES IN PCWA*OTIS [01DEC80]
003021  003244 0620 00 R.  +2525          ADX     Y,X$CRBAS       ADD IN BASE*OTIS                            [01DEC80]
003022  200000 3010 03 ..    2526          CANX    X,B$IOCPM,DU    CP CHANNEL?                                 [05NOV77]
003023  003026 6000 00 R.    2527          TZE     *+3             NO, SKIP                                    [05NOV77]
003024  000016 6360 14 ..    2528          EAQ     DCW,T           FOR CP CHANNEL, LPW POINTS TO DATA DCW      [05NOV77]
003025  003027 7100 00 R.    2529          TRA     *+2             SKIP MASK TO DN30, CONSOLE, MPC RESET       [05NOV77]
003026  005337 3750 00 R.    2530          ANA     =0777700777777  MASK OUT ADDRESS EXTENSION FOR DN30, CONSOLE [05NOV77]
                             2531                                                                            [05NOV77]
003027  557777 3610 03 ..    2532          ANX     X,-1-B$IOCPM-B$IOCDN,DU  TURN OFF BITS                      [05NOV77]
                             2533                                                                            [05NOV77]
                 003030      2534  CIOC7   NULL                                                             [05NOV77]
003030  000000 7550 12 ..    2535          STA     0,Y             STORE COMMAND                               [05NOV77]
003031  000000 7560 10 .. -+2536          STQ     X$LPW,0         STORE LPW*OTIS                              [01DEC80]
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003032  000000 4410 16 X.   2537            SXL     X,P$STAT,P      RESTORE CHANNEL STATUS BITS          [05NOV77]
                            2538    *
                            2539    ENDIOM  MARK                                                         [09DEC79]
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```
                    2540            EJECT                                                                   [09DEC79]
          003033    2541            IFIOC                                                                   [09DEC79]
                    2542    *
                    2543    CIOC    NULL
                    2544            EAQ     DCW+1,T         POINT TO SECOND DCW
                    2545            LDA     -1,QU           GET FIRST DCW
                    2546    CIO1    NULL                    SMBX1 IN A, SMBX2 IN Q
                    2547            STZ     P$SMBX3,P       CLEAR OUT CARD PUNCH MODE, ETC.
                    2548            STZ     P$SMBX4,P
                    2549    CIO2    NULL                    SMBX3 AND SMBX4 SET UP
                    2550            ORQ     =0776,DL        FORM BAR FOR IOC                                [21APR77]
                    2551            STAQ    P$SMBX1,P       SAVE FIRST AND SECOND MAILBOXES                 [21APR77]
                    2552    *                                                                               [21APR77]
                    2553    *       CALCULATE PMBX                                                          [21APR77]
                    2554    *                                                                               [21APR77]
                    2555            STZ     PMBXI,T         CLEAR OUT WORD TO START                         [21APR77]
                    2556            STX     P,PMBXI,T       SAVE PUB ADDRESS                                [21APR77]
                    2557            LDA     U$PDA,S         GET PHYSICAL DEVICE ADDRESS                     [21APR77]
                    2558            ANA     =0007700,DU     ISOLATE DEVICE CODE                             [21APR77]
                    2559            ORA     T$IOCPC,Z       OR IN DEVICE COMMAND
                    2560            ORA     PMBXI,T         PUT IN PUB NUMBER
                    2561    *
                    2562    *       SET FLAGS AND THINGS
                    2563    *
                    2564            LXL     X,P$STAT,P      GET CHANNEL STATUS
                    2565            IFG     $DEBUG,0,2      IF WE ARE DEBUGGING
                    2566            CANX    X,B$IOBSY,DU    SEE IF OPERATION IS OUT ON THIS PUB
                    2567            TNZ     $ZOPF,*         PUB QUEUEING FAILURE
                    2568            ORX     X,B$IOBSY,DU    SHOW WE EXPECT AN INTERRUPT ON THIS CHANN
                    2569            CANX    X,B$CIORR,DU    SEE IF READ-REGISTER COMMAND
                    2570            TZE     *+3             SKIP IF NOT
                    2571            ERX     X,B$CIORR,DU    TURN OFF BIT
                    2572            ANA     NDMSK           AND REMOVE DEVICE CODE FROM PMBXI
                    2573            CANX    X,B$IOCPM,DU    IS THIS CARD PUNCH MODE?
                    2574            TZE     *+3             NO, SO SKIP
                    2575            ERX     X,B$IOCPM,DU    TURN OFF BIT
                    2576            STA     P$SMBX3,P       SAVE PMBX IN SMBX3
                    2577            CANX    X,B$IOCDM,DU    SEE IF DRUM OPERATION
                    2578            TZE     *+4             SKIP IF NOT
                    2579            ERX     X,B$IOCDM,DU    TURN OFF BIT FOR NEXT TIME
                    2580            ANA     =0007777,DU     ISOLATE DEVICE ADDRESS                          [21APR77]
                    2581            ORA     DRSK            CREATE SEEK COMMAND
                    2582            STA     PMBXI,T         SAVE IN LIST ELEMENT
                    2583            SXL     X,P$STAT,P      RESTORE STATUS BITS
                    2584    *
                    2585    ENDIOC  MARK                                                                    [09DEC79]
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                                2586            EJECT                                                                   [09DEC79]
                                2587    *
003033  170077 2210 03 ..       2588            LDX     X,-1-B$IOSPC-B$IOSKC-B$BUTON,DU MASK FOR INTERRUPT BITS
003034  000000 3410 17 X.       2589            ANSX    X,U$STAT,S      FORGET ABOUT SPECIALS FOR THIS DEVICE
                                2590    *
                                2591    *       SET TICK-TOCK GOING
                                2592    *
003035  000004 3360 13 ..       2593            LCQ     T$IOTMO,Z       GET TIMEOUT QUANTITY FOR THIS OPERATION
003036  777777 2760 03 ..       2594            ORQ     -1,DU           MASK OFF UPPER HALF
003037  000000 7560 16 X.       2595            STQ     P$TICK,P        SAVE IN TICKER
                                2596    *
                                2597    *       ISSUE CONNECT
                                2598    *
                                2599    *
003040  003245 7200 00 R. -+2600                LXL0    X$CRIOM         GET IOM# BACK TO X0*OTIS                        [01DEC80]
003041  000000 0150 10 X.  +2601                CIOC    X$IOM,0         ISSUE CONNECT ON SELECTED IOM*OTIS              [01DEC80]
                                2602    *                                                                               [22SEP78]
                                2603    *       SET CHANNEL BUSY STATISTICS TIMER                                       [22SEP78]
                                2604    *                                                                               [22SEP78]
                        003042  2605            GTIM                    GET TIME SINCE BOOTLOAD                         [22SEP78]
003042  000000 7000 00 X.               TSX0    X$GTIM          RETURN TIMER UNITS IN A
003043  000000 7550 16 X.       2606            STA     X$IOSTB,P       SAVE TIMER IN IO START TIME TABLE        16AUG74 [22SEP78]
003044  000000 7100 00 X.       2607            TRA     $EXIT           AND MOVE ON...                           16AUG74 [22SEP78]
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                                2608            EJECT                                                                   [22SEP78]
                                2609    *                                                                               [22SEP78]
                                2610    *                                                                               [22SEP78]
                                2611    *       ALTERNATE CONNECT ROUTINES                                              [22SEP78]
                                2612    *                                                                               [22SEP78]
                                2613    *                                                                               [22SEP78]
                      003045    2614            IFIOM                                                                   [09DEC79]
                                2615    *
                                2616    *
                                2617    *       DISK SEEK
                                2618    *
                      003045    2619    CIOCS   NULL
003045  000004 6350 14 ..       2620            EAA     SEKAD,T         POINT TO SEEK ADDRESS
003046  000001 2750 07 ..       2621            ORA     1,DL            MAKE IOTD FOR 1 WORD
003047  000016 7550 14 ..       2622            STA     DCW,T           SAVE IN LIST
003050  002671 7100 00 R.       2623            TRA     CIOC            JOIN NORMAL ROUTINE
                                2624    *
                                2625    *       DN30 FUNCTIONAL HEADER READ AND WRITE                                   [05NOV77]
                                2626    *                                                                               [05NOV77]
                      003051    2627    CIODN   NULL                                                                    [05NOV77]
003051  000002 4430 14 ..       2628            SXL     Z,CMD,T         SAVE CURRENT COMMAND IN CASE OF RETRY           [05NOV77]
003052  000000 6350 16 X.       2629            EAA     P$TEMP,P        POINT TO UNUSED PLACE                           [05NOV77]
003053  000002 2750 07 ..       2630            ORA     2,DL            MAKE A 2 WORD IOTD                              [05NOV77]
003054  000015 7550 14 ..       2631            STA     IDCW,T          SAVE IN SPECIAL KLUDGE PLACE                    [05NOV77]
003055  020000 2350 07 ..       2632            LDA     B$IOCDN,DL      TELL CONNECT ROUTINE
003056  000000 2550 16 X.       2633            ORSA    P$STAT,P
003057  002671 7100 00 R.       2634            TRA     CIOC            JOIN NORMAL ROUTINE
                               +2635    *                                                                               [01DEC80]
                               +2636    *       LEVEL 6 CONNECT SETUP                                                   [01DEC80]
                               +2637    *                                                                               [01DEC80]
                      003060   +2638    L6CIO   NULL                                                                    [01DEC80]
003060  040000 2350 07 ..      +2639            LDA     B$IOLV6,DL      NOTIFY ALL THAT WE ARE SPECIAL                  [01DEC80]
003061  000000 2550 16 X.      +2640            ORSA    P$STAT,P                                                        [01DEC80]
003062  002671 7100 00 R.      +2641            TRA     CIOC            CONTINUE NORMALLY                               [01DEC80]
                                2642    *
                                2643    *       CARD PUNCH MODE
                                2644    *
                      003063    2645    CIOCP   NULL
003063  200000 2350 07 ..       2646            LDA     B$IOCPM,DL      TELL CONNECT ROUTINE
003064  000000 2550 16 X.       2647            ORSA    P$STAT,P        TO FUDGE IT
003065  002671 7100 00 R.       2648            TRA     CIOC            CONTINUE NORMALLY
                                2649    *
                                2650    *       MULTI-RECORD SET UP
                                2651    *
                      003066    2652    CIOMR   NULL
003066  000007 2350 14 ..       2653            LDA     MODE,T          GET RECORD COUNT
003067  000022 7710 00 ..       2654            ARL     18              SHIFT TO CORRECT FIELD
003070  000001 6210 13 ..       2655            EAX     X,T$IOCPC,Z     POINT TO IDCW IMAGE
003071  003072 7410 00 R.       2656            STX     X,*+1
003072  000000 7510 01 ..       2657            STCA    ...,01          PUT RECORD COUNT INTO IDCW
003073  002671 7100 00 R.       2658            TRA     CIOC            AND CONTINUE NORMALLY
                                2659    *
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                                    2660     *       POST-READ WRITE ON CONSOLE                                                  [05NOV77]
                                    2661     *                                                                                   [05NOV77]
                          003074    2662     CIOTY   NULL                                                                        [05NOV77]
003074  020000 2350 07 ..  2663             LDA     B$IOCDN,DL      SET DN30 MODE BECAUSE THE DCW                               [05NOV77]
003075  000000 2550 16 X.  2664             ORSA    P$STAT,P        FOR THE WRITE IS IN IDCW,T                                  [05NOV77]
003076  002671 7100 00 R.  2665             TRA     CIOC            CONTINUE                                                    [05NOV77]
                                    2666     *
                                    2667     *       DRUM SEEK-READ OR SEEK-WRITE
                                    2668     *
                          003077    2669     CIODM   NULL
003077  100000 2350 07 ..  2670             LDA     B$IOCDM,DL      SET SETUP BITS
003100  000000 2550 16 X.  2671             ORSA    P$STAT,P        FOR CHANNEL
003101  000004 6350 14 ..  2672             EAA     SEKAD,T         GENERATE SEEK DCW
003102  000001 2750 07 ..  2673             ORA     1,DL
003103  000014 7550 14 ..  2674             STA     SKDCW,T         PUT INTO LIST
003104  000000 2350 17 X.  2675             LDA     U$PDA,S         GET DEVICE ADDRESS
003105  007700 3750 03 ..  2676             ANA     =07700,DU       ONLY                                                        [21APR77]
003106  003234 2750 00 R.  2677             ORA     DRSK            OR IN SEEK COMMAND
003107  000013 7550 14 ..  2678             STA     SIDCW,T         SAVE IN LIST
003110  002671 7100 00 R.  2679             TRA     CIOC            CONTINUE NORMALLY
                                    2680     *                                                                                   [17OCT76]
                                    2681     *       SET UP FOR MPC RETRY ON TAPE                                                [17OCT76]
                                    2682     *                                                                                   [17OCT76]
                          003111    2683     MTCIO   NULL                                                                        [17OCT76]
003111  000000 2350 17 X.  2684             LDA     U$RETRY,S       GET THE NUMBER OF THIS RETRY                                [17OCT76]
003112  000007 3750 07 ..  2685             ANA     7,DL            MASK DOWN                                                   [17OCT76]
003113  003116 6000 00 R.  2686             TZE     *+3             SKIP AUTO RETRY ON FIRST PASS                               [17OCT76]
003114  000030 2750 07 ..  2687             ORA     =030,DL         FORM MPC COMMAND                                            [17OCT76]
003115  000006 7350 00 ..  2688             ALS     6                                                                           [17OCT76]
003116  000001 6210 13 ..  2689             EAX     X,T$IOCPC,Z     POINT TO THE COMMAND                                        [17OCT76]
003117  003120 7410 00 R.  2690             STX     X,*+1           MODIFY INSTRUCTION                                          [17OCT76]
003120  000000 7510 02 ..  2691             STCA    ...,02          TO MODIFY COMMAND                                           [17OCT76]
003121  002671 7100 00 R.  2692             TRA     CIOC                                                                        [17OCT76]
                                    2693     *                                                                                   [17OCT76]
                                    2694     *       READ DETAIL STATS                                                           [17OCT76]
                                    2695     *                                                                                   [17OCT76]
                          003122    2696     DSPS1   NULL                                                                        [17OCT76]
003122  000000 2210 17 X.  2697             LDX     X,U$PTYPE,S     GET PHYSICAL TYPE                                           [17OCT76]
003123  000151 2340 11 R.  2698             SZN     T$DVSTB,X       CHECK TABLE ENTRY                                           [17OCT76]
003124  004325 6000 00 R.  2699             TZE     RJCT                                                                        [17OCT76]
003125  000000 7100 10 ..  2700             TRA     0,0             RETURN IF ONE EXISTS                                        [17OCT76]
                                    2701     *                                                                                   [17OCT76]
                          003126    2702     DSAC1   NULL                                                                        [17OCT76]
003126  000000 2210 17 X.  2703             LDX     X,U$PTYPE,S     GET PHYSICAL TYPE                                           [17OCT76]
003127  000151 2350 11 R.  2704             LDA     T$DVSTB,X       GET PHYSICAL COMMAND                                        [17OCT76]
003130  000000 6000 20 X.  2705             TZE     $ZOPF,*         CHECK OUT *-4                                               [17OCT76]
003131  000001 7550 13 ..  2706             STA     T$IOCPC,Z                                                                   [17OCT76]
003132  002671 7100 00 R.  2707             TRA     CIOC            CONTINUE NORMALLY                                           [17OCT76]
                           -2708     *                                                                                           [09DEC79]
                            2709     ENDIOM  MARK                                                                                [09DEC79]
```

I PHYSICAL I/O -- MAIN OPERATION DRIVER RELEASED 01DEC80

```
                    2710            EJECT                                                   [09DEC79]
                    2711    *                                                               [09DEC79]
          003133    2712            IFIOC                                                   [09DEC79]
                    2713    *
                    2714    *       DISC SEEK
                    2715    *
                    2716    CIOCS   NULL                        DATA FROM SEKAD,T (ONE WORD)
                    2717            EAA       SEKAD,T           POINT TO SEEK ADDRESS
                    2718            ORA       1,DL              ONE WORD, IOTD
                    2719    CIO3    NULL
                    2720            LDQ       0,DL              NO NEXT DCW
                    2721            TRA       CIO1              REJOIN NORMAL CONNECT SEQUENCE
                    2722    *
                    2723    *
                    2724    *       DATANET-30 WRITE
                    2725    *
                    2726    CIODW   NULL                        PREFIX FUNCTIONAL HEADER
                    2727            EAA       P$TEMP,P          POINT TO TWO WORD TEMP
                    2728            ORA       2+M$IOTP,DL       2 WORDS, IOTP
                    2729            EAQ       DCW,T             POINT TO USER'S DCW LIST
                    2730            TRA       CIO1              REJOIN NORMAL ROUTINE
                    2731    *
                    2732    *
                    2733    *       DATANET-30 READ
                    2734    *
                    2735    CIODR   NULL                        DUAL COMMAND MODE TO READ FUNCTIONAL HEAD
                    2736            EAA       P$TEMP,P          POINT TO 2 WORD TEMP
                    2737            ORA       2,DL              TWO WORDS, IOTD
                    2738            EAQ       DCW,T             POINT TO USER DCW LIST
                    2739            STQ       P$SMBX4,P         SAVE FOR DUAL COMMAND MODE
                    2740            LDQ       B$IOCPM,DL        BIT TO SAY
                    2741            ORSQ      P$STAT,P          PUT PMBX IN SMBX3
                    2742            LDQ       0,DL              NO NEXT DCW FOR FIRST COMMAND
                    2743            TRA       CIO2              REJOIN NORMAL ROUTINE
                    2744    *
                    2745    *
                    2746    *       CARD PUNCH MODE
                    2747    *
                    2748    CIOCP   NULL                        PUNCH A CARD
                    2749            EAQ       DCW,T             POINT TO USER DCW LIST
                    2750            STQ       P$SMBX4,P         SAVE FOR REUSE IN CARD PUNCH MODE
                    2751            EAQ       1,QU              GENERATE A NEXT-DCW POINTER
                    2752            LDA       B$IOCPM,DL        GET A BIT FOR SMBX3
                    2753            ORSA      P$STAT,P          TURN IT ON SO WE DO SETUP LATER
                    2754            LDA       -1,QU             GET FIRST DCW
                    2755            TRA       CIO2              REENTER NORMAL ROUTINE
                    2756    *
                    2757    *       MULTI RECORD SET-UP
                    2758    *
                    2759    CIOMR   LDA      MODE,T             GET RECORD COUNT
                    2760            ARL       18                SHIFT TO CORRECT FIELD
                    2761            EAX       X,T$IOCPC,Z       POINT TO PMBX IMAGE
```

```
                    2762            STX     X,*+1
                    2763            STCA    ...,01          PUT RECORD COUNT IN PMBX IMAGE
                    2764            LDA     B$IOCPM,DL      GET BIT TO COPY PMBX TO SMBX3
                    2765            ORSA    P$STAT,P        AND PUT IT IN CHANNEL STATUS
                    2766            TRA     CIOC            CONTINUE NORMALLY
                    2767    *
                    2768    *
                    2769    *       POST-READ WRITE ON CN, SINGLE CHARACTER ON TAPE
                    2770    *
                    2771    CIOTY   NULL
                    2772            LDA     SEKAD,T         GET DCW FOR WRITE
                    2773            LDQ     0,DU            NO NEXT DCW
                    2774            TRA     CIO1            TAKE NORMAL ROUTE FROM HERE
                    2775    *
                    2776    *       DRUM SEEK-READ OR SEEK-WRITE
                    2777    *
                    2778    CIODM   NULL
                    2779            LDA     B$IOCDM+B$IOCPM,DL SET BITS FOR SETUP
                    2780            ORSA    P$STAT,P        IN CHANNEL STATUS
                    2781            EAQ     DCW,T           POINT TO USER DCW LIST
                    2782            STQ     P$SMBX4,P       SAVE IN FIRST DCW POINTER
                    2783            EAQ     1,QU            POINT TO NEXT DCW
                    2784            EAA     SEKAD,T         GENERATE SEEK DCW
                    2785            ORA     1,DL            IOTD, 1 WORD
                    2786            TRA     CIO2            CONTINUE NORMALLY
                    2787    *
                    2788    *
                    2789    *       READ-REGISTER ON 2314 DISCS
                    2790    *
                    2791    CIORR   NULL
                    2792            LDA     B$CIORR,DL      GET BIT FOR PMBX FUDGE
                    2793            ORSA    P$STAT,P        SET IT IN PUB STATUS
                    2794    CIOR1   NULL                    HERE ON ERROR CHECK READ-REGISTER
                    2795            EAA     P$TEMP,P        POINT TO TEMP STORAGE
                    2796            ORA     2,DL            LENGTH OF TEMPORARY AREA
                    2797            TRA     CIO3            REJOIN NORMAL ROUTINES
                    2798    *
                    2799    *       READ BINARY OR BCD ON TAPE (CHECK GAIN INTENSITY)
                    2800    *
                    2801    MTCIO   NULL
                    2802            LDA     =0020000,DU     GET BIT TO FLIP COMMANDS                [21APR77]
                    2803            ERSA    T$IOCPC,Z       SWAP IN SAVED DEVICE COMMAND
                    2804            TRA     CIOC            AND RETURN TO CONNECT SEQUENCE
                    2805    *                                                                       [17OCT76]
                    2806    ENDIOC  MARK                                                            [09DEC79]
                    2807    *                                                                       [17OCT76]
                    2808    *
                    2809    *
                    2810    *       CONSTANTS AND STORAGE FOR CONNECT ROUTINES
                    2811    *
003133              2812    RSEEK   BSS     64              PHYSICAL SEEK ADDRESS FOR ERROR LOGGING [05NOV77]
                    2813                                                                            [05NOV77]
```

I PHYSICAL I/O -- MAIN OPERATION DRIVER RELEASED 01DEC80

```
                    003233      2814    CTEMP   BSS     1               TEMP FOR CONNECT ROUTINES                   [05NOV77]
                                2815    *
                    003234      2816            IFIOM                                                               [09DEC79]
                                2817    *                                                                           [09DEC79]
003234  340000720001    ..      2818    DRSK    OCT     340000720001    DRUM SEEK IDCW                              [09DEC79]
                                2819    *                                                                           [09DEC79]
                                2820    ENDIOM  MARK                                                                [09DEC79]
                    003235      2821            IFIOC                                                               [09DEC79]
                                2822    *
                                2823    CIOCT   OCT     0               LAST PMBX NOT PICKED UP BY IOC
                                2824    CIOCF   OCT     0               COUNT OF PMBX'S NOT PICKED UP
                                2825    DRSK    OCT     340000240002    DRUM SEEK COMMAND
                                2826    NDMSK   OCT     770077777777    MASK TO REMOVE DEVICE CODE
                                2827    *
                                2828    ENDIOC  MARK                                                                [09DEC79]
                                2829    *
```

I PHYSICAL I/O -- INITIALIZATION DATA FOR MAILBOXES RELEASED 01DEC80

```
                              2830              TTLS    PHYSICAL I/O -- INITIALIZATION DATA FOR MAILBOXES
                              2831    *
                              2832    *
                              2833    *
                    003235    2834              IFIOM                                                        [09DEC79]
                              2835    *
                              2836              HEAD    X
                              2837
 003235  000000011007
                    003236    2838              EVEN
 003236  000005 040000  ..  -+2839    LPDCW     ZERO    FAUCH+1,M$NCB   FAULT CHANNEL LPW PROTOTYPE*OTIS              [01DEC80]
 003237  000000000040  ..   +2840              IOTD    0,SISTKL        FAULT CHANNEL DCW PROTOTYPE*OTIS             [01DEC80]
 003240  000012 040000  ..   +2841    LPPCW     ZERO    CONCH+2,M$NCB   CONNECT CHANNEL LPW PROTOTYPE*OTIS          [01DEC80]
 003241  400000720201  ..    2842              OCT     400000720201    AND RESET STATUS PCWA
 003242  000031 040000  ..  -+2843    SPDCW     ZERO    SPECH+1,M$NCB   SPECIAL STATUS CHANNEL LPW PROTO.*OTIS     [01DEC80]
 003243  000000000020  ..   +2844              IOTD    0,SPSTKL        SPECIAL STATUS CHANNEL DCW PROTO.*OTIS       [01DEC80]
                             +2845    *                                                                          [01DEC80]
                    003244   +2846    CRBAS     BSS     1               COPY OF X$MBXP ENTRY FOR CURRENT IOM*OTIS    [01DEC80]
                    003245   +2847    CRIOM     BSS     1               IOM# FOR CURRENT CONNECT *OTIS               [01DEC80]
                              2848    *
                              2849    ENDIOM    MARK                                                         [09DEC79]
                              2850    *
```

```
                    2851            TTLS    CONTROL EXEC ENTRY -- INTERRUPT RECOGNITION
                    2852            HEAD    X
                    2853            INHIB   SAVE,ON
                    2854    *
                003246  2855            IFIOM                                                   [09DEC79]
                    2856    *
                    2857    *       INTERRUPTS ARE RECEIVED BY HAVING THE PROCESSOR EXECUTE A "WIRED IN"     [01SEP80]
                    2858    *       XED OF A PAIR OF INSTRUCTIONS IN THE "INTERRUPT VECTOR" IN WORDS        [01SEP80]
                    2859    *       0-77(8) OF MEMORY.  A SWITCH ON THE SCU CONTROLS WHICH PROCESSOR(S)     [01SEP80]
                    2860    *       MAY RECEIVE INTERRUPTS, AND ON DTSS ONLY THE CONTROL PROCESSOR MAY.     [01SEP80]
                    2861    *                                                                       [01SEP80]
                    2862    *       WHILE THE HARDWARE DEFINES 32 INTERRUPT TYPES, SOME SCUS SUPPORT ONLY   [01SEP80]
                    2863    *       FOUR.  DTSS USES ONLY THESE FOUR.                               [01SEP80]
                    2864    *                                                                       [01SEP80]
                    2865    *        **WARNING** SOME OLD DTSS DOCUMENTATION MAY STATE THAT DTSS USES       [01SEP80]
                    2866    *        TWO UNDEFINED INTERRUPT TYPES FOR "JOB" AND "CRASH" INTERRUPTS.  THIS IS [01SEP80]
                    2867    *        NO LONGER TRUE.                                                [01SEP80]
                    2868    *                                                                       [01SEP80]
                    2869    *       INTERRUPTS ARE INTENDED PRIMARILY FOR COMMUNICATION BETWEEN THE IOM(S)  [01SEP80]
                    2870    *       AND THE CONTROL PROCESSOR.  DTSS ALSO USES THEM FOR INTER-PROCESSOR     [01SEP80]
                    2871    *       COMMUNICATION.                                                  [01SEP80]
                    2872    *                                                                       [01SEP80]
                    2873    *       THE FOUR KINDS OF INTERRUPTS IMPLEMENTED ON ALL HARDWARE ARE:           [01SEP80]
                    2874    *                                                                       [01SEP80]
                    2875    *       1) SYSTEM INTERRUPTS -- IOM SIGNALLING SOME TERRIBLE ERROR              [01SEP80]
                    2876    *       2) INITIATE-TERMINATE INTERRUPTS -- IOM SIGNALLING COMPLETION OF I/O    [01SEP80]
                    2877    *       3) SPECIAL INTERRUPTS -- IOM SIGNALLING SOME CHANGE IN A DEVICE, SUCH   [01SEP80]
                    2878    *            AS A TAPE DRIVE BECOMMING READY.                           [01SEP80]
                    2879    *       4) MARKER INTERRUPTS -- IOM SIGNALLING PARTIAL COMPLETION OF I/O        [01SEP80]
                    2880    *                                                                       [01SEP80]
                    2881    *       ON SYSTEMS WITH MULTIPLE IOMS, THERE ARE SEPARATE INTERRUPT TYPES RESERVED [01SEP80]
                    2882    *       FOR EACH IOM.                                                   [01SEP80]
                    2883    *                                                                       [01SEP80]
                    2884    *       MARKER INTERRUPTS COME FROM THE IOM ONLY WHEN A REQUEST IS MADE BY THE  [01SEP80]
                    2885    *       OPERATING SYSTEM  FOR AN INTERRUPT AT SOME INTERMEDIATE POINT.  DTSS NEVER [01SEP80]
                    2886    *       MAKES SUCH REQUESTS AND THEREFORE NEVER EXPECTS MARKER INTERRUPTS FROM   [01SEP80]
                    2887    *       THE IOM.  THE MARKER INTERRUPT TYPE IS USED BY DTSS FOR NON-CONTROL     [01SEP80]
                    2888    *       PROCESSORS TO SIGNAL THE CONTROL PROCESSOR THAT A JOB HAS ISSUED A MME AND [01SEP80]
                    2889    *       THAT THE PROCESSING QUEUE SHOULD BE EXAMINED.  FOR GENERALITY, THIS MECHANISM
                    2890    *       IS ALSO USED FOR NCONTROL TO CALL THE MAIN EXEC EVEN ON SINGLE PROCESSOR [01SEP80]
                    2891    *       SYSTEMS.                                                        [01SEP80]
                    2892    *                                                                       [01SEP80]
                    2893    *       THERE ARE FOUR ROUTINES WHICH ARE CALLED AT INTERRUPT TIME WHEN INTERRUPTS [01SEP80]
                    2894    *       OCCUR.  THE DSTART ROUTINE INITIALIZES THE INTERRUPT VECTOR WITH THE    [01SEP80]
                    2895    *       APPROPRIATE STC1/TRA PAIRS WHICH IT PICKS UP AS SYINT-2, ETC.           [01SEP80]
                    2896    *                                                                       [01SEP80]
                    2897    *       THE ROUTINE WHICH PROCESSES MARKER INTERRUPTS IS CALLED JINT AND IS LOCATED [01SEP80]
                    2898    *       IN THE MMES SEGMENT INSTEAD OF HERE.                            [01SEP80]
                    2899    *                                                                       [01SEP80]
                    2900    *       NOTE: NO INTERRUPT ROUTINES SHOULD MODIFY THE MBA OR MBB UNLESS         [08AUG77]
                    2901    *       THEY RESTORE THEM BEFORE CALLING INTX.                          [08AUG77]
                    2902    *                                                                       [08AUG77]
```

```
                                2903     *
                                2904     *       SYSTEM INTERRUPTS
                                2905     *
                                2906     *       THIS ROUTINE IS ENTERED ON IOM SYSTEM INTERRUPTS
                                2907     *       BY A HARDWARE XED OF THE INTERRUPT CELL CONTAINING:
                                2908     *
                    003246      2909             EVEN
003246  000000 5542 55 X.       2910             STC1    N$ICO,DIC       SAVE THE INSTRUCTION COUNTER                    [01MAY79]
003247  003250 7102 00 R.       2911             TRA     SYINT           AND BREAK XED
                    003250      2912     SYINT   NULL                    SYSTEM INTERRUPT ENTRY POINT
003250  003254 7172 00 R.      +2913             XED     SYINT1          ENTRY FOR IOM#0*OTIS                            [01DEC80]
003251  003254 7172 00 R.      +2914             XED     SYINT1            IOM#1*OTIS                                    [01DEC80]
003252  003254 7172 00 R.      +2915             XED     SYINT1            IOM#2*OTIS                                    [01DEC80]
003253  003254 7172 00 R.      +2916             XED     SYINT1            IOM#3*OTIS                                    [01DEC80]
                    003254     +2917     SYINT1  NULL                                                                    [01DEC80]
003254  000000 7532 53 X.      +2918             SREG    IREGT,AD        SAVE REGISTERS*OTIS                             [01DEC80]
003255  003256 7002 00 R.      +2919             TSX0    *+1             BREAK XED*OTIS                                  [01DEC80]
003256  003251 1602 03 R.      +2920             SBX0    SYINT+1,DU      COMPUTE IOM# IN X0*OTIS                         [01DEC80]
003257  000000 0112 03 ..       2921     TSOP01  NOP     0,DU            SPACE FOR LCPR INST. ON 66/X7                   [30DEC76]
                    003260     -2922             DABL                      DISABLE THE INTERRUPTS
003260  000000 2332 00 X.              RMCM    X$MEM           READ MASK FROM MEMORY CONTROLLER
003261  000000 3772 00 X.              ANAQ    X$DABL          DISABLE SPEC-INIT-TERM-MARK
003262  000000 5532 00 X.              SMCM    X$MEM           SET NEW MASK
                                2923             INHIB   RESTORE
                    003263      2924             CKPT    11
003263  000000 7170 00 X.              XED     $CKPT
003264  004200 6340 07 ..       2925             LDI     M$OVMSK+M$MMODE,DL MASK OFF OVERFLOW FAULTS
003265  000000 2210 10 X.      +2926             LDX     X,X$SISTP,0     PUT THIS IOM'S SYSTEM FAULT BASE IN X*OTIS       [01DEC80]
003266  003355 4400 00 R.      +2927             SXL0    NIOS            SAVE THE IOM# TEMPORARILY *OTIS                 [01DEC80]
003267  100240 6200 00 ..       2928             EAX0    32*M$RTAL+M$CBIT+M$TNZ MAKE RPT LOOK AT SYSTEM FAULT AREA
003270  000000 5202 01 ..      -2929     SYRPT   RPTX    ,1              LOOK FOR ALL NON-ZERO ENTRIES
003271  000000 0340 11 ..       2930             LDAC    0,X             GET AN ENTRY
003272  000000 6000 00 X.       2931             TZE     INTX            ZERO MEANS NO MORE INTERRUPTS
003273  003722 7400 00 R.       2932             STX0    INTMP           SAVE RPTX UPPER
003274  003722 4410 00 R.       2933             SXL     X,INTMP         SAVE POINTER TO CURRENT ENTRY
003275  003723 7550 00 R.       2934             STA     INTMP+1         SAVE THE SYSTEM FAULT CODE
003276  000000 2240 03 ..       2935             LDX     T,0,DU          SPPML
                    003277      2936             MTASK   SYLOG,INTMP+1   CREATE A TASK TO LOG IT                         [17OCT76]
                    003277                      GETD    2,NBUG
003277  000002 2350 03 ..              LDA     2,DU
003300  000000 7000 00 X.              TSX0    A$GETNB         CALL TO ENTRY THAT WILL NOT BUG THE LIST ELEMENT
003301  003723 2350 00 R.              LDA     INTMP+1         PARAMETER IS INTMP+1
003302  000001 7550 14 ..              STA     1,T             SAVE IT
003303  003337 2350 07 R.              LDA     SYLOG,DL        RESTART ADDRESS
                    003304             MTQA                    QUEUE TASK TO START AT SYLOG
003304  000000 7000 00 X.              TSX0    Q$MTQA          CALL SUBROUTINE TO QUEUE TASK
003305  000000 2240 03 ..              LDX     T,0,DU          SPPML
003306  003724 2370 00 R.       2937             LDAQ    SYLIM           IS THIS A DATA CHANNEL?
003307  003723 1110 00 R.       2938             CWL     INTMP+1         COMPARE TO THE CHANNEL SPECIFIED
003310  003332 6010 00 R.       2939             TNZ     SYRET           NO-- KEEP LOOKING AT FAULTS
003311  003347 7000 00 R.      +2940             TSX0    NIO             GO SET CHANNEL BASE *OTIS                       [01DEC80]
003312  003723 2350 00 R.       2941             LDA     INTMP+1         ELSE GET THE FAULT WORD
```

X CONTROL EXEC ENTRY -- INTERRUPT RECOGNITION RELEASED 01DEC80

```
003313  000777 3750 03 ..   2942            ANA     =0777,DU          MASK TO CHANNEL NUMBER                          [21APR77]
003314  000002 7350 00 ..   2943            ALS     2                 SHIFT TO ALLOW INDEXING OF P$ TABLES
003315  003355 0750 00 R.  +2944            ADA     NIOS              ADD IN BASE *OTIS                               [01DEC80]
003316  400000 2360 07 ..   2945            LDQ     B$IOBSY,DL        WERE WE EXPECTING AN INTERRUPT?
003317  000000 3160 01 X.   2946            CANQ    P$STAT,AU         CHECK THE CHANNEL STATUS
003320  003332 6000 00 R.   2947            TZE     SYRET             NO-- SPURIOUS INFORMATION
003321  000000 6560 01 X.   2948            ERSQ    P$STAT,AU         YES-- TURN OFF THE BIT
003322  777777 7240 01 X.   2949            LXL     T,Q$BUSY+P$Q,AU   GET THE ASSOCIATED TASK
003323  000000 6000 20 X.   2950            TZE     $ZOPF,*           NO TASK???                          16AUG74
003324  003346 2360 00 R.   2951            LDQ     IOCQW             GIVE IOC TYPE RETURN                            [29JAN77]
003325  000005 7560 14 ..   2952            STQ     I$QWORD,T          .                                              [29JAN77]
003326  000016 2360 14 ..   2953            LDQ     I$DCW,T           AND AN UNTOUCHED DCW RESIDUE                    [29JAN77]
003327  000012 7560 14 ..   2954            STQ     I$DCWWD,T          .                                              [29JAN77]
003330  003726 2350 07 R.   2955            LDA     I$ITERM,DL        AND QUEUE UP A TASK
                  003331    2956            MTQA                      TO FINISH UP THE I/O
003331  000000 7000 00 X.                   TSX0    Q$MTQA            CALL SUBROUTINE TO QUEUE TASK
003332  003722 2200 00 R.   2957  SYRET    LDX0    INTMP             GET THE RPTX TALLY
003333  776000 3000 03 ..   2958            CANX0   =0776000,DU       ARE WE REALLY FINISHED?                         [21APR77]
003334  000000 6000 00 X.   2959            TZE     INTX              ZERO MEANS NO MORE INTERRUPTS
003335  003722 7210 00 R.   2960            LXL     X,INTMP           ELSE  RESTORE POINTER TO CURRENT ENTRY
003336  003270 7100 00 R.   2961            TRA     SYRPT             AND LOOK SOME MORE
                  003337    2962  SYLOG    NULL                      TASK TO LOG SYSTEM INTERRUPT
                  003337    2963            LOG     (IOM INTRPT),(IENT,T)  LOG IT
003337  000000 4500 00 X.                   STZ     I$FLOG            DON'T INHIBIT DEVICE OUTPUT
003340  000000 7000 00 X.                   TSX     0,I$LOG           CAN BE CALLED FROM THE OUTSIDE WORLD
003341  314644203145  ..                    BCI     2,IOM INTRPT        TEXT ARGUMENT
003342  635147632020
003343  000001 0000 14 ..                   ARG     IENT,T            YES, POINT TO IT
                  003344    2964  SYIN2    REL     RELEASE           THE LIST ELEMENT
003344  000000 7000 00 X.                   TSX0    A$REL
003345  000000 7100 00 X.   2965            TRA     $EXIT             AND GO AWAY
003346  020020770000  ..    2966  IOCQW    OCT     020020770000      DEVICE ATTN; IOC ERROR FAKE QUEUEWORD
```

X CONTROL EXEC ENTRY -- INTERRUPT RECOGNITION RELEASED 01DEC80

```
                                    2967            EJECT                                                                   [09DEC79]
                                   +2968    *                                                                               [01DEC80]
                          003347   +2969    NIO     NULL                PUTS CHANNEL BASE IN NIOS(UPPER) *OTIS          [01DEC80]
003347  003355 2360 00 R.  +2970            LDQ     NIOS                GET SAVED IOM# *OTIS                            [01DEC80]
003350  000003 3760 07 ..  +2971            ANQ     3,DL                MASK OFF *OTIS                                  [01DEC80]
003351  000340 4020 07 ..  +2972            MPY     CHTLEN,DL           MULTIPLY BY LEN *OTIS                           [01DEC80]
003352  000022 7360 00 ..  +2973            QLS     18                  PUT IN UPPER *OTIS                              [01DEC80]
003353  003355 7560 00 R.  +2974            STQ     NIOS                SAVE *OTIS                                      [01DEC80]
003354  000000 7100 10 ..  +2975            TRA     0,0                 RETURN *OTIS                                    [01DEC80]
                           +2976    *                                                                                   [01DEC80]
                          003355   +2977    NIOS    BSS     1                                                           [01DEC80]
                           +2978    *                                                                                   [01DEC80]
                            2979    *
                            2980    *       INITIATE-TERMINATE INTERRUPTS
                            2981    *
                            2982            INHIB   SAVE,ON
                          003356    2983            EVEN
003356  000000 5542 55 X.   2984            STC1    N$ICO,DIC           SAVE WHERE WE WERE                              [01MAY79]
003357  003360 7102 00 R.   2985            TRA     *+1                 AND BREAK THE XED
                          003360    2986    ITINT   NULL
003360  003364 7172 00 R.  +2987            XED     ITINT1              ENTRY FOR IOM#0*OTIS                            [01DEC80]
003361  003364 7172 00 R.  +2988            XED     ITINT1                IOM#1*OTIS                                    [01DEC80]
003362  003364 7172 00 R.  +2989            XED     ITINT1                IOM#2*OTIS                                    [01DEC80]
003363  003364 7172 00 R.  +2990            XED     ITINT1                IOM#3*OTIS                                    [01DEC80]
                          003364   +2991    ITINT1  NULL                                                                [01DEC80]
003364  000000 7532 53 X.  +2992            SREG    IREGT,AD            SAVE REGISTERS*OTIS                             [01DEC80]
003365  003366 7002 00 R.  +2993            TSX0    *+1                 BREAK XED*OTIS                                  [01DEC80]
003366  003361 1602 03 R.  +2994            SBX0    ITINT+1,DU          COMPUTE IOM# IN X0*OTIS                         [01DEC80]
003367  000000 0112 03 ..   2995    TSOP02  NOP     0,DU                SPACE FOR LCPR INST. ON 66/X7                   [30DEC76]
                          003370   -2996            DABL                  DISABLE INTERRUPTS
003370  000000 2332 00 X.                   RMCM    X$MEM               READ MASK FROM MEMORY CONTROLLER
003371  000000 3772 00 X.                   ANAQ    X$DABL              DISABLE SPEC-INIT-TERM-MARK
003372  000000 5532 00 X.                   SMCM    X$MEM               SET NEW MASK
003373  004200 6342 07 ..   2997            LDI     M$OVMSK+M$MMODE,DL  MASK OFF OVERFLOW FAULTS
                            2998            INHIB   RESTORE
003374  003355 4400 00 R. -+2999            SXL0    NIOS                SAVE IOM# *OTIS                                 [01DEC80]
003375  000000 7210 10 X.  +3000            LXL     X,X$STTSP,0         PUT THIS IOM'S SW BASE IN X*OTIS                [01DEC80]
003376  003722 7410 00 R.  +3001            STX     X,INTMP             WHY DO YOU THINK THEY CALL IT RELY?*OTIS        [01DEC80]
003377  001354 0340 10 ..  +3002            LDAC    X$IMW+12,0          GET TERMINATE IMW FOR THIS IOM*OTIS             [01DEC80]
003400  000000 7550 00 X.   3003            STA     Z$IMW               SAVE FOR IMWCK ROUTINE
003401  000000 7000 00 X.   3004            TSX0    Z$IMWCK             CONVERT TO CHANNEL NUMBER
003402  000000 6000 00 X.   3005            TZE     INTX                ZERO MEANS NO MORE INTERRUPTS
003403  000000 6260 02 ..   3006            EAX     P,0,QU              PUT PUB TIMES FOUR IN P
003404  003347 7000 00 R.  +3007            TSX0    NIO                 GET CHANNEL BASE FOR THIS IOM *OTIS             [01DEC80]
003405  003355 0660 00 R.  +3008            ADX     P,NIOS              COMPLETE CHANNEL PTR *OTIS                      [01DEC80]
                            3009    *
                            3010    *       COUNT CHANNEL BUSY TIME
                            3011    *
003406  000000 2340 16 X.   3012            SZN     X$IOSTB,P           DID WE SET THE TIMER?
003407  003416 6000 00 R.   3013            TZE     ITIN1               NO, DON'T COUNT TIME
                          003410    3014            GTIM                GET TIME SINCE BOOTLOAD
003410  000000 7000 00 X.                   TSX0    X$GTIM              RETURN TIMER UNITS IN A
```

CONTROL EXEC ENTRY -- INTERRUPT RECOGNITION RELEASED 01DEC80

```
                X                                  CONTROL EXEC ENTRY -- INTERRUPT RECOGNITION                                RELEASED 01DEC80

    003411  000000 1750 16 X.    3015             SBA     X$IOSTB,P       SUBTRACT START FROM CURRENT
    003412  000000 0550 16 X.    3016             ASA     X$IOUTB,P       MAINTAIN TOTAL BUSY TIME
    003413  000000 4500 16 X.    3017             STZ     X$IOSTB,P       CLEAR TIMER IN CASE OF SPURIOUS INTERRUPT
    003414  000000 6360 16 ..    3018             EAQ     0,P             RESTORE Q (BE PARANOID)
    003415  003355 1760 00 R.   +3019             SBQ     NIOS            REMOVE BASE *OTIS                                  [01DEC80]
                    003416       3020     ITIN1   NULL
    003416  000001 7720 00 ..    3021             QRL     1               CONVERT TO RELATIVE STATUS ADDRESS
    003417  400000 2350 03 ..    3022             LDA     B$SIGN,DU       GET IOM SYNC BIT
    003420  000000 6210 02 ..  -+3023             EAX     X,0,QU          *OTIS                                              [01DEC80]
    003421  003722 0610 00 R.   +3024             ADX     X,INTMP         MAKE STATUS ADDRESS ABSOLUTE*OTIS                  [01DEC80]
    003422  000000 3150 11 ..   +3025             CANA    0,X             DID WE GET STATUS?*OTIS                            [01DEC80]
    003423  003432 6010 00 R.    3026             TNZ     ITINS           YES, TAKE IT AWAY                                  [01DEC80]
    003424  000002 2350 07 ..    3027             LDA     B$SPIOP,DL      WATCH OUT FOR SPECIAL OPS                          [01DEC80]
    003425  000000 3150 16 X.    3028             CANA    P$STAT,P        (SOME DON'T RETURN STATUS)                         [01DEC80]
    003426  003454 6000 00 R.    3029             TZE     ITSTA           EVERYONE ELSE SHOULD HAVE STATUS                   [01DEC80]
    003427  004341 2350 00 R.    3030             LDA     I$FKOKS         PICK UP A FAKE STATUS RETURN                       [01DEC80]
    003430  000000 7550 11 ..  -+3031             STA     0,X             SAVE IT *ROBINSON                                  [01DEC80]
    003431  000001 4500 11 ..   +3032             STZ     1,X             *ROBINSON                                          [01DEC80]
                    003432       3033     ITINS   NULL                                                                       [01DEC80]
    003432  400000 2350 07 ..    3034             LDA     B$IOBSY,DL      WERE WE EXPECTING?
    003433  000000 3150 16 X.    3035             CANA    P$STAT,P        CHECK CHANNEL STATE
    003434  003475 6000 00 R.    3036             TZE     ITSPR           NO-- LOG SPURIOUS INTERRUPT
    003435  000000 6550 16 X.    3037             ERSA    P$STAT,P        ELSE TURN OFF THE BIT
    003436  777777 7240 16 X.    3038             LXL     T,Q$BUSY+P$Q,P  GET THE ASSOCIATED TASK
    003437  000000 6000 20 X.    3039             TZE     $ZOPF,*         NO TASK???                                  16AUG74
    003440  000000 0340 11 .. -+3040             LDAC    0,X             GET THE STATUS WORD*OTIS                           [01DEC80]
    003441  003516 3750 00 R.    3041             ANA     ITMSK           MASK OUT ODD/EVEN, MARKER, ETC. (TO AVOID CARRY)
    003442  000020 0750 03 ..    3042             ADA     =020,DU         FUDGE TO LOOK LIKE IOC INITIATE                    [21APR77]
    003443  000002 3150 03 ..    3043             CANA    2,DU            WERE WE RIGHT?                                     [21APR77]
    003444  003446 6010 00 R.    3044             TNZ     *+2             YES, IT'S AN INITIATE                              [21APR77]
    003445  000020 0750 03 ..    3045             ADA     =020,DU         NO, SO MAKE IT A TERMINATE                         [21APR77]
    003446  000005 7550 14 ..    3046             STA     I$QWORD,T       SAVE AS IOC QUEUE WORD
    003447  000001 2360 11 .. -+3047             LDQ     1,X             ALSO THE DCW RESIDUE*OTIS                          [01DEC80]
    003450  000012 7560 14 ..    3048             STQ     I$DCWWD,T       .                                                  [29JAN77]
    003451  003726 2350 07 R.    3049             LDA     I$ITERM,DL      AND QUEUE A TASK FOR THE INTERRUPT
                    003452       3050             MTQA
    003452  000000 7000 00 X.                     TSX0    Q$MTQA          CALL SUBROUTINE TO QUEUE TASK
    003453  000000 7100 00 X.    3051             TRA     Z$IMWC1         LOOP FOR ALL IMW BITS
                                 3052     *                                                                                  [01DEC80]
                    003454       3053     ITSTA   NULL                    CHANNEL RETURNED NO STATUS                         [01DEC80]
    003454  000001 7720 00 ..    3054             QRL     1               PUT PUB NUMBER IN QU
    003455  003722 7560 00 R.    3055             STQ     INTMP           SAVE IT
    003456  000000 2240 03 ..    3056             LDX     T,0,DU          SPPML
                    003457       3057             MTASK   ITLG1,INTMP     CREATE A TASK TO LOG IT                            [17OCT76]
                    003457                       GETD    2,NBUG
    003457  000002 2350 03 ..                     LDA     2,DU
    003460  000000 7000 00 X.                     TSX0    A$GETNB         CALL TO ENTRY THAT WILL NOT BUG THE LIST ELEMENT
    003461  003722 2350 00 R.                     LDA     INTMP           PARAMETER IS INTMP
    003462  000001 7550 14 ..                     STA     1,T             SAVE IT
    003463  003467 2350 07 R.                     LDA     ITLG1,DL        RESTART ADDRESS
                    003464                       MTQA                    QUEUE TASK TO START AT ITLG1
    003464  000000 7000 00 X.                     TSX0    Q$MTQA          CALL SUBROUTINE TO QUEUE TASK
```

X CONTROL EXEC ENTRY -- INTERRUPT RECOGNITION RELEASED 01DEC80

```
003465  000000 2240 03 ..                  LDX     T,0,DU          SPPML
003466  000000 7100 00 X.   3058           TRA     Z$IMWC1         CONTINUE CHECKING IMW
                003467      3059   ITLG1   NULL                    LOG NO STATUS
                003467      3060           LOG     (NO STATUS),(IENT,T)  MESSAGE AND PUB NUMBER
003467  000000 4500 00 X.                  STZ     I$FLOG          DON'T INHIBIT DEVICE OUTPUT
003470  000000 7000 00 X.                  TSX     0,I$LOG         CAN BE CALLED FROM THE OUTSIDE WORLD
003471  454620626321   ..                  BCI     2,NO STATUS      TEXT ARGUMENT
003472  636462202020
003473  000001 0000 14 ..                  ARG     IENT,T          YES, POINT TO IT
003474  003344 7100 00 R.   3061           TRA     SYIN2           VANISH
                003475      3062   ITSPR   NULL                    TASK TO LOG SPURIOUS INTERRUPT
003475  000001 7720 00 ..   3063           QRL     1               PUT CHANNEL NUMBER IN QU
003476  003722 7560 00 R.   3064   ITSP1   STQ     INTMP           SAVE IT
003477  000000 2240 03 ..   3065           LDX     T,0,DU          SPPML
                003500      3066           MTASK   ITLG2,INTMP     CREATE A TASK TO LOG IT                    [17OCT76]
                003500                     GETD    2,NBUG
003500  000002 2350 03 ..                  LDA     2,DU
003501  000000 7000 00 X.                  TSX0    A$GETNB         CALL TO ENTRY THAT WILL NOT BUG THE LIST ELEMENT
003502  003722 2350 00 R.                  LDA     INTMP           PARAMETER IS INTMP
003503  000001 7550 14 ..                  STA     1,T             SAVE IT
003504  003510 2350 07 R.                  LDA     ITLG2,DL        RESTART ADDRESS
                003505                     MTQA                    QUEUE TASK TO START AT ITLG2
003505  000000 7000 00 X.                  TSX0    Q$MTQA          CALL SUBROUTINE TO QUEUE TASK
003506  000000 2240 03 ..                  LDX     T,0,DU          SPPML
003507  000000 7100 00 X.   3067           TRA     Z$IMWC1         CONTINUE CHECKING THE IMW
                003510      3068   ITLG2   LOG     (SPURIOUS INT),(IENT,T)
003510  000000 4500 00 X.                  STZ     I$FLOG          DON'T INHIBIT DEVICE OUTPUT
003511  000000 7000 00 X.                  TSX     0,I$LOG         CAN BE CALLED FROM THE OUTSIDE WORLD
003512  624764513146   ..                  BCI     2,SPURIOUS INT      TEXT ARGUMENT
003513  646220314563
003514  000001 0000 14 ..                  ARG     IENT,T          YES, POINT TO IT
003515  003344 7100 00 R.   3069           TRA     SYIN2           EVAPORATE
003516  777702777777   ..   3070   ITMSK   OCT     777702777777    MASK TO REMOVE ODD/EVEN, MARKER, ETC.      [05NOV77]
```

X CONTROL EXEC ENTRY -- INTERRUPT RECOGNITION RELEASED 01DEC80

```
                                3071            EJECT                                                                   [09DEC79]
                                3072    *                                                                               [09DEC79]
                                3073    *       RANDOM(UNDEFINED) INTERRUPT TYPES COME HERE.                            [09DEC79]
                                3074    *                                                                               [09DEC79]
                                3075            INHIB   SAVE,ON                                                         [09DEC79]
003517  000000011207
                     003520     3076            EVEN                    WORDPAIR                                        [09DEC79]
003520  000000 5542 55 X.       3077            STC1    N$ICO,DIC       STACK STATE                                     [09DEC79]
003521  003522 7102 00 R.       3078            TRA     *+1             ENTER ENTRY VECTOR                              [09DEC79]
                                3079                                                                                    [09DEC79]
                     003522     3080    QINT    NULL                    ENTRY VECTOR FOR INTERRUPTS 0..31               [09DEC79]
                                3081            DUP     1,32            ENTRY VECTOR                                    [09DEC79]
003522  003562 7172 00 R.       3082            XED     QINT1                                                           [09DEC79]
003523  003562 7172 00 R.               XED     QINT1
003524  003562 7172 00 R.               XED     QINT1
003525  003562 7172 00 R.               XED     QINT1
003526  003562 7172 00 R.               XED     QINT1
003527  003562 7172 00 R.               XED     QINT1
003530  003562 7172 00 R.               XED     QINT1
003531  003562 7172 00 R.               XED     QINT1
003532  003562 7172 00 R.               XED     QINT1
003533  003562 7172 00 R.               XED     QINT1
003534  003562 7172 00 R.               XED     QINT1
003535  003562 7172 00 R.               XED     QINT1
003536  003562 7172 00 R.               XED     QINT1
003537  003562 7172 00 R.               XED     QINT1
003540  003562 7172 00 R.               XED     QINT1
003541  003562 7172 00 R.               XED     QINT1
003542  003562 7172 00 R.               XED     QINT1
003543  003562 7172 00 R.               XED     QINT1
003544  003562 7172 00 R.               XED     QINT1
003545  003562 7172 00 R.               XED     QINT1
003546  003562 7172 00 R.               XED     QINT1
003547  003562 7172 00 R.               XED     QINT1
003550  003562 7172 00 R.               XED     QINT1
003551  003562 7172 00 R.               XED     QINT1
003552  003562 7172 00 R.               XED     QINT1
003553  003562 7172 00 R.               XED     QINT1
003554  003562 7172 00 R.               XED     QINT1
003555  003562 7172 00 R.               XED     QINT1
003556  003562 7172 00 R.               XED     QINT1
003557  003562 7172 00 R.               XED     QINT1
003560  003562 7172 00 R.               XED     QINT1
003561  003562 7172 00 R.               XED     QINT1
                                3083                                                                                    [09DEC79]
                     003562     3084            EVEN                                                                    [09DEC79]
                     003562     3085    QINT1   NULL                                                                    [09DEC79]
003562  000000 7532 53 X.       3086            SREG    IREGT,AD        STACK REGISTERS                                 [09DEC79]
003563  003564 7002 00 R.       3087            TSX0    *+1             REMEMBER ENTRY                                  [09DEC79]
003564  000000 0112 03 ..       3088    TSOP07  NOP     0,DU            SPACE FOR LCPR INST. ON 66/X7                   [09DEC79]
                     003565     3089            DABL                    DISABLE FURTHER INTERRUPTS                      [09DEC79]
003565  000000 2332 00 X.               RMCM    X$MEM           READ MASK FROM MEMORY CONTROLLER
```

```
003566  000000 3772 00 X.           ANAQ    X$DABL          DISABLE SPEC-INIT-TERM-MARK
003567  000000 5532 00 X.           SMCM    X$MEM           SET NEW MASK
003570  004200 6342 07 ..    3090   LDI     M$OVMSK+M$MMODE,DL MASK OFF OVERFLOW FAULTS                    [09DEC79]
                             3091   INHIB   RESTORE         OK NOW                                         [09DEC79]
003571  777777 6350 10 ..    3092   EAA     -1,0            GET ENTRY POINT                                [09DEC79]
003572  003522 1350 03 R.    3093   SBLA    QINT,DU         CONVERT TO INTERRUPT ADDRESS                   [09DEC79]
003573  000001 7710 00 ..    3094   ARL     1               CONVERT TO INTERRUT NUMBER                     [09DEC79]
003574  003722 7550 00 R.    3095   STA     INTMP           SAVE FOR MESSAGE                               [09DEC79]
003575  000000 2240 03 ..    3096   LDX     T,0,DU          SPPML                                          [09DEC79]
              003576         3097   MTASK   QINT2,INTMP     CREATE TASK TO LOG IT                          [09DEC79]
              003576                GETD    2,NBUG
003576  000002 2350 03 ..           LDA     2,DU
003577  000000 7000 00 X.           TSX0    A$GETNB         CALL TO ENTRY THAT WILL NOT BUG THE LIST ELEMENT
003600  003722 2350 00 R.           LDA     INTMP           PARAMETER IS INTMP
003601  000001 7550 14 ..           STA     1,T             SAVE IT
003602  003606 2350 07 R.           LDA     QINT2,DL        RESTART ADDRESS
              003603                MTQA                    QUEUE TASK TO START AT QINT2
003603  000000 7000 00 X.           TSX0    Q$MTQA          CALL SUBROUTINE TO QUEUE TASK
003604  000000 2240 03 ..           LDX     T,0,DU          SPPML
003605  000000 7100 00 X.    3098   TRA     INTX            AND EVAPORATE                                  [09DEC79]
                             3099                                                                          [09DEC79]
              003606         3100   QINT2   NULL            TASK TO LOG RANDOM INTERRUPT                   [09DEC79]
              003606         3101           LOG     (INTERRUPT),(IENT,T)                                   [09DEC79]
003606  000000 4500 00 X.           STZ     I$FLOG          DON'T INHIBIT DEVICE OUTPUT
003607  000000 7000 00 X.           TSX     0,I$LOG         CAN BE CALLED FROM THE OUTSIDE WORLD
003610  314563255151  ..            BCI     2,INTERRUPT      TEXT ARGUMENT
003611  644763202020
003612  000001 0000 14 ..           ARG     IENT,T          YES, POINT TO IT
003613  003344 7100 00 R.    3102   TRA     SYIN2           EVAPORATE                                      [09DEC79]
```

```
                                3103            EJECT                                                   [09DEC79]
                                3104    *
                                3105    *       SPECIAL INTERRUPT
                                3106    *
                                3107            INHIB   SAVE,ON
                     003614     3108            EVEN
003614  000000 5542 55 X.       3109            STC1    N$ICO,DIC       SAVE WHERE WE WERE              [01MAY79]
003615  003616 7102 00 R.       3110            TRA     *+1
                     003616     3111    SPINT   NULL
003616  003622 7172 00 R.      +3112            XED     SPINT1          ENTRY FOR IOM#0*OTIS            [01DEC80]
003617  003622 7172 00 R.      +3113            XED     SPINT1            IOM#1*OTIS                    [01DEC80]
003620  003622 7172 00 R.      +3114            XED     SPINT1            IOM#2*OTIS                    [01DEC80]
003621  003622 7172 00 R.      +3115            XED     SPINT1            IOM#3*OTIS                    [01DEC80]
                     003622    +3116    SPINT1  NULL                                                    [01DEC80]
003622  000000 7532 53 X.      +3117            SREG    IREGT,AD        SAVE REGISTERS*OTIS             [01DEC80]
003623  003624 7002 00 R.      +3118            TSX0    *+1             BREAK XED*OTIS                  [01DEC80]
003624  003617 1602 03 R.      +3119            SBX0    SPINT+1,DU      COMPUTE IOM# IN X0*OTIS         [01DEC80]
003625  000000 0112 03 ..       3120    TSOP03  NOP     0,DU            SPACE FOR LCPR INST. ON 66/X7   [30DEC76]
                     003626    -3121            DABL                    DISABLE THE INTERRUPTS
003626  000000 2332 00 X.               RMCM    X$MEM           READ MASK FROM MEMORY CONTROLLER
003627  000000 3772 00 X.               ANAQ    X$DABL          DISABLE SPEC-INIT-TERM-MARK
003630  000000 5532 00 X.               SMCM    X$MEM           SET NEW MASK
003631  004200 6342 07 ..       3122            LDI     M$OVMSK+M$MMODE,DL MASK OFF OVERFLOW FAULTS
                                3123            INHIB   RESTORE
003632  003355 4400 00 R.      -+3124            SXL0    NIOS            SAVE IOM# *OTIS                 [01DEC80]
003633  000000 7220 10 X.      +3125            LXL     Y,X$SPSTP,0     PUT THIS IOM'S SPECIAL SW BASE IN X*OTIS [01DEC80]
003634  003722 7420 00 R.      +3126            STX     Y,INTMP         FOR SAFEKEEPING*OTIS            [01DEC80]
003635  001374 0340 10 ..      +3127            LDAC    X$IMW+28,0      GET SPECIAL IMW FOR THIS IOM*OTIS [01DEC80]
003636  000000 7550 00 X.       3128            STA     Z$IMW           SAVE FOR THE IMW CONVERSION ROUTINE
003637  000000 7000 00 X.       3129            TSX0    Z$IMWCK         CONVERT IT TO CHANNEL NUMBER
003640  000000 6000 00 X.       3130            TZE     INTX            ZERO MEANS NO MORE INTERRUPTS
003641  000030 1160 03 ..       3131            CMPQ    SPECH,DU        IS THIS FROM THE SPECIAL STATUS CHANNEL ?
003642  003661 6010 00 R.       3132            TNZ     SPIN5           NO, CONTINUE NORMALLY
                                3133
003643  003722 2220 00 R.      -+3134            LDX     Y,INTMP         RESTORE*OTIS                    [01DEC80]
003644  777777 6210 12 ..      +3135            EAX     X,-1,Y          X POINTS TO SPECIAL STATUS STACK BASE*OTIS [01DEC80]
003645  000020 0620 03 ..      +3136            ADX     Y,SPSTKL,DU     Y POINTS TO LAST ENTRY*OTIS      [01DEC80]
003646  003722 7420 00 R.      +3137            STX     Y,INTMP         SAVE FOR TEST*OTIS              [01DEC80]
003647  000001 0610 03 ..       3138    SPIN6   ADX     X,1,DU          INCREMENT POINTER
003650  003722 1010 00 R.      -+3139            CMPX    X,INTMP         BEYOND STACK?*OTIS              [01DEC80]
003651  000000 6030 00 X.       3140            TRC     Z$IMWC1         YES, GET THE REST OF THE SPECIALS
003652  000000 0340 11 ..       3141            LDAC    0,X             GET THE NEXT POSSIBLE SPECIAL
003653  003647 6000 00 R.       3142            TZE     SPIN6           NONE HERE, CONTINUE
003654  000011 7710 00 ..       3143            ARL     9               MOVE CHANNEL # TO AU
003655  400000 2360 03 ..       3144            LDQ     =0400000,DU     SET A BIT TO SHIFT RIGHT        [21APR77]
003656  000000 7720 01 ..       3145            QRL     0,AU            MOVE BIT TO THE RIGHT PLACE FOR AN IMW
003657  000000 2560 00 X.       3146            ORSQ    Z$IMW           PRETEND THE SPECIAL CAME IN ON THE RIGHT CHANNEL
003660  003647 7100 00 R.       3147            TRA     SPIN6           CONTINUE
                                3148
003661  000000 6270 02 ..      -+3149    SPIN5   EAX     S,0,QU          GET 4*CH *OTIS                  [01DEC80]
003662  003347 7000 00 R.      +3150            TSX0    NIO             GET CHANNEL BASE FOR THIS IOM *OTIS [01DEC80]
003663  003355 0670 00 R.      +3151            ADX     S,NIOS          COMPLETE CHANNEL LOC *OTIS      [01DEC80]
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```
003664  000000 6350 17 ..  +3152          EAA     0,S             INITIALIZE TO AU *OTIS                          [01DEC80]
                           +3153    *                                                                           [01DEC80]
003665  000000 2270 01 X.  +3154          LDX     S,P$CHAN,AU     GET ENTTRY FOR THIS DEVICE *OTIS                [01DEC80]
003666  003672 6050 00 R.  +3155          TPL     *+4             CONTINUE IF NO CROSSBARING *OTIS                [01DEC80]
003667  000000 6350 17 ..  +3156          EAA     0,S             ELSE PUT PTR TO NEW PUB IN AU *OTIS             [01DEC80]
003670  001524 7000 00 R.  +3157          TSX0    I$CHLOC         GET THE PUB *OTIS                               [01DEC80]
003671  003665 7100 00 R.  +3158          TRA     *-4             TRY AGAIN *OTIS                                 [01DEC80]
003672  003700 6010 00 R.  +3159          TNZ     SPIN1           FOUND ONE;GO CHECK IT *OTIS                     [01DEC80]
003673  000000 6260 01 ..  +3160          EAX     P,0,AU          PUT ENTRY IN XP *OTIS                           [01DEC80]
003674  001546 7000 00 R.  +3161          TSX0    I$IOMS          RETREIVE 4*CH *OTIS                             [01DEC80]
003675  000000 6360 12 ..  +3162          EAQ     0,Y             PUT IN QU *OTIS                                 [01DEC80]
003676  000002 7720 00 ..   3163          QRL     2               PUT CHANNEL IN QU
003677  003476 7100 00 R.   3164          TRA     ITSP1           AND LOG SPURIOUS INTERRUPT
003700  000000 2240 17 X.   3165  SPIN1   LDX     T,U$SPEC,S      GET TASK FOR THIS DEVICE
003701  003705 6000 00 R.   3166          TZE     SPIN2           NO SUCH TASK
003702  000000 6440 17 X.   3167          ERSX    T,U$SPEC,S      ERASE THE TASK
                  003703    3168          MTQ                     AND QUEUE IT UP                                 [05NOV77]
003703  000000 7000 00 X.                 TSX0    Q$MTQ           GO QUEUE THE TASK
003704  003711 7100 00 R.   3169          TRA     SPIN4           CHECK OTHER DEVICES
003705  400000 2210 03 ..   3170  SPIN2   LDX     X,B$IOSPC,DU    GET BIT SAYNING SPECIAL ARRIVED
003706  000000 2410 17 X.   3171          ORSX    X,U$STAT,S      SET IT
003707  000000 7210 17 X.   3172          LXL     X,U$SPEC,S      CHECK FOR EXEC TASK FOR BESPECIALLED DEVICE
003710  003714 6010 00 R.   3173          TNZ     SPIN3           YES-- QUEUE IT
003711  000000 7270 17 X.   3174  SPIN4   LXL     S,U$CHAN,S      GET NEXT DEVICE ON PUB
003712  003700 6010 00 R.   3175          TNZ     SPIN1           CONTINUE IF MORE
003713  000000 7100 00 X.   3176          TRA     Z$IMWC1         ELSE CONTINUE TO NEXT PUB
                  003714    3177  SPIN3   GETD    I$DCW+1         GET A LIST ELEMENT FOR TASK
003714  000017 2350 03 ..                 LDA     I$DCW+1,DU
003715  000000 7000 00 X.                 TSX0    A$GET
003716  000001 7470 14 ..   3178          STX     S,I$DEV,T       SAVE THE DEVICE NUMBER
003717  000000 2350 17 X.   3179          LDA     U$SPEC,S        GET THE TASK START ADDRESS
                  003720    3180          MTQA                    AND QUEUE IT                                    [05NOV77]
003720  000000 7000 00 X.                 TSX0    Q$MTQA          CALL SUBROUTINE TO QUEUE TASK
003721  003711 7100 00 R.   3181          TRA     SPIN4           CONTINUE
                           3182
                  003722    3183          EVEN
                  003722    3184  INTMP   BSS     2               TEMPORARY FOR INTERRUPT HANDLER
003724  000010 000000  .. -+3185  SYLIM   ZERO    $FPCHN          LOWER LIMIT FOR DATA CHANNELS *OTIS             [01DEC80]
003725  000077 000000  ..  +3186          ZERO    $NCHAN-1        UPPER LIMIT *OTIS                               [01DEC80]
                           3187    *
                           3188  ENDIOM  MARK                                                                    [09DEC79]
```

```
                    3189            EJECT                                                   [09DEC79]
          003726    3190            IFIOC                                                   [09DEC79]
                    3191    *
                    3192    *
                    3193    *
                    3194    *               COUNTER PARITY INTERRUPTS
                    3195    *
                    3196    *       THIS ROUTINE IS ENTERED ON A COUNTER PARITY INTERRUPT
                    3197    *       BY A HARDWARE XED OF THE INTERRUPT CELL CONTAINING:
                    3198    *
                    3199            EVEN
                    3200            STC1    N$ICO,DIC       SAVE IC/IR                      [01MAY79]
                    3201            TRA     CPINT           GO TO ROUTINE
                    3202    CPINT   NULL
                    3203            SREG     IREGT,AD       SAVE REGISTERS                  [09DEC79]
                    3204            DABL                    DISABLE INTERRUPTS
                    3205            CKPT     11             NOTE COUNTER PARITY INTERRUPT
                    3206            LDX      T,0,DU         SPPML
                    3207            INHIB    RESTORE
                    3208            GETD     2              GET A BLOCK FOR QUEUEING
                    3209            LDQ      PMBX+7         SAVE CP INT DATA WORD
                    3210            STQ      1,T            .                               [29JAN77]
                    3211            LDA      CPI1,DL        GET ADDRESS OF TASK
                    3212            MTQA                    QUEUE IT
                    3213            AOS      CPN            COUNT COUNTER PARITY INTERRUPTS
                    3214            TRA      INTX           EXIT
                    3215    *
                    3216    *       LOG COUNTER PARITY INTERRUPT
                    3217    *
                    3218    CPI1    NULL
                    3219            LOG      (IOC           CTR PAR),(1,T)
                    3220            REL                     RELEASE LIST ELEMENT
                    3221            TRA      $EXIT
                    3222    CPN     OCT     0               TOTAL COUNT OF CP INTS
                    3223            INHIB    SAVE,ON
                    3224    *
                    3225    *
                    3226    *               SPECIAL INTERRUPTS
                    3227    *
                    3228    *       THIS ROUTINE GETS CONTROL ON A SPECIAL INTERRUPT BY
                    3229    *       A HARDWARE XED OF THE INTERRUPT CELL CONTAINING:
                    3230    *
                    3231            EVEN
                    3232            STC1     N$ICO,DIC      SAVE IC/IR                      [01MAY79]
                    3233            TRA      SINT           BREAK XED
                    3234    SINT    NULL
                    3235            SREG     IREGT,AD       SAVE REGISTERS                  [09DEC79]
                    3236            LDX      J,3,DU         FLAG TYPE OF INTERRUPT
                    3237            TRA      INT            JOIN COMMON ROUTINE
                    3238    *
                    3239    *               INITIATE INTERRUPTS
                    3240    *
```

```
3241    *       THIS ROUTINE RECEIVES CONTROL ON AN INITIATE INTERRUPT BY
3242    *       A HARDWARE XED OF THE INTERRUPT CELL CONTAINING:
3243    *
3244            EVEN
3245            STC1    N$ICO,DIC       SAVE IC/IR                      [01MAY79]
3246            TRA     IINT            BREAK XED
3247    IINT    NULL
3248            SREG    IREGT,AD        SAVE REGISTERS                  [09DEC79]
3249            LDX     J,1,DU          FLAG TYPE OF INTERRUPT
3250            TRA     INT             JOIN COMMON ROUTINE
3251    *
3252    *               TERMINATE INTERRUPTS
3253    *
3254    *       THIS ROUTINE GETS CONTROL ON A TERMINATE INTERRUPT BY
3255    *       A HARDWARE XED OF THE INTERRUPT CELL CONTAINING:
3256    *
3257            EVEN
3258            STC1    N$ICO,DIC       SAVE IC/IR                      [01MAY79]
3259            TRA     TINT            BREAK XED
3260    TINT    NULL
3261            SREG    IREGT,AD        SAVE REGISTERS                  [09DEC79]
3262            LDX     J,2,DU          FLAG TYPE OF INTERRUPT
3263            REM     FALL  THROUGH TO COMMON ROUTINE
3264    *
3265    *               COMMON INTERRUPT ROUTINE
3266    *
3267    *       REGISTER USAGE
3268    *
3269    *       J       1,2,3 FOR INIT, TERM, SPECIAL
3270    *       S       INDEX TO QUEUE TABLE (0-15)
3271    *       0       CORE ADDRESS OF QUEUE ENTRY
3272    *
3273    INT     NULL                    INTERRUPT TYPE IN XR - J
3274            DABL                    MASK OFF INTERRUPTS
3275            LDI     M$OVMSK+M$MMODE,DL MASK OFF OVERFLOW FAULTS
3276            INHIB   RESTORE         INTERRUPTS ARE MASKED OFF
3277    INT1    NULL                    SERVICE NEXT INTERRUPT
3278            LDX     T,0,DU          SPPML
3279            LDX     S,PMBX+3,J      GET MY QUEUE COUNTER
3280            SZN     IPIK,J*         CHECK LAST INTERRUPT
3281            TPL     INT4            IF PICKED UP, NO PROBLEMS
3282            GETD    2               BURST OF INTERRUPTS
3283            STX     J,1,T           SAVE TYPE OF INTERRUPTS
3284            LDA     INT2,DL         ROUTINE TO LOG OCCURANCE
3285            MTQA                    QUEUE IT UP
3286            TRA     INT5            SKIP CHECK FOR EMPTY QUEUE
3287    INT2    NULL                    TASK TO LOG BURST OF INTERRUPTS
3288            LOG     (INTRPT         BURST),(1,T)"1=INIT,2=TERM,3=SPEC
3289    INT3    REL                     RELEASE TASK BLOCK
3290            TRA     $EXIT
3291    INT4    NULL                    CHECK FOR QUEUE EMPTY
3292            CMPX    S,PMBX+0,J      SEE IF ANY NEW ONES HAVE COME
```

```
3293             TZE     INTX            NO - EXIT INTERRUPT PICKUP
3294     INT5    NULL                    PICK UP NEXT INTERRUPT
3295             EAX     S,1,S           STEP MY COUNTER
3296             ANX     S,15,DU         WRAP AT 16
3297             STX     S,PMBX+3,J      RESTORE MY QUEUE COUNT
3298             LDA     INTM            GET MAST FOR INTERRUPT
3299             ANA     IPIK,J*         PICK IT UP
3300             LDXO    -1-B$SIGN,DU    PREPARE TO UNSET IOC SYNC BIT
3301             ANSXO   IPIK,J*         REMOVE IT
3302             EAQ     IPIK,J*         POINT TO INTERRUPT QUEUE
3303             ANQ     =077,DU         JUST THE QUEUE POINTER                  [21APR77]
3304             STQ     QWORD           SAVE  QUEUE POINTER
3305             ORA     QWORD           PLACE QUEUE POINTER IN QUEUE WORD
3306             TPL     INT7            NOT A REAL INTERRUPT
3307             EAX     P,0,AL          GET PUB NUMBER IN XR-P
3308             ANX     P,60,DU         ONLY
3309             CMPX    J,3,DU          SPECIAL CHECK
3310             TZE     INT10           HANDLE SPECIAL INTERRUPTS DIFFERENTLY
3311             LDQ     B$IOBSY,DL      CHECK FOR OPERATION OUTSTANDING
3312             CANQ    P$STAT,P        ON THIS PUB
3313             TZE     INT7            UNEXPECTED INTERRUPT - LOG
3314             ERSQ    P$STAT,P        TURN OFF BUSY BIT
3315             LXL     T,Q$BUSY+P$Q,P  GET PHYSICAL I/O LIST ELEMENT
3316             TZE     $ZOPF,*         NO LIST ELEMENT ?
3317             STA     I$QWORD,T       SAVE INTERRUPT WORD
3318     *                                                               16AUG74
3319     *       COUNT BUSY TIME:                                        16AUG74
3320     *                                                               16AUG74
3321             SZN     X$IOSTB,P       SEE IF WE SET THE TIMER ON IO INITIATION 16AUG74
3322             TZE     INT15           IF NOT, THEN DO NOT COUNT TIME  16AUG74
3323             GTIM                    OTHERWISE GET TIME SINCE BOOTLOAD 16AUG74
3324             SBA     X$IOSTB,P       SUBTRACT STARTING TIME FROM CURRENT TIME 16AUG74
3325             ASA     X$IOUTB,P       ADD UP TIME IN THE I O USED TIME TABLE 16AUG74
3326             STZ     X$IOSTB,P       CLEAR OUT TABLE IN CASE OF SPURIOUS INTS. 16AUG74
3327     INT15   NULL                                                    16AUG74
3328             LDA     I$ITERM,DL      TERMINATE SERVICE ROUTINE
3329     INT6    MTQA                    QUEUE TASK FOR THIS INTERRUPT
3330             TRA     INT1            AND GO SERVICE NEXT INTERRUPT
3331     INT7    NULL                    UNEXPECTED INTERRUPT
3332             STA     QWORD           SAVE QUEUEWORD
3333             GETD    ILEN            GET A LIST ELEMENT
3334             LDA     INT9,DL         GET ADDRESS OF LOGGING ROUTINE
3335     INT8    NULL                    MOVE QUEUE WORD TO LIST ELEMENT
3336             LDQ     QWORD           SAVE QUEUE WORD                         [29JAN77]
3337             STQ     IENT,T           .                                      [29JAN77]
3338             TRA     INT6            QUEUE UP TASK
3339     INT9    NULL                    LOG SPURIOUS INTERRUPT
3340             LOG     (SPURIOUS       INT),(IENT,T)
3341             TRA     INT3            RELEASE TASK AND EXIT
3342     INT10   NULL
3343             LDX     S,P$CHAN,P      GET DEVICE NUMBER
3344             TPL     *+3             CHECK FOR CROSSBARRING
```

```
3345                EAX     P,B$SIGN,S      AND GET ALTERNATE IF CROSSBARRED
3346                TRA     INT10           AND TRY AGAIN
3347                TZE     INT1            NO DEVICES ON THIS CHANNEL
3348    INT11       LDX     T,U$SPEC,S      GET TASK FOR THIS DEVICE
3349                TZE     INT12           NO SUCH TASK
3350                ERSX    T,U$SPEC,S      ERASE RECORD OF TASK
3351                MTQ                     QUEUE TASK FOR THIS DEVICE
3352                TRA     INT13           AND EXIT
3353    INT12       LDX     X,B$IOSPC,DU    GET BIT THAT SAYS SPECIAL ARRIVED
3354                ORSX    X,U$STAT,S      SET IT
3355                LXL     X,U$SPEC,S      CHECK FOR EXEC TASK FOR DEVICE
3356                TNZ     INT14           NO
3357    INT13       LXL     S,U$CHAN,S      LINK TO NEXT DEVICE
3358                TNZ     INT11           CONTINUE IF MORE
3359                TRA     INT1            EXIT IF NOT
3360    INT14       NULL
3361                GETD    I$DCW+1         GET A LIST ELEMENT FOR TASK
3362                STX     S,I$DEV,T
3363                LDA     U$SPEC,S        GET ADDRESS OF TASK
3364                MTQA                    AND QUEUE IT
3365                TRA     INT13           AND EXIT
3366                REM
3367    IPIK        EQU     *-1             POINTERS TO QUEUES
3368                ARG     PMBX+16,S       INITIATE QUEUE
3369                ARG     PMBX+32,S       TERMINATE QUEUE
3370                ARG     PMBX+48,S       SPECIAL QUEUE
3371    INTM        OCT     777700770074    MASK FOR INTERRESTING PARTS
3372                REM
3373    QWORD       BSS     1               STORAGE FOR QUEUE WORD
3374    *
3375    ENDIOC      MARK                                                [09DEC79]
3376    *
```

X PHYSICAL I/O -- INTERRUPT SERVICE RELEASED 01DEC80

```
                                    3377            TTLS    PHYSICAL I/O -- INTERRUPT SERVICE
                                    3378            HEAD    I               I FOR I/O
                                    3379    *
                                    3380    *       INITIATE/TERMINATE INTERRUPTS
                                    3381    *
                    003726          3382    ITERM   NULL                    ENTERED AS MASTER TASK
                                    3383    *
                                    3384    *       GET IOC/MEM STATUS
                                    3385    *
                    003726          3386            RREG                    RESTORE REGISTERS
003726  001520 7000 00 R.                           TSX0    RREG            CALL SUBROUTINE
003727  000000 4500 16 X.   3387                    STZ     P$TICK,P        TURN OFF TICKER
                                    3388    *
                                    3389    *       WEED OUT DIAGNOSTIC AND SPECIAL COMMANDS
                                    3390    *
003730  000002 2350 07 ..   3391                    LDA     B$SPIOP,DL      GET SPECIAL OPERATION BIT
003731  000000 3150 16 X.   3392                    CANA    P$STAT,P        IS IT SET?
003732  003736 6000 00 R.   3393                    TZE     *+4             NO - PROCEED WITH ERROR CHECKS
003733  000000 6550 16 X.   3394                    ERSA    P$STAT,P        YES - TURN IT OFF
003734  000004 2200 13 ..   3395                    LDX0    T$IOSTS,Z       POINT TO FOLLOWUP ROUTINE
003735  000000 7100 10 ..   3396                    TRA     0,0             GO DO IT
                                    3397    *
                                    3398    *       CHECK FOR ERROR RECOVERY SUPPRESSED
                                    3399    *
003736  000005 2350 14 ..   3400                    LDA     QWORD,T         GET QUEUE WORD
003737  000002 2210 03 ..   3401                    LDX     X,B$IONRV,DU    GET BIT FOR NO ERROR RECOVERY
003740  000000 3010 17 X.   3402                    CANX    X,U$STAT,S      IS IT SET?
003741  003745 6000 00 R.   3403                    TZE     *+4             NO, PROCEED NORMALLY
003742  770000 3750 07 ..   3404                    ANA     =0770000,DL     CHECK FOR IOC ERROR                                     [21APR77]
003743  004305 6010 00 R.   3405                    TNZ     FIN3            GIVE ERROR IF SO                                        [21APR77]
003744  004014 7100 00 R.   3406                    TRA     MSTSR           DO THE NECESSARY POST-I/O PROCESSING AND RETURN         [21APR77]
                                    3407    *                                                                               [21APR77]
                                    3408    *       CHECK IOC/MEM STATUS                                                    [21APR77]
                                    3409    *                                                                               [21APR77]
003745  770000 3750 07 ..   3410                    ANA     =0770000,DL     ISOLATE IOC/MEM STATUS                          [21APR77]
003746  003756 6000 00 R.   3411                    TZE     ITRM2           ZERO IS GOLDEN
                                    3412    *
                                    3413    *       IOC ERROR - TAKE APPROPRIATE ACTION
                                    3414    *
                    003747          3415            ELOG    (IOM ERROR)     LOG IT                                          [05NOV77]
003747  000000 4500 00 X.                           STZ     FLOG            DON'T INHIBIT DEVICE OUTPUT
003750  002136 7000 00 R.                           TSX0    ELOG            CALL SUBROUTINE
003751  314644202551    ..                          BCI     2,IOM ERROR             TEXT TO LOG
003752  514651202020
003753  000004 2200 13 ..   3416                    LDX0    T$IOSTS,Z       POINT TO STATUS CHECK ROUTINE
003754  000001 1200 03 ..   3417                    SBLX0   1,DU            ADJUST FOR GENERAL ERROR RETURN
003755  004010 7100 00 R.   3418                    TRA     ITRM5           LOAD STATUS AND RETURN
                                    3419    *
                                    3420    *       IOC/MEM OK - CHECK POWER BIT
                                    3421    *
                    003756          3422    ITRM2   NULL
003756  000005 2350 14 ..   3423                    LDA     QWORD,T         GET STATUS WORD
```

I PHYSICAL I/O -- INTERRUPT SERVICE RELEASED 01DEC80

```
003757  200000 3150 03 ..    3424           CANA    =0200000,DU     CHECK FOR POWER OFF                                  [21APR77]
003760  003767 6000 00 R.    3425           TZE     ITRM3           SKIP IF NORMAL
              003761         3426           DLOG    ( POWER)        LOG POWER OFF STATUS
003761  000000 4500 00 X.                   STZ     FLOG            DON'T INHIBIT DEVICE OUTPUT
003762  002120 7000 00 R.                   TSX0    DLOG            CALL SUBROUTINE
003763  204746662551   ..                   BCI     1,POWER              TEXT TO LOG
                       3427    *
                       3428    *       FAKE AN ATTENTION STATUS ON POWER OFF                                        [05NOV77]
                       3429    *                                                                                    [05NOV77]
003764  000002 2360 03 ..    3430           LDQ     2,DU            FAKE AN ATTENTION STATUS FOR STATUS CHECKER
003765  000004 2200 13 ..    3431           LDX0    T$IOSTS,Z       POINT TO STATUS CHECKING ROUTINE
003766  000001 7100 10 ..    3432           TRA     1,0             HANDLE LIKE ATTENTION
                       3433    *
                       3434    *       CHECK CHANNEL BUSY STATUS
                       3435    *
              003767   3436    ITRM3  NULL
003767  100000 3150 03 ..    3437           CANA    =0100000,DU     CHECK A BIT                                          [21APR77]
003770  004000 6000 00 R.    3438           TZE     ITRM4           EVERYTHING IS OK                                     [21APR77]
003771  070000 3150 03 ..    3439           CANA    =0070000,DU     BUT IS IT AN MPC STATUS?                             [21APR77]
003772  004033 6010 00 R.  -+3440           TNZ     RETRY           YES;COULD BE IOM QUEING PROBLEM;TRY IT TWICE *OTIS   [01DEC80]
              003773   3441           ELOG    (CHANNEL BUSY)
003773  000000 4500 00 X.                   STZ     FLOG            DON'T INHIBIT DEVICE OUTPUT
003774  002136 7000 00 R.                   TSX0    ELOG            CALL SUBROUTINE
003775  233021454525   ..                   BCI     2,CHANNEL BUSY       TEXT TO LOG
003776  432022646270
003777  004305 7100 00 R.    3442           TRA     FIN3            GIVE RECOVERABLE STATUS TO USER
                       3443    *
                       3444    *       CHECK FOR TIMEOUT TO LOG
                       3445    *
              004000   3446    ITRM4  NULL
004000  777777 2360 07 ..    3447           LDQ     -1,DL           MASK OFF LOWER HALF
004001  004347 2110 00 R.    3448           CMK     STIMO           IS IT TIMEOUT STATUS?
004002  004007 6010 00 R.    3449           TNZ     ITRM5-1         NO - SKIP LOG
              004003   3450           ELOG    (CHANNEL TIMO)  LOG ERROR
004003  000000 4500 00 X.                   STZ     FLOG            DON'T INHIBIT DEVICE OUTPUT
004004  002136 7000 00 R.                   TSX0    ELOG            CALL SUBROUTINE
004005  233021454525   ..                   BCI     2,CHANNEL TIMO       TEXT TO LOG
004006  432063314446
004007  000004 2200 13 ..    3451           LDX0    T$IOSTS,Z       POINT TO SPECIFIC STATUS CHECK ROUTINE
              004010   3452    ITRM5  NULL                    ENTERED HERE ON GENERAL ERROR
004010  000005 2360 14 ..    3453           LDQ     QWORD,T         GET STATUS WORD
004011  377760 3760 03 ..    3454           ANQ     =0377760,DU     ISOLATE STATUS AND QUEUE COUNTER                     [21APR77]
004012  000014 7720 00 ..    3455           QRL     12              MAJOR STATUS TO QU
004013  000001 7100 10 ..    3456           TRA     1,0             CHECK SPECIFIC STATUSES
```

```
                                3457            EJECT
                                3458    *                                                                       [05NOV77]
                                3459    *                                                                       [05NOV77]
                                3460    *       CONTROL RETURNS TO HERE AT THE END OF MOST I/O OPERATIONS       [05NOV77]
                                3461    *       WHICH TERMINATE SUCCESSFULLY.                                   [05NOV77]
                                3462    *                                                                       [05NOV77]
                    004014      3463    MSTSR   NULL                            RETURN FROM STATUS CHECKING
004014  000006 2200 13 ..       3464            LDXO    T$IONXT,Z               POINT TO NEXT ROUTINE
004015  000000 7100 10 ..       3465            TRA     0,0                     GO DO IT
                                3466    *
                                3467    *       COMMAND LINKING
                                3468    *
                    004016      3469    CLINK   NULL
004016  000006 7230 13 ..       3470            LXL     Z,T$IONXT,Z             GET LINK TO NEXT COMMAND
004017  000002 7430 14 ..       3471            STX     Z,CMD,T                 SAVE IN COMMAND POINTER
004020  002667 7100 00 R.       3472            TRA     MPCSR                   RETURN WITH PUB SIEZED
                                3473    *
                                3474    *       THESE INSTRUCTIONS ARE CALLED FROM VARIOUS STATUS CHECKING
                                3475    *       ROUTINES WHICH DO NOT EXPECT MPC STATUSES.
                                3476    *
004021  000000011007
                    004022      3477            EVEN                            THESE INSTRUCTIONS ARE XEDED
004022  000010 1160 03 ..       3478    MPCCK   CMPQ    8,DU                    CHECK FOR MAJOR STATUS > 8
004023  004301 6030 00 R.       3479            TRC     FAIL                    FORCE TO FAIL IF SO
```

I PHYSICAL I/O -- RETRY OPERATION RELEASED 01DEC80

```
                                3480            TTLS    PHYSICAL I/O -- RETRY OPERATION
                                3481    *
                                3482    *       CONTROL IS TRANSFERRED HERE WHEN IT IS DECIDED TO
                                3483    *       RETRY THE LAST OPERATION. REGISTERS SHOULD BE RESTORED
                                3484    *       AND THE PUB SIEZED BEFORE ENTRY.
                                3485    *
                    004024      3486    LRTRY   NULL                    HERE TO LOG AND RETRY
004024  000000 7210 17 X.       3487            LXL     X,U$RETRY,S     SEE IF WE HAVE RETRIED BEFORE
004025  004033 6010 00 R.       3488            TNZ     RETRY           SKIP LOGGING IF SO
                    004026      3489    LRTR1   NULL                    HERE FOR RETRY
                    004026      3490            DLOGF   ( ERROR)        ELSE LOG THIS ERROR
004026  000000 4500 00 X.                       STZ     FLOG
004027  000000 7500 00 X.                       STC2    FLOG
004030  002120 7000 00 R.                       TSX0    DLOG
004031  202551514651    ..                     BCI     1, ERROR
                    004032      3491            IFIOM                                                   [09DEC79]
004032  004040 7000 00 R.       3492            TSX0    DVSTS           READ AND LOG DETAILED STATUS    [09DEC79]
                                3493    ENDIOM  MARK                                                    [09DEC79]
                    004033      3494    RETRY   NULL
004033  000000 0540 17 X.       3495            AOS     U$RETRY,S       INCREMENT THE RETRY COUNTER
004034  000000 7210 17 X.       3496            LXL     X,U$RETRY,S     GET THE RETRY COUNT
004035  000005 1010 13 ..       3497            CMPX    X,T$IORTM,Z     COMPARE TO MAXIMUM              [01MAY79]
004036  002667 6020 00 R.       3498            TNC     RISUE           IF LESS, REISSUE THE COMMAND
004037  004301 7100 00 R.       3499            TRA     FAIL            LOG AND RETURN RECOVERABLE ERROR
```

I PHYSICAL I/O -- ISSUE READ DEVICE STATUS RELEASED 01DEC80

```
                                3500            TTLS    PHYSICAL I/O -- ISSUE READ DEVICE STATUS
                                3501    *
                                3502    *
                                3503    *       SUBROUTINE TO READ AND LOG DEVICE STATUS
                               +3504    *                                                              [01DEC80]
                               +3505    *       DEVICE DETAIL STATUS LOGGING TO CONSOLE MACRO          [01DEC80]
                               +3506    *          THIS MACRO WILL LOG TO THE CONSOLE A                [01DEC80]
                               +3507    *          DEVICE DETAIL STATUS FOR AN URMPC PRINTER           [01DEC80]
                               +3508    *                                                              [01DEC80]
                               +3509    DVSTL   MACRO                                                  [01DEC80]
                               +3510            CRSM    SAVE,OFF                                      [01DEC80]
                               +3511            STZ     I$FLOG                                        [01DEC80]
                               +3512            LDX     X,U$PTYPE,S                                   [01DEC80]
                               +3513            EAX     X,T$DVSTB,X                                   [01DEC80]
                               +3514            CMPX    X,T$URPRT,DU                                  [01DEC80]
                               +3515            TZE     2,IC                                          [01DEC80]
                               +3516            STC2    I$FLOG                                        [01DEC80]
                               +3517            TSX0    I$LOG                                         [01DEC80]
                               +3518            BCI     2,#1                                          [01DEC80]
                               +3519            INE     '#2',''                                       [01DEC80]
                               +3520            ARG     #2                                            [01DEC80]
                               +3521            INE     '#3',''                                       [01DEC80]
                               +3522            ARG     #3                                            [01DEC80]
                               +3523            INE     '#4',''                                       [01DEC80]
                               +3524            ARG     #4                                            [01DEC80]
                               +3525            INE     '#5',''                                       [01DEC80]
                               +3526            ARG     #5                                            [01DEC80]
                               +3527            CRSM    RESTORE                                       [01DEC80]
                               +3528            ENDM    DVSTL                                         [01DEC80]
                               +3529    *                                                             [01DEC80]
                               +3530    *                                                             [01DEC80]
                                3531    *
                    000006      3532    MAXDST  EQU     6               MAX SIZE OF DEVICE STATUS IN WORDS
                                3533    *
                    004040      3534    DVSTS   NULL                    READ DETAILED STATUS
                                3535    *
                                3536    *       CHECK TABLE OF READ DETAILED STATUS COMMANDS TO SEE IF WE SHOULD READ
                                3537    *
004040  000000 2210 17 X.       3538            LDX     X,U$PTYPE,S     GET DEVICE TYPE
004041  000151 2340 11 R.       3539            SZN     T$DVSTB,X       CHECK TABLE ENTRY FOR DEVICE TYPE
004042  000000 6000 10 ..       3540            TZE     0,0             NO DETAILED STATUS COMMAND
                                3541
004043  000000 6250 10 ..       3542            EAX     J,0,0           SAVE RETURN IN XR-J             [05NOV77]
                                3543    *
                                3544    *       GET NEW BLOCK AND COPY INTO IT
                                3545    *
                    004044      3546            GETD    I$DCW+1+MAXDST  GET BLOCK FOR DEVICE STATUS READ
004044  000025 2350 03 ..               LDA     I$DCW+1+MAXDST,DU
004045  000000 7000 00 X.               TSX0    A$GET
004046  777777 2210 14 ..       3547            LDX     X,T$LINK,T      GET PTR TO OLD ELEMENT
004047  000000 6220 14 ..       3548            EAX     Y,0,T           POINTER TO NEW
004050  000000011007
```

I PHYSICAL I/O -- ISSUE READ DEVICE STATUS RELEASED 01DEC80

```
004051  035600 5602 01 ..   3549            RPD     I$DCW,1          COPY BLOCK
004052  000000 2350 11 ..   3550            LDA     0,X
004053  000000 7550 12 ..   3551            STA     0,Y
                     3552    *
                     3553    *       SAVE RETURN, RESET PUB BUSY, SET COMMAND, AND REISSUE BLOCK
                     3554    *
004054  000006 7450 14 ..   3555            STX     J,I$URET,T       SAVE RETURN IN LIST ELEMENT                [05NOV77]
004055  777777 4440 16 X.   3556            SXL     T,Q$BUSY+P$Q,P   RESET PUB BUSY TASK
004056  000002 2350 07 ..   3557            LDA     B$SPIOP,DL       SPECIAL OPERATION
004057  000000 2550 16 X.   3558            ORSA    P$STAT,P         TO PREVENT ERROR RECOVERY
004060  000000 2210 17 X.   3559            LDX     X,U$PTYPE,S      GET DEVICE TYPE
004061  000206 6230 00 R.   3560            EAX     Z,T$RDDTS        POINT TO READ BLOCK
004062  000151 2350 11 R.   3561            LDA     T$DVSTB,X        GET READ STATUS COMMAND FOR THIS DEVICE
004063  000001 7550 13 ..   3562            STA     T$IOCPC,Z        SAVE IN COMMAND TABLE
004064  000002 7430 14 ..   3563            STX     Z,CMD,T          SAVE PTR TO TABLE
004065  000000 2200 03 ..   3564            LDXO    0,DU             SET ADDRESS EXTENSION TO FIRST 256K        [05NOV77]
004066  000006 4400 14 ..   3565            SXLO    ADEXT,T          SINCE ALL LIST ELEMENTS SHOULD BE THERE    [05NOV77]
004067  000017 6350 14 ..   3566            EAA     I$DCW+1,T        CREATE DCW TO DATA AREA
004070  000006 2750 07 ..   3567            ORA     MAXDST,DL        ADD MAX TALLY
004071  000016 7550 14 ..   3568            STA     I$DCW,T
004072  002667 7100 00 R.   3569            TRA     RISUE            ISSUE READ DEVICE STATUS
                     3570    *
                     3571    *       HERE TO CHECK STATUS OF DEVICE STATUS READ
                     3572    *       LOG INFO READ ON CONSOLE
                     3573    *
              004073 3574    DVST1    NULL                    LOG DATA
              004073 -+3575           DVSTL   (DETAIL STATS),(U$PDA,S),(I$DCW+1,T),(I$DCW+2,T),(I$DCW+3,T)    [01DEC80]
004073  000000 4500 00 X.             STZ     I$FLOG
004074  000000 2210 17 X.             LDX     X,U$PTYPE,S
004075  000151 6210 11 R.             EAX     X,T$DVSTB,X
004076  000173 1010 03 R.             CMPX    X,T$URPRT,DU
004077  000002 6000 04 ..             TZE     2,IC
004100  000000 7500 00 X.             STC2    I$FLOG
004101  000000 7000 00 X.             TSX0    I$LOG
004102  242563213143    ..            BCI     2,DETAIL STATS
004103  206263216362
004104  000000 0000 17 X.             ARG     U$PDA,S
004105  000017 0000 14 ..             ARG     I$DCW+1,T
004106  000020 0000 14 ..             ARG     I$DCW+2,T
004107  000021 0000 14 ..             ARG     I$DCW+3,T
              004110    +3576         DVSTL   (STATS (CONT)),(U$PDA,S),(I$DCW+4,T),(I$DCW+5,T),(I$DCW+6,T)    [01DEC80]
004110  000000 4500 00 X.             STZ     I$FLOG
004111  000000 2210 17 X.             LDX     X,U$PTYPE,S
004112  000151 6210 11 R.             EAX     X,T$DVSTB,X
004113  000173 1010 03 R.             CMPX    X,T$URPRT,DU
004114  000002 6000 04 ..             TZE     2,IC
004115  000000 7500 00 X.             STC2    I$FLOG
004116  000000 7000 00 X.             TSX0    I$LOG
004117  626321636220    ..            BCI     2,STATS (CONT)
004120  352346456355
004121  000000 0000 17 X.             ARG     U$PDA,S
004122  000022 0000 14 ..             ARG     I$DCW+4,T
```

I PHYSICAL I/O -- ISSUE READ DEVICE STATUS RELEASED 01DEC80

```
004123  000023 0000 14 ..            ARG     I$DCW+5,T
004124  000024 0000 14 ..            ARG     I$DCW+6,T
004125  000006 2250 14 ..    3577    LDX     J,I$URET,T      GET RETURN                    [05NOV77]
                004126       3578    REL                     RELEASE BLOCK                 [05NOV77]
004126  000000 7000 00 X.            TSX0    A$REL
                004127       3579    RREG                    RESTORE REGISTERS             [05NOV77]
004127  001520 7000 00 R.            TSX0    RREG            CALL SUBROUTINE
004130  777777 4440 16 X.    3580    SXL     T,Q$BUSY+P$Q,P  RESET PUB BUSY                [05NOV77]
004131  000000 7100 15 ..    3581    TRA     0,J             RETURN                        [05NOV77]
```

I PHYSICAL I/O -- DIAGNOSTIC DRIVER RELEASED 01DEC80

```
                                3582            TTLS    PHYSICAL I/O -- DIAGNOSTIC DRIVER
                                3583            HEAD    I               I FOR I/O
                                3584    *
                                3585    *
                                3586    *
                    004132      3587    DIAG    NULL                    ENTER HERE WITH I$MODE IN AU
                                3588    *
                                3589    *       SEE IF WE SHOULD SIEZE DEVICE
                                3590    *
004132  000020 3150 03 ..       3591            CANA    B$DGUHD,DU      DOES IT SAY 'USED HELD DEVICE'?
004133  004136 6010 00 R.       3592            TNZ     DIAG1           YES - CHECK IF POSSIBLE
004134  004154 2200 03 R.       3593            LDXO    DIAG3,DU        NO  - GET RESTART ADDRESS
004135  002627 7100 00 R.       3594            TRA     IO2             AND TAKE NORMAL QUEUEING ROUTE
                                3595    *
                                3596    *       QUEUEING BYPASS REQUESTED
                                3597    *
                    004136      3598    DIAG1   NULL
004136  000001 2210 03 ..       3599            LDX     X,B$IODGH,DU    GET GIAGNOSTIC-HOLD BIT
004137  000000 3010 17 X.       3600            CANX    X,U$STAT,S      SEE IF UNIT IS HELD
004140  004150 6010 00 R.       3601            TNZ     DIAG2           YES, SO USE IT
                                3602    *
                                3603    *       UNIT NOT HELD - FAKE DEVICE BUSY RETURN
                                3604    *
004141  000006 2210 14 ..       3605            LDX     X,URET,T        MOVE USER RETURN AROUND                 [29JAN77]
004142  000000 4410 14 ..       3606            SXL     X,Q$RUN,T        .                                      [29JAN77]
004143  004346 2350 00 R.       3607            LDA     DGDVB           FAKE STATUS WORD
004144  000011 7550 14 ..       3608            STA     QUEWD,T         SAVE FOR USER
004145  000016 2350 14 ..       3609            LDA     DCW,T           GET FIRST DCW
004146  000012 7550 14 ..       3610            STA     DCWWD,T         MAKE IT LAST DCW
004147  000000 7100 00 X.       3611            TRA     $EXIT1          RETURN TO USER
                                3612    *
                                3613    *
                                3614    *       DEVICE IS HELD - USE IT
                                3615    *
                    004150      3616    DIAG2   NULL
004150  000000 6410 17 X.       3617            ERSX    X,U$STAT,S      TURN OFF BIT TO PREVENT CONFLICT
004151  000000 2210 17 X.       3618            LDX     X,U$Q,S         POINT TO DEVICE QUEUE
004152  004154 6040 00 R.       3619            TMI     *+2             NO QUEUE - DON'T BOTHER
004153  777777 4440 11 ..       3620            SXL     T,Q$BUSY,X      SIEZE UNIT FOR US
                                3621    *
                                3622    *       DEVICE IS OURS - NOW GET PUB
                                3623    *
                    004154      3624    DIAG3   NULL
                    004154      3625            RREG                    RESTORE REGISTERS AFTER QUEUING
004154  001520 7000 00 R.               TSX0    RREG            CALL SUBROUTINE
004155  000000 2350 17 X.       3626            LDA     U$PDA,S         SEE IF LEGAL DEVICE
004156  004335 6040 00 R.       3627            TMI     POFF            NO-- FAKE A POWER OFF
004157  001524 7000 00 R.      -+3628            TSX0    CHLOC           GET CHANNEL LOC *OTIS                   [01DEC80]
004160  000000 6260 01 ..       3629            EAX     P,0,AU          AND PUT IN XRP
004161  000007 2350 14 ..       3630            LDA     MODE,T          GET USER'S COMMAND
004162  000004 3150 03 ..       3631            CANA    B$DGUHP,DU      SEE IF QUEUING BYPASS REQUESTED
004163  004201 6000 00 R.       3632            TZE     DIAG6           NO, QUEUE NORMALLY
```

```
                                    3633     *
                                    3634     *       QUEUE BYPASS REQUESTED - CHECK IF POSSIBLE
                                    3635     *
                          004164    3636     DIAG4   NULL                    PUB NUMBER IN XR-P
004164  000000 7210 16 X.         3637             LXL     X,P$STAT,P       GET PUB STATUS
004165  000001 3010 03 ..         3638             CANX    X,B$IOPDH,DU     CHECK FOR PREVIOUSLY HELD
004166  004174 6010 00 R.         3639             TNZ     DIAG5            YES - USE THIS PUB
004167  000000 2350 16 X.         3640             LDA     P$CHAN,P         NO-- ARE WE CROSSBARRED?
004170  004337 6050 00 R.         3641             TPL     CBUSY            NO-- FAKE CHANNEL BUSY RETURN
004171  001524 7000 00 R. -+3642  3642             TSX0    CHLOC            GET CHANNEL LOC *OTIS                [01DEC80]
004172  000000 6260 01 ..         3643             EAX     P,0,AU           PUT IT INTO PUB REGISTER
004173  004164 7100 00 R.         3644             TRA     DIAG4            AND TRY AGAIN
                                    3645     *
                                    3646     *       HELD PUB FOUND
                                    3647     *
                          004174    3648     DIAG5   NULL
004174  000003 7460 14 ..         3649             STX     P,PUB,T          SAVE PUB NUMBER IN LIST ELEMENT
004175  000001 6610 03 ..         3650             ERX     X,B$IOPDH,DU     TURN OFF BIT TO PREVENT CONFLICT
004176  000000 4410 16 X.         3651             SXL     X,P$STAT,P       RESTORE PUB STATUS
004177  777777 4440 16 X.         3652             SXL     T,Q$BUSY+P$Q,P   SHOW WE ARE USING THE PUB
004200  004203 7100 00 R.         3653             TRA     DIAG7            AND SKIP NORMAL QUEUEING
                                    3654     *
                                    3655     *       NORMAL QUEUEING FOR PUB
                                    3656     *
                          004201    3657     DIAG6   NULL
                          004201    3658             SIEZE   PUB
004201  000002 6230 00 ..                          EAX     Z,2              ASSUME DEFAULT PRIORITY
004202  001561 7000 00 R.                          TSX0    SIEZE            CALL SUBROUTINE TO QUEUE
                          004203    3659     DIAG7   NULL
                                    3660     *
                                    3661     *       SET UP PARAMETERS FOR CONNECT
                                    3662     *
                          004203    3663             RREG                     RESTORE REGISTERS AFTER QUEUEING
004203  001520 7000 00 R.                          TSX0    RREG             CALL SUBROUTINE
004204  000002 2350 07 ..         3664             LDA     B$SPIOP,DL       GET SPECIAL OPERATION BIT
004205  000000 2550 16 X.         3665             ORSA    P$STAT,P         TO SUPRESS ERROR CHECKING
004206  000215 6230 00 R.         3666             EAX     Z,T$IODG         POINT TO FAKE DIAGNOSTIC CONTROL BLOCK
004207  000002 7430 14 ..         3667             STX     Z,CMD,T          SAVE IN COMMAND TABLE POINTER
004210  000007 2350 14 ..         3668             LDA     MODE,T           GET USER'S COMMAND
004211  007700 3750 03 ..         3669             ANA     =0007700,DU      ISOLATE DEVICE COMMAND               [21APR77]
004212  000006 7350 00 ..         3670             ALS     6                LEFT JUSTIFY                         [21APR77]
004213  000001 7550 13 ..         3671             STA     T$IOCPC,Z        SAVE IN CONTROL BLOCK                [21APR77]
004214  000007 2350 14 ..         3672             LDA     MODE,T           RETRIEVE MODE                        [21APR77]
                                    3673     *                                                                    [21APR77]
                                    3674     *       CHECK IOC COMMAND                                            [21APR77]
                                    3675     *                                                                    [21APR77]
004215  010000 3150 03 ..         3676             CANA    =0010000,DU      CHECK FOR NON-DATA-TRANSFER COMMAND  [21APR77]
004216  002671 6000 00 R.         3677             TZE     CIOC             NO, SO GO                            [21APR77]
004217  000201 2350 07 ..         3678             LDA     =0000201,DL      SET FOR NON-DATA TRANSFER, 1 RECORD  [21APR77]
                                    3679     *
004220  020000 2360 07 ..         3680             LDQ     B$IOCDN,DL       SET BIT TO SKIP RESET STATUS
004221  000000 2560 16 X.         3681             ORSQ    P$STAT,P         USUALLY DONE BEFORE ISSUING OPERATION
```

I PHYSICAL I/O -- DIAGNOSTIC DRIVER

```
004222  000001 2550 13 ..   3682          ORSA    T$IOCPC,Z       INTO COMMAND WORD
004223  002671 7100 00 R.   3683          TRA     CIOC            AND ISSUE CONNECT
```

I PHYSICAL I/O -- DIAGNOSTIC DRIVER RELEASED 01DEC80

```
                                    3684              EJECT
                                    3685    *
                                    3686    *         COMPLETION OF DIAGNOSTIC COMMAND
                                    3687    *
                        004224      3688    DIAGX     NULL                        I$MODE IN XR-X
004224  004320 7170 00 R.           3689              XED       GQWRD             GET THE STW#1 WITH ADDRESS EXTENSION MASKED OUT   [05NOV77]
004225  000011 7550 14 ..           3690              STA       QUEWD,T           SAVE FOR USER                                     [05NOV77]
                                    3691    *
                                    3692    *         WHAT DO WE DO WITH THE PUB?
                                    3693    *
004226  000007 2210 14 ..           3694              LDX       X,MODE,T          GET THE MODE OF THE OPERATION
004227  000010 3010 03 ..           3695              CANX      X,B$DGHPB,DU      SHOULD WE HOLD PUB?
004230  004234 6000 00 R.           3696              TZE       DAGX1             NO - FREE IT
004231  000001 2350 07 ..           3697              LDA       B$IOPDH,DL        SET BIT TO SHOW HELD
004232  000000 2550 16 X.           3698              ORSA      P$STAT,P          IN CHANNEL STATUS
004233  004241 7100 00 R.           3699              TRA       DAGX2             AND SKIP RELEASE
                                    3700    *
                                    3701    *         PUB NOT HELD - RELEASE IT
                                    3702    *
                        004234      3703    DAGX1     NULL
                        004234      3704              FREE      PUB
004234  001620 7000 00 R.                             TSX0      I$FREE
004235  000001 2270 14 ..           3705              LDX       S,DEV,T           RESTORE UNIT NUMBER TO XR-S
004236  000007 2210 14 ..           3706              LDX       X,MODE,T          GET I$MODE AGAIN
                                    3707    *
                                    3708    *         NOW CONSIDER THE UNIT (PHYSICAL DEVICE)
                                    3709    *
004237  000040 3010 03 ..           3710              CANX      X,B$DGHDV,DU      SHOULD WE HOLD THE UNIT?
004240  004262 6000 00 R.           3711              TZE       RETD              NO - RETURN NORMALLY
                                    3712    *
                                    3713    *         SAVE THE UNIT
                                    3714    *
                        004241      3715    DAGX2     NULL                        IF PUB IS SAVED, SAVE UNIT
004241  000001 2350 03 ..           3716              LDA       B$IODGH,DU        GET BIT TO HOLD
004242  000000 2550 17 X.           3717              ORSA      U$STAT,S          SET IT IN UNIT STATUS
004243  000006 2210 14 ..           3718              LDX       X,URET,T          MOVE USER RETURN AROUND                           [29JAN77]
004244  000000 4410 14 ..           3719              SXL       X,Q$RUN,T          .                                                [29JAN77]
                        004245      3720              MTQ                         SET UP RETURN FOR USER
004245  000000 7000 00 X.                             TSX0      Q$MTQ             GO QUEUE THE TASK
004246  000000 7100 00 X.           3721              TRA       $EXIT             AND EXIT
```

I PHYSICAL I/O -- RETURN STATUS TO USER RELEASED 01DEC80

```
                                3722            TTLS    PHYSICAL I/O -- RETURN STATUS TO USER
                                3723            HEAD    I               I FOR I/O
                                3724    *
                                3725    *
                                3726    *       FINO - ENTER WITH PUB SIEZED. RETURN GOOD STATUS TO USER REGARDLE
                                3727    *
                        004247  3728    FINO    NULL
004247  004320 7170 00 R.       3729            XED     GQWRD           GET RETURN WORD W/ADDRESS EXTENSION MASKED OUT  [05NOV77]
004250  000012 2360 14 ..       3730            LDQ     DCWWD,T         AND LAST DCW WORD                               [05NOV77]
004251  004257 7100 00 R.       3731            TRA     RETO1           JOIN NORMAL ROUTINE
                                3732    *
                                3733    *
                                3734    *       FIN1: RETURN ZERO OR ONE STATUS DEPENDING ON RESIDUE IN SMBX1
                                3735    *       ENTER WITH PUB SIEZED
                                3736    *
                        004252  3737    FIN1    NULL
004252  004320 7170 00 R.       3738            XED     GQWRD           GET STATUS WORD WITH ADDRESS EXTENSION MASKED OUT [05NOV77]
004253  000012 2360 14 ..       3739            LDQ     DCWWD,T         AND LAST DCW                                    [05NOV77]
004254  707777 3160 07 ..       3740            CANQ    =0707777,DL     CHECK FOR WORD OR CHARACTER RESIDUE             [21APR77]
004255  004257 6000 00 R.       3741            TZE     RETO1           IF NONE, TREAT AS FINO
004256  000100 2750 07 ..       3742            ORA     1*B$IORET,DL    ELSE SET PARTIAL TRANSFER RETURN
                                3743
                        004257  3744    RETO1   NULL                    QUEWD IN A, DCWWD IN Q
004257  000011 7550 14 ..       3745            STA     QUEWD,T         SAVE USER STATUS WORD
004260  000012 7560 14 ..       3746            STQ     DCWWD,T         SAVE LAST DCW IMAGE
                        004261  3747    RETF    FREE    PUB             RELEASE THE CHANNEL
004261  001620 7000 00 R.               TSXO    I$FREE
                        004262  3748    RETD    NULL                    JOINED HERE BY DIAGNOSTICS
004262  000001 2270 14 ..       3749            LDX     S,DEV,T         RESTORE  DEVICE NUMBER
004263  000006 2210 14 ..       3750            LDX     X,URET,T        RESTORE USER RETURN                             [29JAN77]
004264  000000 4410 14 ..       3751            SXL     X,Q$RUN,T        .                                              [29JAN77]
                        004265  3752            MTQ                     SET UP RETURN TO USER
004265  000000 7000 00 X.               TSXO    Q$MTQ           GO QUEUE THE TASK
                                3753    **********************LOG END OF I/O CALL FOR SYSTEM LOGGER***
004266  700000 2350 03 ..       3754            LDA     =14B21,DU       GET TYPE OF CALL (I/O END)                      [21APR77]
004267  004271 0110 03 R.       3755    SYS2    NOP     IOSLG,DU        ******CHANGE TO TSXO WHEN LOGGING******
                                3756    ************************************************************
004270  002644 7100 00 R.       3757            TRA     NEXT            START NEXT OPERATION ON THIS DEVICE
                                3758    *
                                3759    *       LOG I/O TYPE CALL FOR SWAPPER LOGGER
                                3760    *
                        004271  3761    IOSLG   NULL
004271  004300 7400 00 R.       3762            STXO    IOLGX           SAVE EXIT
004272  000000 7000 00 X.       3763            TSXO    X$LHEAD         LOG A HEADER
004273  000000 6360 14 ..       3764            EAQ     0,T             GET T
004274  000010 2350 14 ..       3765            LDA     I$DAC,T         GET DEVICE CODE
004275  000022 7710 00 ..       3766            ARL     18              MOVE OVER
004276  000022 7370 00 ..       3767            LLS     18              NOW PUT IN  T
004277  000000 7170 00 X.       3768            XED     H$TLOG          LOG IT
004300  000000 7100 00 ..       3769    IOLGX   TRA     ...             RETURN
```

I PHYSICAL I/O -- RETURN STATUS TO USER

```
                                3770            EJECT                                                                   [05NOV77]
                                3771    *
                                3772    *
                                3773    *       FAIL - LOG ERROR AND THEN RETURN RECOVERABLE ERROR TO USER.
                                3774    *       ENTER WITH PUB SIEZED
                                3775    *
                     004301     3776    FAIL    NULL
                     004301     3777            DLOG    ( FAIL)         NOTE WE GO BACK TO USER
004301  000000 4500 00 X.                       STZ     FLOG            DON'T INHIBIT DEVICE OUTPUT
004302  002120 7000 00 R.                       TSX0    DLOG            CALL SUBROUTINE
004303  202621314320   ..                      BCI     1, FAIL             TEXT TO LOG
                                3778                                    AND FALL THROUGH TO FIN3
004304  004040 7000 00 R.       3779            TSX0    DVSTS           READ AND LOG DETAILED STATUS
                                3780    *
                                3781    *
                                3782    *       FIN3 - LIKE FAIL, BUT NO LOGGING
                                3783    *
                     004305     3784    FIN3    NULL
004305  004320 7170 00 R.       3785            XED     GQWRD           GET STATUS WORD WITH RETURN FIELD CLEARED       [05NOV77]
004306  000300 2750 07 ..       3786            ORA     3*B$IORET,DL    SET RECOVERABLE ERROR STATUS
004307  004312 7100 00 R.       3787            TRA     RET34           JOIN OTHER ROUTINES
                                3788    *
                                3789    *
                                3790    *       FIN2 - END OF FILE RETURN ON TAPE; LAST BATCH ON CARD READER; ETC
                                3791    *       ENTER WITH PUB SIEZED, AS USUAL
                                3792    *
                     004310     3793    FIN2    NULL
004310  004320 7170 00 R.       3794            XED     GQWRD           GET STATUS WORD WITH PIO RETURN CLEARED         [05NOV77]
004311  000200 2750 07 ..       3795            ORA     2*B$IORET,DL    SET STATUS                                      [05NOV77]
                     004312     3796    RET34   NULL                                                                    [05NOV77]
004312  000012 2360 14 ..       3797            LDQ     DCWWD,T         AND LAST DCW IMAGE                              [05NOV77]
004313  004257 7100 00 R.       3798            TRA     RET01           GIVE RETURN
                                3799    *
                                3800    *
                                3801    *       FIN4 - UNRECOVERABLE ERROR. ENTER WITH PUB SIEZED. THIS STATUS
                                3802    *       INFORMS USER NOT TO RETRY COMMAND.
                                3803    *
                     004314     3804    FIN4    NULL
004314  004320 7170 00 R.       3805            XED     GQWRD           GET STATUS WORD WITH RETURN FIELD CLEARED       [05NOV77]
004315  000400 2750 07 ..       3806            ORA     4*B$IORET,DL    SET STATUS                                      [05NOV77]
004316  004312 7100 00 R.       3807            TRA     RET34           JOIN OTHER ROUTINES                             [05NOV77]
                                3808    *                                                                               [05NOV77]
                                3809    *       DO AN XED  GQWRD TO LOAD THE QUEUE WORD (STW1 FROM IOM) INTO R-A        [05NOV77]
                                3810    *       AND MASK OUT THE ADDRESS EXTENSION (WHICH INTERFERES WITH THE PIO       [05NOV77]
                                3811    *       STATUS RETURN).                                                         [05NOV77]
                                3812    *                                                                               [05NOV77]
004317  000000011007
                     004320     3813            EVEN                                                                    [05NOV77]
004320  000005 2350 14 ..       3814    GQWRD   LDA     QWORD,T         LOAD IOM GENERATED STATUS WORD                  [05NOV77]
004321  004322 3750 00 R.       3815            ANA     ADXMK           MASK OUT ADDRESS EXTENSION                      [05NOV77]
                                3816                                                                                    [05NOV77]
004322  777777770077    ..      3817    ADXMK   OCT     777777770077    MASK TO CLEAR PIO RETURN FIELD                  [05NOV77]
```

```
                                3818              EJECT
                                3819    *
                                3820    *         FAKE STATUSES
                                3821    *
                                3822    *
                                3823    *         THESE ROUTINES GENERALLY RETURN STATUSES WHEN THE PUB IS NOT
                                3824    *         SIEZED, AS OPPOSED TO THE ROUTINES ON THE PRECEEDING PAGE.
                                3825    *
                                3826    *
                                3827    *         FAKE0 - FAKE GOOD STATUS
                                3828    *
                     004323     3829    FAKE0     NULL
004323  000000 2350 07 ..       3830              LDA       0,DL              VERY GOOD STATUS
004324  004326 7100 00 R.       3831              TRA       FAKE1             JOIN OTHER ROUTINES
                                3832    *
                                3833    *         RJCT - FAKE A COMMAND REJECT FOR A NON-RECOGNIZABLE COMMAND IN I$
                                3834    *
                     004325     3835    RJCT      NULL
004325  004343 2350 00 R.       3836              LDA       RJCTS             GETSTATUS
                     004326     3837    FAKE1     NULL                        ENTER HERE WITH QWORD IN A
004326  000001 2270 14 ..       3838              LDX       S,DEV,T           RESTORE UNIT NUMBER
004327  000016 2360 14 ..       3839              LDQ       DCW,T             GET THE FIRST DCW IMAGE
004330  000012 7560 14 ..       3840              STQ       DCWWD,T           MAKE IT LAST ALSO
004331  000011 7550 14 ..       3841              STA       QUEWD,T           SAVE STATUS JUST FAKED
004332  004262 7100 00 R.       3842              TRA       RETD              RETURN TO USER, LOGGING EXIT OF PIO
                                3843    *
                                3844    *
                                3845    *         BDAD - REJECT COMMAND FOR ADDRESS OUT OF BOUNDS
                                3846    *
                     004333     3847    BDAD      NULL                        ENTER WITH DEVICE SIEZED
004333  004344 2350 00 R.       3848              LDA       BDADS             GET STATUS
004334  004326 7100 00 R.       3849              TRA       FAKE1             JOIN OTHER ROUTINE
                                3850    *
                                3851    *
                                3852    *         POFF - FAKE POWER OFF
                                3853    *
                     004335     3854    POFF      NULL
004335  004345 2350 00 R.       3855              LDA       POFFS             GET STATUS
004336  004326 7100 00 R.       3856              TRA       FAKE1             RETURN IT TO USER
                                3857    *
                                3858    *
                                3859    *         CBUSY - CHANNEL BUSY FAKED FROM DIAGNOSTICS
                                3860    *
                     004337     3861    CBUSY     NULL
004337  004351 2350 00 R.       3862              LDA       CBSYS             GET STATUS WORD
004340  004326 7100 00 R.       3863              TRA       FAKE1             RETURN IT TO USER
```

I PHYSICAL I/O -- RETURN STATUS TO USER RELEASED 01DEC80

```
                                3864            EJECT                                                                   [09DEC79]
                                3865    *                                                                               [09DEC79]
                                3866    *       FAKE STATUS RETURNS. AS A MATTER OF POLICY WE DON'T                     [09DEC79]
                                3867    *       LIGHT THE SYNC BIT, TO LET THE USER KNOW THAT IT'S                      [09DEC79]
                                3868    *       A FAKE STATUS.                                                          [09DEC79]
                                3869    *                                                                               [09DEC79]
004341  000040000000    ..      3870    FKOKS   OCT     000040000000    STATUS RETURN ON TIMEOUT OR NO STATUS           [01DEC80]
004342  030220000400    ..      3871    BSERR   OCT     030220000400    BUFFER LENGTH ERROR FOR L6                      [09DEC79]
004343  050100000400    ..      3872    RJCTS   OCT     050100000400    STATUS TO REJECT COMMAND IN I$MODE
004344  030400000400    ..      3873    BDADS   OCT     030400000400    BAD DEVICE TYPE FIELD                           [01MAY79]
004345  200000000400    ..      3874    POFFS   OCT     200000000400    STATUS TO FAKE POWER OFF
004346  010000000400    ..      3875    DGDVB   OCT     010000000400    DEVICE BUSY FAKE BY DIAG
004347  070000000500    ..      3876    STIMO   OCT     070000000500    CHANNEL TIMEOUT STATUS
004350  070100000500    ..      3877    TICKS   OCT     070100000500    SPECIAL INTERRUPT WAIT TIMEOUT
004351  100000000400    ..      3878    CBSYS   OCT     100000000400    CHANNEL BUSY STATUS
```

```
3879                TTLS    PHYSICAL I/O -- STATUS CHECKING -- DRUM
3880    *
3881    *
3882    *           SPECIAL KLUDGE # 17                                          [21APR77]
3883    *                                                                        [21APR77]
3884    *           THE FOLLOWING CODE IS BEING SAVED FOR HISTORICAL REASONS.  WE DO [21APR77]
3885    *           NOT EXPECT THAT THERE WILL BE A NEED FOR MDU201,DSS167,DSS170, OR [21APR77]
3886    *           DSS180 ON AN IOM.  IF, HOWEVER, SUCH A THING BECOMES NECESSARY [21APR77]
3887    *           AND YOU DECIDE TO USE THE FOLLOWING CODE ON AN IOM, BE FOREWARNED [21APR77]
3888    *           THAT NONE OF IT HAS BEEN TESTED.                             [21APR77]
3889    *                                                                        [21APR77]
3890                INE     IOMFLG,1,%ZQX3  DELETE CODE FOR IOM                  [21APR77]
3891    *                                                                        [21APR77]
3892    *           SEEK-READ, SEEK-WRITE
3893    *
3894    DRRD1       NULL                    ENTRY FROM READ DRUM
3895    DRWT1       NULL                    ENTRY FROM WRITE DRUM
3896                TRA     RETRY           RETRY GENERAL TYPE ERRORS
3897                XED     MPCCK           LOG FAIL ON MPC STATUSES
3898                TRA     *+1,QU          BRANCH ON MAJOR STATUS
3899    *
3900    *           MAJOR STATUS BRANCH TABLE
3901    *
3902                TRA     MSTSR           0 = CHANNEL READY - RETURN
3903                TRA     FAIL            1 = DEVICE BUSY - WE BLEW IT BAD
3904                TRA     DRRD2           2 = ATTENTION - NOTE IT IN BIG LETTERS
3905                TRA     DRRD3  LRTRY      FOR NOW, LOG WORD COUNT ON DATA ALERTS
3906                TRA     MSTSR           4 = EOF (IOC-C HAS CORRECT RESIDUE)
3907                TRA     LRTRY           5 = COMMAND REJECT - LOG AND RETRY
3908                TRA     FAIL            6 = INTERMEDIATE - IMPOSSIBLE
3909                TRA     RETRY           7 = TIMEOUT - RETRY
3910    *
3911    *           ATTENTION CONDITION ON DRUM
3912    *
3913    DRRD2       NULL
3914                ORDER   3,(ATTENTION    DRUM)
3915                RREG                    RESTORE F REGISTERS AFTER ROADBLOCKING
3916                TRA     LRTRY           RETRY AND HOPE
3917    *
3918    *           DATA ALERT -- COMPUTE WORD ON THE DRUM WHICH IS BAD
3919    *
3920    DRRD3       NULL
3921                AOS     DRUME           COUNT DRUM ERRORS
3922                LXL     X,U$RETRY,S     CHECK FOR RETRY
3923                TNZ     DRRD5           RETRY, CHECK FOR TIMING ERRORS
3924                CANQ    =0010000,DL     CHECK FOR TRANSFER TIMING ERROR      [21APR77]
3925                TNZ     RETRY           JUST RETRY IF SO
3926                STZ     DRLT            ZERO OUT TEMP
3927    *
3928    ********************************
3929    *IOM
3930                IFE     IOMFLG,1,MARK
```

```
3931    *
3932            EAX     X,DCW,T         POINT TO ORIGINAL DCW
3933    *
3934    MARK    MARK
3935    *IOM
3936    ********************************
3937    *IOC
3938            INE     IOMFLG,1,MARK1
3939    *
3940            LDX     X,P$SMBX4,P     GET ORRIGINAL DCW POINTER
3941    *
3942    MARK1   MARK
3943    *IOC
3944    ********************************
3945    *
3946    DRRD4   NULL
3947            LDA     0,X             GET A DCW
3948            ANA     4096-1,DL       JUST THE COUNT
3949            TNZ     *+2             ZERO IS SPECIAL
3950            LDA     4096,DL         AND MEANS 4096
3951            ASA     DRLT            INCREMENT COUNT OF WORDS
3952    *
3953    ********************************
3954    *IOM
3955            IFE     IOMFLG,1,MARK
3956    *
3957            EAA     0,X             GET POINTER TO DCW
3958            ARL     18              IN A-LOWER
3959            ADX     X,1,DU          AND INCREMENT POINTER TO NEXT DCW
3960            EAQ     -1              MASK FOR LPWX IN Q-LOWER
3961            CMK     X$LPWX,P        ARE WE DONE YET?
3962            TNC     DRRD4           NO-- LOOP
3963            LDA     DCWWD,T         GET RESIDUE
3964    *
3965    MARK    MARK
3966    *IOM
3967    ********************************
3968    *IOC
3969            INE     IOMFLG,1,MARK1
3970    *
3971            ADX     X,1,DU          INCREMENT DCW POINTER
3972            CMPX    X,P$SMBX2,P     ARE WE DONE YET?
3973            TNC     DRRD4           NO -- LOOP
3974            LDA     P$SMBX1,P       GET RESIDUE
3975    *
3976    MARK1   MARK
3977    *IOC
3978    ********************************
3979    *
3980            ANA     4096-1,DL       JUST THE RESIDUE
3981            NEG                     NEGATE
3982            ASA     DRLT            ADJUST FOR OVERSHOOT
```

```
3983                LOG     (WORD           OFFSET),DRLT" LOG THE OFFSET
3984                RREG                    RESTORE REGISTERS
3985                TRA     LRTRY           RETRY OPERATION
3986    *
3987    DRRD5       NULL
3988                CANQ    =0010000,DL     CHECK FOR TRANSFER TIMING ERROR          [21APR77]
3989                TZE     RETRY           RETRY IF NOT
3990                TRA     LRTR1           FORCE LOG IF SO
3991    *
3992    DRUME       OCT     0               DRUM ERROR COUNTER
3993    *
3994    DRLT        ZERO                    TEMP FOR ROUTINE
3995                TTLS    PHYSICAL        I/O -- STATUS CHECKING -- DISK
3996    *
3997    *
3998    *           RESTORE 2314 (ERROR RECOVERY)
3999    *
4000    DKSK1       NULL                    SEEKS FOR BOTH READ AND WRITE
4001    DPRS1       NULL                    RESTORE (RECALIBRATE) INSTRUCTION
4002                TRA     RETRY           JUST RETRY GENERAL ERRORS ON SEEK
4003                XED     MPCCK           LOG FAIL ON MPC STATUSES
4004                TRA     *+1,QU          BRANCH ON MAJOR STATUS
4005                TRA     MSTSR           0 = CHANNEL READY - PROCEED TO NEXT TASK
4006                TRA     FAIL            1 = DEVICE BUSY - WE BLEW IT
4007                TRA     DKSK2           2 = ATTENTION - NOTIFY OPERATOR
4008                TRA     LRTRY           3 = DATA ALERT - LOG AND RETRY
4009                TRA     FAIL            4 = END-OF-FILE - SHOULDN'T HAPPEN ON SEE
4010                TRA     LRTRY           5 = CMD RJCT - LOG AND RETRY
4011                TRA     FAIL            6 = INTERMEDIATE - SHOULD NOT HAPPEN
4012                TRA     RETRY           7 = TIMEOUT - RETRY SEEK
4013    *
4014    *           ATTENTION
4015    *
4016    DKSK2       NULL
4017                ORDER   3,(ATTENTION    DISK)
4018                RREG                    RESTORE REGISTERS AFTER ROADBLOCKING
4019                TRA     FAIL            LOG STATUS AND RETURN TO USER
4020    *
4021    *           SEEK DSS167/DSS 170 DISCS
4022    *
4023    DPSK1       NULL
4024    DQSK1       NULL
4025                TRA     RETRY           RETRY IOC ERRORS
4026                XED     MPCCK           LOG FAIL ON MPC STATUSES
4027                TRA     *+1,QU          BRANCH ON MAJOR STATUS
4028    *
4029    *           MAJOR STATUS BRANCH TABLE
4030    *
4031                TRA     MSTSR           0 = READY - CONTINUE ONWARD
4032                TRA     FAIL            1 = DEVICE BUSY - SHOULD NOT OCCUR
4033                TRA     DPSK2           2 = ATTENTION - CHECK FOR 'SEEK INCOMPLETE'
4034                TRA     LRTRY           3 = DATA ALERT - LOG AND RETRY
```

```
4035                TRA     FAIL            4 = EOF - SHOULD NOT OCCUR ON SEEK
4036                TRA     DPSK3           5 = COMMAND REJECT - DIAGNOSE
4037                TRA     FAIL            6 = INTERMEDIATE - IMPOSSIBLE
4038                TRA     RETRY           7 = TIMEOUT - RESEEK
4039    *
4040    *       ATTENTION ON 2314 SEEK
4041    *
4042    DPSK2   NULL
4043                LDX     Y,CMD,T         GET POINTER TO SEEK COMMAND
4044    DPATN   NULL                        JOINED HERE FROM R/W COMMANDS
4045                SXL     Y,CMD,T         SAVE POINTER TO SEEK COMMAND
4046    DKRQ3   NULL                        ATTENTION ON REQUEST STATUS AFTER SPECIAL
4047                CANQ    =0020000,DL     CHECK FOR "SEEK INCOMPLETE" STATUS          [21APR77]
4048                TZE     DKSK2           IF NOT, LOG AND RETURN TO USER
4049    DPRST   NULL                        ISSUE RESTORE ON DISK PACK
4050                LDX     Z,T$DPRS,DU     POINT TO RESTORE (RECALIBRATE) COMMAND
4051                STX     Z,CMD,T         SAVE IN COMMAND POINTER
4052                TRA     LRTRY           LOG, THEN TRY RESTORE COMMAND
4053    *
4054    *       COMMAND REJECT ON 2314 SEEK, READ REGISTER, OR RESTORE
4055    *
4056    DPSK3   NULL
4057                CANQ    =0200000,DL     CHECK FOR 'HSFC BUSY' STATUS                [21APR77]
4058                TZE     LRTRY           JUST LOG AND RETRY IF NOT
4059    DPRJT   NULL                        JOINED HERE BY READ/WRITE
4060                SWAIT                   AWAIT SPECIAL INTERRUPT - SHOULD NOT TAKE LONG
4061                RREG                    RESTORE REGISTERS AFTER QUEUEING
4062                TRA     RETRY           RETRY WITHOUT LOGGING
4063                EJECT
4064    *
4065    *
4066    *       REQUEST STATUS AFTER SPECIAL
4067    *
4068    DKRQ1   NULL
4069                TRA     RETRY           JUST RETRY IOC ERRORS
4070                XED     MPCCK           LOG FAIL ON MPC STATUSES
4071                TRA     *+1,QU          BRANCH ON MAJOR STATUS
4072                TRA     MSTSR           0 = READY - GO AHEAD AND READ
4073                TRA     DKWT2           1 = DEVICE BUSY - STILL SEEKING
4074                TRA     DKRQ3           2 = ATTENTION - MAYBE DSS167 'SEEK INCOMPLETE'
4075                TRA     DKRQ2           3 = DATA ALERT - MUST RESEEK
4076                TRA     FAIL            4 = END OF FILE ?
4077                TRA     LRTRY           5 = CMD RJCT - LOG AND RETRY
4078                TRA     MSTSR           6 = INTERMEDIATE - SEEK IS COMPLETE
4079                TRA     DKRQ2           7 = TIMEOUT - REISSUE SEEK
4080    *
4081    *       DATA ALERT ON REQUEST STATUS AFTER SEEK DSU204
4082    *
4083    DKRQ2   NULL
4084                LXL     Z,CMD,T         GET SAVED R/W COMMAND POINTER
4085                TRA     DKRSK           BACK UP AND RESEEK
4086    *
```

```
4087    *       2314 READ-REGISTER COMMAND
4088    *
4089    DPRR1   NULL
4090            TRA     RETRY           RETRY IOC ERRORS
4091            XED     MPCCK           LOG FAIL ON MPC STATUSES
4092            TRA     *+1,QU          BRANCH ON MAJOR STATUS
4093    *
4094    *       MAJOR STATUS BRANCH TABLE
4095    *
4096            TRA     MSTSR           0 = READY - NEXT TASK WILL CHECK RESULT
4097            TRA     FAIL            1 = DEVICE BUSY - HSFC BUSY?
4098            TRA     LRTRY  DKSK2      2 = ATTENTION - SPURIOUS STATUS FROM HSFC?
4099            TRA     LRTRY           3 = DATA ALERT - LOG AND RETRY
4100            TRA     FAIL            4 = EOF - SHOULD NOT OCCUR
4101            TRA     DPSK3           5 = COMMAND REJECT - CHECK FOR HSFC BUSY
4102            TRA     FAIL            6 = INTERMEDIATE - IMPOSSIBLE
4103            TRA     RETRY           7 = TIMEOUT - JUST RETRY
4104    *
4105    *       READ-REGISTER SUCCESSFUL - NOTE COMPLETED SEEKS
4106    *
4107    DPRR2   NULL
4108    *
4109    ********************************
4110    *IOM
4111            IFE     IOMFLG,1,MARK
4112    *
4113            LDA     P$CHAN,P        CHECK ALL DEVICES ON THIS PUB
4114            TPL     DPRR6           WE HAVE THE FIRST DEVICE IN A
4115            ANA     -1,DU           MASK TO NEXT CROSSBARRED PUB
4116            ALS     2               SHIFT FOR INDEXING
4117            EAX     P,0,AU          PUT INTO PUB REGISTER
4118            TRA     DPRR2           TRY AGAIN
4119    DPRR6   LDX     P,PUB,T         RESTORE PUB NUMBER
4120            LDX     X,B$IOSKC,DU    GET "SEEK COMPLETE" BIT
4121            EAX     Y,0,AU          PUT DEVICE NUMBER IN Y
4122    *
4123    MARK    MARK
4124    *IOM
4125    ********************************
4126    *IOC
4127            INE     IOMFLG,1,MARK1
4128    *
4129            LDX     Y,P$CHAN,P      CHECK ALL DEVICES ON THIS PUB
4130            TPL     *+3             WE HAVE FIRST LINK IN Y
4131            EAX     P,B$SIGN,Y      WATCH OUT FOR CROSSBARRING
4132            TRA     DPRR2           TRY AGAIN
4133            LDX     P,PUB,T         RESTORE PUB NUMBER TO P
4134            LDX     X,B$IOSKC,DU    GET "SEEK COMPLETE" BIT
4135    *
4136    MARK1   MARK
4137    *IOC
4138    ********************************
```

```
4139     *
4140     DPRR3   NULL
4141             CANX     X,U$STAT,Y      SEE IF SEEK IS COMPLETE HERE
4142             TZE      DPRR5           NO, MUST CHECK
4143     DPRR4   LXL      Y,U$CHAN,Y      LINK TO NEXT CHANNEL
4144             TNZ      DPRR3           LOOP IF MORE
4145             TRA      DPRQX           NOW SEE IF WE CAN READ OR WRITE
4146     DPRR5   LDQ      U$PDA,Y         GET DEVICE NUMBER
4147             QRL      6               IN QU
4148             LDA      P$TEMP,P        GET RESULT OF READ REGISTER
4149             ALS      -1,QU           POSITION BIT FOR DEVICE
4150             TMI      DPRR4           SEEK NOT COMPLETE
4151             ORSX     X,U$STAT,Y      SET SEEK COMPLETE BIT
4152             TRA      DPRR4           LINK TO NEXT DEVICE
4153             EJECT
4154     *
4155     *       RESEEK OPERATION AND RETRY
4156     *
4157     DKRSK   NULL
4158             LXL      Z,T$IORTY,Z     GET POINTER BACK TO SEEK COMMAND
4159             STX      Z,CMD,T         SAVE IN LIST ELEMENT
4160             TRA      LRTRY           AND RETRY THE OPERATION
4161             EJECT
4162     *
4163     *       2314 R/W
4164     *       DSS167 R/W
4165     *
4166     DPRD1   NULL
4167     DPWT1   NULL
4168     DQWT1   NULL
4169     DQRD1   NULL
4170             TRA      *+3             SKIP ON IOC/IOM ERRORS
4171             XED      MPCCK           LOG FAIL ON MPC STATUSES
4172             TRA      DKRD1,QU        BRANCH ON MAJOR STATUS
4173             CANQ     =0004000,DL     CHECK FOR TERMINATE INTERRUPT          [21APR77]
4174             TZE      RETRY           JUST RETRY IF NOT
4175             LXL      Z,T$IORTY,Z     ELSE, MUST RESEEK
4176             STX      Z,CMD,T         POINT BACK TO SEEK AGAIN
4177             TRA      RETRY           WE HAVE ALREADY LOGGED
4178     *
4179     *       MAJOR STATUS BRANCH TABLE
4180     *
4181     DKRD1   NULL
4182             TRA      DPWT0  MSTSR      0 = READY - TEMP CHECK ON DCW RESIDUE ******
4183             TRA      FAIL            1 = DEVICE BUSY - WE BLEW IT
4184             TRA      DPWT2           2 = ATTENTION - CHECK FOR SEEK INCOMPLETE STATUS
4185             TRA      DPWT3           3 = DATA ALERT - WATCH FOR 'HEADER VERIFICATION F
4186             TRA      DKRSK           4 = EOF, RESEEK AND RETRY
4187             TRA      DPWT5           5 = COMMAND REJECT - CHECK FOR 'HSFC BUSY'
4188             TRA      FAIL            6 = INTERMEDIATE - IMPOSSIBLE
4189             TRA      DKRSK           7 = TIMEOUT - RESEEK AND RETRY
4190     *
```

```
4191    *       TEMPORARY CHECK FOR DCW RESIDUE ******************
4192    *
4193    DPWTO   NULL
4194    *
4195    *********************************
4196    *IOM
4197            IFE     IOMFLG,1,MARK
4198    *
4199            LDQ     DCWWD,T         GET DCW RESIDUE
4200    *
4201    MARK    MARK
4202    *IOM
4203    *********************************
4204    *IOC
4205            INE     IOMFLG,1,MARK1
4206    *
4207            LDQ     P$SMBX1,P       GET DCW RESIDUE
4208    *
4209    MARK1   MARK
4210    *IOC
4211    *********************************
4212    *
4213            CANQ    =07777,DL       SHOULD BE ZERO                          [21APR77]
4214            TZE     MSTSR           IT IS, SO RETURN NORMALLY
4215            TRA     DKRSK           IT ISN'T - PROBABLY HARDWARE ERROR - RETRY
4216    *
4217    *       ATTENTION ON 2314 R/W
4218    *
4219    DPWT2   NULL
4220            LXL     Y,T$IORTY,Z     POINT BACK TO SEEK COMMAND
4221            TRA     DPATN           JOIN ROUTINE FOR SEEK
4222    *
4223    *       DATA ALERT ON 2314 R/W
4224    *
4225    DPWT3   NULL
4226            LXL     Y,T$IORTY,Z     POINT BACK TO SEEK COMMAND
4227            CANQ    =0320000,DL     CHECK FOR DATA ERRORS                   [21APR77]
4228            TRA     DKRSK           ON WARREN'S INSTRUCTIONS ************
4229            TZE     DKRSK           IF NOT, RESEEK AND RETRY
4230            SXL     Y,CMD,T         SAVE POINTER TO SEEK COMMAND
4231    *
4232    *       SET UP READ-REGISTER COMMAND TO GET DETAILS
4233    *
4234            PROTO   (0,T)           GET ANOTHER WORKING BLOCK
4235            SXL     T,Q$BUSY+P$Q,P  UPDATE PUB BUSY POINTER
4236            LDA     B$SPIOP,DL      GET SPECIAL OPERATION BIT
4237            ORSA    P$STAT,P        TO PREVENT ERROR RECOVERY
4238            LDX     Z,T$DPRRA,DU    POINT TO READ REGISTER COMMAND
4239            LDX     X,B$IONSK,DU    GET BIT TO TELL IF DSS180
4240            CANX    X,U$STAT,S      CHECK IT
4241            TZE     *+2             NO
4242            LDX     Z,T$DPRRB,DU    READ REGISTER IS DIFFERENT ON DSS180
```

```
4243            STX     Z,CMD,T         SAVE IN COMMAND POINTER
4244    *
4245    ********************************
4246    *IOM
4247            IFE     IOMFLG,1,MARK
4248    *
4249            LDQ     DCW,T                                                   [29JAN77]
4250            STQ     SEKAD,T                                                 [29JAN77]
4251            EAA     P$TEMP,P        POINT TO TEMPORARY STORAGE
4252            ORA     2,DL            LENGTH OF THE TEMP
4253            STA     DCW,T           SAVE AS DCW
4254    *
4255    MARK    MARK
4256    *IOM
4257    ********************************
4258    *IOC
4259            INE     IOMFLG,1,MARK1
4260    *
4261            LDQ     P$SMBX1,P       PRESERVE SMBX1 FOR ERROR PRINTOUT       [29JAN77]
4262            STQ     SEKAD,T          .                                      [29JAN77]
4263    *
4264    MARK1   MARK
4265    *IOC
4266    ********************************
4267    *
4268            TRA     RISUE           ISSUE READ REGISTER INSTRUCTION
4269    *
4270    *       RETURN FROM READ REGISTER INSTRUCTION
4271    *
4272    DPRA1   NULL                    DON'T SKIP ONE BECAUSE B$SPIOP WAS ON
4273    *
4274    ********************************
4275    *IOM
4276            IFE     IOMFLG,1,MARK
4277    *
4278            LDQ     SEKAD,T                                                 [29JAN77]
4279            STQ     DCW,T                                                   [29JAN77]
4280    *
4281    MARK    MARK
4282    *IOM
4283    ********************************
4284    *IOC
4285            INE     IOMFLG,1,MARK1
4286    *
4287            LDQ     SEKAD,T         RESTORE MAILBOX FOR ERROR LOG           [29JAN77]
4288            STQ     P$SMBX1,P        .                                      [29JAN77]
4289    *
4290    MARK1   MARK
4291    *IOC
4292    ********************************
4293    *
4294            LOG     (READ           REGISTR),(P$TEMP,P),(P$TEMP+1,P),(QWORD,T)" LOG IT
```

I PHYSICAL I/O -- STATUS CHECKING -- DRUM RELEASED 01DEC80

```
4295              REL                        RELEASE EXTRA BLOCK
4296              RREG                       RESTORE REGISTERS AFTER LOGGING AND REL
4297              SXL       T,Q$BUSY+P$Q,P   RESET BUSY POINTER
4298              TRA       DPRST            GO ISSUE RESTORE AND RETRY
4299    *
4300    *         COMMAND REJECT ON 2314 R/W
4301    *
4302    DPWT5     NULL
4303              LDX       X,U$STAT,S       GET THE DEVICE'S BITS
4304              CANX      X,B$IONSK,DU     IS THIS A 180?
4305              TNZ       RETRY            YES, JUST RETRY THE OPERATION
4306              CANQ      =0200000,DL      CHECK FOR 'HSFC BUSY' STATUS          [21APR77]
4307              TNZ       DPRJT            WAIT FOR SPECIAL AND RETRY IF SO      [21APR77]
4308              TRA       DKRSK            ELSE RESEEK AND RETRY                 [21APR77]
4309    *                                                                          [21APR77]
4310    ZQX3      MARK                                                            [21APR77]
```

```
                                    4311            EJECT
                                    4312    *
                                    4313    *
                                    4314    *       STATUS CHECKING -- DSS190 FAMILY SEEK/READ, SEEK/WRITE
                                    4315    *
                        004352      4316    D9RD1   NULL
                        004352      4317    D9WT1   NULL
                        004352      4318    D9FT1   NULL                    FOR FORMAT COMMAND                          [01MAY79]
004352  004033 7100 00 R.           4319            TRA     RETRY           RETRY ON IOM ERRORS
004353  004354 7100 02 R.           4320            TRA     *+1,QU          BRANCH ON MAJOR STATUS
                                    4321    *
                                    4322    *       MAJOR STATUS BRANCH TABLE FOR DSS190 FAMILY
                                    4323    *
004354  004014 7100 00 R.           4324            TRA     MSTSR           0 = READY, RETURN GOOD STATUS
004355  004424 7100 00 R.           4325            TRA     D9RDF           1 = DEVICE BUSY, WE BLEW IT                 [05NOV77]
004356  004400 7100 00 R.           4326            TRA     D9RD3           2 = ATTENTION                               [05NOV77]
004357  004422 7100 00 R.           4327            TRA     D9RDR           3 = DATA ALERT, LOG AND RETRY               [05NOV77]
004360  004424 7100 00 R.           4328            TRA     D9RDF           4 = EOF,PROBABLY A BAD TRACK                [05NOV77]
004361  004424 7100 00 R.           4329            TRA     D9RDF           5 = COMMAND REJECT, WE BLEW IT              [05NOV77]
004362  004424 7100 00 R.           4330            TRA     D9RDF           6 = INTERMEDIATE, IMPOSSIBLE                [05NOV77]
004363  004422 7100 00 R.           4331            TRA     D9RDR           7 = TIMEOUT, LOG AND RETRY                  [05NOV77]
004364  000000 7100 20 X.           4332            TRA     $ZOPF,*         10 = CHANNEL BUSY, WE SHOULD HAVE CAUGHT IT [05NOV77]
004365  004424 7100 00 R.           4333            TRA     D9RDF           11 = IMPOSSIBLE                             [05NOV77]
004366  004417 7100 00 R.           4334            TRA     D9RD4           12 = MPC ATTENTION, CHECK FURTHER           [05NOV77]
004367  004372 7100 00 R.           4335            TRA     D9RD2           13 = MPC DATA ALERT, CHECK FURTHUR          [05NOV77]
004370  004424 7100 00 R.           4336            TRA     D9RDF           14 = IMPOSSIBLE                             [05NOV77]
004371  004424 7100 00 R.           4337            TRA     D9RDF           15 = MPC COMMAND REJECT, IMPOSSIBLE         [05NOV77]
                                    4338    *
                                    4339    *       MPC DATA ALERT ON DSS190 FAMILY READ/WRITE
                                    4340    *
                        004372      4341    D9RD2   NULL
004372  770000 3760 07 ..           4342            ANQ     =0770000,DL     MASK TO MINOR STATUS ONLY                   [05NOV77]
004373  300000 1160 07 ..           4343            CMPQ    =0300000,DL     CHECK FOR OK GROUP                          [05NOV77]
004374  004424 6020 00 R.           4344            TNC     D9RDF           STATUS < 30(8) ARE ALL BAD                  [05NOV77]
004375  340000 1160 07 ..           4345            CMPQ    =0340000,DL     CHECK FOR EDAC UNCORRECTABLE                [05NOV77]
004376  004424 6000 00 R.           4346            TZE     D9RDF           YES, RETURN BAD STATUS                      [05NOV77]
004377  004422 7100 00 R.           4347            TRA     D9RDR           ELSE RETRY                                  [05NOV77]
                                    4348    *
                                    4349    *       DEVICE ATTENTION ON DSS190 FAMILY
                                    4350    *
                        004400      4351    D9RD3   NULL
004400  120000 3160 07 ..           4352            CANQ    =0120000,DL     CHECK/SEEK INCOMPLETE?                      [05NOV77]
004401  004422 6010 00 R.           4353            TNZ     D9RDR           YES, JUST LOG AND RETRY                     [05NOV77]
004402  004040 7000 00 R.           4354            TSX0    DVSTS           READ AND LOG DEVICE DETAIL STATUS           [21APR77]
                        004403      4355            FREE    PUB             RELEASE THE CHANNEL
004403  001620 7000 00 R.                           TSX0    I$FREE
                        004404      4356            RREG
004404  001520 7000 00 R.                           TSX0    RREG            CALL SUBROUTINE
                        004405      4357            LOG     (ATTN DISK???),(U$PDA,S),(QWORD,T)
004405  000000 4500 00 X.                           STZ     I$FLOG          DON'T INHIBIT DEVICE OUTPUT
004406  000000 7000 00 X.                           TSX     0,I$LOG         CAN BE CALLED FROM THE OUTSIDE WORLD
004407  216363452024   ..                           BCI     2,ATTN DISK???      TEXT ARGUMENT
```

I PHYSICAL I/O -- STATUS CHECKING -- DRUM RELEASED 01DEC80

```
004410  316242171717
004411  000000 0000 17 X.                       ARG     U$PDA,S         YES, POINT TO IT
004412  000005 0000 14 ..                       ARG     QWORD,T
                004413      4358                ALARM
                                                INHIB   SAVE,OFF        UNINHIBIT
004413  262334 0110 03 ..                       NOP     91356,DU        SIGNAL ALARM WANTED
                                                INHIB   RESTORE         RESTORE INHIBIT
                004414      4359                SWAIT   RETURN          WAIT FOR A SPECIAL FROM
004414  002177 7000 00 R.                       TSX0    SWAIR
                004415      4360                RREG
004415  001520 7000 00 R.                       TSX0    RREG            CALL SUBROUTINE
004416  002661 7100 00 R.   4361                TRA     MAINA           RETRY THE OPERATION
                            4362    *
                            4363    *       MPC DEVICE ATTENTION                                    [21APR77]
                            4364    *                                                               [21APR77]
                004417      4365    D9RD4   NULL                                                    [21APR77]
004417  700000 3160 07 ..   4366            CANQ    =0700000,DL     CHECK FOR SUBSTATUS < 10(8)     [21APR77]
004420  004424 6000 00 R.   4367            TZE     D9RDF           YES, MPC FAILURE                [05NOV77]
004421  004422 7100 00 R.   4368            TRA     D9RDR           MIGHT BE RECOVERABLE, RETRY     [05NOV77]
                            4369    *                                                               [05NOV77]
                            4370    *       LOG AND RETRY BUT FIRST COMPUTE SEEK ADDRESS OF ERROR   [05NOV77]
                            4371    *                                                               [05NOV77]
                004422      4372    D9RDR   NULL                                                    [05NOV77]
004422  004426 7000 00 R.   4373            TSX0    MKSEEK          COMPUTE SEEK ADDRESS OF ERROR   [05NOV77]
004423  004024 7100 00 R.   4374            TRA     LRTRY           LOG AND RETRY                   [05NOV77]
                            4375    *                                                               [05NOV77]
                            4376    *       GENERATE FAIL MESSAGE BUT FIRST COMPUTE SEEK ADDRESS OF ERROR   [05NOV77]
                            4377    *                                                               [05NOV77]
                004424      4378    D9RDF   NULL                                                    [05NOV77]
004424  004426 7000 00 R.   4379            TSX0    MKSEEK          COMPUTE SEEK ADDRESS OF ERROR   [05NOV77]
004425  004301 7100 00 R.   4380            TRA     FAIL            AND GENERATE FAIL               [05NOV77]
```

I PHYSICAL I/O -- STATUS CHECKING -- DRUM RELEASED 01DEC80

```
                                    4381          EJECT                                                                  [05NOV77]
                                    4382    *                                                                            [05NOV77]
                                    4383    *                                                                            [05NOV77]
                                    4384    *     THIS SUBROUTINE COMPUTES THE REAL SEEK ADDRESS AFTER AN ERROR ON       [05NOV77]
                                    4385    *     A D191 OR M451 DISK AND STUFFS IT IN RSEEK,S.  IT ASSUMES THAT THE     [05NOV77]
                                    4386    *     MAILBOX FOR CHANNEL HAS NOT BEEN MODIFIED AND THAT THE LPW POINTS      [05NOV77]
                                    4387    *     TO THE FIRST DCW NOT USED.                                             [05NOV77]
                                    4388    *                                                                            [05NOV77]
                          004426    4389    MKSEEK  NULL                                                                 [05NOV77]
004426  004460 7400 00 R.         4390            STX0    MKSKX           SAVE RETURN                                    [05NOV77]
004427  004461 4500 00 R.         4391            STZ     MKTOT           CLEAR COUNT OF WORDS TRANSFERED                [05NOV77]
                                    4392                                                                                 [05NOV77]
004430  000016 6210 14 ..         4393            EAX     X,DCW,T         POINT TO THE START OF THE DCW LIST             [05NOV77]
004431  001546 7000 00 R.        -+4394            TSX0    IOMS            GET 4*CH IN YR;IOM# IN AL *OTIS                [01DEC80]
004432  000000 0620 05 X.        +4395            ADX     Y,X$MBXP,AL     GET LOC IN MAILBOXES *OTIS                     [01DEC80]
004433  000000 1010 12 ..        +4396            CMPX    X,X$LPW,Y       CHECK AGAINST LAST DCW*OTIS                    [01DEC80]
004434  004455 6050 00 R.         4397            TPL     MKS2            IOM DIDN'T GET HERE, ASSUME NO DATA TRANSFERED [05NOV77]
                                    4398    *                                                                            [05NOV77]
                                    4399    *     LOOP ADDING UP DCWS                                                    [05NOV77]
                                    4400    *                                                                            [05NOV77]
                          004435    4401    MKS1    NULL                                                                 [05NOV77]
004435  000000 2350 11 ..         4402            LDA     0,X             GET A DCW                                      [05NOV77]
004436  007777 3750 07 ..         4403            ANA     =07777,DL       MASK TO LENGTH                                 [05NOV77]
004437  004441 6010 00 R.         4404            TNZ     *+2             SKIP IF LENGTH VALID                           [05NOV77]
004440  010000 2350 07 ..         4405            LDA     4096,DL         0 = 4096                                       [05NOV77]
004441  004461 0550 00 R.         4406            ASA     MKTOT           ADD TO TOTAL                                   [05NOV77]
004442  000001 0610 03 ..         4407            ADX     X,1,DU          POINT TO NEXT DCW                              [05NOV77]
004443  000000 1010 12 ..        -+4408            CMPX    X,X$LPW,Y       DID THE IOM GET HERE?*OTIS                     [01DEC80]
004444  004435 6040 00 R.         4409            TMI     MKS1            YES, LOOP                                      [05NOV77]
                                    4410    *                                                                            [05NOV77]
                                    4411    *     NOW DECREMENT TOTAL BY THE DCW RESIDUE                                 [05NOV77]
                                    4412    *                                                                            [05NOV77]
004445  000012 2350 14 ..         4413            LDA     DCWWD,T         GET THE DCW RESIDUE                            [05NOV77]
004446  007777 3750 07 ..         4414            ANA     =07777,DL       MASK TO COUNT                                  [05NOV77]
004447  004451 6010 00 R.         4415            TNZ     *+2             SKIP IF VALID                                  [05NOV77]
004450  010000 2350 07 ..         4416            LDA     4096,DL         0 = 4096                                       [05NOV77]
004451  000000 5310 00 ..         4417            NEG                     TO SUBTRACT FROM TOTAL                         [05NOV77]
004452  004461 0750 00 R.         4418            ADA     MKTOT           NOW HAVE ACTUAL WORDS TRANSFERED               [05NOV77]
004453  000006 7710 00 ..         4419            ARL     6               DIVIDE BY 64 TO GET RECORDS TRANSFERED         [05NOV77]
004454  004461 7550 00 R.         4420            STA     MKTOT           AND SAVE                                       [05NOV77]
                                    4421    *                                                                            [05NOV77]
                                    4422    *     NOW COMPUTE ACTUAL SEEK ADDRESS & STUFF IN RSEEK                       [05NOV77]
                                    4423    *                                                                            [05NOV77]
                          004455    4424    MKS2    NULL                                                                 [05NOV77]
004455  000004 2350 14 ..         4425            LDA     SEKAD,T         LOAD STARTING SEEK ADDRESS                     [05NOV77]
004456  004461 0750 00 R.         4426            ADA     MKTOT           ADD NUMBER OF RECORDS SUCCESSFULLY TRANSFERED  [05NOV77]
004457  003133 7550 17 R.         4427            STA     RSEEK,S         SAVE IN TABLE                                  [05NOV77]
004460  000000 7100 00 ..         4428    MKSKX   TRA     ...             AND RETURN                                     [05NOV77]
                                    4429    *                                                                            [05NOV77]
                                    4430    *     STORAGE                                                                [05NOV77]
                                    4431    *                                                                            [05NOV77]
                          004461    4432    MKTOT   BSS     1               PLACE TO ACCUMULATE LENGTH TRANSFERED          [05NOV77]
```

```
                                  4433            TTLS    PHYSICAL I/O -- STATUS CHECKING -- HONEYWELL 716
                                  4434    *
                                  4435    *       READ, WRITE
                                  4436    *
                    004462       +4437    L6CHK   NULL                                                    [01DEC80]
                    004462        4438    H7RD1   NULL
                    004462        4439    H7WT1   NULL
    004462  004033 7100 00 R.     4440            TRA     RETRY           RETRY IOC ERRORS
    004463  004022 7170 00 R.     4441            XED     MPCCK           LOG FAIL ON MPC STATUSES
    004464  004465 7100 02 R.     4442            TRA     *+1,QU          BRANCH ON MAJOR STATUS
                                  4443    *
                                  4444    *       MAJOR STATUS BRANCH TABLE
                                  4445    *
    004465  004014 7100 00 R.     4446            TRA     MSTSR           0 = CHANNEL READY
    004466  004301 7100 00 R.     4447            TRA     FAIL            1 = DEVICE BUSY
    004467  004301 7100 00 R.     4448            TRA     FAIL            2 = DEVICE ATTENTION
    004470  004024 7100 00 R.     4449            TRA     LRTRY           3 = DATA  ALERT
    004471  004301 7100 00 R.     4450            TRA     FAIL            4 = EOF -- PUNT
    004472  004024 7100 00 R.     4451            TRA     LRTRY           5 = COMMAND REJECT
    004473  004301 7100 00 R.     4452            TRA     FAIL            6 = INTERMEDIATE -- SHOULDN'T HAPPEN
    004474  004301 7100 00 R.     4453            TRA     FAIL            7 = TIMEOUT
```

I PHYSICAL I/O -- STATUS CHECKING -- DATANET-30 RELEASED 01DEC80

```
                                4454            TTLS    PHYSICAL I/O -- STATUS CHECKING -- DATANET-30
                                4455    *
                                4456    *
                     004475     4457            IFIOM                                                   [09DEC79]
                                4458    *
                                4459    *       PROCESS STATUS FROM FUNCTIONAL HEADER READ/WRITE        [05NOV77]
                                4460    *                                                               [05NOV77]
                     004475     4461    DNRD1   NULL                                                    [05NOV77]
                     004475     4462    DNWT1   NULL                                                    [05NOV77]
    004475  004033 7100 00 R.   4463            TRA     RETRY           RETRY ON IOM ERRORS
    004476  004022 7170 00 R.   4464            XED     MPCCK           LOG FAIL ON MPC STATUSES
    004477  004500 7100 02 R.   4465            TRA     *+1,QU          BRANCH ON MAJOR STATUS
                                4466    *
                                4467    *
                                4468    *       MAJOR STATUS BRANCH TABLE FOR FUNCTIONAL MESSAGE READ/WRITE [05NOV77]
                                4469    *                                                               [05NOV77]
    004500  004510 7100 00 R.   4470            TRA     DNRD3           0 = CHANNEL READY - OK IF WRITE     [05NOV77]
    004501  004301 7100 00 R.   4471            TRA     FAIL            1 = DEVICE BUSY - SHOULD NEVER HAPPEN
    004502  004301 7100 00 R.   4472            TRA     FAIL            2 = ATTENTION
    004503  004527 7100 00 R.   4473            TRA     DNRTY           3 = DATA ALERT, TELL OPERATOR AND RETRY
    004504  004301 7100 00 R.   4474            TRA     FAIL            4 = END-OF-FILE, SHOULD NEVER HAPPEN
    004505  004536 7100 00 R.   4475            TRA     DNRD4           5 = COMD REJECT - DIAGNOSE
    004506  004541 7100 00 R.   4476            TRA     DNRD5           6 = INTERMEDIATE, CONTINUE
    004507  004301 7100 00 R.   4477            TRA     FAIL            7 = TIMEOUT - LET USER RECOVER
                                4478    *
                                4479    *       CHANNEL READY ON FUNCTIONAL HEADER READ/WRITE           [05NOV77]
                                4480    *                                                               [05NOV77]
                     004510     4481    DNRD3   NULL                                                    [05NOV77]
    004510  000002 7200 14 ..   4482            LXLO    CMD,T           GET ORIGINAL COMMAND TABLE POINTER [05NOV77]
    004511  001313 1000 03 R.   4483            CMPXO   T$DNWT,DU       WAS CHANNEL READY FROM WRITE?      [05NOV77]
    004512  004541 6000 00 R.   4484            TZE     DNRD5           YES, CONTINUE                      [05NOV77]
    004513  004301 7100 00 R.   4485            TRA     FAIL            FROM READ, SHOULD BE 6(INTERMEDIATE) STATUS [05NOV77]
                                4486    *                                                               [05NOV77]
                                4487    *       READ, WRITE
                                4488    *
                     004514     4489    DNRD2   NULL                    ENTRY FROM READ
                     004514     4490    DNWT2   NULL                    ENTRY FROM WRITE                   [05NOV77]
    004514  004033 7100 00 R.   4491            TRA     RETRY           JUST RETRY GENERAL ERRORS          [05NOV77]
    004515  004022 7170 00 R.   4492            XED     MPCCK           LOG FAIL ON MPC STATUSES
    004516  004517 7100 02 R.   4493            TRA     *+1,QU          BRANCH ON MAJOR STATUS
                                4494    *
                                4495    *       MAJOR STATUS BRANCH TABLE
                                4496    *
    004517  004014 7100 00 R.   4497            TRA     MSTSR           0 = CHANNEL READY - GOOD RETURN
    004520  004301 7100 00 R.   4498            TRA     FAIL            1 = DEVICE BUSY - SHOULD NEVER HAPPEN
    004521  004301 7100 00 R.   4499            TRA     FAIL            2 = ATTENTION
    004522  004527 7100 00 R.   4500            TRA     DNRTY           3 = DATA ALERT
    004523  004301 7100 00 R.   4501            TRA     FAIL            4 = END-OF-FILE - SHOULD NEVER HAPPEN
    004524  004536 7100 00 R.   4502            TRA     DNRD4           5 = CMD RJCT - DIAGNOSE
    004525  004301 7100 00 R.   4503            TRA     FAIL            6 = INTERMEDIATE - WE BLEW IT
    004526  004301 7100 00 R.   4504            TRA     FAIL            7 = TIMEOUT - LET USER RECOVER
                                4505    *
```

```
                                4506     *       RESTORE FIRST COMMAND AND RETRY
                                4507     *
004527  000002 7230 14 ..       4508     DNRTY   LXL     Z,CMD,T         REPLACE CURRENT COMMAND WITH 2-WORD
004530  000002 7430 14 ..       4509             STX     Z,CMD,T         READ OR WRITE
004531  000000 0540 17 X.       4510             AOS     U$RETRY,S       INCREMENT RETRY COUNT
004532  000000 7210 17 X.       4511             LXL     X,U$RETRY,S     EXAMINE RETRY COUNT
004533  000005 1010 13 ..       4512             CMPX    X,T$IORTM,Z     COMPARE AGAINST MAX                    [01MAY79]
004534  004301 6030 00 R.       4513             TRC     FAIL            IF MAX, LOG ERROR
004535  002665 7100 00 R.       4514             TRA     DPS1R           ELSE RE-EXECUTE PRE-CONNECT ROUTINE
                                4515     *
                                4516     ENDIOM  MARK                                                    [09DEC79]
                  004536        4517             IFIOC                                                   [09DEC79]
                                4518     *
                                4519     *
                                4520     *       READ ,  WRITE
                                4521     *
                                4522     DNRD1   NULL                    READ ENTRY
                                4523     DNWT1   NULL                    WRITE ENTRY
                                4524             TRA      RETRY          RETRY GENERAL ERRORS
                                4525             TRA      *+1,QU         BRANCH ON MAJOR STATUS
                                4526     *
                                4527     *       MAJOR STATUS BRANCH TABLE
                                4528     *
                                4529             TRA      MSTSR          0 = CHANNEL READY, GOOD
                                4530             TRA      FAIL           1 = DEVICE BUSY
                                4531             TRA      FAIL           2 = DEVICE ATTN
                                4532             TRA      LRTRY          3 = DATA ALTERT
                                4533             TRA      FAIL           4 = EOF, IMPOSSIBLE
                                4534             TRA      DNRD4          5 = COMMAND REJECT, GO DIAGNOSE
                                4535             TRA      FAIL           6 =  INTERMEDAITE STATUS
                                4536             TRA      FAIL           7 = TIMEOUT
                                4537     *
                                4538     ENDIOC  MARK                                                    [09DEC79]
                                4539     *
                                4540     *
                                4541     *       COMMAND REJECT
                                4542     *
                  004536        4543     DNRD4   NULL
004536  010000 3160 07 ..       4544             CANQ     =0010000,DL    SEE IF INVALID COMMAND SEQUENCE????    [21APR77]
004537  004033 6010 00 R.       4545             TNZ      RETRY  FIN3    ***RETRY IF WE MISSED THE WINDOW
004540  004024 7100 00 R.       4546             TRA      LRTRY          ELSE LOG AND RETRY
                                4547     *                                                               [09DEC79]
                  004541        4548             IFIOM                                                   [09DEC79]
                                4549     *
                                4550     *       INTERMEDIATE STATUS ON READ OF FUNCTIONAL
                                4551     *       HEADER -- SET PUNCH MODE AND CONTINUE
                                4552     *
                  004541        4553     DNRD5   NULL
004541  200000 2350 07 ..       4554             LDA      B$IOCPM,DL     SET CARD PUNCH MODE
004542  000000 2550 16 X.       4555             ORSA     P$STAT,P       IN PUB STATUS WORD
004543  004014 7100 00 R.       4556             TRA      MSTSR          AND CONTINUE WITH NEXT COMMAND
                                4557     *
```

```
4558     ENDIOM  MARK
4559     *
```

```
                                4560            TTLS    PHYSICAL I/O -- STATUS CHECKING -- CONSOLE TYPEWRITER
                                4561            HEAD    I               I FOR I/O
                                4562    *
                                4563    *
                                4564    *       CONSOLE WRITE
                                4565    *
                        004544  4566    CNWT1   NULL                    CONSOLE WRITE
004544  004033 7100 00 R.       4567            TRA     RETRY           RETRY IOC AND GENERAL ERRORS
004545  004022 7170 00 R.       4568            XED     MPCCK           LOG FAIL ON MPC STATUSES
004546  004547 7100 02 R.       4569            TRA     *+1,QU          BRANCH ON MAJOR STATUS
                                4570    *
                                4571    *       MAJOR STATUS BRANCH TABLE
                                4572    *
004547  004014 7100 00 R.       4573            TRA     MSTSR           0 - READY - RETURN GOOD STATUS
004550  004301 7100 00 R.       4574            TRA     FAIL            1 - DEVICE BUSY - SHOULD NOT HAPPEN
004551  004301 7100 00 R.       4575            TRA     FAIL            2 - ATTENTION - LOG AND RETURN TO USER
004552  004024 7100 00 R.       4576            TRA     LRTRY           3 - DATA ALERT - LOG AND RETRY
004553  004301 7100 00 R.       4577            TRA     FAIL            4 - EOF - IMPOSSIBLE
004554  004024 7100 00 R.       4578            TRA     LRTRY           5 - CMD REJECT
004555  004301 7100 00 R.       4579            TRA     FAIL            6 - INTERMEDIATE - IMPOSSIBLE
004556  004033 7100 00 R.       4580            TRA     RETRY           7 = TIMEOUT - RETRY
                                4581    *
                                4582    *
                                4583    *       WRITE ALARM
                                4584    *
                        004557  4585    CNAL1   NULL
004557  004033 7100 00 R.       4586            TRA     RETRY           RETRY GENERAL ERRORS
004560  004022 7170 00 R.       4587            XED     MPCCK           LOG FAIL ON MPC STATUSES
004561  004562 7100 02 R.       4588            TRA     *+1,QU          BRANCH ON MAJOR STATUS
                                4589    *
                                4590    *       MAJOR STATUS BRANCH TABLE
                                4591    *
004562  004014 7100 00 R.       4592            TRA     MSTSR           0 - READY - GOOD
004563  004301 7100 00 R.       4593            TRA     FAIL            1 - DEV BUSY - IMPOSSIBLE
004564  004305 7100 00 R.       4594            TRA     FIN3            2 - ATTENTION - PROBABLY OK ANYWAY
004565  004301 7100 00 R.       4595            TRA     FAIL            3 - DATA ALERT - WHAT DATA?
004566  004301 7100 00 R.       4596            TRA     FAIL            4 - EOF - IMPOSSIBLE
004567  004024 7100 00 R.       4597            TRA     LRTRY           5 - CMD RJCT - LOG AND RETRY
004570  004301 7100 00 R.       4598            TRA     FAIL            6 - INTERMEDIATE - IMPOSSIBLE
004571  004033 7100 00 R.       4599            TRA     RETRY           7 = TIMEOUT - JUST RETRY
                                4600    *
                                4601    *
                                4602    *       READ
                                4603    *
                        004572  4604    CNRD1   NULL
004572  004654 7100 00 R.       4605            TRA     CNDEL           PRINT 'DELETED' AND RETRY IOC ERRS
004573  004022 7170 00 R.       4606            XED     MPCCK           LOG FAIL ON MPC STATUSES
004574  004575 7100 02 R.       4607            TRA     *+1,QU          BRANCH ON MAJOR STATUS
                                4608    *
                                4609    *       MAJOR STATUS BRANCH TABLE
                                4610    *
004575  004612 7100 00 R.       4611            TRA     CNCR            0 - READY - GIVE CR
```

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004576  004301 7100 00 R.   4612          TRA     FAIL            1 - DEV BUSY - IMPOSSIBLE
004577  004301 7100 00 R.   4613          TRA     FAIL            2 - ATTENTION - RETURN TO USER
004600  004605 7100 00 R.   4614          TRA     CNALT           3 - DATA ALERT - DIAGNOSE
004601  004301 7100 00 R.   4615          TRA     FAIL            4 - EOF - IMPOSSIBLE
004602  004024 7100 00 R.   4616          TRA     LRTRY           5 - COMMAND REJECT - LOG AND RETRY
004603  004301 7100 00 R.   4617          TRA     FAIL            6 - INTERMEDIATE - IMPOSSIBLE
004604  004654 7100 00 R.   4618          TRA     CNDEL           7 = TIMEOUT - PRINT 'DELETED' AND RETRY
                            4619    *
                            4620    *       DATA ALERT ON READ
                            4621    *
                    004605  4622    CNALT   NULL
004605  100000 3160 07 ..   4623          CANQ    =0100000,DL     CHECK FOR OPERATOR DISTRACTED                   [21APR77]
004606  004650 6000 00 R.   4624          TZE     CNLT2           NO, KEEP CHECKING
                            4625    *
                            4626    *       OPERATOR DISTRACTED - GIVE STATUS BACK TO USER
                            4627    *
004607  004320 7170 00 R.   4628          XED     GQWRD           GET STATUS IN A WITH PIO RETURN FIELD CLEAR     [05NOV77]
004610  000300 2750 07 ..   4629          ORA     3*B$IORET,DL    MAKE IT A RECOVERABLE ERROR STATUS              [05NOV77]
004611  000005 7550 14 ..   4630          STA     QWORD,T         AND SAVE FOR FUTURE PICKUP                      [05NOV77]
                            4631                                  FALL THROUGH FOR CR                             [05NOV77]
                            4632    *                                                                             [05NOV77]
                            4633    *       HERE TO PAD LAST WORD OF INPUT WITH "77" AND SEND EOL               [05NOV77]
                            4634    *
                    004612  4635    CNCR    NULL                    ADJUST CHARACTER INPUT AND PRINT EOL
004612  000000 2360 07 ..   4636          LDQ     0,DL            CLEAR Q
004613  000012 2350 14 ..   4637          LDA     DCWWD,T         GET THE DCW RESIDUE
004614  700000 3750 07 ..   4638          ANA     =0700000,DL     MASK TO CHARACTER RESIDUE                       [21APR77]
004615  004645 6000 00 R.   4639          TZE     CNCR1           NONE-- SKIP                                     [21APR77]
004616  000006 7360 00 ..   4640    CNCR2   QLS     6               SHIFT MASK OVER ONE CHARACTER                   [21APR77]
004617  000077 2760 07 ..   4641          ORQ     =077,DL         ADD IN ANOTHER EOL FLAG                         [21APR77]
004620  100000 0750 07 ..   4642          ADA     =0100000,DL     INCREMENT CHARACTER COUNT                       [21APR77]
004621  600000 1150 07 ..   4643          CMPA    =0600000,DL     AT WORD BOUNDRY YET?                            [21APR77]
004622  004616 6010 00 R.   4644          TNZ     CNCR2           NO, GO MAKE BIGGER MASK
                            4645                                                                                  [05NOV77]
004623  000012 2350 14 ..   4646          LDA     DCWWD,T         GET THE DCW RESIDUE                             [05NOV77]
004624  000001 1750 03 ..   4647          SBA     1,DU            POINT TO THE LAST (PARTIAL) WORD TRANSFERED     [05NOV77]
004625  000000 2340 00 X.   4648          SZN     EXTMEM          RUNNING EXTENDED MEMORY?                        [05NOV77]
004626  004631 6010 00 R.   4649          TNZ     *+3             YES, MUCH WORK TO DO                            [05NOV77]
004627  000000 2560 01 ..   4650          ORSQ    0,AU            FILL OUT UNTRANSMITTED CHARACTERS               [05NOV77]
004630  004645 7100 00 R.   4651          TRA     CNCR1           DONE                                            [05NOV77]
                            4652    *                                                                             [05NOV77]
                            4653    *       FILL OUT LAST WORD FOR EXTENDED MEMORY                              [05NOV77]
                            4654    *                                                                             [05NOV77]
004631  777777 3750 03 ..   4655          ANA     -1,DU           MASK TO ADDRESS OF WORD TO BE FILLED IN         [05NOV77]
004632  000011 7710 00 ..   4656          ARL     18-9            RIGHT-JUSTIFY ADDRESS/512 IN AU, REST IN AL     [05NOV77]
004633  003233 7550 00 R.   4657          STA     CTEMP                                                           [05NOV77]
004634  000006 2350 14 ..   4658          LDA     ADEXT,T         LOAD ADDRESS EXTENSION                          [05NOV77]
004635  000033 7350 00 ..   4659          ALS     18+9            ALIGN TO LEFT OF ADDRESS IN CTEMP               [05NOV77]
004636  003233 2750 00 R.   4660          ORA     CTEMP           NOW HAVE ADDRESS/512 IN AU, REST IN AL          [05NOV77]
004637  000200 1750 03 ..   4661          SBA     2*64,DU         ADJUST FOR LMBA                                 [05NOV77]
004640  003233 7550 00 R.   4662          STA     CTEMP                                                           [05NOV77]
004641  003233 5700 00 R.   4663          LMBA    CTEMP           LOAD POINTER TO ADDRESS-64K                     [05NOV77]
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I PHYSICAL I/O -- STATUS CHECKING -- CONSOLE TYPEWRITER RELEASED 01DEC80

```
004642  777777 3750 07 ..   4664            ANA     -1,DL           MASK TO ADDRESS MOD 512                          [05NOV77]
004643  000011 7710 00 ..   4665            ARL     9               RIGHT JUSTIFY                                    [05NOV77]
004644  200000 2560 05 ..   4666            ORSQ    64*1024,AL      FILL OUT UNTRANSMITTED CHARACTERS                [05NOV77]
                            4667                                                                                     [05NOV77]
                004645      4668    CNCR1   NULL                                                                     [05NOV77]
                            4669    *                                                                                [05NOV77]
004645  004715 2350 00 R.   4670            LDA     CNCRM           DCW FOR CR                                       [05NOV77]
004646  004665 7000 00 R.   4671            TSX0    CNSAV           SAVE CURRENT STATUS TO REPORT AFTER WRITE        [05NOV77]
004647  004014 7100 00 R.   4672            TRA     MSTSR           CONTINUE
                            4673    *
                            4674    *       MORE DATA ALERTS
                            4675    *
                004650      4676    CNLT2   NULL
004650  400000 3160 07 ..   4677            CANQ    =0400000,DL     CHECK LINE TOO LONG                              [21APR77]
004651  004654 6000 00 R.   4678            TZE     CNDEL           GIVE DELETED MESSAGE IF NOT
004652  004717 2350 00 R.   4679            LDA     CNLTL           DCW FOR LINE TOO LONG MESSAGE
004653  004655 7100 00 R.   4680            TRA     CNDEL+1         AND SKIP OTHER LOAD
                004654      4681    CNDEL   NULL                    HERE TO PRINT 'DELETED'
004654  004726 2350 00 R.   4682            LDA     CNDLM           GET DCW
004655  000005 2360 14 ..   4683            LDQ     QWORD,T         LOAD QUEUE WORD (IOM STW1)                       [05NOV77]
004656  004322 3760 00 R.   4684            ANQ     ADXMK           MASK OUT PIO RETURN FIELD                        [05NOV77]
004657  000300 2760 07 ..   4685            ORQ     3*B$IORET,DL    MAKE IT A RECOVERABLE I/O ERROR                  [05NOV77]
004660  000005 7560 14 ..   4686            STQ     QWORD,T         RESTORE FOR LATER PICKUP                         [05NOV77]
004661  004665 7000 00 R.   4687            TSX0    CNSAV           SAVE FOR RETURN TO USER                          [05NOV77]
004662  000005 7230 13 ..   4688            LXL     Z,T$IORTY,Z     LOAD RETRY COMMAND                               [05NOV77]
004663  000002 7430 14 ..   4689            STX     Z,CMD,T         MAKE IT CURRENT                                  [05NOV77]
004664  004024 7100 00 R.   4690            TRA     LRTRY           LOG AND RETRY                                    [05NOV77]
                            4691    *                                                                                [05NOV77]
                            4692    *       SUBROUTINE TO SAVE STATUSES FROM CONSOLE READ                            [05NOV77]
                            4693    *                                                                                [05NOV77]
                004665      4694    CNSAV   NULL                                                                     [05NOV77]
004665  000015 7550 14 ..   4695            STA     IDCW,T          SAVE DCW TO POST-READ MESSAGE                    [05NOV77]
004666  000002 4430 14 ..   4696            SXL     Z,CMD,T         SAVE CURRENT COMMAND                             [05NOV77]
004667  000005 2350 14 ..   4697            LDA     QWORD,T         LOAD STATUS FROM READ                            [05NOV77]
004670  000011 7550 14 ..   4698            STA     QUEWD,T         SAVE IN CASE WE WANT TO RETURN IT                [05NOV77]
004671  000012 2350 14 ..   4699            LDA     DCWWD,T         LOAD THE DCW RESIDUE                             [05NOV77]
004672  000013 7550 14 ..   4700            STA     SIDCW,T         SAVE IN KLUDGE PLACE IN CASE WE NEED TO RESTORE  [05NOV77]
004673  000000 7100 10 ..   4701            TRA     0,0             RETURN                                           [05NOV77]
                            4702    *
                            4703    *
                            4704    *       POST-READ WRITE CHECKING
                            4705    *
                004674      4706    CNWT2   NULL
004674  004033 7100 00 R.   4707            TRA     RETRY           RETRY IOC ERRORS
004675  004022 7170 00 R.   4708            XED     MPCCK           LOG FAIL ON MPC STATUSES
004676  004677 7100 02 R.   4709            TRA     *+1,QU          BRANCH ON MAJOR STATUS
                            4710    *
                            4711    *       MAJOR STATUS BRANCH TABLE
                            4712    *
004677  004014 7100 00 R.   4713            TRA     MSTSR           0 = READY - CONTINUE NORMALLY
004700  004301 7100 00 R.   4714            TRA     FAIL            1 = DEVICE BUSY - IMPOSSIBLE
004701  004014 7100 00 R.   4715            TRA     MSTSR           2 = ATTENTION - IGNORE IT HERE
```

```
004702  004033 7100 00 R.   4716            TRA     RETRY           3 = DATA ALERT - JUST RETRY
004703  004301 7100 00 R.   4717            TRA     FAIL            4 = EOF - IMPOSSIBLE
004704  004033 7100 00 R.   4718            TRA     RETRY           5 = COMMAND REJECT - JUST RETRY
004705  004301 7100 00 R.   4719            TRA     FAIL            6 = INTERMEDIATE - IMPOSSIBLE
004706  004033 7100 00 R.   4720            TRA     RETRY           7 = TIMEOUT - RETRY
                            4721
                004707      4722    CNDLX   NULL                    HERE AFTER PRINTING 'DELETED'                    [05NOV77]
004707  000002 7230 14 ..   4723            LXL     Z,CMD,T         RESTORE OLD COMMAND POINTER                      [05NOV77]
004710  000002 7430 14 ..   4724            STX     Z,CMD,T                                                          [05NOV77]
004711  002667 7100 00 R.   4725            TRA     MPCSR           AND RETRY ORIGINAL COMMAND                       [05NOV77]
                            4726                                                                                     [05NOV77]
                004712      4727    CNRDX   NULL                    HERE TO TRAP READ                                [05NOV77]
004712  000013 2360 14 ..   4728            LDQ     SIDCW,T         LOAD DCW RESIDUE FROM READ                       [05NOV77]
004713  000012 7560 14 ..   4729            STQ     DCWWD,T         SAVE WHERE RETURN ROUTINES EXPECT IT             [05NOV77]
004714  004261 7100 00 R.   4730            TRA     RETF            AND RETURN WITH STATUS SAVED                     [05NOV77]
                            4731
004715  004716000001    R.  4732    CNCRM   IOTD    *+1,1           CARRIAGE RETURN
004716  770117171717    ..  4733            BCI     1,!1????
                            4734
004717  004720000006    R.  4735    CNLTL   IOTD    *+1,6                                                            [01SEP79]
004720  770143314525    ..  4736            BCI     6,!1LINE TOO LONG, TRY ANOTHER!!!!1???                           [01SEP79]
004721  206346462043
004722  464527732063
004723  517020214546
004724  633025517777
004725  777701171717
                            4737
004726  004727000002    R.  4738    CNDLM   IOTD    *+1,2
004727  202425432563    ..  4739            BCI     2, DELETED!1??
004730  252477011717
```

```
                                        4740            TTLS    PHYSICAL I/O -- STATUS CHECKING -- MAG TAPE
                                        4741    *       *
                                        4742    *       READ, WRITE, FWD SPACE, WEF, WRITE-SINGLE-CHARACTER
                                        4743    *
                    004731              4744    MTRD1   NULL
                    004731              4745    MTWT1   NULL
                    004731              4746    MTFF1   NULL
                    004731              4747    MTFR1   NULL
                    004731              4748    MTWF1   NULL
                    004731              4749    MTWO1   NULL
004731  004733 7100 00 R.               4750            TRA     *+2             ENTRY FOR GENERAL ERRORS
004732  004736 7100 02 R.               4751            TRA     MTRD2,QU        BRANCH ON MAJOR STATUS
004733  004000 3160 07 ..               4752            CANQ    =0004000,DL     CHECK FOR TERMINATE INTERRUPT                [21APR77]
004734  004033 6000 00 R.               4753            TZE     RETRY           JUST RETRY IF NOT
004735  005002 7100 00 R.               4754            TRA     MTRD5           ELSE BACKSPACE AND RETRY
                                        4755    *
                                        4756    *       MAJOR STATUS BRANCH TABLE
                                        4757    *
                    004736              4758    MTRD2   NULL
004736  004754 7100 00 R.               4759            TRA     MTRD9           0 = CHANNEL READY - CHECK FOR ASCII ALERT    [05NOV77]
004737  004305 7100 00 R.               4760            TRA     FIN3            1 = DEVICE BUSY - RETURN IT TO USER
004740  004771 7100 00 R.               4761            TRA     MTRD3           2 = DEVICE ATTENTION - DIAGNOSE
004741  004774 7100 00 R.               4762            TRA     MTRD4           3 = DATA ALERT - CHECK SOME MORE
004742  004310 7100 00 R.               4763            TRA     FIN2            4 = END-OF-FILE MARK
004743  005021 7100 00 R.               4764            TRA     MTRD6           5 = COMMAND REJECT
004744  004301 7100 00 R.               4765            TRA     FAIL            6 = INTERMEDIATE - TEST SWITCH IS THROWN
004745  004301 7100 00 R.               4766            TRA     FAIL            7 = TIMEOUT - CAN'T TELL WHAT TO DO
004746  000000 7100 20 X.               4767            TRA     $ZOPF,*         10 = CHANNEL BUSY, WE SHOULD HAVE CAUGHT IT
004747  004301 7100 00 R.               4768            TRA     FAIL            11 = IMPOSSIBLE
004750  004757 7100 00 R.               4769            TRA     MTRD8           12 = MPC DEVICE ATTN., DIAGNOSE
004751  004763 7100 00 R.               4770            TRA     MTRD7           13 = MPC DATA ALERT, CHECK FURTHUR
004752  004301 7100 00 R.               4771            TRA     FAIL            14 = IMPOSSIBLE
004753  004301 7100 00 R.               4772            TRA     FAIL            15 = MPC COMMAND REJECT, IMPOSSIBLE
                                        4773    *
                                        4774    *       CHANNEL READY                                                [05NOV77]
                                        4775    *                                                                    [05NOV77]
                    004754              4776    MTRD9   NULL                                                         [05NOV77]
004754  100000 3160 07 ..               4777            CANQ    =0100000,DL     CHECK FOR ASCII ALERT                [05NOV77]
004755  004014 6000 00 R.               4778            TZE     MSTSR           NO, RETURN GOOD STATUS               [05NOV77]
004756  004305 7100 00 R.               4779            TRA     FIN3            YES, RETURN RECOVERABLE I/O ERROR    [05NOV77]
                                        4780    *                                                                    [05NOV77]
                                        4781    *       MPC ATTENTION ON MTS500
                                        4782    *
                    004757              4783    MTRD8   NULL
004757  770000 3760 07 ..               4784            ANQ     =0770000,DL     MASK TO SUBSTATUS                    [21APR77]
004760  100000 1160 07 ..               4785            CMPQ    =0100000,DL     IS IT INCOMPATIBLE MODE?             [21APR77]
004761  004305 6000 00 R.               4786            TZE     FIN3            YES, RETURN TO USER WITH NO LOGGING  [21APR77]
004762  004301 7100 00 R.               4787            TRA     FAIL            MPC FAILURE                          [21APR77]
                                        4788    *                                                                    [21APR77]
                                        4789    *       MPC DATA ALERT ON MTS500                                     [21APR77]
                                        4790    *                                                                    [21APR77]
                    004763              4791    MTRD7   NULL                                                         [21APR77]
```

I PHYSICAL I/O -- STATUS CHECKING -- MAG TAPE RELEASED 01DEC80

```
004763  700000 3160 07 ..   4792          CANQ    =0700000,DL     CHECK FOR BAD MPC STUFF                          [21APR77]
004764  004301 6000 00 R.   4793          TZE     FAIL            YES, LOG FAIL                                    [21APR77]
004765  770000 3760 07 ..   4794          ANQ     =0770000,DL     MASK TO SUBSTATUS                                [04JUL77]
004766  240000 1160 07 ..   4795          CMPQ    =0240000,DL     CODE ALERT??                                     [04JUL77]
004767  004305 6000 00 R.   4796          TZE     FIN3            YES, JUST RETURN TO USER WITHOUT LOGGING         [04JUL77]
004770  005002 7100 00 R.   4797          TRA     MTRD5           ELSE, BAKSPACE AND RETRY                         [21APR77]
                            4798    *                                                                            [21APR77]
                            4799    *       DEVICE ATTENTION                                                     [21APR77]
                            4800    *                                                                            [21APR77]
                004771      4801    MTRD3   NULL                                                                 [21APR77]
004771  700000 3160 07 ..   4802          CANQ    =0700000,DL     NIL/BLANK TAPE ON WRITE/CHECK                    [21APR77]
004772  004305 6000 00 R.   4803          TZE     FIN3            RETURN OTHERS WITHOUT LOGGING                    [21APR77]
004773  004301 7100 00 R.   4804          TRA     FAIL            LOG ERROR AND RETURN TO USER                     [21APR77]
                            4805    *                                                                            [21APR77]
                            4806    *       DATA ALERT CONDITION                                                 [21APR77]
                            4807    *                                                                            [21APR77]
                004774      4808    MTRD4   NULL                                                                 [21APR77]
004774  020000 3160 07 ..   4809          CANQ    =0020000,DL     CHECK FOR BLANK TAPE ON READ                     [21APR77]
004775  004314 6010 00 R.   4810          TNZ     FIN4            THAT IS NOT RECOVERABLE                          [21APR77]
004776  400000 3160 07 ..   4811          CANQ    =0400000,DL     CHECK FOR END-OF-TAPE  FOIL                      [21APR77]
004777  004014 6010 00 R.   4812          TNZ     MSTSR           YES, RETURN GOOD STATUS TO USER                  [21APR77]
                            4813                                  FALL THROUGH TO RETRY ASSORTED ERRORS        [21APR77]
                            4814    *                                                                            [21APR77]
                            4815    *       RETRY TAPE OPERATION                                                 [21APR77]
                            4816    *                                                                            [21APR77]
005000  004000 3160 07 ..   4817          CANQ    =0004000,DL     CHECK FOR TERMINATE INTERRUPT                    [21APR77]
005001  004024 6000 00 R.   4818          TZE     LRTRY           LOG AND RETRY IF NOT
                            4819    *
                            4820    *       BACKSPACE AND RETRY
                            4821    *
                005002      4822    MTRD5   NULL
                            4823    *
                            4824    *       SAVE STATUS FROM BEFORE BACKSPACE
                            4825    *
005002  004320 7170 00 R.   4826          XED     GQWRD           GET STATUS WORD WITH PIO RETURN FIELD CLEAR      [05NOV77]
005003  000300 2750 07 ..   4827          ORA     3*B$IORET,DL    MAKE RECOVERABLE I/O ERROR                       [05NOV77]
005004  000011 7550 14 ..   4828          STA     QUEWD,T         SAVE QUEUE WORD                                  [05NOV77]
                            4829
                            4830                  THE  STRATEGY HERE WILL BE TO ATTEMPT THE BACKSPACE.
                            4831                  IF  THE TAPE DOES NOT SEEM TO MOVE BACKWARDS, THE
                            4832                  SAVED  STATUS WILL BE RETURNED TO THE USER.  OTHERWISE,
                            4833                  THE  OPERATION WILL BE RETRIED.
                            4834
005005  000002 4430 14 ..   4835          SXL     Z,CMD,T         SAVE CURRENT COMMAND POINTER
005006  000005 2210 13 ..   4836          LDX     X,T$IORTM,Z     GET RETRY MAX FOR THIS COMMAND                   [01MAY79]
005007  000005 7230 13 ..   4837          LXL     Z,T$IORTY,Z     GET POINTER TO BACKSPACE COMMAND FOR THIS        [01MAY79]
005010  000005 7410 13 ..   4838          STX     X,T$IORTM,Z     SAVE RETRY MAX                                   [01MAY79]
005011  000002 7430 14 ..   4839          STX     Z,CMD,T         SAVE IN COMMAND POINTER
005012  004024 7100 00 R.   4840          TRA     LRTRY           RETRY THE COMMAND (NOW BACKSPACE)
                            4841    *
                            4842    *       NEXT TASK AFTER BACKSPACE
                            4843    *
```

I PHYSICAL I/O -- STATUS CHECKING -- MAG TAPE RELEASED 01DEC80

```
                  005013      4844    MTBSX   NULL
005013  000007 2210 14 ..     4845            LDX     X,MODE,T        WHAT NEXT?                                  [170CT76]
005014  600000 1010 03 ..     4846            CMPX    X,MDWR,DU       WAS THIS SUPPOSED TO BE A WRITE?            [170CT76]
005015  004016 6000 00 R.     4847            TZE     CLINK           GO ERASE BAD RECORD IF SO                   [170CT76]
                  005016      4848    MTBX1   NULL                                                                [170CT76]
005016  000002 7230 14 ..     4849            LXL     Z,CMD,T         GET OLD COMMAND POINTER BACK
005017  000002 7430 14 ..     4850            STX     Z,CMD,T         POINT TO IT
005020  002667 7100 00 R.     4851            TRA     MPCSR           RETURN WITH PUB SIEZED
                              4852    *
                              4853    *       COMMAND REJECT FROM TAPE
                              4854    *
                  005021      4855    MTRD6   NULL
005021  200000 3160 07 ..     4856            CANQ    =0200000,DL     CHECK FOR READ-AFTER-WRITE CHECK            [21APR77]
005022  004314 6010 00 R.     4857            TNZ     FIN4            UNRECOVERABLE I/O ERROR TO USER             [21APR77]
005023  100000 3160 07 ..     4858            CANQ    =0100000,DL     TAPE AT LOAD POINT ON BACKSPACE             [21APR77]
005024  004305 6010 00 R.     4859            TNZ     FIN3            RETURN THAT STATUS TO USER
005025  004024 7100 00 R.     4860            TRA     LRTRY           ELSE JUST LOG AND RETRY
```

```
                                4861                EJECT
                                4862    *
                                4863    *
                                4864    *           BACKSPACE IN ERROR RECOVERY
                                4865    *
                      005026    4866    MTBS1       NULL
005026  005030 7100 00 R.       4867                TRA     *+2             SKIP ON ERROR
005027  005037 7100 02 R.       4868                TRA     MTBS2,QU        BRANCH ON MAJOR STATUS
005030  004000 3160 07 ..       4869                CANQ    =0004000,DL     CHECK FOR TERMINATE INTERRUPT      [21APR77]
005031  004014 6010 00 R.       4870                TNZ     MSTSR           ASSUME TAPE MOVED IF SO
                                4871    *
                                4872    *           RETURN SAVED STATUS TO USER
                                4873    *
                      005032    4874    MTBS3       NULL                                               [05NOV77]
005032  000013 2360 14 ..       4875                LDQ     SIDCW,T         RETURN OLD DCW RESIDUE     [29JAN77]
005033  000012 7560 14 ..       4876                STQ     DCWWD,T          .                         [29JAN77]
005034  000004 2360 14 ..       4877                LDQ     SEKAD,T         RESTORE OLD DCW            [29JAN77]
005035  000016 7560 14 ..       4878                STQ     DCW,T            .                         [29JAN77]
005036  004261 7100 00 R.       4879                TRA     RETF            RETURN OLD STATUS TO USER
                                4880    *
                                4881    *           MAJOR STATUS BRANCH TABLE
                                4882    *
                      005037    4883    MTBS2       NULL
005037  004014 7100 00 R.       4884                TRA     MSTSR           0 = READY - GOOD
005040  005055 7100 00 R.       4885                TRA     MTBS4           1 = DEVICE BUSY - LOG AND EXIT
005041  005055 7100 00 R.       4886                TRA     MTBS4           2 = ATTENTION - LOG AND EXIT
005042  005026 7100 00 R.       4887                TRA     MTBS1           3 = DATA ALERT - HANDLE LIKE IOC ERROR
005043  005055 7100 00 R.       4888                TRA     MTBS4           4 = EOF - LOG AND EXIT
005044  005026 7100 00 R.       4889                TRA     MTBS1           5 = COMMAND REJECT - LIKE IOC ERROR
005045  005055 7100 00 R.       4890                TRA     MTBS4           6 = INTERMEDIATE - NOT EXPECTED
005046  005032 7100 00 R.       4891                TRA     MTBS3           7 = TIMEOUT - ASSUME TAPE MOVED
005047  000000 7100 20 X.       4892                TRA     $ZOPF,*         10 = CHANNEL BUSY, WE SHOULD HAVE CAUGHT IT
005050  004301 7100 00 R.       4893                TRA     FAIL            11 = IMPOSSIBLE
005051  005055 7100 00 R.       4894                TRA     MTBS4           12 = MPC ATTENTION, LOG ERROR
005052  005026 7100 00 R.       4895                TRA     MTBS1           13 = MPC DATA ALERT, TREAT LIKE IOM ERROR
005053  004301 7100 00 R.       4896                TRA     FAIL            14 = IMPOSSIBLE
005054  004301 7100 00 R.       4897                TRA     FAIL            15 = MPC REJECT, IMPOSSIBLE
                                4898    *
                                4899    *
                                4900    *           UNEXPECTED CONDITIONS
                                4901    *
                      005055    4902    MTBS4       NULL
                      005055    4903                DLOG    ( ERROR)
005055  000000 4500 00 X.                           STZ     FLOG            DON'T INHIBIT DEVICE OUTPUT
005056  002120 7000 00 R.                           TSX0    DLOG            CALL SUBROUTINE
005057  202551514651    ..                          BCI     1, ERROR             TEXT TO LOG
005060  000005 2360 14 ..       4904                LDQ     QWORD,T         RESTORE QUE WORD AFTER LOGGING
005061  000014 7720 00 ..       4905                QRL     18-6
005062  005026 7100 00 R.       4906                TRA     MTBS1           CONTINUE IF TERMINATE INTERRUPT
```

```
                                4907            EJECT
                                4908    *
                                4909    *       SET DENSITY
                                4910    *       SET FILE PROTECT
                                4911    *
                    005063      4912    MTSH1   NULL                    ENTRY FOR SET-HIGH-DENSITY
                    005063      4913    MTSL1   NULL                    ENTRY FOR SET LOW DENSITY
                    005063      4914    MT9H1   NULL                    ENTRY FOR 9 TRACK SET HIGH DENSITY      [21APR77]
                    005063      4915    MT9L1   NULL                    ENTRY FOR 9 TRACK SET LOW DENSITY       [21APR77]
                    005063      4916    MTD11   NULL                    ENTRY FOR SET 200 BPI                   [21APR77]
                    005063      4917    MTD21   NULL                    ENTRY FOR SET 556 BPI                   [21APR77]
                    005063      4918    MTD31   NULL                    ENTRY FOR SET 800 BPI                   [21APR77]
                    005063      4919    MTD41   NULL                    ENTRY FOR SET 1600 BPI                  [21APR77]
                    005063      4920    MTD51   NULL                    ENTRY FOR SET 6250 BPI                  [01MAY79]
                    005063      4921    MTSP1   NULL                    ENTRY ON SET FILE PROTECT
005063  004033 7100 00 R.       4922            TRA     RETRY           ENTRY FOR IOC OR GENERAL ERRORS
005064  004022 7170 00 R.       4923            XED     MPCCK           LOG FAIL ON MPC STATUSES
005065  005066 7100 02 R.       4924            TRA     *+1,QU          BRANCH ON MAJOR STATUS
005066  004014 7100 00 R.       4925            TRA     MSTSR           0 = CHANNEL READY - RETURN TO MAIN LINE
005067  004305 7100 00 R.       4926            TRA     FIN3            1 = DEVICE BUSY - RETURN STATUS TO USER
005070  004771 7100 00 R.       4927            TRA     MTRD3           2 = ATTENTION - SEE IF IT SHOULD BE LOGGE
005071  004024 7100 00 R.       4928            TRA     LRTRY           3 = DATA ALERT - LOG AND RETRY
005072  004301 7100 00 R.       4929            TRA     FAIL            4 = EOF - SHOULDN'T HAPPEN HERE
005073  004024 7100 00 R.       4930            TRA     LRTRY           5 = CMD RJCT - LOG AND RETRY
005074  004301 7100 00 R.       4931            TRA     FAIL            6 = INTERMEDIATE - TEST SWITCH ON
005075  004033 7100 00 R.       4932            TRA     RETRY           7 = TIMEOUT - RETRY
```

```
                                4933            EJECT
                                4934    *
                                4935    *       BACKSPACE RECORD/FILE, REWIND, RWS, WRITE BLANK TAPE
                                4936    *
                                4937    *       (NOTE: THE PHILOSOPHY WITH THESE COMMANDS IS TO RETRY THE
                                4938    *       COMMAND IF IT APPEARS THAT THE TAPE DID NOT MOVE, BUT TO
                                4939    *       FORCE THE USER TO DO HIS OWN RECOVERY (IF ANY) WHERE THE
                                4940    *       TAPE SEEMS TO HAVE MOVED.)
                                4941    *
                    005076      4942    MTBR1   NULL                    ENTRY FOR BACKSPACE RECORD
                    005076      4943    MTBF1   NULL                    ENTRY FOR BACKSPACE FILE
                    005076      4944    MTRW1   NULL                    ENTRY FOR REWIND
                    005076      4945    MTRU1   NULL                    ENTRY FOR REWIND-AND-STANDBY
                    005076      4946    MTER1   NULL                    ENTRY FOR WRITE-BLANK-TAPE
    005076  005101 7100 00 R.   4947            TRA     *+3
    005077  004022 7170 00 R.   4948            XED     MPCCK           LOG FAIL ON MPC STATUSES
    005100  005104 7100 02 R.   4949            TRA     MTBR2,QU        ELSE BRANCH ON MAJOR STATUS
                    005101      4950    CRRD5   NULL                    GENERAL ERROR ON CARD READ
                    005101      4951    CPWT5   NULL                    GENERAL ERROR ON CARD PUNCH
    005101  002000 3160 07 ..   4952            CANQ    =0002000,DL     CHECK FOR INITIATE INTERRUPT        [21APR77]
    005102  004305 6000 00 R.   4953            TZE     FIN3            RETURN BAD STATUS TO USER IF NOT
    005103  004033 7100 00 R.   4954            TRA     RETRY           ELSE RETRY THE OPERATION
                                4955    *
                                4956    *       BRANCH TABLE FOR MAJOR STATUS
                                4957    *
                    005104      4958    MTBR2   NULL
    005104  004014 7100 00 R.   4959            TRA     MSTSR           0 = CHANNEL READY - RETURN TO MAIN LINE
    005105  004305 7100 00 R.   4960            TRA     FIN3            1 = DEVICE BUSY - RETURN TO USER
    005106  004771 7100 00 R.   4961            TRA     MTRD3           2 = DEVICE ATTENTION - RETURN EVENTUALLY
    005107  005114 7100 00 R.   4962            TRA     MTBR3           3 = DATA ALERT - RETRY IF INITIATE
    005110  004310 7100 00 R.   4963            TRA     FIN2            4 = EOF - CAN HAPPEN ON BACKSPACE
    005111  005021 7100 00 R.   4964            TRA     MTRD6           5 = COMMAND REJECT - PROBABLY RETRY
    005112  004301 7100 00 R.   4965            TRA     FAIL            6 = INTERMEDIATE - TEST SWITCH ON
    005113  004301 7100 00 R.   4966            TRA     FAIL            7 = TIMEOUT - CAN'T TELL WHAT TO DO
                                4967
                                4968    *
                                4969    *       DATA ALERT
                                4970    *
                    005114      4971    MTBR3   NULL
    005114  002000 3160 07 ..   4972            CANQ    =0002000,DL     CHECK FOR INITIATE INTERRUPT        [21APR77]
    005115  004301 6000 00 R.   4973            TZE     FAIL            RETURN TO USER IF NOT INIT
    005116  004024 7100 00 R.   4974            TRA     LRTRY           ELSE RETRY OPERATION
```

I PHYSICAL I/O -- STATUS CHECKING -- MAG TAPE

```
                                    4975            EJECT
                                    4976    *
                                    4977    *       AWAIT READY
                                    4978    *
                          005117    4979    MTAR1   NULL
005117  004033 7100 00 R.           4980            TRA     RETRY           RETRY IOC ERRORS
005120  004022 7170 00 R.           4981            XED     MPCCK           LOG FAIL ON MPC STATUSES
005121  005122 7100 02 R.           4982            TRA     *+1,QU          BRANCH ON MAJOR STATUS
                                    4983    *
                                    4984    *       MAJOR STATUS BRANCH TABLE
                                    4985    *
005122  004014 7100 00 R.           4986            TRA     MSTSR           0 = READY - RETURN TO USER
005123  005132 7100 00 R.           4987            TRA     MTAR2           1 = DEVICE BUSY - WAIT AND RETRY
005124  005132 7100 00 R.           4988            TRA     MTAR2           2 = ATTENTION - WAIT FOR SPECIAL
005125  004301 7100 00 R.           4989            TRA     FAIL            3 = DATA ALERT - IMPOSSIBLE
005126  004301 7100 00 R.           4990            TRA     FAIL            4 = EOF - IMPOSSIBLE
005127  004024 7100 00 R.           4991            TRA     LRTRY           5 = CMD RJCT - LOG AND RETRY
005130  004301 7100 00 R.           4992            TRA     FAIL            6 = INTERMEDIATE
005131  004033 7100 00 R.           4993            TRA     RETRY           7 = TIMEOUT - JUST RETRY
                                    4994    *
                                    4995    *       WAIT AND RETRY
                                    4996    *
                          005132    4997    MTAR2   NULL
                          005132    4998    PRAR2   NULL
005132  000000 0540 17 X.           4999            AOS     U$RETRY,S       INCREMENT RETRY COUNTER
005133  000000 7210 17 X.           5000            LXL     X,U$RETRY,S     CHECK COUNTER
005134  000005 1010 13 ..           5001            CMPX    X,T$IORTM,Z     AGAINST MAXIMUM                 [01MAY79]
005135  004305 6030 00 R.           5002            TRC     FIN3            RETURN BAD STATUS IF TOO LONG
                          005136    5003            FREE    PUB             RELEASE CHANNEL
005136  001620 7000 00 R.                           TSX0    I$FREE
                          005137    5004            SWAIT                   WAIT FOR SPECIAL INTERRUPT
005137  002175 7000 00 R.                           TSX0    SWAIT
                          005140    5005            SIEZE   PUB,1           GET CHANNEL AGAIN
005140  000001 6230 00 ..                           EAX     Z,1             GET PRIORITY FOR ENQUEUEING
005141  001561 7000 00 R.                           TSX0    SIEZE           CALL SUBROUTINE TO QUEUE
                          005142    5006            RREG                    RESTORE REGISTERS AFTER QUEUING
005142  001520 7000 00 R.                           TSX0    RREG            CALL SUBROUTINE
005143  002667 7100 00 R.           5007            TRA     RISUE           RETRY OPERATION
```

```
                                    5008            TTLS    PHYSICAL I/O -- STATUS CHECKING -- CARD READER
                                    5009    *
                                    5010    *       READ
                                    5011    *
                          005144    5012    CRRD1   NULL
005144  005101 7100 00 R.           5013            TRA     CRRD5           ENTRY POINT FOR GENERAL ERROR
005145  004022 7170 00 R.           5014            XED     MPCCK           LOG FAIL ON MPC STATUSES
005146  005147 7100 02 R.           5015            TRA     *+1,QU          BRANCH ON MAJOR STATUS
                                    5016    *
                                    5017    *       BRANCH TABLE FOR MAJOR STATUS
                                    5018    *
005147  004014 7100 00 R.           5019            TRA     MSTSR           0 = READY - GOOD
005150  004301 7100 00 R.           5020            TRA     FAIL            1 = DEVICE BUSY - IMPOSSIBLE
005151  005157 7100 00 R.           5021            TRA     CRRD3           2 = ATTENTION - DIAGNOSE
005152  005166 7100 00 R.           5022            TRA     CRRD4           3 = DATA ALERT - ALSO DIAGNOSE
005153  004301 7100 00 R.           5023            TRA     FAIL            4 = END-OF-FILE - IMPOSSIBLE
005154  004024 7100 00 R.           5024            TRA     LRTRY           5 = CMD RJCT - RETRY
005155  004301 7100 00 R.           5025            TRA     FAIL            6 = INTERMEDIATE - IMPOSSIBLE
005156  004301 7100 00 R.           5026            TRA     FAIL            7 = TIMEOUT - CARD PROBABLY MOVED
                                    5027    *
                                    5028    *       CARD READER DEVICE ATTENTION
                                    5029    *
                          005157    5030    CRRD3   NULL
005157  700000 3160 07 ..           5031            CANQ    =0700000,DL     SNEAK FEED/READ/JAM/FEED ALERTS         [21APR77]
005160  004301 6010 00 R.           5032            TNZ     FAIL            RETURN THESE ERRORS TO USER             [21APR77]
005161  004000 3160 07 ..           5033            CANQ    =0004000,DL     CHECK FOR TERMINATE INTERRUPT           [21APR77]
005162  004014 6010 00 R.           5034            TNZ     MSTSR           ASSUME CARD WAS SUCCESSFULLY READ IF SO [21APR77]
005163  040000 3160 07 ..           5035            CANQ    =0040000,DL     CHECK LAST BATCH LIGHT                  [21APR77]
005164  004310 6010 00 R.           5036            TNZ     FIN2            GIVE EOF RETURN IF ON                   [21APR77]
005165  004305 7100 00 R.           5037            TRA     FIN3            ELSE RETURN HALT STATUS WITHOUT LOGGING [21APR77]
                                    5038    *                                                                       [21APR77]
                                    5039    *       DATA ALERT STATUS                                               [21APR77]
                                    5040    *                                                                       [21APR77]
                          005166    5041    CRRD4   NULL                                                            [21APR77]
005166  020000 3160 07 ..           5042            CANQ    =0020000,DL     VALIDITY ALERT?                         [21APR77]
005167  004305 6010 00 R.           5043            TNZ     FIN3            DON'T BOTHER LOGGING SUCH               [21APR77]
005170  004000 3160 07 ..           5044            CANQ    =0004000,DL     CHECK FOR TERMINATE INTERRUPT           [21APR77]
005171  004301 6010 00 R.           5045            TNZ     FAIL            LET THE USER DO HIS OWN BACKSPACE
005172  004024 7100 00 R.           5046            TRA     LRTRY           RETRY IF CARD DIDN'T MOVE
```

```
                                    5047            TTLS    PHYSICAL I/O -- STATUS CHECKING -- CARD PUNCH
                                    5048    *
                                    5049    *
                                    5050    *       WRITE
                                    5051    *
                        005173      5052    CPWT1   NULL
                                    5053    *       (AS USUAL, THE PHILOSOPHY IS TO RETURN TO THE USER ANY
                                    5054    *       STATUSES WHICH WILL REQUIRE OPERATOR INTERVENTION FOR
                                    5055    *       RECOVERY)
005173  005101 7100 00 R.           5056            TRA     CPWT5           ENTRY POINT FOR GENERAL ERRORS
005174  004022 7170 00 R.           5057            XED     MPCCK           LOG FAIL ON MPC STATUSES
005175  005176 7100 02 R.           5058            TRA     *+1,QU          BRANCH ON MAJOR STATUS
                                    5059    *
                                    5060    *       MAJOR STATUS BRANCH TABLE
                                    5061    *
005176  004014 7100 00 R.           5062            TRA     MSTSR           0 = CHANNEL READY - RETURN TO MAIN LINE
005177  004301 7100 00 R.           5063            TRA     FAIL            1 = DEVICE BUSY - IMPOSSIBLE
005200  005206 7100 00 R.           5064            TRA     CPWT3           2 = ATTENTION - TO LOG OR NOT TO LOG?
005201  005215 7100 00 R.           5065            TRA     CPWT4           3 = DATA ALERT - CHECK A LITTLE
005202  004301 7100 00 R.           5066            TRA     FAIL            4 = EOF - IMPOSSIBLE
005203  004024 7100 00 R.           5067            TRA     LRTRY           5 = CMD RJCT - PARITY, WE HOPE
005204  004301 7100 00 R.           5068            TRA     FAIL            6 = INTERMEDIATE - WE BLEW IT
005205  004301 7100 00 R.           5069            TRA     FAIL            7 = TIMEOUT - CARD PROBABLY MOVED
                                    5070    *
                                    5071    *       ATTENTION ON CARD PUNCH
                                    5072    *
                        005206      5073    CPWT3   NULL
005206  600000 3160 07 ..           5074            CANQ    =0600000,DL     NIL/CARD JAM                            [21APR77]
005207  004301 6010 00 R.           5075            TNZ     FAIL            REAL ERROR-TYPE ERRORS                  [21APR77]
005210  004000 3160 07 ..           5076            CANQ    =0004000,DL     CHACK FOR TERMINATE INTERRUPT           [21APR77]
005211  004014 6010 00 R.           5077            TNZ     MSTSR           ASSUME CARD WAS CORRECTLY PUNCHED       [21APR77]
005212  100000 3160 07 ..           5078            CANQ    =0100000,DL     FEED FAILURE                            [21APR77]
005213  004301 6010 00 R.           5079            TNZ     FAIL            LOG THIS ERROR                          [21APR77]
005214  004305 7100 00 R.           5080            TRA     FIN3            ELSE RETURN WITHOUT LOGGING             [21APR77]
                                    5081    *                                                                       [21APR77]
                                    5082    *       DATA ALERT CONDITION                                            [21APR77]
                                    5083    *                                                                       [21APR77]
                        005215      5084    CPWT4   NULL                                                            [21APR77]
005215  744000 3160 07 ..           5085            CANQ    =0744000,DL     NIL/NIL/NIL/PUNCH ALERT/TERMINATE       [21APR77]
005216  004301 6010 00 R.           5086            TNZ     FAIL            THESE GO BACK TO THE USER
005217  004024 7100 00 R.           5087            TRA     LRTRY           ELSE LOG AND RETRY
```

```
                                    5088            TTLS    PHYSICAL I/O -- STATUS CHECKING -- PRINTER
                                    5089    *
                                    5090    *       WRITE
                                    5091    *
                          005220    5092    PRWT1   NULL
005220  004033 7100 00 R.           5093            TRA     RETRY           ENTRY POINT FOR GENERAL ERRORS
005221  004022 7170 00 R.           5094            XED     MPCCK           LOG FAIL ON MPC STATUSES
005222  005223 7100 02 R.           5095            TRA     *+1,QU          BRANCH ON MAJOR STATUS
                                    5096    *
                                    5097    *       STATUS BRANCH TABLE
                                    5098    *
005223  004014 7100 00 R.           5099            TRA     MSTSR           0 = READY - GOOD
005224  004301 7100 00 R.           5100            TRA     FAIL            1 = DEVICE BUSY - IMPOSSIBLE
005225  005233 7100 00 R.           5101            TRA     PRWT2           2 = ATTENTION - DIAGNOSE
005226  005240 7100 00 R.           5102            TRA     PRWT3           3 = DATA ALERT - DIAGNOSE
005227  004301 7100 00 R.           5103            TRA     FAIL            4 = END-OF-FILE - IMPOSSIBLE
005230  005242 7100 00 R.           5104            TRA     PRWT6           5 = COMMAND REJECT - DIAGNOSE
005231  004301 7100 00 R.           5105            TRA     FAIL            6 = INTERMEDIATE - IMPOSSIBLE
005232  004033 7100 00 R.           5106            TRA     RETRY           7 = TIMEOUT - JUST RETRY
                                    5107    *
                                    5108    *       DEVICE ATTENTION
                                    5109    *
                          005233    5110    PRWT2   NULL
005233  740000 3160 07 ..           5111            CANQ    =0740000,DL     NIL/NIL/CHECK/VFU                [21APR77]
005234  004301 6010 00 R.           5112            TNZ     FAIL            LOG THESE AND RETURN TO USER     [21APR77]
005235  012000 3160 07 ..           5113            CANQ    =0012000,DL     CHECK FOR PAPER OUT OR INITIATE  [21APR77]
005236  004305 6010 00 R.           5114            TNZ     FIN3            IF SO -- DATA NOT TRANSFERED     [21APR77]
005237  004014 7100 00 R.           5115            TRA     MSTSR           ELSE DATA WAS TRANSFERRED        [21APR77]
                                    5116    *                                                                [21APR77]
                                    5117    *       DATA ALERT                                               [21APR77]
                                    5118    *                                                                [21APR77]
                          005240    5119    PRWT3   NULL                                                     [21APR77]
005240  022000 3160 07 ..           5120            CANQ    =0022000,DL     CHECK FOR ALERT BEFORE PRINTING  [21APR77]
005241  005245 6000 00 R.           5121            TZE     PRWT4           NO, CHECK SOME MORE              [21APR77]
                          005242    5122    PRWT6   NULL                    JOINED HERE BY COMMAND REJECT    [21APR77]
005242  400000 3160 07 ..           5123            CANQ    =0400000,DL     CHECK FOR TOP OF PAGE ECHO       [21APR77]
005243  004305 6010 00 R.           5124            TNZ     FIN3            RETURN IT TO USER IF SO          [21APR77]
005244  004024 7100 00 R.           5125            TRA     LRTRY           ELSE COUNT, LOG AND RETRY        [21APR77]
                          005245    5126    PRWT4   NULL                    ALERT AFTER PRINTING STARTED     [21APR77]
005245  500000 3160 07 ..           5127            CANQ    =0500000,DL     CHECK TOP PAGE OR PAPER LOW      [21APR77]
005246  004014 6010 00 R.           5128            TNZ     MSTSR           HANDLE LIKE NORMAL STATUS        [21APR77]
005247  004301 7100 00 R.           5129            TRA     FAIL            ELSE LOG AND RETURN TO USER      [21APR77]
                                    5130    *                                                                [21APR77]
                                    5131    *       COMMAND REJECT ON REQUEST STATUS                         [21APR77]
                                    5132    *                                                                [21APR77]
                          005250    5133    PRWT5   NULL                                                     [21APR77]
005250  600000 3160 07 ..           5134            CANQ    =0600000,DL     TPG ECHO/SLEW ALERT              [21APR77]
005251  004033 6010 00 R.           5135            TNZ     RETRY           NO USE LOGGING THOSE
005252  004024 7100 00 R.           5136            TRA     LRTRY           ELSE LOG AND RETRY
```

I PHYSICAL I/O -- STATUS CHECKING -- PRINTER RELEASED 01DEC80

```
                                    5137            EJECT
                                    5138    *
                                    5139    *
                                    5140    *       REQUEST STATUS AFTER 'WAIT SPECIAL'
                                    5141    *
                          005253    5142    PRRQ2   NULL
005253  004014 7100 00 R.           5143            TRA     MSTSR           IGNORE IOC ERRORS
005254  004022 7170 00 R.           5144            XED     MPCCK           LOG FAIL ON MPC STATUSES
005255  005256 7100 02 R.           5145            TRA     *+1,QU          BRANCH ON MAJOR STATUS
                                    5146    *
                                    5147    *       MAJOR STATUS BRANCH TABLE
                                    5148    *
005256  004014 7100 00 R.           5149            TRA     MSTSR           RETURN BUTTONS STATUS AND ALL TO USER
005257  004301 7100 00 R.           5150            TRA     FAIL            1 = DEVICE BUSY - IMPOSSIBLE
005260  004014 7100 00 R.           5151            TRA     MSTSR           2 = ATTENTION - NOT OUR PROBLEM
005261  004014 7100 00 R.           5152            TRA     MSTSR           3 = DATA ALERT - NOT OUR PROBLEM
005262  004301 7100 00 R.           5153            TRA     FAIL            4 = EOF - IMPOSSIBLE
005263  005250 7100 00 R.           5154            TRA     PRWT5           5 = COMMAND REJECT - DIAGNOSE
005264  004301 7100 00 R.           5155            TRA     FAIL            6 = INTERMEDIATE - IMPOSSIBLE
005265  004033 7100 00 R.           5156            TRA     RETRY           7 = TIMEOUT - RETRY REQUEST STATUS
                                    5157    *
                                    5158    *       AFTER REQUEST STATUS
                                    5159    *       (AWAIT READY)
                                    5160    *
                          005266    5161    PRRQ1   NULL
005266  004033 7100 00 R.           5162            TRA     RETRY           RETRY IOC ERRORS
005267  004022 7170 00 R.           5163            XED     MPCCK           LOG FAIL ON MPC STATUSES
005270  005271 7100 02 R.           5164            TRA     *+1,QU          BRANCH ON MAJOR STATUS
                                    5165    *
                                    5166    *       MAJOR STATUS BRANCH TABLE
                                    5167    *
005271  004014 7100 00 R.           5168            TRA     MSTSR           0 = READY - RETURN TO USER
005272  004301 7100 00 R.           5169            TRA     FAIL            1 = DEVICE BUSY - IMPOSSIBLE
005273  005132 7100 00 R.           5170            TRA     PRAR2           2 = ATTENTION - WAIT FOR SPECIAL
005274  004014 7100 00 R.           5171            TRA     MSTSR           3 = DATA ALERT - NOT OUR PROBLEM
005275  004301 7100 00 R.           5172            TRA     FAIL            4 = EOF - IMPOSSIBLE
005276  005250 7100 00 R.           5173            TRA     PRWT5           5 = COMMAND REJECT - DIAGNOSE
005277  004301 7100 00 R.           5174            TRA     FAIL            6 = INTERMEDIATE
005300  004033 7100 00 R.           5175            TRA     RETRY           7 = TIMEOUT - RETRY
```

I PHYSICAL I/O -- STATUS CHECKING -- MPC RELEASED 01DEC80

```
                                    5176            TTLS    PHYSICAL I/O -- STATUS CHECKING -- MPC                  [18AUG76]
                                    5177    *                                                                       [18AUG76]
                                    5178    *       WE RETURN EVERYTHING HERE                                       [18AUG76]
                                    5179    *                                                                       [18AUG76]
                        005301      5180    MPCS1   NULL                                                            [18AUG76]
                        005301      5181    MPCS2   NULL                                                            [18AUG76]
                        005301      5182    MPCS3   NULL                                                            [18AUG76]
                        005301      5183    MPCS4   NULL                                                            [18AUG76]
005301  004033 7100 00 R.           5184            TRA     RETRY           RETRY GENERAL ERRORS                    [18AUG76]
005302  004022 7170 00 R.           5185            XED     MPCCK           FAIL MPC SCREWUPS                       [18AUG76]
005303  005304 7100 02 R.           5186            TRA     *+1,QU          BRANCH ON MAJOR                         [18AUG76]
                                    5187    *                                                                       [18AUG76]
                                    5188    *       BRANCH TABLE                                                    [18AUG76]
                                    5189    *                                                                       [18AUG76]
005304  004014 7100 00 R.           5190            TRA     MSTSR           0 = READY -- WE LIKE THAT               [18AUG76]
                                    5191            DUP     1,7             FAIL ALL ELSE                           [18AUG76]
005305  004301 7100 00 R.           5192            TRA     FAIL                                                    [18AUG76]
005306  004301 7100 00 R.                           TRA     FAIL
005307  004301 7100 00 R.                           TRA     FAIL
005310  004301 7100 00 R.                           TRA     FAIL
005311  004301 7100 00 R.                           TRA     FAIL
005312  004301 7100 00 R.                           TRA     FAIL
005313  004301 7100 00 R.                           TRA     FAIL
                                    5193    *                                                                       [18AUG76]
                                    5194    *       STATUS CHECKING -- RESET                                        [18AUG76]
                                    5195    *                                                                       [18AUG76]
                        005314      5196    CNRS1   NULL                    STATUS CHECK FOR CONSOLE RESET          [01SEP79]
                        005314      5197    MPCS5   NULL                                                            [18AUG76]
005314  000005 2350 14 ..           5198            LDA     QWORD,T         GET THE STATUS                          [18AUG76]
005315  004347 1150 00 R.           5199            CMPA    STIMO           TIMEOUT?                                [18AUG76]
005316  004301 6010 00 R.           5200            TNZ     FAIL            IF NOT, N.G.                            [18AUG76]
005317  004341 2350 00 R.           5201            LDA     FKOKS           GET THE FAKE GOOD STATUS                [09DEC79]
005320  000005 7550 14 ..           5202            STA     QWORD,T                                                 [09DEC79]
005321  004014 7100 00 R.           5203            TRA     MSTSR           AND RETURN TRIUMPHANT                   [09DEC79]
```

I PHYSICAL I/O -- STATUS CHECKING -- LEVEL 6 RELEASED 01DEC80

```
                                5204            TTLS    PHYSICAL I/O -- STATUS CHECKING -- LEVEL 6                    [09DEC79]
                                5205    *                                                                             [09DEC79]
                                5206    *       THESE STATUS RETURNS ARE WRITTEN BY THE LEVEL 6. THERE'S              [09DEC79]
                                5207    *       NOT MUCH TO ADD.                                                      [09DEC79]
                                5208    *       REMEMBER: THESE ARE B$SPIOP                                           [09DEC79]
                                5209    *                                                                             [09DEC79]
                      005322    5210    L6RD1   NULL                                                                  [09DEC79]
                      005322    5211    L6WT1   NULL                                                                  [09DEC79]
005322  004014 7100 00 R.       5212            TRA     MSTSR           DELIVER THE NEWS                              [09DEC79]
005323  000000 7100 20 X.       5213            TRA     $ZOPF,*         SHOULD ALWAYS BE USED WITH B$SPIOP            [09DEC79]
```

I PHYSICAL I/O -- STATUS CHECKING -- READ DETAILED STATS RELEASED 01DEC80

```
                                    5214            TTLS    PHYSICAL I/O -- STATUS CHECKING -- READ DETAILED STATS          [170CT76]
                                    5215    *                                                                               [170CT76]
                                    5216    *       FAIL ALL BUT IOM ERRORS                                                 [170CT76]
                                    5217    *                                                                               [170CT76]
                          005324    5218    DSST1   NULL                                                                    [170CT76]
                          005324    5219    DSST2   NULL                                                                    [170CT76]
                          005324    5220    DSST3   NULL                                                                    [170CT76]
005324  004033 7100 00 R. 5221            TRA     RETRY           RETRY IOM ERRORS                                        [170CT76]
005325  004022 7170 00 R. 5222            XED     MPCCK           FAIL MPC STATS                                          [170CT76]
005326  005327 7100 02 R. 5223            TRA     *+1,QU          BRANCH ON MAJOR STATUS                                  [170CT76]
                          5224    *                                                                               [170CT76]
                          5225    *       MAJOR STATUS BRANCH TABLE -- READ DETAIL STATUS                         [05NOV77]
                          5226    *                                                                               [05NOV77]
005327  004014 7100 00 R. 5227            TRA     MSTSR           0 = GOOD                                                [05NOV77]
005330  004301 7100 00 R. 5228            TRA     FAIL            1 = DEVICE BUSY                                         [05NOV77]
005331  004305 7100 00 R. 5229            TRA     FIN3            2 = ATTENTION, RETURN TO USER W/O LOGGING               [05NOV77]
005332  004301 7100 00 R. 5230            TRA     FAIL            3 = DATA ALERT                                          [05NOV77]
005333  004301 7100 00 R. 5231            TRA     FAIL            4 = EOF??                                               [05NOV77]
005334  004301 7100 00 R. 5232            TRA     FAIL            5 = COMMAND REJECT                                      [05NOV77]
005335  004301 7100 00 R. 5233            TRA     FAIL            6 = INTERMEDIATE                                        [05NOV77]
005336  004301 7100 00 R. 5234            TRA     FAIL            7 = TIMEOUT                                             [05NOV77]
```

```
                          5235            EJECT
                          5236     *
                          5237     *
                          5238     *
                          5239            DETAIL  ON                                                    [05NOV77]
    005337  777700777777  ..      5240            LIT                 EXPAND LITERAL POOL HERE          [05NOV77]
                          5241     *                                                                    [05NOV77]
                  005340          5242        THE END
```

CROSS REFERENCE TABLE

0	A EXP	117								
0	A GET	118	1247	3177	3546					
0	A REL	120	1258	2169	2210	2964	3578			
0	AGETNB	119	2936	3057	3066	3097				
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							
10000	B MDA	567	583							
40000	B OWN	640	646							
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 SIGN	549	2499	3022						
400000	B SWAP	562	583							
7700	BBUTON	206	2207	2588						
400	BCFRVM	667	676							
40	BDGHDV	180	3710							
10	BDGHPB	182	3695							
20	BDGUHD	181	3591							
4	BDGUHP	183	3631							
10000	BIO301	205	70	1832						
400000	BIOBSY	188	2280	2442	2444	2945	3034			
100000	BIOCDM	190	2145	2465	2467	2670				
20000	BIOCDN	192	2151	2470	2532	2632	2663	3680		
200000	BIOCPM	189	2470	2526	2532	2646	4554			
1	BIODGH	208	3599	3716						
40000	BIOLV6	191	2475	2520	2639					
40000	BIOMDA	203	1706	1738	1739	1774	1793	1813		
100000	BIOMDD	202	71	1716	1738	1774	1784	1793	2175	
2	BIONRV	207	1801	1808	3401					
20000	BIONSK	204	72							
1	BIOPDH	195	3638	3650	3697					
10000	BIORCH	193	73	1101	1161	1243				
100	BIORET	948	1863	3742	3786	3795	3806	4629	4685	4827
200000	BIOSKC	201	2588							
400000	BIOSPC	200	1571	1694	2588	3170				
2	BSPIOP	194	2151	3027	3391	3557	3664			
4000	BSWREQ	568	583							
10	C CATR	1630	1649							
4	C CLEN	477	495							
6	C DALT	489	495							

CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

				2270 2334 2342 2356 2371 2391 2445 2589 2675 2684 2697 2703
				3402 3487 3495 3496 3538 3559 3575 3576 3600 3617 3618 3626
				3705 3717 3749 3838 4357 4427 4510 4511 4999 5000
4	I	T	163	1021 1022 1023 1097 1098 1122 1129 1130 1133 1152 1156 1197
				1249 1251 1252 1255 1256 1515 1516 1519 1522 1532 1535 1537
				1562 1563 1564 1581 1687 1720 1743 1763 1766 1870 1874 1877
				2129 2131 2138 2139 2141 2142 2144 2150 2167 2194 2196 2198
				2200 2202 2206 2229 2248 2257 2259 2264 2266 2267 2270 2273
				2284 2286 2287 2289 2292 2320 2328 2331 2333 2334 2335 2336
				2349 2355 2360 2362 2373 2374 2452 2462 2463 2468 2479 2504
				2508 2528 2620 2622 2628 2631 2653 2672 2674 2678 3400 3423
				3453 3471 3547 3548 3555 3556 3563 3565 3566 3568 3575 3576
				3577 3580 3605 3606 3608 3609 3610 3620 3630 3649 3652 3667
				3668 3672 3690 3694 3705 3706 3718 3719 3730 3739 3745 3746
				3749 3750 3751 3764 3765 3797 3814 3838 3839 3840 3841 4357
				4393 4413 4425 4482 4508 4509 4630 4637 4646 4658 4683 4686
				4689 4695 4696 4697 4698 4699 4700 4723 4724 4728 4729 4828
				4835 4839 4845 4849 4850 4875 4876 4877 4878 4904 5198 5202
1	I	X	160	1122 1157 1158 1160 1161 1165 1168 1175 1177 1178 1183 1184
				1187 1189 1190 1240 1242 1243 1245 1252 1490 1491 1559 1561
				1562 1571 1572 1575 1694 1695 1705 1706 1715 1716 1731 1733
				1736 1774 1776 1784 1786 1793 1801 1808 1813 1832 1834 1845
				1846 2124 2125 2175 2176 2267 2268 2358 2362 2373 2390 2391
				2394 2395 2399 2400 2406 2407 2434 2436 2441 2442 2444 2465
				2467 2470 2475 2520 2526 2532 2537 2588 2589 2655 2656 2689
				2690 2697 2698 2703 2704 3401 3402 3487 3496 3497 3538 3539
				3547 3550 3559 3561 3575 3576 3599 3600 3605 3606 3617 3618
				3620 3637 3638 3650 3651 3694 3695 3706 3710 3718 3719 3750
				3751 4393 4396 4402 4407 4408 4511 4512 4836 4838 4845 4846
				5000 5001
2	I	Y	161	1060 1062 1064 1122 1165 1178 1180 1183 1186 1187 1190 1192
				1193 1195 1252 1286 1287 1291 1292 1315 1321 1354 1360 1366
				1372 1391 1393 1421 2260 2261 2362 2373 2422 2430 2463 2517
				2518 2524 2525 2535 3548 3551 4395 4396 4408
3	I	Z	162	1023 1180 1181 1183 1190 1252 1283 1286 1290 1291 1301 1344
				1387 1408 1412 1416 1582 1583 1685 1708 1719 1720 1742 1743
				2171 2172 2333 2342 2343 2348 2349 2362 2394 2397 2399 2406
				2448 2485 2487 2494 2501 2593 2628 2655 2689 2706 3395 3416
				3431 3451 3464 3470 3471 3497 3560 3562 3563 3658 3666 3667
				3671 3682 4508 4509 4512 4688 4689 4696 4723 4724 4835 4836
				4837 4838 4839 4849 4850 5001 5005
2600	I	IO	2318	82 2201
0	I	...	168	1158 1184 1248 1746 1847 2126 2657 2691 3769 4428
2	I	CMD	880	882 1023 1516 1720 1743 2349 2628 3471 3563 3667 4482 4508
				4509 4689 4696 4723 4724 4835 4839 4849 4850
2400	I	D2Q	2111	79
10	I	DAC	892	893 2196 2328 2331 3765
16	I	DCW	898	2286 2479 2508 2528 2622 2953 3177 3546 3549 3566 3568 3575
				3576 3609 3839 4393 4878
1	I	DEV	878	900 1022 1098 1519 1564 2167 2194 2206 2257 2264 2334 3178
				3705 3749 3838
2627	I	IO2	2354	3594

CROSS REFERENCE TABLE

0	I LOG	132	1530	2270	2963	3060	3068	3101	3575	3576	4357			
3	I PUB	882	883	884	885	900	1021	1129	1181	1195	1247	1255	1522	2129
			2259	3649										
4333	I BDAD	3847	503											
1717	I CHAN	1226	74	2118										
2671	I CIOC	2414	2623	2634	2641	2648	2658	2665	2679	2692	2707	3677	3683	
2247	I CKM9	1735	1732											
2236	I CKMD	1714	655	658	769	775	793	806	836	839	881	883	898	901
			1707	1767										
4612	I CNCR	4635	4611											
2442	I CNSP	2166	76											
1764	I CONV	1275	77	2332										
2442	I CRSP	2165	78											
4132	I DIAG	3587	2338											
2120	I DLOG	1487	3426	3490	3777	4903								
3234	I DRSK	2818	2677											
2136	I ELOG	1504	3415	3441	3450									
4301	I FAIL	3776	3479	3499	4380	4447	4448	4450	4452	4453	4471	4472	4474	4477
			4485	4498	4499	4501	4503	4504	4513	4574	4575	4577	4579	4593
			4595	4596	4598	4612	4613	4615	4617	4714	4717	4719	4765	4766
			4768	4771	4772	4787	4793	4804	4893	4896	4897	4929	4931	4965
			4966	4973	4989	4990	4992	5020	5023	5025	5026	5032	5045	5063
			5066	5068	5069	5075	5079	5086	5100	5103	5105	5112	5129	5150
			5153	5155	5169	5172	5174	5192	5200	5228	5230	5231	5232	5233
			5234											
4247	I FINO	3728	642	643	665	666	667	668	669	670	671	678	679	680
			681	682	683	684	696	698	699	700	701	729	762	763
			819	820	841	842	903	917						
4252	I FIN1	3737	597	598	599	600	601	602	603	621	658	659	741	752
			753	754	755	769	770	775	776	793	794	806	807	814
			818	823	836	837	839	840	845	846	863	874	881	882
			883	884	898	899	900	901	902	915	918	919	920	1873
			1878											
4310	I FIN2	3793	4763	4963	5036									
4305	I FIN3	3784	3405	3442	4594	4760	4779	4786	4796	4803	4859	4926	4953	4960
			5002	5037	5043	5080	5114	5124	5229					
4314	I FIN4	3804	4810	4857										
0	I FLOG	131	2270	2963	3060	3068	3101	3415	3426	3441	3450	3490	3575	
			3576	3777	4357	4903								
1620	I FREE	1151	81	2263	3704	3747	4355	5003						
1715	I FREQ	1209	1183	1186	1187	1192								
1661	I FREX	1184	1177	1189										
15	I IDCW	897	898	2150	2462	2463	2631	4695						
1546	I IOMS	1059	2416	3161	4394									
2657	I MAIN	2389	2353											
100000	I MDAR	959	729	820	841	903								
110000	I MDAS	960	735	819	842									
330000	I MDBF	978	671											
310000	I MDBR	976	665											
231000	I MDD1	966	680											
232000	I MDD2	967	681											
233000	I MDD3	968	682											

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234000	I MDD4	969	683											
235000	I MDD5	970	684											
700000	I MDDG	1000	503	509	516	520	632	638	656	659	663	664	753	755
			770	776	794	807	837	840	863	874	882	884	899	901
			902	2197	2337									
670000	I MDDS	999	741											
350000	I MDEF	981	667											
340000	I MDER	979	642	700										
320000	I MDFF	977	670											
300000	I MDFR	975	669											
640000	I MDLC	996	918											
650000	I MDLM	997	919											
660000	I MDLP	998	920											
410000	I MDMR	986	775											
610000	I MDMW	993	818	839										
150000	I MDNR	962	740											
400000	I MDRD	985	597	622	655	752	769	862	881	898	915			
420000	I MDRH	987	599											
70000	I MDRS	958	643	917										
371000	I MDRU	984	668											
140000	I MDRV	961	736											
370000	I MDRW	983	666											
260000	I MDSA	973	757	822	844	904								
200000	I MDSB	963	725											
210000	I MDSD	964	726	821	843									
220000	I MDSE	965	756											
240000	I MDSH	971	678	762										
250000	I MDSL	972	679	763										
270000	I MDSP	974	698											
620000	I MDWI	994	823	845										
360000	I MDWO	982	699											
600000	I MDWR	992	598	621	658	754	793	806	814	836	873	883	900	916
			4846											
630000	I MDWV	995	846											
4435	I MKS1	4401	4409											
4455	I MKS2	4424	4397											
7	I MODE	890	891	892	900	1763	2198	2336	2653	3630	3668	3672	3694	3706
			4845											
2440	I MPRC	2155	2137											
2441	I MPRS	2156	2149											
2644	I NEXT	2370	3757											
4335	I POFF	3854	1100	3627										
2462	I PRSP	2193	86											
3	I PUBL	883	901	1249	1256									
2	I QSET	2362	1183	1190	1209	1252	2111	2362						
4262	I RETD	3748	3711	3842										
4261	I RETF	3747	4730	4879										
4325	I RJCT	3835	520	916	1835	2699								
1520	I RREG	1020	89	1134	1536	1697	1821	2130	3386	3579	3625	3663	4356	4360
			5006											
2603	I SYS1	2323	90											
4267	I SYS2	3755	91											

CROSS REFERENCE TABLE

2374	I TEMP	2108	1518	1521	1526	1528	1533				
2504	I TICK	2226	2303								
2575	I TOCK	2303	92								
1	I TYPE	879	880	901	2333						
6	I URET	887	889	890	900	2320	3555	3577	3605	3718	3750
6	IADEXT	889	901	2200	2452	2504	3565	4658			
4322	IADXMK	3817	3815	4684							
4344	IBDADS	3873	3848								
4351	ICBSYS	3878	3862								
4337	ICBUSY	3861	1118	2127	3641						
1740	ICHAN0	1248	1232	1237	1239	1257	1259				
1752	ICHAN1	1255	1250								
1756	ICHAN2	1259	1264								
1761	ICHAN3	1262	1246								
1524	ICHLOC	1033	75	1107	1174	1233	2183	3157	3628	3642	
3030	ICIOC7	2534	2476	2521							
2764	ICIOCA	2490	2486								
2774	ICIOCB	2499	2488								
3007	ICIOCC	2512	2502								
3010	ICIOCD	2514	2497	2510							
3020	ICIOCE	2523	2471								
3063	ICIOCP	2645	621	622	642	643	793	794	819	820	
3077	ICIODM	2669	597	598	599	600	601	602	603		
3051	ICIODN	2627	862	873							
3066	ICIOMR	2652	775	776	818	839	840				
3074	ICIOTY	2662	632	638							
2244	ICKM9R	1731	752								
2260	ICKM9T	1746	1736	1742							
2246	ICKM9W	1733	754								
2241	ICKMDX	1718	1709								
2231	ICKML6	1704	900								
4016	ICLINK	3469	622	862	873	4847					
4557	ICNAL1	4585	642								
4605	ICNALT	4622	4614								
4645	ICNCR1	4668	4639	4651							
4616	ICNCR2	4640	4644								
4715	ICNCRM	4732	4670								
4654	ICNDEL	4681	4605	4618	4678	4680					
4726	ICNDLM	4738	4682								
4707	ICNDLX	4722	632								
0	ICNLOW	1005	1391	1421							
4650	ICNLT2	4676	4624								
4717	ICNLTL	4735	4679								
4572	ICNRD1	4604	622								
4712	ICNRDX	4727	638								
5314	ICNRS1	5196	643								
4665	ICNSAV	4694	4671	4687							
2454	ICNSP1	2181	2173								
1	ICNUPR	1006	1393								
2036	ICNV10	1359	285								
2024	ICNV11	1340	286								
2040	ICNV12	1365	287								

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2042	ICNV13	1371	288										
4544	ICNWT1	4566	621										
4674	ICNWT2	4706	632	638									
2005	ICONV0	1299	280	289	1331	1423							
2007	ICONV1	1306	275										
2007	ICONV2	1307	276	281									
2012	ICONV3	1314	277										
2014	ICONV4	1320	278										
2016	ICONV5	1326	279										
2024	ICONV7	1338	282										
2024	ICONV8	1339	283										
2034	ICONV9	1353	284										
2000	ICONVA	1288	1277										
2057	ICONVC	1404	1322	1355	1367								
2044	ICONVF	1383	1316	1361	1373								
2116	ICONVT	1444	1278	1284	1343	1346	1386	1389	1409	1411	1414	1415	1418	1420
5173	ICPWT1	5052	793	794	806	807							
5206	ICPWT3	5073	5064										
5215	ICPWT4	5084	5065										
5101	ICPWT5	4951	5056										
5144	ICRRD1	5012	769	770	775	776							
5157	ICRRD3	5030	5021										
5166	ICRRD4	5041	5022										
5101	ICRRD5	4950	5013										
3233	ICTEMP	2814	2456	2457	2483	2507	2514	2516	4657	4660	4662	4663	
4352	ID9FT1	4318	600	601	602	603							
4352	ID9RD1	4316	597	599									
4372	ID9RD2	4341	4335										
4400	ID9RD3	4351	4326										
4417	ID9RD4	4365	4334										
4424	ID9RDF	4378	4325	4328	4329	4330	4333	4336	4337	4344	4346	4367	
4422	ID9RDR	4372	4327	4331	4347	4353	4368						
4352	ID9WT1	4317	598										
4234	IDAGX1	3703	3696										
4241	IDAGX2	3715	3699										
2004	IDAMSK	1294	80	1285	1289	2329							
12	IDCWWD	894	895	1535	1870	1874	1877	2287	2954	3048	3610	3730	3739	3746
			3797	3840	4413	4637	4646	4699	4729	4876			
4346	IDGDVB	3875	3607										
4136	IDIAG1	3598	3592										
4150	IDIAG2	3616	3601										
4154	IDIAG3	3624	3593										
4164	IDIAG4	3636	3644										
4174	IDIAG5	3648	3639										
4201	IDIAG6	3657	3632										
4203	IDIAG7	3659	3653										
4224	IDIAGX	3688	516										
2224	IDNPC1	1693	862										
4475	IDNRD1	4461	862										
4514	IDNRD2	4489	863										
4510	IDNRD3	4481	4470										
4536	IDNRD4	4543	4475	4502									

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4461	IMKTOT	4432	4391	4406	4418	4420	4426							
2656	IMMASK	2382	2344											
7	IMODEL	891	901											
4022	IMPCCK	3478	4441	4464	4492	4568	4587	4606	4708	4923	4948	4981	5014	5057
			5094	5144	5163	5185	5222							
5301	IMPCS1	5180	915											
5301	IMPCS2	5181	918											
5301	IMPCS3	5182	919											
5301	IMPCS4	5183	920											
5314	IMPCS5	5197	917											
2667	IMPCSR	2401	503	509	516	520	597	598	599	621	622	632	638	642
			656	659	663	664	665	666	667	668	669	670	671	678
			679	680	681	682	683	684	696	698	699	700	701	725
			726	729	735	736	740	741	753	755	756	757	762	763
			770	776	794	807	814	818	819	820	821	822	823	837
			840	841	842	843	844	845	846	863	873	874	882	884
			899	902	903	904	918	919	920	1698	3472	4725	4851	
2420	IMPPC1	2137	915											
2433	IMPPC2	2149	643	917										
2403	IMPPS1	2116	915	917	918	919	920							
2414	IMPPS2	2128	2120											
2663	IMPSSR	2396	509	516	597	598	599	600	601	602	603	621	622	632
			638	642	643	655	656	658	659	663	664	665	666	667
			668	669	670	671	678	679	680	681	682	683	684	696
			698	699	700	701	729	752	753	754	755	762	763	769
			770	775	776	793	794	806	807	862	863	873	874	881
			882	883	884	898	899	900	901	902	903			
4014	IMSTSR	3463	3406	4324	4446	4497	4556	4573	4592	4672	4713	4715	4778	4812
			4870	4884	4925	4959	4986	5019	5034	5062	5077	5099	5115	5128
			5143	5149	5151	5152	5168	5171	5190	5203	5212	5227		
5063	IMT9H1	4914	762											
5063	IMT9L1	4915	763											
5117	IMTAR1	4979	729	903										
5132	IMTAR2	4997	4987	4988										
2317	IMTAS1	1819	735											
5076	IMTBF1	4943	671											
5076	IMTBR1	4942	665											
5104	IMTBR2	4958	4949											
5114	IMTBR3	4971	4962											
5026	IMTBS1	4866	663	664	4887	4889	4895	4906						
5037	IMTBS2	4883	4868											
5032	IMTBS3	4874	4891											
5055	IMTBS4	4902	4885	4886	4888	4890	4894							
5013	IMTBSX	4844	663											
5016	IMTBX1	4848	664											
3111	IMTCIO	2683	655	656	752	753								
5063	IMTD11	4916	680											
5063	IMTD21	4917	681											
5063	IMTD31	4918	682											
5063	IMTD41	4919	683	696										
5063	IMTD51	4920	684											
5076	IMTER1	4946	700	701										

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4731	IMTFF1	4746	670										
4731	IMTFR1	4747	669										
2310	IMTNR1	1800	740										
2351	IMTR9X	1869	655	656									
4731	IMTRD1	4744	655	656	752	753							
4736	IMTRD2	4758	4751										
4771	IMTRD3	4801	4761	4927	4961								
4774	IMTRD4	4808	4762										
5002	IMTRD5	4822	4754	4797									
5021	IMTRD6	4855	4764	4964									
4763	IMTRD7	4791	4770										
4757	IMTRD8	4783	4769										
4754	IMTRD9	4776	4759										
5076	IMTRU1	4945	668										
2312	IMTRV1	1807	736										
5076	IMTRW1	4944	666										
2314	IMTSA1	1811	757	904									
2276	IMTSB1	1773	725	1783	1792	1812							
2277	IMTSB2	1775	1809										
2301	IMTSD1	1782	726										
2303	IMTSD2	1785	1794	1802	1814								
2305	IMTSE1	1791	756										
5063	IMTSH1	4912	678										
5063	IMTSL1	4913	679										
5063	IMTSP1	4921	698										
4731	IMTWF1	4748	667	699									
4731	IMTWT1	4745	658	659	754	755							
1	IOMFLG	67	352	507	526	529	538	541	548	562	565	579	582	595
			606	610	619	625	631	634	640	646	661	704	728	731
			738	744	772	780	790	797	816	826	833	849	860	866
			871	889	893	913	923	1227	1590	1883	2412	2541	2614	2712
			2816	2821	2834	2855	3190	3491	3890	4457	4517	4548		
2301	IP4S61	1781	843										
2314	IP4S91	1810	844										
4345	IPOFFS	3874	3855										
5132	IPRAR2	4998	5170										
2343	IPRPS1	1858	814	818	836	837	839	840	845	846			
2341	IPRPS2	1852	823										
5266	IPRRQ1	5161	820	841									
5253	IPRRQ2	5142	819	842									
2330	IPRS61	1837	821										
2333	IPRS91	1842	822										
2335	IPRS92	1845	1840										
2503	IPRSPS	2213	2204										
2501	IPRSPX	2209	2203	2205									
5220	IPRWT1	5092	814	818	823	836	837	839	840	845	846		
5233	IPRWT2	5110	5101										
5240	IPRWT3	5119	5102										
5245	IPRWT4	5126	5121										
5250	IPRWT5	5133	5154	5173									
5242	IPRWT6	5122	5104										
11	IQUEWD	893	894	2202	3608	3690	3745	3841	4698	4828			

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5	IQWORD	886	887	1532	2289	2952	3046	3400	3423	3453	3814	4357	4630	4683
			4686	4697	4904	5198	5202							
2261	IR9TAB	1748	1731											
4257	IRET01	3744	3731	3741	3798									
4312	IRET34	3796	3787	3807										
4033	IRETRY	3494	3440	3488	4319	4440	4463	4491	4545	4567	4580	4586	4599	4707
			4716	4718	4720	4753	4922	4932	4954	4980	4993	5093	5106	5135
			5156	5162	5175	5184	5221							
2667	IRISUE	2405	3498	3569	5007									
4343	IRJCTS	3872	3836											
2367	IROTA1	2103	87											
2366	IROTAT	2102	88											
3133	IRSEEK	2812	1534	4427										
2324	IS69CK	1831	1838	1843	1853									
4	ISEKAD	885	886	1687	1766	2139	2142	2144	2270	2335	2620	2672	4425	4877
13	ISIDCW	895	896	2138	2468	2678	4700	4728	4875					
1567	ISIEZ1	1106	1116											
1610	ISIEZ3	1128	1112											
1561	ISIEZE	1096	2397	3658	5005									
1617	ISIEZT	1137	1102	1114	1117									
14	ISKDCW	896	897	2141	2674									
3	ISPRET	884	901	1562	2267	2273								
2573	ISPTMO	2297	1559	2268										
4347	ISTIMO	3876	2288	3448	5199									
2212	ISWAI1	1580	1573											
2177	ISWAIR	1561	4359											
2175	ISWAIT	1558	819	820	841	842	1696	1820	5004					
2220	ITIBIT	1684	600	601	602	603								
2511	ITICK1	2232	2240											
2515	ITICK2	2237	2234	2293										
2555	ITICK3	2279	2235											
2521	ITICK4	2245	2249	2251	2275									
2537	ITICK6	2265	2262											
2552	ITICK7	2272	2269											
4350	ITICKS	3877	2298											
3364	ITINT1	2991	2987	2988	2989	2990								
2265	IW9TAB	1753	1733											
40000	M EC	247	2474											
20	M EIS	282	288											
40000	M NCB	245	2839	2841	2843									
4000	M NSA	275	288											
40	M TNZ	220	2928											
200	M CBIT	218	2928											
700000	M IDCW	246	2458	2515										
2000	M RTAL	215	2928											
6	MAXDST	3532	3546	3567										
400	MBXLEN	95	126											
400	MCACHE	278	288											
200	MEXMEM	279	288											
7740	MFTVMK	272	287											
4426	MKSEEK	4389	4373	4379										
200	MMMODE	232	2925	2997	3090	3122								

CROSS REFERENCE TABLE

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					
53	SIOCHG	354	355						
62	SIOFAC	364	365						
71	SIOTIM	369	370						
70	SIOUCH	368	369						
40	SISTKL	96	130	2840					
40	SJACES	342	343						
43	SJTIME	345	346						
32	SLIMIT	333	334	377					
3622	SPINT1	3116	3112	3113	3114	3115			
20	SPSTKL	97	126	2844	3136				
72	SPTIMR	370	371						
20	SPTLEN	329	330						
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					
3254	SYINT1	2917	2913	2914	2915	2916			
26	T DNL	350	95						
777777	T LEN	858	861	1180					
0	T REC	214	102	1344	1387	1416			
177	T BDAD	503	301	305	306	527	539	563	580
1070	T BPWT	806	315						
350	T CNAL	642	622						
323	T CNRD	622	621						
357	T CNRS	643	642						
314	T CNWT	621	310						
55	T CONV	274	1286	1291					
645	T CPSB	808	793	806					
1052	T CPWT	793	312						
1034	T CRMR	775	769						
1016	T CRRD	769	311						
645	T CRSB	777	775						
177	T D2RD	539	307						
233	T D9RD	597	316	321					
251	T D9RH	599	598						
242	T D9WT	598	597						
1275	T DNRD	862	314						
1313	T DNWT	873	862	4483					
177	T DQRD	563	304						
177	T DRRD	527	303						
177	T DSRD	580	302						

17	T FILE	235	96	1408	1412		
1331	T H7RD	881	317				
645	T H7SM	885	883				
1347	T H7WT	883	881				
215	T IODG	516	3666				
1430	T L6AR	903	900	2501			
1365	T L6RD	898	322	2485			
1437	T L6SA	904	903				
645	T L6SM	905	904				
1403	T L6WT	900	898	2487			
777777	T LINK	857	860	3547			
1473	T MPLC	918	917				
1502	T MPLM	919	918				
1511	T MPLP	920	919				
1446	T MPRD	915	320				
1464	T MPRS	917	916				
1455	T MPWT	916	915				
1000	T MT9H	762	97	757			
1007	T MT9L	763	98	762			
663	T MTAR	729	726				
672	T MTAS	735	729	920			
512	T MTBF	671	670				
440	T MTBR	665	658	763			
537	T MTD1	680	679				
546	T MTD2	681	680				
555	T MTD3	682	681				
564	T MTD4	683	682				
573	T MTD5	684	683				
717	T MTDS	741	740				
627	T MTER	700	699				
503	T MTFF	670	669				
474	T MTFR	669	668				
710	T MTNR	740	736				
726	T MTR9	752	309	1749			
366	T MTRD	655	308	1748			
465	T MTRU	668	667				
701	T MTRV	736	603	643	735	853	873
447	T MTRW	666	665				
771	T MTSA	757	756				
645	T MTSB	725	701	777	808	885	905
654	T MTSD	726	725				
762	T MTSE	756	754				
521	T MTSH	678	99	671			
530	T MTSL	679	100	678			
611	T MTSP	698	696				
744	T MTW9	754	752	1754			
456	T MTWF	667	666				
620	T MTWO	699	698				
404	T MTWT	658	655	1753			
1223	T P4AR	841	839				
1232	T P4AS	842	841				
1205	T P4MW	839	836				

CROSS REFERENCE TABLE

1241	T P4S6	843	842									
1250	T P4S9	844	843									
1257	T P4WI	845	844									
1167	T P4WT	836	319									
1266	T P4WV	846	845									
1133	T PRAR	820	818									
1124	T PRAS	819	820									
1115	T PRMW	818	814									
701	T PRRV	853	823	846								
1142	T PRS6	821	819									
1151	T PRS9	822	821									
1160	T PRWI	823	822									
1106	T PRWT	814	313	318								
224	T RJCT	520	741									
55	T SIZE	273	103									
1544	TABLOC	1052	1034	1039	1042	1045	1047	1048				
1077	TBPWTA	807	806									
74	TCATSZ	293	93	1410								
332	TCNWTA	632	622									
341	TCNWTB	638	622									
1061	TCPWTA	794	793									
1043	TCRMRA	776	775									
1025	TCRRDA	770	769									
260	TD9FTC	600	599									
267	TD9FT1	601	600									
276	TD9FT2	602	601									
305	TD9FT3	603	602									
123	TDNAME	327	94	350	1491							
1304	TDNRDA	863	862									
1322	TDNWTA	874	873									
151	TDVSTB	357	2698	2704	3539	3561	3575	3576				
1340	TH7RDA	882	881									
1356	TH7WTA	884	883									
2	TIOCIO	395	396	2406								
75	TIOCMD	299	2343									
1	TIOCPC	393	394	2448	2655	2689	2706	3562	3671	3682		
6	TIONXT	402	3464	3470								
3	TIOPCS	396	398	1685	1708	1719	2399					
2	TIOPSS	394	395	2394								
5	TIORTM	400	401	3497	4512	4836	4838	5001				
5	TIORTY	401	402	4688	4837							
4	TIOSTS	398	399	3395	3416	3431	3451					
4	TIOTMO	399	400	2593								
1374	TL6RDA	899	898									
1412	TL6WTA	901	900									
1421	TL6WTB	902	901									
422	TMTBSA	663	655	656	658	659	667	669	670	699	752	753	754	755
602	TMTD16	696	684									
636	TMTDSE	701	700									
431	TMTERA	664	663									
735	TMTR9E	753	1751									
375	TMTRDA	656	655	1750								

753	TMTW9E	755	1756										
413	TMTWTA	659	658	1755									
1214	TP4MWD	840	839										
1176	TP4WTD	837	836										
36	TRANGE	254	101										
206	TRDDTS	509	3560										
3257	TSOP01	2921	104										
3367	TSOP02	2995	105										
3625	TSOP03	3120	106										
3564	TSOP07	3088	107										
75	TSWAIT	300	1583										
173	TURPRT	376	3575	3576									
0	U Q	148	2356	2371	3618								
11	U CON	1071	2172										
0	U PDA	146	1099	1425	1494	1520	1845	2117	2182	2270	2445	2675	3575
			3576	3626	4357								
0	U CHAN	145	3174										
0	U SPEC	150	1566	1581	2248	2261	2266	3165	3167	3172	3179		
0	U STAT	151	1572	1575	1695	1705	1715	1737	1776	1786	1834	1859	1862
			2176	2208	2589	3171	3402	3600	3617	3717			
0	U TICK	152	1585	2250									
0	UPTYPE	147	1490	1582	2171	2342	2697	2703	3538	3559	3575	3576	
0	URETRY	149	2391	2684	3487	3495	3496	4510	4511	4999	5000		
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	2282										
23	WPTEDT	2283	2284										
35	WPTEND	2287	2288										
20	WPTEUN	2280	2281										

CROSS REFERENCE TABLE

22	WPTEWC	2282	2283											
25	WPTFAC	2284	2285											
4	WPTGIF	2279	2280											
2	WPTUSR	2278	2279											
6	X P	176	3006	3008	3012	3015	3016	3017	3018	3028	3035	3037	3038	3160
7	X S	177	3149	3151	3152	3154	3156	3165	3167	3171	3172	3174	3178	3179
4	X T	174	2935	2936	2949	2952	2953	2954	2963	3038	3046	3048	3056	3057
			3060	3065	3066	3068	3096	3097	3101	3165	3167	3178		
1	X X	171	2926	2930	2933	2960	3000	3001	3023	3024	3025	3031	3032	3040
			3047	3135	3138	3139	3141	3170	3171	3172				
2	X Y	172	3125	3126	3134	3135	3136	3137	3162					
3	X DCW	917	2480											
1340	X IMW	930	3002	3127										
0	X IOM	157	1073	2601										
0	X LPW	914	2536	4396	4408									
1400	X MBX	927	934	1523										
0	X MEM	163	2922	2996	3089	3121								
3347	X NIO	2969	2940	3007	3150									
2	X SCW	916	2435	2436	2493	2500								
1	X TIM	1046	2229											
0	X DABL	153	2922	2996	3089	3121								
0	X GTIM	154	1131	1204	1262	2227	2605	3014						
1	X IENT	866	2963	3060	3068	3101								
0	X INTX	155	2931	2959	3005	3098	3130							
1	X LPWX	915	1523	2437	2478	2490	2519							
0	X MBXP	164	2420	4395										
3355	X NIOS	2977	2927	2944	2970	2974	2999	3008	3019	3124	3151			
1412	X PCWA	934	935											
3522	X QINT	3080	110	3093										
0	X STIM	167	2230											
10	XCONCH	908	934	2427	2429	2432	2447	2517	2524	2841				
3244	XCRBAS	2846	2421	2423	2518	2525								
3245	XCRIOM	2847	2419	2600										
4	XFAUCH	907	2839											
3722	XINTMP	3184	2932	2933	2934	2936	2938	2941	2957	2960	3001	3024	3055	3057
			3064	3066	3095	3097	3126	3134	3137	3139				
3346	XIOCQW	2966	2951											
0	XIODTB	156	1206											
0	XIOQTB	158	1132	1205	1207	1263								
0	XIOSTB	159	2606	3012	3015	3017								
0	XIOUTB	160	3016											
0	XIREGT	161	2918	2992	3086	3117								
3416	XITIN1	3020	3013											
3432	XITINS	3033	3026											
3360	XITINT	2986	108	2994										
3467	XITLG1	3059	3057											
3510	XITLG2	3068	3066											
3516	XITMSK	3070	3041											
3476	XITSP1	3064	3164											
3475	XITSPR	3062	3036											
3454	XITSTA	3053	3029											
0	XLHEAD	162	3763											

CROSS REFERENCE TABLE

3236	XLPDCW	2839	109										
3240	XLPPCW	2841	2426	2428									
3562	XQINT1	3085	3082										
3606	XQINT2	3100	3097										
400000	XRFLAG	918	1075										
0	XSISTP	165	2926										
3242	XSPDCW	2843	111										
30	XSPECH	912	2843	3131									
3700	XSPIN1	3165	3159	3175									
3705	XSPIN2	3170	3166										
3714	XSPIN3	3177	3173										
3711	XSPIN4	3174	3169	3181									
3661	XSPIN5	3149	3132										
3647	XSPIN6	3138	3142	3147									
3616	XSPINT	3111	112	3119									
0	XSPSTP	166	3125										
0	XSTTSP	168	3000										
0	XSWPCT	169	1123	1199	1253	2363	2377						
3344	XSYIN2	2964	3061	3069	3102								
3250	XSYINT	2912	113	2911	2920								
3724	XSYLIM	3185	2937										
3337	XSYLOG	2962	2936										
3332	XSYRET	2957	2939	2947									
3270	XSYRPT	2929	2961										
0	Z IMW	170	3003	3128	3146								
0	ZIMWC1	171	3051	3058	3067	3140	3176						
0	ZIMWCK	172	3004	3129									
0	ZOPF	173	1038	1159	1282	1427	1567	1741	2119	2258	2282	2285	2312
			2418	2443	2455	2705	2950	3039	4332	4767	4892	5213	

MACRO CROSS REFERENCE TABLE

2	ALARM	1548	2271	4358									
0	ALC	1115											
0	APROC	1150											
0	ATACH	1930											
0	BUG	1226											
0	BUGA	1236											
0	CATC	1769											
0	CATH	1792											
0	CATL	1823											
0	CATN	1844											
1	CHAN	2027	2118										
2	CKPT	1270	2319	2924									
0	COPY	1578											
4	DABL	1188	2922	2996	3089	3121							
0	DEALOC	2057											
0	DECCT	2138											
0	DELC	1973											
4	DEQ	1371	1165	1178	1187	2373							
3	DLOG	1455	3426	3777	4903								
1	DLOGF	1470	3490										
0	DQJ	2091											
0	DTACH	1933											
0	DUSE	1890											
2	DVSTL	3509	3575	3576									
3	ELOG	1462	3415	3441	3450								
0	ELOGF	1477											
0	ENABL	1194											
5	ENQ	1320	1122	1183	1190	1252	2362						
0	ENQJ	2108											
0	EQJ	2075											
0	EXPAND	1497											
0	FCBLIS	2049											
0	FCBPNT	1682											
5	FREE	2007	2263	3704	3747	4355	5003						
0	FUSE	1872											
0	GET	1424											
0	GETB	1446											
0	GETBQ	1468											
7	GETD	1434	1247	2936	3057	3066	3097	3177	3546				
0	GFCBC	1956											
0	GFDA	1778											
0	GFR	1690											
6	GTIM	1983	1131	1204	1262	2227	2605	3014					
28	IFIOC	75	529	541	548	565	582	606	610	625	634	646	704
			731	744	780	797	826	849	866	889	923	1227	1590
			1883	2541	2712	2821	3190	4517					
29	IFIOM	71	352	507	526	538	562	579	595	619	631	640	661
			728	738	772	790	816	833	860	871	893	913	2412
			2614	2816	2834	2855	3491	4457	4548				
0	INSC	1908											
0	INVERT	1139											
103	IT	408	503	509	516	520	597	598	599	600	601	602	603
			621										

MACRO CROSS REFERENCE TABLE

				622	632	638	642	643	655	656	658	659	663	664	665
				666	667	668	669	670	671	678	679	680	681	682	683
				684	696	698	699	700	701	725	726	729	735	736	740
				741	752	753	754	755	756	757	762	763	769	770	775
				776	793	794	806	807	814	818	819	820	821	822	823
				836	837	839	840	841	842	843	844	845	846	862	863
				873	874	881	882	883	884	898	899	900	901	902	903
				904	915	916	917	918	919	920					
	6	LOG	1513	2270	2963	3060	3068	3101	4357						
	0	LOGF	1531												
	4	MTASK	1383	2936	3057	3066	3097								
	4	MTQ	1348	1196	3168	3720	3752								
	9	MTQA	1357	2274	2291	2936	2956	3050	3057	3066	3097	3180			
	0	ORDER	1566												
	0	OVCPY	1992												
	0	PIO	2168												
	0	PROS	1172												
	0	PROTO	1132												
	0	PTQ	1306												
	0	QLOCK	1697												
	0	QNLOCK	1701												
	2	QUEUE	1285	1209	2111										
	5	REL	1477	1258	2169	2210	2964	3578							
	0	RELC	1965												
	0	RFCB	2040												
	0	RFCBC	1927												
	12	RREG	1014	1134	1536	1697	1821	2130	3386	3579	3625	3663	4356	4360	5006
	0	SHRINK	1484												
	3	SIEZE	1084	2397	3658	5005									
	0	SPEBLK	2064												
	0	SPROC	1163												
	4	SWAIT	1547	1696	1820	4359	5004								
	0	TCATL	1828												
	0	TREE	2133												
	0	WSC	1718												
	0	XLOG	2195												

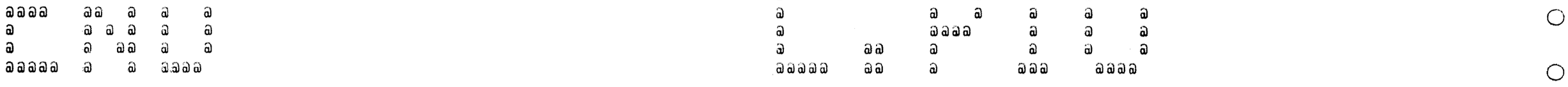
OPCODE CROSS REFERENCE TABLE

1	CIOC	2601					
5	LDAC	2930	3002	3040	3127	3141	
1	LMBA	4663					
1	MLDA	1809					
6	RMCM	1189	1195	2922	2996	3089	3121
6	SMCM	1191	1197	2922	2996	3089	3121

THERE WEREN'T ANY WARNING FLAGS IN THIS ASSEMBLY
5340 IS THE NEXT AVAILABLE LOCATION
23 K CORE USED IN THIS ASSEMBLY

THERE WERE 475 ALTERS IN THIS ASSEMBLY.

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