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DENNIS HAUGH

1. Theory of Operation

2. Implementation

3. Program Documentation

IOCPC for 7# D9WT in PIO

```
100             INDEX
110             SOURCE  ON
120             COND    OFF,INE,IFG,IFL,IDRP,CRSM
130             COND    OFF,DCARD,COND,USE
140             CRSM    OFF
150             PMC     ON              PRINT OUT MACROS
160             UNDEF   765432
```

```
                                        DEFINITIONS--FILE ACCESS, TYPE AND PREFERENCES (03/24/74)

                    170                 TTLS    DEFINITIONS--FILE ACCESS, TYPE AND PREFERENCES (03/24/74)
                    180     *
                    190     *
                    200     *           ACCESS DEFINITIONS
                    210     *
                    220                 HEAD    F,B
            400000  230     CAT         BOOL    400000          CATALOG/FILE BIT
            200000  240     COM         BOOL    200000          FILE IS COMM FILE (ON PASS)
            200000  250     PSW         BOOL    200000          FORCE PASSWORD CHECK (ON OPEN)
            100000  260     RET         BOOL    100000          RETURN BIT
            040000  270     OWN         BOOL    040000          OWNER (CATALOGS)
            020000  280     FET         BOOL    020000          FETCH PERMISSION
            010000  290     EX          BOOL    010000          EXECUTE/SEARCH PERMISSION
            010000  300     SCH         BOOL    010000          SEARCH PERMISSION FOR CATALOGS
            004000  310     AP          BOOL    004000          APPEND PERMISSION
            002000  320     WT          BOOL    002000          WRITE PERMISSION
            001000  330     RD          BOOL    001000          READ PERMISSION
            017000  340     RWAX        BOOL    EX+AP+WT+RD     EXECUTE, APPEND, READ, WRITE
            007000  350     RWA         BOOL    AP+WT+RD
            410000  360     CSER        BOOL    CAT+SCH
            414000  370     CSA         BOOL    CAT+SCH+AP      CATALOG, SEARCH, APPEND
            415000  380     CSRA        BOOL    CAT+SCH+RD+AP   CATALOG, SEARCH, READ, APPEND
                    390     *
                    400     *
                    410     *           ACCESS DEFINITIONS FOR SIMPLE MONITOR (USER BITS)
                    420     *
            000400  430     LIST        BOOL    000400          FILE MAY BE LISTED
            000200  440     SAVE        BOOL    000200          FILE MAY BE SAVED
            000100  450     COMP        BOOL    000100          FILE IS COMPILED PROGRAM
            000040  460     PUB         BOOL    000040          FILE IS AVAILABLE TO EVERYONE
            000020  470     GROUP       BOOL    000020          FILE IS AVAILABLE TO GROUP
            000017  480     SYS         BOOL    000017          SYSTEM CODE UNDER WHICH FILE WAS SAVED
            000600  490     LS          BOOL    LIST+SAVE
                    500     *
                    510     *
                    520     *           PREFERENCE SETTINGS
                    530     *
                    540                 HEAD    F
            000001  550     SW          BOOL    1               SWAP FILES
            000002  560     SY          BOOL    2               SYSTEM AND HIGH SPEED SCRATCH FILES
            000003  570     CA          BOOL    3               CATALOGS
            000004  580     SS          BOOL    4               SYSTEM SCRATCH FILES
            000005  590     PS          BOOL    5               PRIVILEGED SAVED FILES
            000006  600     SF          BOOL    6               STANDARD SAVED FILES
            000007  610     PM          BOOL    7               PERMANENT DATA BASE
```

F

```
                                    DEFINITIONS--FILE ACCESS, TYPE AND PREFERENCES (03/24/74)

                    620             EJECT
                    630     *
                    640     *
                    650     *       FILE TYPES -- RETURNED TO USER IN RESPONSE TO A REQUEST STATUS.
                    660     *       BITS 29-35 OF THE ACCESS/TYPE WORD CONTAIN THE FOLLOWING INFORMATION:
                    670     *               BITS 29-31  FILE PREFERENCE
                    680     *               BITS 32-35  FILE TYPE
                    690     *
          000000    700     RSF     BOOL    0               REGULAR SCRATCH FILE
          000001    710     RSC     BOOL    1               REGULAR SCRATCH CATALOG
          000002    720     RCF     BOOL    2               REGULAR CATALOGED FILE
          000003    730     RCC     BOOL    3               REGULAR CATALOGED CATALOG
          000004    740     SSF     BOOL    4               SPECIAL SCRATCH FILE (NOT USED)
          000005    750     SSC     BOOL    5               SPECIAL SCRATCH CATALOG (NOT USED)
          000006    760     SCF     BOOL    6               SPECIAL CATALOGED FILE (CAN'T DESTROY)
          000007    770     SCC     BOOL    7               SPECIAL CATALOGED CATALOG (CAN'T DESTROY)
          000010    780     CS      BOOL    10              COMMUNICATIONS SLAVE
          000011    790     CM      BOOL    11              COMMUNICATIONS MASTER
          000012    800     RJ      BOOL    12              RUNNING JOB
          000013    810     NF      BOOL    13              NON-EXISTENT FILE (CLOSED COMMUNICATION FILE)
          000014    820     OLF     BOOL    14              OFF-LINE FILE
                    830             HEAD
```

```
                                        DEFINITIONS--INDICATOR, REPEAT, TALLY AND GENERAL CONSTANTS (03/24/7
                    840                 TTLS    DEFINITIONS--INDICATOR, REPEAT, TALLY AND GENERAL CONSTANTS (03/24/74)
                    850     *
                    860     *           INDICATOR REGISTER BITS
                    870     *
                    880                 HEAD    M               M FOR MACHINE
            004000  890     OMSK        BOOL    004000          MASK OVERFLOW FAULTS
                    900     *
                    910     *           BITS FOR REPEAT INSTRUCTIONS
                    920     *
            000000  930     RPT         BOOL    0               FOR USE WITH RPTX INSTRUCTION
            001400  940     RPD         BOOL    1400            INCREMENT BOTH REGISTERS
            001000  950     RPDA        BOOL    1000            INCREMENT FIRST REGISTER
            000400  960     RPDB        BOOL    400             INCREMENT SECOND REGISTER
            000200  970     RPDC        BOOL    200             LOAD X0 FROM BITS 0-17 OF INSTRUCTION
            000100  980     TZE         BOOL    100             TERMINATE IF ZERO INDICATOR ON
            000040  990     TNZ         BOOL    40              TERMINATE IF ZERO INDICATOR OFF
            000020  1000    TMI         BOOL    20              TERMINATE IF NEGATIVE INDICATOR ON
            000010  1010    TPL         BOOL    10              TERMINATE IF NEGATIVE INDICATOR OFF
            000004  1020    TRC         BOOL    4               TERMINATE IF CARRY INDICATOR ON
            000002  1030    TNC         BOOL    2               TERMINATE IF CARRY INDICATOR OFF
            000001  1040    TOV         BOOL    1               TERMINATE IF OVERFLOW INDICATOR ON
            002000  1050    RTAL        BOOL    2000            TALLY OF ONE
                    1060    *
                    1070    *           BITS FOR SEQUENCE CHARACTER INDIRECT WORDS
                    1080    *
            777700  1090    TFM         BOOL    777700          TALLY FIELD MASK
            000007  1100    TPM         BOOL    000007          CHARACTER POSITION MASK
            000040  1110    BYTE        BOOL    40              NINE-BIT CHARACTER FLAG
            000100  1120    CTAL        BOOL    100             TALLY OF ONE
            000400  1130    WTAL        BOOL    400             TALLY OF ONE WORD (4 CHARACTERS)
                    1140    *
                    1150    *           MISCELLANEOUS BIT PATTERNS
                    1160    *
                    1170                HEAD    B
            776000  1180    TRM         BOOL    776000          TALLY FOR REPEAT INSTRUCTIONS
            000077  1190    MASDL       BOOL    000077          MASK FOR DELTA
            777777  1200    MASKH       BOOL    777777          HALF WORD MASK
            000777  1210    MASLQ       BOOL    000777          LOWER QUARTER MASK
            777000  1220    MASUQ       BOOL    777000          UPPER QUARTER MASK
            757500  1230    ERROR       BOOL    757500          USED TO GENERATE MEMORY FAULTS
            757500  1240    BUGBUG      BSET    757500          SYSTEM BUGGING CONSTANT
            000001  1250    DEBUG       BOOL    000001          DEVELOPEMENT FLAG (=1 IF DEBUGGING AND CHECKS DESIRED)
            000200  1260    INHIB       BOOL    000200          INHIB IT BIT
            000077  1270    TAG         BOOL    000077          MASK FOR TAG
            000060  1280    INDRG       BOOL    000060          INDIRECT THEN REGISTER
            000020  1290    RGIND       BOOL    000020          REGISTER THEN INDIRECT
            777000  1300    OPOS        BOOL    777000          OP CODE MASK
            000737  1310    MASUK       BOOL    000737          USED TO CONVERT LETTER TO UPPER CASE
                    1320                HEAD
```

DEFINITIONS--REGISTERS (03/24/74)

```
                    1330            TTLS    DEFINITIONS--REGISTERS (03/24/74)
                    1340    *
                    1350    *
                    1360    *       NOTE THAT THE HARDWARE TREATS XR-T AS SPECIAL IN RPD, RPL AND
                    1370    *       RPT INSTRUCTIONS, WHICH DESTROY THE CONTENTS OF XR-T.
                    1380
000000              1390    T       BOOL    0               TEMPORARY REGISTER USED FOR SUBROUTINE CALLS
                    1400
                    1410
                    1420    *       SCRATCH REGISTERS WITH EPHEMERAL EXISTENCE, NEVER PRESERVED
                    1430    *       ACROSS SUBROUTINE CALLS.
                    1440
000001              1450    X       BOOL    1
000002              1460    Y       BOOL    2
000003              1470    Z       BOOL    3
                    1480
                    1490
                    1500    *       REGISTERS ALMOST ALWAYS GUARANTEED TO HAVE CONSTANT VALUES FOR
                    1510    *       ANY ONE PASS THROUGH A SEGMENT OF CODE, AND ARE NEVER TO BE MODIFIED
                    1520    *       BY SUBROUTINES EXCEPT THOSE SUBROUTINES WHOSE EXPLICIT FUNCTION
                    1530    *       IT IS TO SET THEM UP OR DESTROY THEM
                    1540
000006              1550    B       BOOL    6               ADDRESS OF CURRENT TRAP BLOCK, QUEUE  BLOCK,
000004              1560    L       BOOL    4
000005              1570    M       BOOL    5
000006              1580    N       BOOL    6
000007              1590    O       BOOL    7
                    1600
                    1610    *       OPTIONAL REGISTER DEFINITIONS
                    1620
000000              1630    X0      BOOL    0
000000              1640    FRN0    EQU     0               WHEN X0 USED FOR FRN
000001              1650    X1      BOOL    1
000001              1660    BUFP    EQU     1               WHEN X1 PTR TO BUF
000001              1670    QTAIL   EQU     1               WHEN X1 USED FOR QUEUE MAINPULATION
000002              1680    X2      BOOL    2
000002              1690    FRN2    EQU     2               WHEN X2 USED FOR FRN (DESTINATION)
000003              1700    X3      BOOL    3
000004              1710    X4      BOOL    4
000004              1720    FLAGS   EQU     4               WHEN X4 USED FOR ACCESS:FLAGS
000004              1730    QENTRY  EQU     4               WHEN X4 USED FOR QUEUE MANIPULATION
000005              1740    X5      BOOL    5
000006              1750    X6      BOOL    6
000006              1760    TRAP    EQU     6               WHEN X6 USED FOR TRAP:BLOCK PTR
000007              1770    X7      BOOL    7
                    1780    *
                    1790    *               EIS REGISTER DEFINITIONS
                    1800    *
000000              1810    AR0     EQU     0
000001              1820    AR1     EQU     1
000002              1830    AR2     EQU     2
000003              1840    AR3     EQU     3
```

DEFINITIONS--REGISTERS (03/24/74)

```
000004  1850  AR4     EQU     4
000005  1860  AR5     EQU     5
000006  1870  AR6     EQU     6
000007  1880  AR7     EQU     7
        1890  *
        1900  *               EIS MF FIELD MODIFICATION FLAG MENMONICS
        1910  *
000001  1920  AR      EQU     1               1ST FIELD FOR ADDRESS REGISTER MODS
000001  1930  RL      EQU     1               2ND FIELD FOR REGISTER WITH LENGTH OF STRING
000001  1940  ID      EQU     1               3RD FIELD FOR INDIRECT DESSCRIPTOR
        1950  *
        1960  *               NDSC DESCRIPTOR SIGN FIELDS
        1970  *
000000  1980  LSF     EQU     0               LEADING SIGN, FLOATING POINT
000001  1990  LS      EQU     1               LEADING SIGN, SCALED
000002  2000  TS      EQU     2               TRAILING SIGN
000003  2010  NS      EQU     3               NO SIGN
        2020  *
        2030  *               EIS SIZING CONSTANTS
        2040  *
000010  2050  EIS4    EQU     8               BYTES/WORD (PACKED DECIMAL)
000006  2060  EIS6    EQU     6               BYTES/WORD (BCD)
000004  2070  EIS9    EQU     4               BYTES/WORD (ASCII)
        2080  *
        2090  *               INTEGER MNEMONICS
        2100  *
777777  2110  MINUS1  EQU     -1
000000  2120  ZERO    EQU     0
000001  2130  ONE     EQU     1
000002  2140  TWO     EQU     2
000003  2150  THREE   EQU     3
000004  2160  FOUR    EQU     4
000005  2170  FIVE    EQU     5
000006  2180  SIX     EQU     6
000007  2190  SEVEN   EQU     7
000014  2200  TWELVE  EQU     12              NUMBER OF OCTAL DIGITS/WORD
        2210  *
        2220  *               MNEMONICS FOR SREG AREA
        2230  *
000000  2240  SVX0    EQU     0               X0 IN UPPER
000000  2250  SVX1    EQU     0               X1 IN LOWER
000001  2260  SVX2    EQU     1               X2 IN UPPER
000001  2270  SVX3    EQU     1               X3 IN LOWER
000002  2280  SVX4    EQU     2               X4 IN UPPER
000002  2290  SVX5    EQU     2               X5 IN LOWER
000003  2300  SVX6    EQU     3               X6 IN UPPER
000003  2310  SVX7    EQU     3               X7 IN LOWER
000004  2320  SVA     EQU     4               A-REG
000005  2330  SVQ     EQU     5               Q-REG
000006  2340  SVE     EQU     6               EXP REG IN 0..7
000007  2350  SVTR    EQU     7               TIMER:REG IN 0..26
```

```
                    2360            TTLS    DEFINITIONS--MMES (01/17/74)
                    2370    *
                    2380    *
                    2390    *       PHASE II EXECUTIVE MMES
                    2400    *
                    2410            HEAD    M
          500000    2420    TER     BOOL    500000          TERMINATE
          500001    2430    STI     BOOL    500001          SET TIMER
          500002    2440    RTI     BOOL    500002          RUNNING TIME
          500003    2450    ATI     BOOL    500003          ASCII TIME OF DAY
          500004    2460    DAT     BOOL    500004          ASCII DATE
          500005    2470    PAU     BOOL    500005          PAUSE
          500006    2480    MEM     BOOL    500006          MEMORY REQUEST
          500007    2490    SQU     BOOL    500007          SQUEEZE
          500010    2500    BTI     BOOL    500010          BINARY TIME SINCE BOOTLOAD
          500011    2510    PUR     BOOL    500011          PURE
          500012    2520    JTI     BOOL    500012          JOB RUNNING TIME
          500013    2530    LPA     BOOL    500013          LONG PAUSE
          500014    2540    CLK     BOOL    500014          ELAPSED TIME CLOCK
          500017    2550    ENA     BOOL    500017          ENABLE MME
                    2560    *
                    2570    *
                    2580    *       TRAPPING MMES
                    2590    *
          500100    2600    OPS     BOOL    500100          OPEN SCRATCH
          500101    2610    OPE     BOOL    500101          OPEN FILE
          500103    2620    CAT     BOOL    500103          CATALOG
          500104    2630    UNC     BOOL    500104          UNCATALOG
          500105    2640    CLO     BOOL    500105          CLOSE
          500106    2650    OVY     BOOL    500106          OVERLAY
          500107    2660    TRU     BOOL    500107          TRUNCATE
          500110    2670    SCR     BOOL    500110          SCRATCH
          500111    2680    CCE     BOOL    500111          CHANGE CATALOG ENTRY
          500112    2690    ERA     BOOL    500112          ERASE
          500113    2700    SET     BOOL    500113          SET POINTER
          500114    2710    RCA     BOOL    500114          READ CATALOG
          500115    2720    REQ     BOOL    500115          REQUEST STATUS
          500116    2730    REP     BOOL    500116          REPLACE
          500117    2740    EXE     BOOL    500117          EXECUTE
          500120    2750    RUN     BOOL    500120          RUN
          500121    2760    CON     BOOL    500121          CONTINUE
          500122    2770    PAS     BOOL    500122          PASS
          500123    2780    ALT     BOOL    500123          ALTER ACCESSES
          500124    2790    CMX     BOOL    500124          CHANGE CATALOG MAX
          500126    2800    PDA     BOOL    500126          PROVIDE DEVICE ADDRESSES
          500127    2810    CCO     BOOL    500127          COPY CATALOG AND OPEN FILES
          500131    2820    COP     BOOL    500131          COPY
          500132    2830    DRI     BOOL    500132          DRIVE
          500133    2840    REA     BOOL    500133          READ
          500134    2850    WRI     BOOL    500134          WRITE
          500135    2860    RES     BOOL    500135          RESET STATUS
          500136    2870    TOPE    BOOL    500136          TALLY OPEN
```

M DEFINITIONS--MMES (01/17/74)

```
500137  2880    TERA    BOOL    500137          TALLY ERASE
500140  2890    TREP    BOOL    500140          TALLY REPLACE
```

```
M                                   DEFINITIONS--MMES (01/17/74)

                    2900            EJECT
                    2910    *
                    2920    *
                    2930    *       200 SERIES MMES  -- ASSUME A PAUSE FOR 1 UPON ISSUEING THE MME
                    2940    *
          500200    2950    OPS2    BOOL    500200          OPEN SCRATCH, PAUSE
          500201    2960    OPE2    BOOL    500201          OPEN FILE, PAUSE
          500203    2970    CAT2    BOOL    500203          CATALOG, PAUSE
          500204    2980    UNC2    BOOL    500204          UNCATALOG, PAUSE
          500205    2990    CLO2    BOOL    500205          CLOSE, PAUSE
          500206    3000    OVY2    BOOL    500206          OVERLAY, PAUSE
          500207    3010    TRU2    BOOL    500207          TRUNCATE, PAUSE
          500210    3020    SCR2    BOOL    500210          SCRATCH, PAUSE
          500211    3030    CCE2    BOOL    500211          CHANGE CATALOG ENTRY, PAUSE
          500212    3040    ERA2    BOOL    500212          ERASE, PAUSE
          500213    3050    SET2    BOOL    500213          SET POINTER, PAUSE
          500214    3060    RCA2    BOOL    500214          READ CATALOG, PAUSE
          500215    3070    REQ2    BOOL    500215          REQUEST STATUS, PAUSE
          500216    3080    REP2    BOOL    500216          REPLACE, PAUSE
          500217    3090    EXE2    BOOL    500217          EXECUTE, PAUSE
          500220    3100    RUN2    BOOL    500220          RUN, PAUSE
          500221    3110    CON2    BOOL    500221          CONTINUE, PAUSE
          500222    3120    PAS2    BOOL    500222          PASS, PAUSE
          500223    3130    ALT2    BOOL    500223          ALTER ACCESSES, PAUSE
          500224    3140    CMX2    BOOL    500224          CHANGE CATALOG MAX, PAUSE
          500226    3150    PDA2    BOOL    500226          PROVIDE DEVICE ADDRESSES, AND PAUSE
          500227    3160    CCO2    BOOL    500227          COPY CATALOG AND OPEN FILES, PAUSE
          500231    3170    COP2    BOOL    500231          COPY, PAUSE
          500232    3180    DRI2    BOOL    500232          DRIVE, PAUSE
          500233    3190    REA2    BOOL    500233          READ, PAUSE
          500234    3200    WRI2    BOOL    500234          WRITE, PAUSE
          500235    3210    RES2    BOOL    500235          RESET STATUS, PAUSE
          500236    3220    TOPE2   BOOL    500236          TALLY OPEN, PAUSE
          500237    3230    TERA2   BOOL    500237          TALLY ERASE, PAUSE
          500240    3240    TREP2   BOOL    500240          TALLY REPLACE, PAUSE
```

M DEFINITIONS--MME STATUS RETURNS

```
                    3250            TTLSS   MME STATUS RETURNS
                    3260    *
                    3270    *
                    3280    *       STATUS RETURNS ON MME
                    3290    *
                    3300            HEAD    S
          000000    3310    SOK     BOOL    000             OPERATION SUCCESSFUL
          000020    3320    RES     BOOL    020             STATUS WAS RESET
          000040    3330    QUO     BOOL    040             QUOTAS EXCEEDED
          000060    3340    STO     BOOL    060             SYSTEM OUT OF STORAGE
          000100    3350    ACC     BOOL    100             ACCESS ERROR, MISSING ACCESSES IN 0-8
          000120    3360    BSY     BOOL    120             FILE BUSY
          000140    3370    ERA     BOOL    140             A REGISTER PARAMETER ERROR
          000160    3380    ERQ     BOOL    160             Q REGISTER PARAMETER ERROR
          000200    3390    ER0     BOOL    200             PARAMETER X0 ERROR
          000220    3400    ER1     BOOL    220             PARAMETER X1 ERROR
          000240    3410    ER2     BOOL    240             PARAMETER X2 ERROR
          000260    3420    ER3     BOOL    260             PARAMETER X3 ERROR
          000300    3430    ER4     BOOL    300             PARAMETER X4 ERROR
          000320    3440    ER5     BOOL    320             PARAMETER X5 ERROR
          000360    3450    ER7     BOOL    360             PARAMETER X7 ERROR
          000400    3460    RER     BOOL    400             RECOVERABLE ERROR
          000420    3470    UER     BOOL    420             UNRECOVERABLE ERROR
                    3480    *
                    3490    *
                    3500    *
                    3510    *       COPY
                    3520    *
          000001    3530    SFE     BOOL    1               SOURCE FILE EXHAUSTED
          000002    3540    DFE     BOOL    2               DESTINATION FILE EXHAUSTED
          000003    3550    INA     BOOL    3               OPERATION INAPPROPRIATE
          000004    3560    SPT     BOOL    4               SOURCE POINTER OUT OF BOUNDS
          000005    3570    DPT     BOOL    5               DESTINATION POINTER OUT OF BOUNDS
          000006    3580    CFB     BOOL    6               COMFILE BUSY
          000007    3590    MNA     BOOL    7               MASTER END OF COMM FILE NOT ACCEPTING SPECIALS
                    3600    *
                    3610    *       OPEN,ERASE,REPLACE
                    3620    *
          000001    3630    PRL     BOOL    1               PARTIAL SUCCESS
          000002    3640    LOK     BOOL    2               LOCKOUT
          000003    3650    NOF     BOOL    3               FILE NOT FOUND
          000004    3660    PRV     BOOL    4               PROTECTION VIOLATION
          000005    3670    FAL     BOOL    5               FAIL (NOT ENOUGH PERMISSIONS)
          000006    3680    BTN     BOOL    6               BAD TREE NAME
          000007    3690    CLE     BOOL    7               CLIMB ERROR
          000010    3700    OFL     BOOL    10              OFF-LINE FILE (OPEN ONLY)
          000011    3710    DEV     BOOL    11              ILLEGAL CAUSE FILE WAS DEVICE FILE (ERASE, REPLACE ONLY)
          000012    3720    FOR     BOOL    12              FORMAT ERROR (TALLY OPERATIONS ONLY)
                    3730    *
                    3740    *       CCE
                    3750    *
          000001    3760    FNC     BOOL    1               FILE NOT CATALOGED
```

```
S                                   DEFINITIONS--MME STATUS RETURNS

000002  3770    DUP     BOOL    2           DUPLICATE FILENAME
000003  3780    ITB     BOOL    3           ILLEGAL TRAP BITS
000005  3790    IUD     BOOL    5           ILLEGAL USAGE,DATES,PREF,OR TYPE
        3800    *
        3810    *       RUN,EXECUTE
        3820    *
000001  3830    TRO     BOOL    1           TIMER RUNOUT
000002  3840    ABO     BOOL    2           JOB ABORTED
000005  3850    RLI     BOOL    5           RUNLIST ERROR
000006  3860    SWA     BOOL    6           SWAP ERROR
        3870    *
        3880    *       CATALOG
        3890    *
000001  3900    ITP     BOOL    1           ILLEGAL TRAP PROTECTION BIT
000003  3910    CAT     BOOL    3           ALREADY CATALOGED
000004  3920    PRE     BOOL    4           PREFERENCE TOO LOW
        3930    *
        3940    *       DRIVE
        3950    *
000001  3960    DEF     BOOL    1           END OF FILE ON DEVICE FILE
000010  3970    DCW     BOOL    10          BAD DCW
000003  3980    NAP     BOOL    3           COMMAND INAPPROPRIATE
000007  3990    NSP     BOOL    7           SLAVE NOT ACCEPTING SPECIALS
        4000    *
        4010    *       COPY CATALOG AND OPEN FILES
        4020    *
000014  4030    SVF     BOOL    14          STATE VECTOR FULL, NO MORE FCB'S
000015  4040    SWP     BOOL    15          JOB SWAPPED BEFORE CCO COMPLETE
        4050    *
        4060    *       OTHERS
        4070    *
000001  4080    SPC     BOOL    1           CHANGE CAT MAX--NOT ENABLED FOR SPEC. CATALOG
000001  4090    REJ     BOOL    1           OVERLAY--REJECTED CAUSE MME'S OUTSTANDING
000001  4100    RIP     BOOL    1           RESET STATUS--RESET ALREADY IN PROGRESS
000002  4110    CLO     BOOL    2           ALTER ACCESSES--FILE CLOSED SINCE NO MORE ACCESSES
000002  4120    MNR     BOOL    2           PASS--MESSAGE NOT READ
```

S DEFINITIONS--DEVICE DRIVES AND X4 BITS

```
                    4130            TTLSS   DEVICE DRIVES AND X4 BITS
                    4140    *
                    4150    *
                    4160    *       DEVICE DRIVES -- CAUSE THE SPECIFIED FUNCTION TO BE APPLIED
                    4170    *       TO THE DEVICE.  THESE FUNCTIONS ARE REQUESTED BY A DRIVE OF
                    4180    *       TYPE 12 OR 24 (DEVICE DRIVE).
                    4190    *
                    4200            HEAD
000012              4210    DEVDR   BOOL    12              DEVICE DRIVE (SINGLE ACTION)
000024              4220    DEVDRW  BOOL    24              DEVICE DRIVE (WITH DCW'S)
                    4230    *
                    4240            HEAD    M               M FOR MODE
100000              4250    DAR     BOOL    100000          WAIT UNTIL DEVICE IS READY
110000              4260    DAS     BOOL    110000          WAIT FOR A HARDWARE SPECIAL INTERRUPT TO OCCUR
140000              4270    DEE     BOOL    140000          ENABLE ERROR RECOVERY
150000              4280    DSE     BOOL    150000          SUPPRESS ERROR RECOVERY
200000              4290    DSB     BOOL    200000          SET BINARY MODE (CARDS OR TAPE)
210000              4300    DSD     BOOL    210000          SET DECIMAL MODE (PUN, TAP) OR MIXED MODE (RDR)
240000              4310    DSH     BOOL    240000          SET HIGH DENSITY MODE FOR TAPE
250000              4320    DSL     BOOL    250000          SET LOW DENSITY MODE FOR TAPE
270000              4330    DSF     BOOL    270000          SET FILE PROTECT
300000              4340    DFR     BOOL    300000          FORWARD SPACE TAPE ONE RECORD
310000              4350    DBR     BOOL    310000          BACKWARD SPACE TAPE ONE RECORD
320000              4360    DFF     BOOL    320000          FORWARD SPACE TAPE ONE FILE
330000              4370    DBF     BOOL    330000          BACKSPACE TAPE ONE FILE
340000              4380    DER     BOOL    340000          ERASE TAPE OR SOUND CONSOLE TYPEWRITER ALARM
350000              4390    DEF     BOOL    350000          WRITE END-OF-FILE MARK ON TAPE
360000              4400    DWO     BOOL    360000          WRITE ONE CHAR XX (30-35) RECORD ON TAPE
370000              4410    DRW     BOOL    370000          REWIND TAPE
371000              4420    DRU     BOOL    371000          REWIND AND UNLOAD TAPE
                    4430    *
                    4440    *               DRIVES WITH DCW'S (TYPE 24)
                    4450    *
410000              4460    MRR     BOOL    410000          MULTI RECORD READ (4100XX)
420001              4470    RTH     BOOL    420001          READ TRACK HEADER
430001              4480    FMT     BOOL    430001          FORMAT TRACK (43X001 - X --> TRACK INDICATOR)
610000              4490    MRW     BOOL    610000          MULTI RECORD WRITE (6100XX)
620001              4500    WIM     BOOL    620001          WRITE PRINT TRAIN IMAGE
630001              4510    WVFC    BOOL    630001          WRITE VFC
640001              4520    LCS     BOOL    640001          WRITE CONTROL STORE (MPC)
650001              4530    LMM     BOOL    650001          LOAD MAIN MEMORY (MPC)
660001              4540    LP      BOOL    660001          LOAD PORT PERSONALITY (MPC)
670001              4550    RDS     BOOL    670001          READ DETAILED STATUS (MPC)
                    4560    *
                    4570    *               GENERIC DCW DRIVES
                    4580    *
400000              4590    READ    BOOL    400000
600000              4600    WRITE   BOOL    600000
700000              4610    DIAG    BOOL    700000
                    4620    *
                    4630    *
                    4640    *       BIT DESCRIPTIONS FOR X4 SETTINGS FOR COPY, READ, WRITE, DRIVE
```

```
M                                   DEFINITIONS--DEVICE DRIVES AND X4 BITS

                    4650    *       AND RESET STATUS COMMANDS
                    4660    *
          400000    4670    NTS     BOOL    400000          DO NOT TRAP SOURCE ON COPY
          200000    4680    RSO     BOOL    200000          RESERVE COMMUNICATION FILE REFERENCED BY X0
          000400    4690    NTD     BOOL    400             DO NOT TRAP DESTINATION ON COPY
          000200    4700    RDE     BOOL    200             RESERVE COMMUNICATION FILE REFERENCED BY X2
```

M DEFINITIONS--FAULT VECTOR (06/30/74)

```
                          4710                TTLS    DEFINITIONS--FAULT VECTOR (06/30/74)
                          4720                HEAD
    000000  003372 7100 00  4730                TRA     INIT
    000001  000000 000000  4740  FVTAL         ZERO    0               SPECIAL TALLY -- MUST BE INITIALIZED BY USER DESIRING SPECIALS
    000002  000000000000  4750                OCT     0               2 - MEMORY FAULT
    000003  000656 7170 00  4760                XED     ABORT           .
    000004  000000000000  4770                OCT     0               4 - MME FAULT
    000005  000656 7170 00  4780                XED     ABORT           .
    000006  000000000000  4790                OCT     0               6 - FAULT TAG FAULT
    000007  000656 7170 00  4800                XED     ABORT           .
    000010  000000000000  4810  TROFLT        OCT     0               10 - JOB TIME TIMER RUNOUT FAULT
    000011  001762 7100 00  4820                TRA     TRO             .
    000012  000000000000  4830                OCT     0               12 - COMMAND FAULT
    000013  000656 7170 00  4840                XED     ABORT           .
    000014  000000000000  4850                OCT     0               14 - DERAIL FAULT
    000015  000656 7170 00  4860  ABORTV        XED     ABORT           .
    000016  000000000000  4870                OCT     0               16 - LOCKUP FAULT
    000017  000656 7170 00  4880                XED     ABORT           .
    000020  000000000000  4890  SPIC          OCT     0               20 - SPECIAL INTERRUPT
    000021  001230 7100 00  4900  SPAN          TRA     SPEC            SPECIAL INTERRUPT VECTOR (CMD FLT)
    000022  000000000000  4910                OCT     0               22 - PARITY FAULT
    000023  000656 7170 00  4920                XED     ABORT           .
    000024  000000000000  4930                OCT     0               24 - ZERO OPCODE FAULT
    000025  000656 7170 00  4940                XED     ABORT           .
    000026  000000000000  4950                OCT     0               26 - OP NOT COMPLETE FAULT
    000027  000656 7170 00  4960                XED     ABORT           .
    000030  000000000000  4970                OCT     0               30 - STARTUP FAULT
    000031  000656 7170 00  4980                XED     ABORT           .
    000032  000000000000  4990                OCT     0               32 - OVERFLOW FAULT
    000033  000656 7170 00  5000                XED     ABORT           .
    000034  000000000000  5010                OCT     0               34 - DIVIDE CHECK FAULT
    000035  000656 7170 00  5020                XED     ABORT           .
    000036  000000000000  5030                OCT     0               36 - REAL TIME TIMER RUNOUT FAULT
    000037  000656 7170 00  5040                XED     ABORT           .
                  000040  5050                EIGHT
                  000040  5060  TRMRG         BSS     8               STORE REGISTERS HERE ON PROGRAM ABORT
                  000050  5070  ERIC          BSS     1               IC/IR AT FAULT OR NON-TERMINAL ERROR
    000051  000301071002  5080                DATE                    ASSEMBLY DATE
    000052  000000000000  5090                TTLDAT                  DATE OF UPDATE
    000053  000000000000  5100  TRMST         DATA    0               TERMINATION STATUS
                  000054  5110  RUNDT         BSS     2               DATE OF RUN
                  000056  5120  RUNTM         BSS     2               TIME OF RUN
    000060  000000000000  5130  RUNFA         DATA    0               FAULT TYPE (LOCATION IN FAULT VECTOR)
    000061  000000000000  5140  CORFR         DATA    0               FRN OF MY CORE
    000062  000000000000  5150  MFDFR         DATA    0               FRN OF THE MASTER FILE DIRECTORY
    000063  000000000001  5160  TTYFR         DATA    1               FRN OF TELETYPE PASSED BY SIMON
    000064  000000000002  5170  CATFR         DATA    2               FRN OF MY CATALOG WHEN RUN BY SIMON
    000065  000000000003  5180  CURFR         DATA    3               FRN OF MY CURRENT FILE WHEN RUN BY SIMON
                  000066  5190  PATFV         BSS     24              *PATCH SPACE*
```

DEFINITIONS--TRAP BLOCK (04/23/73)

```
                                5200          TTLS    DEFINITIONS--TRAP BLOCK (04/23/73)
                                5210    *
                                5220    *
                                5230    *     THE FORMAT OF A TRAP BLOCK FOR USE WITH TRAPPING EXECUTIVE
                                5240    *     COMMANDS IS AS FOLLOWS:
                                5250    *
                                5260    *     WORD    NAME
                                5270    *     ----    ----
                                5280    *     +0      T$STW1  (0-35)
                                5290    *     +1      T$STW2  (0-35)
                                5300    *     +2      T$RET   (0-35)
                                5310    *     +3      T$LINK  (0-35)
                                5320    *
                                5330    *
                                5340    *     T$STW1  IS STATUS WORD 1 AND IS SET UP BY THE EXECUTIVE
                                5350    *     T$STW2  IS STATUS WORD 2 AND IS SET UP BY THE EXECUTIVE
                                5360    *     T$RET   IS THE RETURN WORD AND IS SET UP BY THE EXECUTIVE
                                5370    *     T$LINK  IS THE LOCATION TO WHICH THE EXECUTIVE WILL TRANSFER
                                5380    *             UPON TRAPPING THE CORRESPONDING OPERATION
                                5390    *
                                5400    *
                                5410    *     TRAP BLOCK NAME DEFINITIONS
                                5420    *
                                5430    *
                                5440    *           UNIPROGRAMMING TRAP BLOCK DEFINITION
                                5450    *
                                5460          HEAD    T
                      000000    5470    STW1  EQU     0               STATUS WORD ONE
                      000001    5480    STW2  EQU     1               STATUS WORD TWO
                      000002    5490    RET   EQU     2               RETURN FROM TRAP
                      000003    5500    LINK  EQU     3               ROUTINE ADDRESS (RET)
                      000116    5510    TRAP  BSS     3               SOLITARY UNIPROGRAM BLOCK
000121  777777 6300 04          5520          RET     RET-LINK,IC     KISS
                                5530          HEAD    P
                      000000    5540    LINK  EQU     0               TRAP BLOCK LINKAGE (-1)
                      000001    5550    STW1  EQU     1               1ST STATUS WORD (0)
                      000002    5560    STW2  EQU     2               2ND STATUS WORD (1)
                      000003    5570    RET   EQU     3               TRAP RETURN WORD (2)
                      000004    5580    EXEC  EQU     4               TRAP PROCESSING ROUTINE
                      000005    5590    INFO  EQU     5               INFO PTR
                      000006    5600    BUF   EQU     6               PTR TO BUFFER (IN LOWER)
                      000007    5610    BLOCK EQU     7               PTR TO SECTOR NUMBER
                                5620    *
                                5630          HEAD
                      000010    5640    TASKLN EQU    8               WORDS PER TRAP BLOCK
                                5650    *
                                5660          HEAD    C               DURING TRAP FIRING
                      777773    5670    LINK  EQU     -5              LINKAGE WORD (FOR TASK)
                      777774    5680    STW1  EQU     -4
                      777775    5690    STW2  EQU     -3
                      777776    5700    RET   EQU     -2
                      777777    5710    EXEC  EQU     -1              (EXECUTED UPON TRAP)
```

```
C                                   DEFINITIONS--TRAP BLOCK (04/23/73)

000000  5720    INFO    EQU     0           (TASK INFORMATION PTR)
000001  5730    BUF     EQU     1           PTR TO BUFFER (IN LOWER)
000002  5740    BLOCK   EQU     2           PTR TO SECTOR NUMBER
        5750            HEAD    D           DEVICE BLOCK
000000  5760    LINK    EQU     0           STANDARD QUEUE PTR
000001  5770    DEV     EQU     1           DEVICE NUMBER (M45100XX)
000001  5780    FRN     EQU     1           ASSIGNED FRN (FOR OPEN&CLOSE)
000003  5790    EXEC    EQU     3           READ/WRITE DEVICE ROUTINE ADDRESS
000004  5800    MATE    EQU     4           PTR FOR READ/WRITE MATE DEVICE
000005  5810    ERRS    EQU     5           NUMBER OF CONSECUTIVE ERRORS
        5820            HEAD
        5830    *
000006  5840    DEVLNG  EQU     6           LENGTH OF DEVICE BLOCK
        5850            HEAD
```

```
                                        DEFINITIONS--PUSH DOWN LIST (03/24/74)

                                5860            TTLS    DEFINITIONS--PUSH DOWN LIST (03/24/74)
                                5870    *
                                5880    *
                                5890    *       SAVE -- SAVE REGISTER T OR REGISTER SPECIFIED (REG 1 = 'X1'; REG A = 'A')
                                5900    *
                                5910    SAVE    MACRO   REGISTERS
                                5920            IFE     '#1','',2      IF NO REGISTERS SPECIFIED, SAVE T
                                5930            STX     T,$PDL,ID       SAVE T
                                5940            DCARD   3               AND THEN EXIT
                                5950            IDRP    #1              ELSE SAVE ALL OF THE REGISTERS SPECIFIED
                                5960            ST#1    $PDL,ID         SAVE REG #1
                                5970            IDRP                    AND LOOP BACK FOR MORE
                                5980            ENDM    SAVE
                                5990    *
                                6000    *
                                6010    *       RETURN -- RETURN FROM SUBROUTINE
                                6020    *
                                6030    RETURN  MACRO   TRANSFER
                                6040            IFE     '#1','',2      IF NO TRANSFER SPECIFIED, DO A TRA THRU THE PDL
                                6050            TRA     $PDL,DIC        TRANSFER VIA PDL
                                6060            DCARD   1               AND EXIT
                                6070            #1      $PDL,DIC        ELSE DO APPROPRIATE TRANSFER AS USER REQUESTS
                                6080            ENDM    RETURN
                                6090    *
                                6100    *
                                6110    *       POP -- LOAD VALUES FROM THE PDL
                                6120    *
                                6130    POP     MACRO   REGISTERS
                                6140            IFE     '#1','',2      IF NO REGISTER SPECIFIED, LOAD T FROM TOP OF PDL
                                6150            LDX     T,$PDL,DI       LOAD T FROM TOP OF PDL
                                6160            DCARD   3               AND EXIT
                                6170            IDRP    #1              ELSE LOAD ALL OF THE REGISTERS SPECIFIED FROM THE PDL
                                6180            LD#1    $PDL,DI         LOAD A REGISTER
                                6190            IDRP                    AND LOOP BACK FOR MORE
                                6200            ENDM    POP
                                6210    *
                                6220    *       LIST ELEMENT DEFINITIONS
                                6230    *
                          777777 6240    LINK    EQU     -1              LINK TO PREVIOUS BLOCK
                          777777 6250    LEN     EQU     -1              LENGTH OF BLOCK
                                6260    *
                                6270    *       PUSH -DOWN LIST
                                6280    *
000122  000123 0062 51          6290    PDL     TALLYC  *+1,50,I
                          000123 6300            BSS     50
```

```
                                6310            TTLS    ROUTINES--GENERAL IO AND SUPPORTING MACROS (06/30/74)
                                6320    *
                                6330    *
                                6340    *       PAUSE - WAIT FOR ACTIVITY TO CEASE
                                6350    *
                                6360    *       #1 = NUMBER OF ACTIVITIES TO WAIT FOR
                                6370    *
                                6380    PAUSE   MACRO   NUMBER-OF-INTERRUPTS
                                6390            LDX     5,#1,DU         PAUSE FOR #1
                                6400            MME     M$PAU
                                6410            ENDM    PAUSE
                                6420    *
                                6430    *
                                6440    *       WAIT - WAIT FOR THE TRAP POINTED TO BY XRB TO SPRING
                                6450    *
                                6460    WAIT    MACRO
                                6470            TSX     T,WAIT          WAIT FOR TRAP TO COME IN
                                6480            ENDM    WAIT
                                6490    *
000205  000002 2340 16          6500    WAIT    SZN     T$RET,B         HAS TRAP COME IN?
000206  000000 6010 10          6510            TNZ     0,T             YES, RETURN
                000207          6520            PAUSE   ONE             NO - PAUSE
000207  000001 2250 03                          LDX     5,ONE,DU        PAUSE FOR ONE
000210  500005 0010 00                          MME     M$PAU
000211  000205 7100 00          6530            TRA     WAIT            GO SEE IF TRAP CAME IN
                                6540    *
                                6550    *       ISSUE MACRO -- SET UP FOR MME
                                6560    *
                                6570    ISSUE   MACRO   MME,(PAUSE),(TRAP)
                                6580            COND    OFF,WAIT
                                6590            INE     '#3','',1
                                6600            EAX     TRAP,#3
                                6610            STZ     T$RET,TRAP
                                6620            MME     M$#1
                                6630            INE     '#2','NP',1
                                6640            WAIT
                                6650            COND    ON,WAIT
                                6660            ENDM    ISSUE
                                6670    *
                                6680    *       ARGDEF -- DEFINE ARGUMENTS FOR MME
                                6690    *
                                6700    ARGDEF  MACRO   OPCODE,PSEUDOP,ADDRESS,TAG
                                6710            CRSM    OFF             AVOID A MESS
                                6720            IFE     '#4','',2       CHECK FOR NO TAG
                                6730            #1      #3
                                6740            DCARD   7               SKIP THE REST
                                6750            IFL     #4,64,2         IF TAG IS REALLY A TAG
                                6760            #1      #3,#4           DO OP
                                6770            DCARD   4               SKIP THE REST
                                6780            USE     TEMP            ELSE GENERATE A CONSTANT
                                6790    #3      #2      #4
                                6800            USE     PREVIOUS
```

```
6810                #1      #3
6820                ENDM    ARGDEF
6830    *
6840    *           OPEN
6850    *
6860    *           #1 = FRN OF CATALOG
6870    *           #2 = NAME OF FILE
6880    *           #3 = PASSWORD OF FILE
6890    *           #4 = ACCESSES FOR OPEN
6900    *           #5 = FETCH
6910    *           #6 = PAUSE
6920    *           #7 = TRAP
6930    *
6940    OPEN        MACRO
6950                COND    OFF,ARGDEF,SET,BSET,ISSUE
6960                LXL     FRNO,#1             GET FRN
6970                ARGDEF  EAX1,NAME,#2
6980    .SET        SET     #4                  GET ACCESSES
6990                INE     '#3','',2
7000    .SET        BSET    .SET+B$PSW
7010                ARGDEF  EAX3,NAME,#3
7020                INE     '#5','',2
7030                EAX     X7,#5
7040    .SET        BSET    .SET+B$FET          ADD IN FETCH BIT
7050                LDX     FLAGS,.SET,DU       GET ACCESSES
7060                ISSUE   OPE,#6,#7           ISSUE THE OPEN
7070                COND    ON,ARGDEF,SET,BSET,ISSUE
7080                ENDM    OPEN
7090    *
7100    *           COPY
7110    *
7120    *           #1 = FRN OF SOURCE FILE
7130    *           #2 = POINTER IN SOURCE FILE
7140    *           #3 = FRN OF DESTINATION FILE
7150    *           #4 = POINTER IN DEST FILE
7160    *           #5 = LENGTH TO COPY
7170    *           #6 = FLAGS
7180    *           #7 = PAUSE
7190    *
7200    COPY        MACRO
7210                LXL     X0,#1               GET FRN1
7220                COND    OFF,ARGDEF,ISSUE
7230                ARGDEF  EAX1,DATA,#2        DEFINE POINTER
7240                LXL     X2,#3               GET FRN2
7250                ARGDEF  EAX3,DATA,#4        GET POINTER
7260                ARGDEF  EAX7,DATA,#5        DEFINE LINGTH
7270                LDX     X4,#6,DU            GET FLAGS
7280                ISSUE   COP,#7,#8           ISSUE COPY
7290                COND    ON,ARGDEF,ISSUE
7300                ENDM    COPY
7310    *
7320    *           WRITE
```

```
7330     *
7340     *        #1 = FRN
7350     *        #2 = PTR
7360     *        #3 = LENGTH
7370     *        #4 = FLAGS
7380     *        #5 = PAUSE
7390     *
7400     WRITE    MACRO
7410              COND     OFF,ISSUE,ARGDEF
7420              LXL      X2,#1              GET FRN
7430              ARGDEF   EAX1,DATA,#2       GET POINTER
7440              ARGDEF   EAX7,DATA,#3       GET LENGTH
7450              LDX      X4,#4,DU           GET FLAGS
7460              ISSUE    WRI,#5,#6          ISSUE WRITE
7470              COND     ON,ISSUE,ARGDEF
7480              ENDM     WRITE
7490     CRLF     MACRO
7500              OCT      015012177177       <CR>,<LF>,RUBOUTS
7510              ENDM     CRLF
7520     *
7530     CR       MACRO
7540              OCT      015177177177
7550              ENDM     CR
7560     *
7570     LF       MACRO
7580              OCT      012177177177
7590              ENDM     LF
```

```
                                7600            EJECT
                                7610    *
                                7620    *       FOPEN - OPEN A FILE
                                7630    *
                                7640    *       #1 = CATALOG FRN
                                7650    *       #2 = ADDRESS OF FILENAME
                                7660    *       #3 = ADDRESS OF PASSWORD
                                7670    *       #4 = ACCESSES
                                7680    *       ROUTINE RETURNS TO *+2 IF OPEN SUCCESSFUL
                                7690    *                          *+1 IF NOT
                                7700    *       AT EXIT TIME:
                                7710    *          DESTROYS REGISTERS X AND Y
                                7720    *          C(X) = EXECUTIVE STATUS
                                7730    *          C(Y) = FILE FRN
                                7740    *
                                7750    FOPEN   MACRO   FRCAT,NAME,PASSWORD,ACCESS
                                7760            TSX     T,FOPEN
                                7770            ZERO    #2,#1
                                7780            ZERO    #3,#4
                                7790            ENDM    FOPEN
                                7800    *
                        000212  7810    FOPEN   NULL
000212  000240 7530 00   7820            SREG    OPER            SAVE ENTRY REGISTERS
000213  000236 7400 00   7830            STX     T,OPEX          SAVE INDEX FOR PARAMETERS
000214  000236 7200 51   7840            LXL     X0,OPEX,I       CAT FRN
000215  000000 7200 10   7850            LXL     FRN0,,X0        .
000216  000236 2210 56   7860            LDX     X1,OPEX,ID      FILENAME
000217  000236 2230 51   7870            LDX     X3,OPEX,I       PW
000220  000236 7240 56   7880            LXL     X4,OPEX,ID      ACCESS
000221  000116 6260 00   7890            EAX     TRAP,T$TRAP     TRAP
                        000222  7900            ISSUE   OPE
000222  000002 4500 16                    STZ     T$RET,TRAP
000223  500101 0010 00                    MME     M$OPE
000224  000205 7000 00                    TSX     T,WAIT          WAIT FOR TRAP TO COME IN
000225  000000 7220 16   7910            LXL     FRN2,T$STW1,TRAP  GET THE FRN
000226  000000 2210 16   7920            LDX     X1,T$STW1,TRAP  GET THE STATUS
000227  000777 3610 03   7930            ANX     X1,B$MASLQ,DU   .
000230  000240 4410 00   7940            SXL     X1,OPER         *****
000231  000241 7420 00   7950            STX     X2,OPER+1       * RESTORE MOST OF THE REGISTERS
000232  000240 0730 00   7960            LREG    OPER            *****
000233  000002 1010 03   7970            CMPX    X1,2,DU         CHECK FOR RELATIVE SUCCESS
000234  000002 6030 10   7980            TRC     2,T             ERROR RETURN
000235  000003 7100 10   7990            TRA     3,T             SUCCESSFUL RETURN
                                8000    *
                                8010    *
000236  000000 0000 20   8020    OPEX    ARG     0,*             PARAMETER POINTER/RETURN WORD
000237  000001710004
                        000240  8030            EIGHT
                        000240  8040    OPER    BSS     8               ENTRY REGISTERS
```

```
                                8050            EJECT
                                8060    *
                                8070    *
                                8080    *       FWRIT - WRITE TO A FILE
                                8090    *
                                8100    *       #1 = ADDRESS OF DESTINATION POINTER
                                8110    *       #2 = ADDRESS OF DESTINATION FRN
                                8120    *       #3 = TRAP ADDRESS
                                8130    *       #4 = ADDRESS OF LENGTH TO WRITE
                                8140    *       PRESERVES REGISTERS
                                8150    *
                                8160    FWRIT   MACRO   ADRESS,FRNO,TRAP,NUMBER-OF-WORDS
                                8170            TSX     T,FWRIT
                                8180            ZERO    #1,#2
                                8190            ZERO    #3,#4
                                8200            ENDM    FWRIT
                                8210    *
                         000250 8220    FWRIT   NULL
000250  000270 7530 00          8230            SREG    WRIR            PRESERVE ENTRANCE REGISTERS
000251  000265 7400 00          8240            STX     T,WRIX          SAVE PARAMETER POINTER
000252  000265 2210 51          8250            LDX     1,WRIX,I        PICK UP ADDRESS
000253  000265 7220 56          8260            LXL     2,WRIX,ID       PICK UP FRN
000254  000000 7220 12          8270            LXL     2,0,2           .
000255  000265 2260 51          8280            LDX     6,WRIX,I        PICK UP TRAP ADDRESS
000256  000265 7270 56          8290            LXL     7,WRIX,ID       PICK UP LENGTH
000257  000000 2240 03          8300            LDX4    0,DU            FLAG BITS
                         000260 8310            ISSUE   WRI
000260  000002 4500 16          8320            STZ     T$RET,TRAP
000261  500134 0010 00          8330            MME     M$WRI
000262  000205 7000 00          8340            TSX     T,WAIT          WAIT FOR TRAP TO COME IN
000263  000270 0730 00          8350            LREG    WRIR            RESTORE REGISTERS
000264  000265 7100 51          8360            TRA     WRIX,I
                                8370    *
                                8380    *
000265  000000 0000 20          8390    WRIX    ARG     0,*
000266  000002710004
                         000270 8400            EIGHT
                         000270 8410    WRIR    BSS     8               ENTRY REGISTERS
```

```
                                    8390            EJECT
                                    8400    *
                                    8410    *
                                    8420    *       FREAD - READ FROM A FILE
                                    8430    *
                                    8440    *       PRESERVES ALL REGISTERS
                                    8450    *
                                    8460    FREAD   MACRO   FRNO,(CORE      ADRESS),TRAP,(NUMBER OF WORDS)
                                    8470            TSX     T,FREAD         ISSUE FREAD WITH THESE ARGUMENTS
                                    8480            ZERO    #1,#2           *FRN,*ADDRESS
                                    8490            ZERO    #3,#4           *TRAP,*LENGTH
                                    8500            ENDM    FREAD
                                    8510    *
                           000300   8520    FREAD   NULL
000300  000320 7530 00             8530            SREG    REAR            SAVE ENTRY REGISTERS
000301  000315 7400 00             8540            STX     T,REAX          SAVE ARGUMENT POINTER
000302  000315 2200 51             8550            LDX     0,REAX,I        *FRN
000303  000000 7200 10             8560            LXL     0,0,0           FRN
000304  000315 7230 56             8570            LXL     3,REAX,ID       *ADDRESS
000305  000315 2260 51             8580            LDX     6,REAX,I        *TRAP
000306  000315 7270 56             8590            LXL     7,REAX,ID       *LENGTH
000307  000000 2240 03             8600            LDX4    0,DU            FLAG BITS
                           000310   8610            ISSUE   REA
000310  000002 4500 16                             STZ     T$RET,TRAP
000311  500133 0010 00                             MME     M$REA
000312  000205 7000 00                             TSX     T,WAIT          WAIT FOR TRAP TO COME IN
000313  000320 0730 00             8620            LREG    REAR            RESTORE REGISTERS
000314  000315 7100 51             8630            TRA     REAX,I
                                    8640    *
                                    8650    *
000315  000000 0000 20             8660    REAX    ARG     0,*             ARGUMENT POINTER/RETURN WORD
000316  000002710004
                           000320   8670            EIGHT
                           000320   8680    REAR    BSS     8               ENTRY REGISTERS
```

```
                                8690            EJECT
                                8700    *
                                8710    *
                                8720    *       FCOPY - COPY FROM ONE FILE TO ANOTHER
                                8730    *
                                8740    *       DESTROYS REGISTERS X
                                8750    *           C(X) = EXECUTIVE STATUS
                                8760    *
                                8770    FCOPY   MACRO   FR1,LOCATION,FR2,LOCATION,TRAP,(NUMBER  OF WORDS)
                                8780            TSX     T,FCOPY         ISSUE FCOPY WITH THESE ARGUMENTS
                                8790            ZERO    #1,#2           *SOURCE FRN,*SOURCE LOC
                                8800            ZERO    #3,#4           *DESTINATION FRN,*DESTINATION LOC
                                8810            ZERO    #5,#6           *TRAP,*RECORD LENGTH
                                8820            ENDM    FCOPY
                                8830    *
                         000330 8840    FCOPY   NULL
000330  000360 7530 00          8850            SREG    COPR            PRESERVE ENTRY REGISTERS
000331  000355 7400 00          8860            STX     T,COPX          SAV ARGUMENT POINTER
000332  000355 2200 51          8870            LDX     0,COPX,I        GET *FRN
000333  000000 7200 10          8880            LXL     0,0,0           GET FRN
000334  000355 7210 56          8890            LXL     1,COPX,ID       *SOURCE LOC
000335  000355 2220 51          8900            LDX     2,COPX,I        *FRN
000336  000000 7220 12          8910            LXL     2,0,2           FRN
000337  000355 7230 56          8920            LXL     3,COPX,ID       *DESTINATION LOC
000340  000000 6240 00          8930            EAX     4,0             NO FLAG BITS
000341  000355 2260 51          8940            LDX     6,COPX,I        *TRAP
000342  000355 7270 56          8950            LXL     7,COPX,ID       *LENGTH
                         000343 8960            ISSUE   COP
000343  000002 4500 16          8970            STZ     T$RET,TRAP
000344  500131 0010 00          8980            MME     M$COP
000345  000205 7000 00          8990            TSX     T,WAIT          WAIT FOR TRAP TO COME IN
000346  000000 2210 16          9000            LDX     X,T$STW1,B      GET THE STATUS
000347  000777 3610 03          9010            ANX     X,B$MASLQ,DU    *****
000350  000360 4410 00          9020            SXL     X,COPR          * RESTORE REGISTERS
000351  000360 0730 00          9030            LREG    COPR            *****
000352  000002 1010 03          9040            CMPX    X,S$SFE+1,DU    CHECK FOR ONE OR LESS
000353  000003 6050 10          9050            TPL     3,T             ERROR EXIT
000354  000004 7100 10          9060            TRA     4,T             SUCCUSSFUL EXIT
                                9070    *
                                9080    *
000355  000000 0000 20          9090    COPX    ARG     0,*
000356  000002710004
                         000360 9100            EIGHT
                         000360 9110    COPR    BSS     8               ENTRY REGISTERS
```

```
                                  9090              EJECT
                                  9100    *
                                  9110    *
                                  9120    *         FCLOS - CLOSE THE SPECIFIED FILE
                                  9130    *
                                  9140    *         PRESERVES ALL REGISTERS
                                  9150    *
                                  9160    FCLOS     MACRO   FRF
                                  9170              TSX     T,FCLOS           ISSUE FCLOS WITH THESE ARGUMENTS
                                  9180              ARG     #1                ADRESS OF FILE'S FRNO
                                  9190              ENDM    FCLOS
                                  9200    *
                         000370   9210    FCLOS     NULL
000370   003410 7530 00          9220              SREG    CLOR              SAVE CALLING REGISTERS
000371   000401 7400 00          9230              STX     T,CLOX            SAVE ARGUMENT POINTER
000372   000401 7200 57          9240              LXL     0,CLOX,IDC
000373   000116 6260 00          9250              EAX     6,T$TRAP
                         000374   9260              ISSUE   CLO               CLOSE THE FILE
000374   000002 4500 16                            STZ     T$RET,TRAP
000375   500105 0010 00                            MME     M$CLO
000376   000205 7000 00                            TSX     T,WAIT            WAIT FOR TRAP TO COME IN
000377   003410 0730 00          9270              LREG    CLOR              RESTORE REGISTERS
000400   000401 7100 51          9280              TRA     CLOX,I            EVAPORATE
                                  9290    *
                                  9300    *
000401   000000 0000 20          9310    CLOX      ARG     0,*               ARGUMENT POINTER/EXIT
                         003410   9320              USE     EIGHT
                         003410   9330    CLOR      BSS     8                 REGISTER STORAGE
                         000402   9340              USE     PREVIOUS
```

```
                                9350            EJECT
                                9360    *       FCATL - CATALOG A FILE
                                9370    *
                                9380    *       #1 = ADDRESS OF CATALOG FRN
                                9390    *       #2 = ADDRESS OF FILENAME
                                9400    *       #3 = ADDRESS OF FILE FRN
                                9410    *       #4 = ADDRESS OF PASSWORD
                                9420    *       #5 = ACCESSES
                                9430    *       #6 = ADDRESS OF USAGE INFORMATION
                                9440    *       RETURNS TO *+2 IF CATALOG SUCCESSFUL
                                9450    *                  *+1 IF NOT
                                9460    *       DESTROYS REGISTER X
                                9470    *          C(X) = EXECUTIVE STATUS
                                9480    *
                                9490    FCATL   MACRO   FRNC,FILN,FRNF,PWF,ACCESS,USAGE,TRAP
                                9500            TSX     T,FCATL
                                9510            ZERO    #1,#2
                                9520            ZERO    #3,#4
                                9530            ZERO    #5,#6
                                9540            ENDM    FCATL
                                9550    *
                         000402 9560    FCATL   NULL
000402  000440 7530 00          9570            SREG    CATR            PRESERVE ENTRY REGISTERS
000403  000430 7400 00          9580            STX     T,CATX          SAVE ARGUMENT POINTER
000404  000430 2200 51          9590            LDX     0,CATX,I        *CAT FRN
000405  000000 7200 10          9600            LXL     0,0,0           CAT FRN
000406  000430 7210 56          9610            LXL     1,CATX,ID       *FILENAME
000407  000430 2220 51          9620            LDX     2,CATX,I        *FILE FRN
000410  000000 7220 12          9630            LXL     2,0,2           FILE FRN
000411  000430 7230 56          9640            LXL     3,CATX,ID       *PASSWORD
000412  000430 2240 51          9650            LDX     4,CATX,I        *ACCESSES
000413  000430 7250 56          9660            LXL     5,CATX,ID       *USAGE
000414  000116 6260 00          9670            EAX     B,T$TRAP        POINT TO TRAP
                         000415 9680            ISSUE   CAT
000415  000002 4500 16                          STZ     T$RET,TRAP
000416  500103 0010 00                          MME     M$CAT
000417  000205 7000 00                          TSX     T,WAIT          WAIT FOR TRAP TO COME IN
000420  000430 2200 00          9690            LDX     T,CATX          SET UP FOR RETURN
000421  000000 2210 16          9700            LDX     X,T$STW1,B      GET THE STATUS
000422  000440 7400 00          9710            STX     T,CATR          *****
000423  000440 4410 00          9720            SXL     X,CATR          * RESTORE REGISTERS
000424  000440 0730 00          9730            LREG    CATR            *****
000425  000777 3610 03          9740            ANX     X,B$MASLQ,DU    ONLY THE STATUS
000426  000001 6000 10          9750            TZE     1,T             SUCCESS
000427  000000 7100 10          9760            TRA     0,T             *YOU LOSE*
                                9770    *
000430  000000 0000 20          9780    CATX    ARG     0,*
000431  000007710004
                         000440 9790            EIGHT
                         000440 9800    CATR    BSS     8               ENTRY REGISTERS
```

```
                                  9810              EJECT
                                  9820    *
                                  9830    *
                                  9840    *         FOPES - OPEN A SCRATCH FILE
                                  9850    *
                                  9860    *         PRESERVES ALL REGISTERS
                                  9870    *
                                  9880    FOPES     MACRO   TYPE,PREF,TRAP,CATM,CATN
                                  9890              TSX     T,FOPES           ISSUE OPEN SCRATCH WITH THESE ARGUMENTS
                                  9900              ZERO    #1,#2             FILE/CAT FLAG,PREFERENCE (FILES ONLY)
                                  9910              ZERO    #3,#4             *TRAP,*CAT MAX
                                  9920              ZERO    #5                *ENTRY GUESS
                                  9930              ENDM    FOPES
                                  9940    *
                           000450 9950    FOPES     NULL
000450  000470 7530 00           9960              SREG    OPSR              PRESERVE ENTRY REGISTERS
000451  000464 7400 00           9970              STX     T,OPSX            SAVE ARGUMENT POINTER
000452  000464 2240 51           9980              LDX     4,OPSX,I          FILE/CATALOG FLAG
000453  000464 7250 56           9990              LXL     5,OPSX,ID         PREFERENCE
000454  000464 2260 51           10000             LDX     6,OPSX,I          *TRAP
000455  000464 2350 57           10010             LDA     OPSX,IDC          CAT MAX
000456  000464 2360 20           10020             LDQ     OPSX,*            CAT GUESS
                           000457 10030             ISSUE   OPS
000457  000002 4500 16                             STZ     T$RET,TRAP
000460  500100 0010 00                             MME     M$OPS
000461  000205 7000 00                             TSX     T,WAIT            WAIT FOR TRAP TO COME IN
000462  000470 0730 00           10040             LREG    OPSR              RESTORE REGISTERS
000463  000464 7100 51           10050             TRA     OPSX,I
                                  10060   *
                                  10070   *
000464  000000 0000 20           10080   OPSX      ARG     0,*
000465  000003710004
                           000470 10090             EIGHT
                           000470 10100   OPSR      BSS     8                 ENTRY REGISTERS
```

```
                                10110          EJECT
                                10120  *
                                10130  *       FDRIV - FUNCTIONAL DRIVE TO A FILE
                                10140  *
                                10150  *       #1 = ADDRESS OF FILE FRN
                                10160  *       #2 = ADDRESS OF FUNCTIONAL WORD
                                10170  *       #3 = ERROR ADDRESS
                                10180  *       #4 = TRAP ADDRESS
                                10190  *       DESTROYS REGISTER X
                                10200  *          C(X) = EXECUTIVE STATUS
                                10210  *
                                10220  FDRIV   MACRO   FRN,TYPWD,ERR
                                10230          TSX     T,FDRIV
                                10240          ZERO    #1,#2
                                10250          INE     '#4','',2
                                10260          ZERO    #3,#4
                                10270          DCARD   1
                                10280          ZERO    #3,T$TRAP
                                10290          ENDM    FDRIV
                                10300  *
                      000500    10310  FDRIV   NULL
000500  000550 7530 00          10320          SREG    DRIG            PRESERVE ENTRY REGISTERS
000501  000545 7400 00          10330          STX     T,DRIX          SAVE PARAMENTER POINTERS
000502  000546 4500 00          10340          STZ     DRIC            CLEAR ERROR COUNT
000503  000545 2200 51          10350          LDX     0,DRIX,I        *FRN
000504  000000 7200 10          10360          LXL     0,0,0           FRN
000505  000000 6240 00          10370          EAX     4,0             ZERO FLAG BITS
000506  000545 2350 56          10380          LDA     DRIX,ID         *TYPE WORD
000507  000000 2350 05          10390          LDA     0,AL            TYPE WORD
000510  000545 2270 51          10400          LDX     7,DRIX,I        *ERROR ROUTINE
000511  000545 7260 56          10410          LXL     6,DRIX,ID       *TRAP
000512  000547 7400 00          10420          STX     0,DRIF          SAVE THE FRN FOR ERROR RECOVERY
000513  000547 2200 00          10430  DRIM    LDX     0,DRIF          RECOVER THE FRN
                      000514    10440          ISSUE   DRI
000514  000002 4500 16                         STZ     T$RET,TRAP
000515  500132 0010 00                         MME     M$DRI
000516  000205 7000 00                         TSX     T,WAIT          WAIT FOR TRAP TO COME IN
000517  000000 2210 16          10450          LDX     X,T$STW1,B      GET THE STATUS
000520  000777 3610 03          10460          ANX     X,B$MASLQ,DU    .
000521  000545 6000 51          10470          TZE     DRIX,I          IF ZERO - EXIT
000522  000542 6000 00          10480          TZE     DRIXT           IF GOOD, EXIT
000523  000400 1010 03          10490          CMPX    X,S$RER,DU      IS IT RECOVERABLE
000524  000532 6010 00          10500          TNZ     DRIP            NO - CHECK SOME MORE
                                10510
000525  000546 0540 00          10520  DRIR    AOS     DRIC            BUMP ERROR COUNT
000526  000546 7210 00          10530          LXL     X,DRIC          GET THE ERROR COUNT
000527  000004 1010 03          10540          CMPX    X,4,DU          CHECK AGAINST MAX
000530  000513 6020 00          10550          TNC     DRIM            TRY SOME MORE
000531  000536 7100 00          10560          TRA     DRIB            TAKE ERROR EXIT
                                10570
000532  000001 1010 03          10580  DRIP    CMPX    X,S$DEF,DU      IS IT EOF?
000533  000542 6000 00          10590          TZE     DRIXT           YES - EXIT SUCCESSFULLY
```

```
000534  000120 1010 03  10600          CMPX    X,S$BSY,DU      WAS IT BUSY
000535  000525 6000 00  10610          TZE     DRIR            YUP - TRY AGAIN
000536  000553 4470 00  10620  DRIB    SXL     7,DRIG+3        ERROR EXIT
000537  000550 4410 00  10630          SXL     X,DRIG          *****
000540  000550 0730 00  10640          LREG    DRIG            * RESTORE REGISTERS AND EXIT
000541  000000 7100 17  10650          TRA     0,7             *****
                        10660
000542  000550 4410 00  10670  DRIXT   SXL     X,DRIG          *****
000543  000550 0730 00  10680          LREG    DRIG            * RESTORE REGISTERS AND EXIT SUCCESSFULLY
000544  000545 7100 51  10690          TRA     DRIX,I          *****
                        10700  *
                        10710  *
000545  000000 0000 20  10720  DRIX    ARG     0,*
000546  000000000000    10730  DRIC    DATA    0
000547  000000000000    10740  DRIF    DATA    0
                000550  10750          EIGHT
                000550  10760  DRIG    BSS     8               ENTRY REGISTERS
```

```
                                        ROUTINES--RUDIMENTARY TELETYPE IO (03/24/74)

                              10770     TTLS    ROUTINES--RUDIMENTARY TELETYPE IO (03/24/74)
                              10780 *
                              10790 *
                              10800 *       PRINT - WRITE A MESSAGE TO A TELETYPE
                              10810 *
                              10820 *       #1 = ADDRESS OF SOURCE POINTER
                              10830 *       #2 = ADDRESS OF LENGTH
                              10840 *       ALL REGISTERS PRESERVED
                              10850 *
                              10860 PRINT   MACRO   LOC,LEN
                              10870         EAX     1,#1            LOC
                              10880         EAX     7,#2            LEN
                              10890         TSX     T,PRINT         DOIT
                              10900         ENDM    PRINT
                              10910 *
                              10920         INHIB   ON
                    000560    10930 PRINT   NULL
000560  000600 7532 00         10940         SREG    PRIR            PRESERVE CALLING REGISTERS
000561  000001 6222 00         10950         EAX     2,1             POINT TO THE TELETYPE
000562  000000 6242 00         10960         EAX     4,0             CLEAN FLAG BITS
000563  000116 6262 00         10970         EAX     B,T$TRAP        POINT TO THE TRAP
                    000564    10980         ISSUE   WRI
000564  000002 4502 16                       STZ     T$RET,TRAP
000565  500134 0012 00                       MME     M$WRI
000566  000205 7002 00                       TSX     T,WAIT          WAIT FOR TRAP TO COME IN
000567  000000 2212 16         10990         LDX     X,T$STW1,B      GET THE STATUS
000570  000777 3612 03         11000         ANX     X,B$MASLQ,DU    .
000571  757500 6012 00         11010         TNZ     B$ERROR         IF NOT PERFECT - DIE
000572  000600 0732 00         11020         LREG    PRIR            RESTORE CALLING REGISTERS
000573  000000 7102 10         11030         TRA     0,T             RETURN
                              11040         INHIB   OFF
                              11050 *
                              11060 *
000574  000004710004
                    000600    11070         EIGHT
                    000600    11080 PRIR    BSS     8               ENTRY REGISTERS
```

```
                                        ROUTINES--RUDIMENTARY TELETYPE IO (03/24/74)

                                 11090          EJECT
                                 11100  *
                                 11110  *
                                 11120  *       INPUT - READ A MESSAGE FROM THE TELETYPE
                                 11130  *
                                 11140  *       #1 = ADDRESS OF DESTINATION POINTER
                                 11150  *       #2 = ADDRESS OF LENGTH
                                 11160  *       DESTROYS REGISTER A, X
                                 11170  *         C(X) = EXECUTIVE STATUS
                                 11180  *         C(A) = WORDS ACTUALLY READ
                                 11190  *
                                 11200  INPUT   MACRO   LOC,LEN
                                 11210          EAX     3,#1            LOC
                                 11220          EAX     7,#2            LEN
                                 11230          TSX     T,INPUT
                                 11240          ENDM    INPUT
                                 11250  *
                          000610 11260  INPUT   NULL
000610  000640 7530 00           11270          SREG    INPR            PRESERVE CALLING REGISTERS
000611  000001 6200 00           11280          EAX     0,1             POINT TO THE TELETYPE
000612  000000 6240 00           11290          EAX     4,0             CLEAN FLAG BITS
000613  000116 6260 00           11300          EAX     B,T$TRAP        POINT THE THE TRAP
                          000614 11310          ISSUE   REA
000614  000002 4500 16                         STZ     T$RET,TRAP
000615  500133 0010 00                         MME     M$REA
000616  000205 7000 00                         TSX     T,WAIT          WAIT FOR TRAP TO COME IN
000617  000000 2350 17           11320         LDA     0,7             GET LENGTH REQUESTED
000620  000001 0750 16           11330         ADA     T$STW2,B        CORRECT TO AMOUNT ACTUALLY TRANSFERRED
000621  000000 2210 16           11340         LDX     X,T$STW1,B      GET THE STATUS
000622  000644 7550 00           11350         STA     INPR+4          *****
000623  000640 4410 00           11360         SXL     X,INPR          * RESTORE THE REGISTERS
000624  000640 0730 00           11370         LREG    INPR            *****
000625  000777 3610 03           11380         ANX     X,B$MASLQ,DU    ONLY THE STATUS
000626  000000 6000 10           11390         TZE     0,T
000627  000001 1010 03           11400         CMPX    X,S$SFE,DU
000630  757500 6010 00           11410         TNZ     B$ERROR         NONE OF THE ABOVE - KRUMP
000631  000000 7100 10           11420         TRA     0,T             EXIT
                                 11430  *
                                 11440  *
000632  000006710004
                          000640 11450          EIGHT
                          000640 11460  INPR    BSS     8               ENTRY REGISTERS
```

```
                                        ROUTINES--RUDIMENTARY TELETYPE IO (03/24/74)

                              11470             EJECT
                              11480     *
                              11490     *       OPRINT
                              11500     *
                              11510     *       OCTAL PRINT ROUTINE
                              11520     *       CALLED BY OPRINT MACRO
                              11530     *       ASSUMES OCTAL NUMBER IN Q LEFT ADJUSTED WITH DIGIT COUNT IN X1
                              11540     *
                              11550     OPRINT  MACRO   LOC,LEN
                              11560             LDX     X1,#1,DU        STUFF LOCATION FIRST
                              11570             STX     X1,TALLY
                              11580             LDX     X1,#2*64+32,DU  GRAB LENGTH OF NIBBLE STRING
                              11590             SXL     X1,TALLY
                              11600             TSX     T,OPRINT        STUFF IT!
                              11610             ENDM    OPRINT
                              11620     *
000650  000006 2350 07        11630     OPRINT  LDA     6,DL            GET AN ASCII ZERL
000651  000003 7370 00        11640             LLS     3               MOVE IN DIGIT
000652  000655 7550 52        11650             STA     TALLY,SC        SAVE IT
000653  000650 6070 00        11660             TTF     OPRINT          GO FOR MORE?
000654  000000 7100 10        11670             TRA     0,T             EXIT
                              11680
000655  000000 0000 40        11690     TALLY   TALLYB  **,**
                              11700     *
                              11710     *
                              11720     *       SPRINT/TXT - FACILITATE USAGE OF PRINT ROUTINE
                              11730     *
                              11740     SPRINT  MACRO   MESSAGE-NAME
                              11750             PRINT   #1P,#1L
                              11760             ENDM    SPRINT
                              11770     *
                              11780     *
                              11790     TXT     MACRO   NAME,MESSAGE-TEXT
                              11800     #1P     DATA    #1              POINT TO THE MESSAGE, #1
                              11810     #1      TEXT    =#2=            THE ACTUAL MESSAGE
                              11820     #1L     DATA    *-#1            GENERATE A WORD WITH THE LENGTH
                              11830             ENDM    TXT
```

```
                                11840          TTLS    ROUTINES--ABORT AND TERMINATE WITH A DUMP (06/30/74)
                                11850  *
                                11860  *       MNAME
                                11870  *
                                11880  *       MACRO USED TO INSERT THE MODULE NAME INTO THE OPEN DUMPFILE
                                11890  *       PORTION OF THE MODULE ABORT ROUTINE.
                                11900  *
                                11910  MNAME   MACRO   MODULE-NAME
                                11920          COND    OFF,SET,ORG
                                11930  PORG    SET     *
                                11940          ORG     MODNM
                                11950          UASCI   2,#1
                                11960          ORG     PORG
                                11970          COND    ON,SET,ORG
                                11980          ENDM    MNAME
                                11990  *
                                12000  *       ABORT - COPY CORE TO DUMP FILE AND TERMINATE WITH PROPER STATUS
                                12010  *
                         000656 12020          EVEN
                         000656 12030  ABORT   NULL                    ENTER FROM FAULT VECTOR
000656 000040 7530 00    12040          SREG    TRMRG                   SAVE REGISTERS FOR DUMP INSPECTION
000657 000660 7000 00    12050          TSX     T,*+1                   BREAK XED, SAVING IC
000660 777776 2350 10    12060          LDA     -2,T                    GET IC/IR AT RAULT TIME
000661 000050 7550 00    12070          STA     ERIC                    SAVE IC/IR AT FAULT TIME
000662 000001 1600 03    12080          SBX     T,1,DU                  CALCULATE FAULT LOCATION
000663 000060 4400 00    12090          SXL     T,RUNFA                 SAVE FOR DUMP INSPECTION
000664 500004 0010 00    12100          MME     M$DAT                   GET DATE OF DEMISE
000665 000054 7570 00    12110          STAQ    RUNDT                   AND STORE
000666 500003 0010 00    12120          MME     M$ATI                   LIKEWISE WITH THE TIME
000667 000056 7570 00    12130          STAQ    RUNTM                   .
000670 000747 5500 00    12140          SBAR    RUNBR                   GET OUR CURRENT LENGTH
000671 000747 2350 00    12150          LDA     RUNBR                   AND SAVE FOR THE COPY
000672 000777 3750 03    12160          ANA     B$MASLQ,DU              .
000673 000011 7710 00    12170          ARL     18-9                    .
000674 000756 7550 00    12180          STA     MODLN                   .
000675 000050 2360 00    12190          LDQ     ERIC                    GET FAULTY LOCATION
000676 000000 2350 07    12200          LDA     0,DL                    CONVERT TO ASCII
000677 000003 7770 00    12210          LLR     3                       .
                         000060 12220  ASC..0  BOOL    060             ASCII NULL CHARACTER
000700 000060 0750 07    12230          ADA     ASC..0,DL               .
000701 000773 7550 52    12240          STA     BOMT,SC                 .
000702 000676 6070 00    12250          TTF     *-4                     .
                         000703 12260          WRITE   TTYFR,BOMP,BOML,,,DTRAP     WRITE FAILURE MESSAGE
000703 000063 7220 00                  LXL     X2,TTYFR                GET FRN
                                       IFE     '','',2                 CHECK FOR NO TAG
000704 000764 6210 00                  EAX1    BOMP
                                       IFE     '','',2                 CHECK FOR NO TAG
000705 000772 6270 00                  EAX7    BOML
000706 000000 2240 03                  LDX     X4,,DU                  GET FLAGS
000707 000760 6260 00                  EAX     TRAP,DTRAP
000710 000002 4500 16                  STZ     T$RET,TRAP
000711 500134 0010 00                  MME     M$WRI
```

ROUTINES--ABORT AND TERMINATE WITH A DUMP (06/30/74)

```
000712  000205 7000 00                      TSX     T,WAIT          WAIT FOR TRAP TO COME IN
000713  000050 2340 00  12270   TRMNT       SZN     ERIC            HAVE THERE BEEN ANY ERRORS
000714  000742 6000 00  12280               TZE     TRM1            NO - DONT DUMP CORE
                000715  12290               OPEN    MFDFR,DCNAM,,B$WT+B$AP,2,,DTRAP     OPEN THE DUMP FILE
000715  000062 7200 00                      LXL     FRNO,MFDFR      GET FRN
                                            IFE     '','',2         CHECK FOR NO TAG
000716  000752 6210 00                      EAX1    DCNAM
000717  000002 6270 00                      EAX     X7,2
000720  026000 2240 03                      LDX     FLAGS,.SET,DU   GET ACCESSES
000721  000760 6260 00                      EAX     TRAP,DTRAP
000722  000002 4500 16                      STZ     T$RET,TRAP
000723  500101 0010 00                      MME     M$OPE
000724  000205 7000 00                      TSX     T,WAIT          WAIT FOR TRAP TO COME IN
000725  000000 7210 16  12300               LXL     X,T$STW1,B      PICK UP THE FRN
000726  000742 6000 00  12310               TZE     TRM1            IF NONE - HOPELESS
000727  000757 4410 00  12320               SXL     X,DFFRN         SAVE THE DUMP FILE FRN
                000730  12330               COPY    CORFR,ZEROS,DFFRN,ZERO,MODLN,,,DTRAP     DUMP US
000730  000061 7200 00                      LXL     X0,CORFR        GET FRN1
                                            IFE     '','',2         CHECK FOR NO TAG
000731  000750 6210 00                      EAX1    ZEROS
000732  000757 7220 00                      LXL     X2,DFFRN        GET FRN2
                                            IFE     '','',2         CHECK FOR NO TAG
000733  000000 6230 00                      EAX3    ZERO
                                            IFE     '','',2         CHECK FOR NO TAG
000734  000756 6270 00                      EAX7    MODLN
000735  000000 2240 03                      LDX     X4,,DU          GET FLAGS
000736  000760 6260 00                      EAX     TRAP,DTRAP
000737  000002 4500 16                      STZ     T$RET,TRAP
000740  500131 0010 00                      MME     M$COP
000741  000205 7000 00                      TSX     T,WAIT          WAIT FOR TRAP TO COME IN
000742  000000 2240 03  12340   TRM1        LDX     4,0,DU          TERMINATE WITH GOOD/BAD STATUS
000743  000060 2340 00  12350               SZN     RUNFA           WAS THERE A TERMINAL ERROR
000744  000746 6000 00  12360               TZE     *+2             NO, TERMINATE WITH GOOD STATUS
000745  400000 2240 03  12370               LDX     4,=0400000,DU   TERMINATE WITH BAD STATUS
000746  500000 0010 00  12380               MME     M$TER           TERMINATE
                        12390   *
                        12400   *
                000747  12410   RUNBR       BSS     1               BASE ADDRESS REGISTER AT DUMP TIME
                000750  12420               EVEN
000750  000000000000    12430   ZEROS       OCT     0,0
000751  000000000000
000752  104125115120    12440   DCNAM       UASCI   2,DUMPCAT
000753  103101124040
000754  040040040040    12450   MODNM       UASCI   2,              MODULE NAME
000755  040040040040
000756  000001 000000   12460   MODLN       ZERO    1,0             A LOT OF CORE
000757  000000000000    12470   DFFRN       DATA    0               DUMPFILE FRN
000760  000000000000    12480   DTRAP       OCT     0,0,0
000761  000000000000
000762  000000000000
000763  777777 6300 04  12490               RET     -1,IC
000764  000000000765    12500   BOMP        DATA    BOMB
```

ROUTINES--ABORT AND TERMINATE WITH A DUMP (06/30/74)

```
000765  015012141142    12510   BOMB    TEXT    =@^ABORT AT: XXXXXX@^=      ABORT MESSAGE (ADDRESS FILLED LATER)
000766  157162164040
000767  141164072040
000770  170170170170
000771  170170015012
000772  000000000005    12520   BOML    DATA    *-BOMB
000773  000770 0006 40  12530   BOMT    TALLYB  BOMB+3,6,0      TALLY TO FAULT ADDRESS IN ABORT MESSAGE
000774  000000 0110 00  12540           NOP
```

```
                                12550           TTLS    ROUTINES--STORAGE MANAGEMENT AND SUPPORTING MACROS (03/24/74)
                                12560   *
                                12570   *       GET ROUTINE
                                12580   *
                                12590   *       CALLED BY TSX7 $GET
                                12600   *
                                12610   *       WITH LENGTH OF BLOCK TO GET IN AL
                                12620   *
                                12630   *       RETURNS A BLOCK IN X4
                                12640   *
                                12650   GETD    MACRO
                                12660           LDA     #1,DL           GET THIS SIZE BLOCK
                                12670           TSX     T,$GET          CALL GET ROUTINE
                                12680           ENDM    GETD
                                12690   *
                                12700   *
                                12710           HEAD
000775  000000000000            12720   GETSIZ  DEC     0               SIZE OF NEEDED BLOCK
000776  000002710004
                        001000  12730           EIGHT
                        001000  12740   GETREG  BSS     8               WE'RE GONNA CLOBBER A BUNCH
                                12750   *
                                12760   *
                                12770   *
                        001010  12780   GET     SAVE
                                        IFE     '','',2         IF NO REGISTERS SPECIFIED, SAVE T
001010  000122 7400 56                  STX     T,$PDL,ID       SAVE T
001011  001000 7530 00  12790           SREG    GETREG          PROTECT THE GUILTY
001012  001205 7550 00  12800           STA     ATEMP           SAVE LENGTH
001013  001205 7440 00  12810           STX     X4,ATEMP        SAVE VALUE OF LINK REGISTER
001014  000001 0350 07  12820           ADLA    ONE,DL          GET ONE EXTRA WORD FOR LENGTH
001015  000000 6350 05  12830           EAA     ,AL             GET LOWER INTO UPPER
001016  000775 7550 00  12840           STA     GETSIZ          STUFF SIZE FOR USE
001017  000022 7710 00  12850           ARL     18              GET SIZE BACK INTO UPPER A
                        001020  12860   GETO    NULL            ENTRANCE FOR RETRY
001020  001204 2250 00  12870           LDX     X5,FPTR         GET POINTER TO FIRST FREE BLOCK
001021  001056 6000 00  12880           TZE     GETM            GO GET MORE IF NOTHING ON THE LIST
001022  001025 7100 00  12890           TRA     GETS            START FROM THE BEGINNING
                        001023  12900   GETR    NULL
001023  000000 2250 15  12910           LDX     X5,,X5          USE FORWARD POINTER
001024  001056 6000 00  12920           TZE     GETM            NO MORE TO TRY, GROW
                        001025  12930   GETS    NULL
001025  000000 7240 15  12940           LXL     X4,,X5          IS THIS BLOCK LARGE 'NUFF
001026  000775 1040 00  12950           CMPX    X4,GETSIZ
001027  001023 6040 00  12960           TMI     GETR            NOPE, TRY AGAIN
001030  001045 6000 00  12970           TZE     GETJ            JUST MATCHED IT
                        001031  12980
001031  000000 5310 00  12990           NEG                     COMPUTE OVERSHOOT LENGTH
001032  000000 0750 15  13000           ADA     0,X5            COMPUTE IT
001033  000000 6240 05  13010           EAX     X4,,AL          SAVE NEW LENGTH OF BLOCK
001034  000000 4440 15  13020           SXL     X4,,X5
001035  000001 6240 05  13030           EAX     X4,-LINK,AL     GET POINTER TO BLOCK
```

```
001036  001037 7450 00  13040          STX     X5,*+1              SAVE POINTER
001037  000000 0640 03  13050          ADX     X4,**,DU            FORM POINTER TO BLOCK TO ALLOCATE
                001040  13060  GETX    NULL
001040  001205 2350 00  13070          LDA     ATEMP               GET LINK/LEN
001041  777777 7550 14  13080          STA     LINK,X4             SAVE IT
001042  001002 7440 00  13090          STX     X4,SVX4+GETREG      GUARD X4 UPON RETURN
001043  001000 0730 00  13100          LREG    GETREG              RESTORE REGS
                001044  13110          RETURN                      RETURN
                                       IFE     '','',2             IF NO TRANSFER SPECIFIED, DO A TRA THRU THE PDL
001044  000122 7100 55                 TRA     $PDL,DIC            TRANSFER VIA PDL
```

```
                                13120           EJECT
                                13130   *
                                13140   *       BLOCK JUST FITS -- DELETE IT FROM THE LIST
                                13150   *
001045  001204 6240 00  13160   GETJ    EAX     X4,FPTR         POINT TO FIRST BLOCK
001046  000000 1050 14  13170           CMPX    X5,0,X4         CHECK FOR THIS LINK
001047  001052 6000 00  13180           TZE     *+3
001050  000000 2240 14  13190           LDX     X4,0,X4         STEP TO NEXT LINK
001051  001046 7100 00  13200           TRA     *-3             LOOP BACK
001052  000000 2200 15  13210           LDX     X0,0,X5         GET NEXT LINK
001053  000000 7400 14  13220           STX     X0,0,X4         SAVE IT
001054  000001 6240 15  13230           EAX     X4,-LINK,X5     POINT TO FIRST WORD OF BLOCK
001055  001040 7100 00  13240           TRA     GETX            EXIT
                                13250   *
                                13260   *       BLOCK CAN'T BE ALLOCATED
                                13270   *
                   001056   13280   GETM    NULL
001056  001203 2240 00  13290           LDX     X4,MEMSIZ       GET MEMORY SIZE
                   001057   13300           SAVE    A               SAVE LENGTH TO ALLOCATE
                                           IFE     'A','',2        IF NO REGISTERS SPECIFIED, SAVE T
001057  000122 7550 56                   STA     $PDL,ID         SAVE REG A
001060  001777 0350 07  13310           ADLA    1024-1,DL       ROUND UP
001061  776000 3750 07  13320           ANA     -1024,DL        AND TRUNCATE
001062  000000 6250 05  13330           EAX     X5,0,AL         GET EXTRA MEMORY NEEDED
001063  001203 0650 00  13340           ADX     X5,MEMSIZ       ADD IN CURRENT SIZE
001064  001203 7450 00  13350           STX     X5,MEMSIZ       SAVE NEW MEMORY SIZE
001065  000020 0540 00  13360           AOS     SPIC            NO SPECIALS NOW
001066  500006 0010 00  13370           MME     M$MEM           GET THE MEMORY
001067  000001 3360 07  13380           LCQ     1,DL            GET A MINUS ONE
001070  000020 0560 00  13390           ASQ     SPIC            NOW LET THE SPECIALS IN
001071  000000 1050 03  13400           CMPX    X5,0,DU         CHECK FOR OK REQUEST
001072  757500 6010 00  13410           TNZ     B$ERROR         WE BLEW IT
001073  001115 7000 00  13420           TSX     T,REL1          RELEASE IT
                   001074   13430           POP     A               RESTORE ALLOCATION LENGTH
                                           IFE     'A','',2        IF NO REGISTER SPECIFIED, LOAD T FROM TOP OF PDL
001074  000122 2350 54                   LDA     $PDL,DI         LOAD A REGISTER
001075  001020 7100 00  13440           TRA     GETO            CONTINUE GET
```

```
                                13450            EJECT
                                13460   *
                                13470   *        RELEASE ROUTINE
                                13480   *
                                13490   *        CALLED VIA TSX7 REL
                                13500   *
                                13510   *        WITH BLOCK TO RELEASE IN X4
                                13520   *
                                13530   REL      MACRO
                                13540            TSX      T,$REL
                                13550            ENDM     REL
                                13560   *
001076  000002710004
                        001100  13570            EIGHT
                        001100  13580   RELREG   BSS      8
                                13590   *
                        001110  13600   REL      NULL
001110  777777 6240 14  13610            EAX      X4,LINK,X4      POINT X4 TO LINK WORD
001111  000000 2350 14  13620            LDA      0,X4            PICK UP USER LINK, LENGTH
001112  000000 6270 01  13630            EAX      X7,0,AU         SAVE USER LINK IN XR7
001113  777777 3750 07  13640            ANA      B$MASKH,DL      GET LENGTH OF USER BLOCK
001114  000001 0750 07  13650            ADA      1,DL            ADD ONE FOR LINK WORD
                        13660
                        001115  13670   REL1     NULL                     ENTRY FROM GETM
                        001115  13680            SAVE
                                         IFE      '','',2         IF NO REGISTERS SPECIFIED, SAVE T
001115  000122 7400 56          STX      T,$PDL,ID       SAVE T
001116  001100 7530 00  13690   SREG     RELREG          PRESERVE ALL BUT A&X4
001117  001204 6250 00  13700   EAX5     FPTR            PICK UP DUMMY FIRST LINK
001120  001206 4500 00  13710   STZ      COMBF           WE HAVE NOT COMBINED THIS BLOCK YET
                        13720
                        13730   *        TRY TO COMBINE THIS BLOCK WITH ONE LOWER IN CORE
                        13740
                        001121  13750   REL2     NULL
001121  000000 2250 15  13760            LDX      X5,0,X5         LINK TO NEXT BLOCK ON LIST
001122  001135 6000 00  13770            TZE      REL3            NO MORE - CAN'T COMBINE BACKWARD
001123  000000 2360 15  13780            LDQ      0,5             GET LINK, LENGTH OF BLOCK ON LIST
001124  001127 7450 00  13790            STX      X5,*+3          ***
001125  000022 7360 00  13800            QLS      18              *FIND FIRST WORD NOT IN BLOCK
001126  001127 0560 00  13810            ASQ      *+1             ***
001127  000000 1040 03  13820            CMPX     X4,**,DU        IS THAT THE FIRST WORD OF OUR BLOCK?
001130  001121 6010 00  13830            TNZ      REL2            IF NOT, LOOP TO NEXT BLOCK ON LIST
                        13840
                        13850   *        WE WILL COMBINE BACKWARDS
                        13860
001131  000000 0750 15  13870            ADA      0,X5            GET LENGTH OF COMBINED BLOCK
001132  777777 3750 07  13880            ANA      B$MASKH,DL      ONLY
001133  000000 6240 15  13890            EAX      X4,0,X5         NEW BLOCK STARTS BEHIND US
001134  001206 5540 00  13900            STC1     COMBF           FLAG THE FACT THAT WE HAVE COMBINED
                        13910
                        13920   *        NOW TRY TO COMBINE THIS BLOCK WITH ONE HIGHER IN CORE
                        13930
```

```
                    001135  13940   REL3    NULL
001135  001136 7440 00  13950           STX     X4,*+1          COMPUTE ADDRESS OF FIRST
001136  000000 6210 05  13960           EAX     X1,**,AL        ... WORD NOT IN OUR BLOCK
001137  001204 6250 00  13970           EAX     X5,FPTR         RESTORE DUMMY FIRST LINK
                        13980
                        13990   *       LOOK FOR A BLOCK LINKING TO ONE DIRECTLY ABOVE US
                        14000
                    001140  14010   REL4    NULL
001140  000000 1010 15  14020           CMPX    X1,0,X5         DOES THIS ONE LINK THERE?
001141  001164 6000 00  14030           TZE     REL5            YES - TACK IT ON THE END OF OURS
001142  000000 2250 15  14040           LDX     X5,0,X5         GO TO NEXT BLOCK ON FREE LIST
001143  001140 6010 00  14050           TNZ     REL4            LOOP IF ONE EXISTS
                        14060   *               NO CAN COMBINE - GRAB LAST QUEUE PTR
001144  001206 2340 00  14070           SZN     COMBF           DID WE COALESCE?
001145  001173 6010 00  14080           TNZ     REL6            YES INDEEDY
001146  000000 2210 03  14090           LDX     X1,ZERO,DU
001147  001204 6250 00  14100           EAX     X5,FPTR         START AT THE FRONT
                    001150  14110   REL7    NULL
001150  000000 1010 15  14120           CMPX    X1,,X5          IS THIS THE LAST ENTRY?
001151  001154 6000 00  14130           TZE     REL8            YOUSIR
001152  000000 2250 15  14140           LDX     X5,,X5          GRAB NEXT PTR
001153  001150 7100 00  14150           TRA     REL7            CHASE YOUR TAIL
                        14160   *
                    001154  14170   REL8    NULL                    JUST STUFF THE PTR
001154  000000 7550 14  14180           STA     ,X4             STA OUR SIZE
001155  000000 7440 15  14190           STX     X4,,X5          STICK OURSELF IN THE QUEUE'S ASS END
001156  000000 1050 15  14200           CMPX    X5,,X5          OUR WE POINTING AT OURSELF?
001157  001162 6010 00  14210           TNZ     REL9            NOPE, WE'RE OK
001160  000000 2240 03  14220           LDX     X4,ZERO,DU      UH-OH
001161  000000 7440 15  14230           STX     X4,,X5          KEEP OUR END CLEAN
                    001162  14240   REL9    NULL
001162  001100 0730 00  14250           LREG    RELREG          RESTORE REGISTERS
                    001163  14260           RETURN
                                            IFE     '','',2         IF NO TRANSFER SPECIFIED, DO A TRA THRU THE PDL
001163  000122 7100 55                    TRA     $PDL,DIC        TRANSFER VIA PDL
                        14270
                        14280   *       WE WILL COMBINE FORWARDS
                        14290
                    001164  14300   REL5    NULL
001164  001165 7440 00  14310           STX     X4,*+1
001165  000000 1050 03  14320           CMPX    X5,**,DU        IS IT US?
001166  001170 6000 00  14330           TZE     REL10           DON'T CAUSE INFINITE LOOPING
001167  000000 7440 15  14340           STX     X4,0,X5         CHANGE PREV. LINK TO POINT TO US
                    001170  14350   REL10   NULL
001170  000000 0750 11  14360           ADA     0,1             AND INCREASE OUR LENGTH TO
001171  777777 3750 07  14370           ANA     -1,DL           ... INCLUDE THE BLOCK ABOVE US
001172  001206 5540 00  14380           STC1    COMBF           FLAG THE FACT THAT WE HAVE COMBINED
                        14390
                        14400
                    001173  14410   REL6    NULL
001173  001174 7440 00  14420           STX     X4,*+1          POINT TO OUR BLOCK
001174  000000 7510 07  14430           STCA    **,07           AND SAVE ITS NEW LENGTH
```

```
001175  000000 6240 17  14440            EAX     X4,0,X7         RETURN OLD LINK TO USER
001176  001206 2340 00  14450            SZN     COMBF           IS THE BLOCK ALREADY COMBINED (LINKED)?
001177  001100 0730 00  14460            LREG    RELREG          RESTORE REGISTERS
                001200  14470            RETURN  TNZ             JUST RETURN IF SO
                                         IFE     'TNZ','',2      IF NO TRANSFER SPECIFIED, DO A TRA THRU THE PDL
001200  000122 6010 55                   TNZ     $PDL,DIC        ELSE DO APPROPRIATE TRANSFER AS USER REQUESTS
001201  000000 7440 15  14480            STX     X4,0,X5         IF NOT, TACK ON END OF LIST
                001202  14490            RETURN                  AND GO HOME
                                         IFE     '','',2         IF NO TRANSFER SPECIFIED, DO A TRA THRU THE PDL
001202  000122 7100 55                   TRA     $PDL,DIC        TRANSFER VIA PDL
                        14500   *
                        14510   *       STORAGE
                        14520   *
001203  000000 000000   14530   MEMSIZ  ZERO                    CURRENT MEMORY SIZE
001204  003372 000000   14540   FPTR    ZERO    INIT            POINT TO FIRST FREE BLOCK
001205  000000 000000   14550   ATEMP   ZERO                    TEMPROARY
                001206  14560   COMBF   BSS     1
```

ROUTINES--ALLOCATABLE STACKING MECHANISM

```
14570           TTLSS   ALLOCATABLE STACKING MECHANISM
14580   *
14590   *       ENQ MACRO
14600   *
14610   *       ENQ TAKES THE THE NAME OF A QUEUE TO QUEUE THE
14620   *       BLOCK POINTED TO BY X4 ON.
14630   *
14640   ENQ     MACRO   QUEUENAME
14650           EAX     QTAIL,#1        POINT TO QUEUE
14660           TSX     T,$ENQ          QUEUE IT
14670           ENDM    ENQ
14680   *
14690   *       DEQ
14700   *
14710   *       DEQ TAKES THE NAME OF A QUEUE AND PRODUCES THE
14720   *       FIRST TASK ON THE QUEUE WITH X4 POINTING TO IT.
14730   *
14740   DEQ     MACRO   QUEUENAME
14750           EAX     QTAIL,#1        POINT TO QUEUE
14760           TSX     T,$DEQ          REMOVE IT
14770           ENDM    DEQ
14780   *
14790   *       QUEUE -- CREATES A QUEUE STRUCTURE
14800   *
14810   QUEUE   MACRO
14820           ZERO    **,#1           POINTS TO THE LAST ENTRY
14830           ENDM    QUEUE
14840
14850
14860
14870   *       THE BLOCKS TO BE QUEUED ARE OF THE FOLLOWING FORMAT.
14880
14890
14900   ************************************************************************
14910   *                               *                                      *
14920   * POINTER TO THE NEXT           *                                      *
14930   *  QUEUE ELEMENT                *                                      *
14940   *                               *                                      *
14950   ************************************************************************
14960   *                               *                                      *
14970   *         USER                  *              DATA                    *
14980   *                               *                                      *
14990   *                               *                                      *
```

```
                                                ROUTINES--ALLOCATABLE STACKING MECHANISM

                                  15000         EJECT
                                  15010  *
                                  15020  *      ENQ
                                  15030  *
                                  15040  *      BY THE QUEUE POINTER.
                                  15050  *
                                  15060  *      ENTER WITH:
                                  15070  *          C(X1) = POINTS TO HEAD OF QUEUE
                                  15080  *          C(X4) = POINTS TO TOP OF QUEUE ELEMENT
                                  15090  *      DESTROYS REGISTER 5
                                  15100  *
                                  15110         INHIB   ON
                           001207 15120  ENQ    NULL                    SPPML
001207  000000 2252 03           15130         LDX     X5,0,DU         (SOCIETY FOR THE PREVENTION OF PROPAGATION OF MEANINGLESS LINKS)
001210  000000 7452 14           15140         STX     X5,0,QENTRY     WIPE OUT QUESTIONABLE LINK
001211  000000 7252 11           15150         LXL     X5,0,QTAIL      GET LAST THING ON QUEUE NOW
001212  000000 7442 15           15160         STX     QENTRY,0,X5     SAVE NEW LAST ITEM ON QUEUE
001213  000000 4442 11           15170         SXL     QENTRY,0,QTAIL  SET POINTER TO END OF QUEUE
001214  000000 7102 10           15180         TRA     0,T             RETURN
                                  15190  *
                                  15200  *      DEQ
                                  15210  *
                                  15220  *      THIS ROUTINE DETACHES THE QUEUE ELEMENT FROM THE BASE
                                  15230  *
                                  15240  *      ENTER WITH:
                                  15250  *         C(X1) = POINTS TO QUEUE BASE
                                  15260  *      RETURNS WITH:
                                  15270  *         C(X4) = POINTS TO TOP OF QUEUE ELEMENT (=0 IF QUEUE EMPTY)
                                  15280  *      DESTROYS REGISTERS 4, 5
                                  15290  *
                           001215 15300  DEQ    NULL
001215  000000 2242 11           15310         LDX     QENTRY,0,QTAIL  GET THE FIRST ITEM ON THE QUEUE
001216  000000 6002 10           15320         TZE     0,T             RETURN IF EMPTY QUEUE
001217  000000 2252 14           15330         LDX     X5,0,QENTRY     GET NEXT ITEM
001220  000000 7452 11           15340         STX     X5,0,QTAIL      SET IT
                                  15350  *
001221  001223 6012 00           15360         TNZ     DEQDUN          NON-EMPTY ROUTE
001222  000000 4412 11           15370         SXL     QTAIL,,QTAIL    MAKE EMPTY QUEUE POINT TO ITSELF AS TAIL
                                  15380  *
                           001223 15390  DEQDUN NULL
001223  000000 6242 14           15400         EAX     QENTRY,0,QENTRY  SET ZERO INDICATOR OFF
001224  000000 7102 10           15410         TRA     0,T             RETURN
                                  15420         INHIB   OFF
                                  15430  *
                                  15440  *      MASTER TASK QUEUE
                                  15450  *
                           001225 15460  MTASK  QUEUE   MTASK           LIST OF WAITING TASKS
001225  000000 001225            ZERO    **,MTASK        POINTS TO THE LAST ENTRY
                           001226 15470  DEVQ   QUEUE   DEVQ            LIST OF DEVICES
001226  000000 001226            ZERO    **,DEVQ         POINTS TO THE LAST ENTRY
                           001227 15480  LTASK  QUEUE   LTASK           LIMBO TASK BLOCKS
001227  000000 001227            ZERO    **,LTASK        POINTS TO THE LAST ENTRY
```

```
15490                TTLS    ROUTINES--SPECIAL INTERRUPT HANDLER (03/24/74)
15500    *
15510    *           THIS ROUTINE RANDLES SPECIALS RETURNED FROM THE DTSS EXECUTIVE.
15520    *           ALL INTERRUPTS WILL BE IGNORED UNLESS OTHERWISE
15530    *           SPECIFIED.  THE CURRENT SPECIAL WILL BE IN SPCUR AND THE ROUTINE MUST
15540    *           TO SPNXT.  IF THE QUEUEING OPTION IS USED A THREE WORD TASK TO SERVICE
15550    *           THE SPECIAL WILL BE GENERATED AND QUEUED ON $MTASK.
15560    *
15570    *           #1 = SPECIAL INTERRUPT TYPE NUMBER
15580    *           #2 = SPECIAL INTERRUPT HANDLING ROUTINE
15590    *           #3 = Q IF THE SPECIAL IS TO BE QUEUED; OTHERWISE PROCESS IMMEDIATELY
15600    *
15610    SPL        MACRO   SPL-NUMBER,RTN-ADDRESS,QUEUE-FLAG
15620               COND    OFF,ORG,USE
15630               USE     TEMP
15640    PORG1      SET     *
15650               ORG     SPTBL+#1          ORG TO TABLE
15660               INE     '#3','Q',1
15670               ZERO    #2,0
15680               IFE     '#3','Q',1
15690               ZERO    0,#2
15700               ORG     PORG1
15710               USE     PREVIOUS
15720               COND    ON,ORG,USE
15730               ENDM    SPL
15740
15750
15760
```

ROUTINES--SPECIAL INTERRUPT HANDLER (03/24/74)

```
                                   15770            EJECT
                                   15780            INHIB   ON
                          001230   15790   SPEC     NULL
001230  001270 7532 00   15800            SREG     SPREG          SAVE REGISTERS
001231  001300 2352 00   15810            LDA      SPTLO          GET TALLY IMAGE
001232  001301 7552 00   15820            STA      SPTAL          SAVE IT
                          001233   15830   SPNXT    NULL
001233  001301 2352 00   15840            LDA      SPTAL          GET OUR TALLY
001234  000001 1152 00   15850            CMPA     FVTAL          SEE IF WE ARE DONE
001235  001260 6002 00   15860            TZE      SPDON          YES
001236  001301 2372 53   15870            LDAQ     SPTAL,AD       GET NEXT TWO WORDS
001237  001304 7572 00   15880            STAQ     SPCUR          SAVE THEM
                          000020   15890   SMAX     EQU      16    HIGHEST POSSIBLE SPECIAL
001240  000020 1152 03   15900            CMPA     SMAX,DU        CHECK FOR MAXIMUM SPECIAL TYPE
001241  757500 6032 00   15910            TRC      B$ERROR
001242  001356 2352 01   15920            LDA      SPTBL,AU       GET ROUTINE FOR THIS SPECIAL
001243  001233 6002 00   15930            TZE      SPNXT          NONE -- IGNORE SPECIAL
001244  777777 3152 03   15940            CANA     B$MASKH,DU     IS IT A DIRECT ROUTINE
001245  000000 6012 01   15950            TNZ      0,AU           YES -- EXECUTE IT
                          001246   15960            GETD     TASKLN         GET A THREE WORD BLOCK
001246  000010 2352 07                    LDA      TASKLN,DL      GET THIS SIZE BLOCK
001247  001010 7002 00                    TSX      T,$GET         CALL GET ROUTINE
001250  001304 2372 00   15970            LDAQ     SPCUR          GET SPECIAL WORDS
001251  000001 7552 14   15980            STA      P$STW1,QENTRY  SAVE FIRST WORD
001252  000002 7562 14   15990            STQ      P$STW2,QENTRY  AND WORD P$STW2
001253  001356 2352 01   16000            LDA      SPTBL,AU       GET ROUTINE ADDRESS
001254  000004 7552 14   16010            STA      P$EXEC,QENTRY  SAVE IT
                          001255   16020            ENQ      $MTASK         QUEUE THE TASK
001255  001225 6212 00                    EAX      QTAIL,$MTASK   POINT TO QUEUE
001256  001207 7002 00                    TSX      T,$ENQ         QUEUE IT
001257  001233 7102 00   16030            TRA      SPNXT          GET NEXT SPECIAL
                                   16040   *
                                   16050   *        DONE WITH SPECIALS
                                   16060   *
                          001260   16070   SPDON    NULL
001260  001300 2352 00   16080            LDA      SPTLO          GET NORMAL TALLY
001261  000001 7552 00   16090            STA      FVTAL          SAVE IT
001262  000020 0342 00   16100            LDAC     SPIC           GET RETURN & CLEAR
001263  001277 7552 00   16110            STA      SPREG+SVTR     SAVE IN TIMER SLOT
001264  001270 0732 00   16120            LREG     SPREG          GET SPECIAL REGISTERS BACK
001265  001277 6302 00   16130            RET      SPREG+SVTR     RETURN
                                   16140            INHIB   OFF
                                   16150   *
                                   16160   *        TABLES AND STORAGE
                                   16170   *
001266  000002710004
                          001270   16180            EIGHT
                          001270   16190   TREG     NULL
                          001270   16200   SPREG    BSS      8
001300  001306 0024 02   16210   SPTLO    TALLYD   SPECB,SPECN,2   INITIAL TALLY
                          001301   16220   SPTAL    BSS      1      WORKING VERSION
001302  001230 7100 00   16230   SPTRA    TRA      SPEC           PROTOTYPE TRANSFER TO THIS ROUTINE
```

ROUTINES--SPECIAL INTERRUPT HANDLER (03/24/74)

```
                    000024  16240   SPECN   EQU     20              20 SPECIALS AT ONCE
001303  000000011007
                    001304  16250           EVEN
                    001304  16260   SPCUR   BSS     2               CURRENT SPECIAL
                    001306  16270   SPECB   BSS     SPECN*2         MAKE ROOM FOR THEM
```

ON WITH THE CODE

```
                                16280
                        001356  16290
    000754  123111101115
    000755  105123105040
```

```
TTLS    ON WITH THE CODE
MNAME   SIAMESE
UASCI   2,SIAMESE
```

SPECIAL INTERRUPT JUMP TABLE

```
                                16300           TTLS    SPECIAL INTERRUPT JUMP TABLE
                         001356 16310   SPTBL   NULL
001356   000015 000001          16320           ZERO    ABORTV,1        TYPE 0
001357   002347 000000          16330           ZERO    TYTERM          TYPE 1 - TERMINAL I/O DONE
001360   000015 000001          16340           ZERO    ABORTV,1        TYPE 2
001361   002350 000000          16350           ZERO    BREAK           TYPE 3 - BREAK
001362   000015 000001          16360           ZERO    ABORTV,1        TYPE 4
001363   000015 000001          16370           ZERO    ABORTV,1        TYPE 5
001364   000015 000001          16380           ZERO    ABORTV,1        TYPE 6
001365   000000 000000          16390           ZERO    **              IGNORE TYPE 7
001366   000015 000001          16400           ZERO    ABORTV,1        TYPE 8
001367   000000 000000          16410           ZERO    **              IGNORE TYPE 9
001370   000015 000001          16420           ZERO    ABORTV,1        TYPE 10
001371   000015 000001          16430           ZERO    ABORTV,1        TYPE 11
001372   000015 000001          16440           ZERO    ABORTV,1        TYPE 12
001373   000015 000001          16450           ZERO    ABORTV,1        TYPE 13
001374   000015 000001          16460           ZERO    ABORTV,1        TYPE 14
001375   000015 000001          16470           ZERO    ABORTV,1        TYPE 15
001376   000015 000001          16480           ZERO    ABORTV,1        TYPE 16
001377   000015 000001          16490           ZERO    ABORTV,1        TYPE 17
```

TRAP HANDLING ROUTINE

```
                                16500              TTLS    TRAP HANDLING ROUTINE
                                16510    *
                                16520    *                  ENTERED VIA XED TRLINK FROM TRAP BLOCK
                                16530    *
                                16540              INHIB   ON
                      001400    16550              EVEN                        EVEN OUT THE CODE!
                      001400    16560    TRLINK    NULL
001400   001417 5542 00          16570              STC1    TBLOCK              SAVE BLOCK LOCATION
001401   001402 7102 00          16580              TRA     XEDBRK              BREAK <XED>
                      001402    16590    XEDBRK    NULL
001402   001270 7532 00          16600              SREG    TREG                SOS
                                16610    *
001403   001417 2202 00          16620              LDX     X0,TBLOCK           GRAB BLOCK LOCATION
001404   000000 2272 10          16630              LDX     X7,C$INFO,T         CHANGE ROUTINE PTR
001405   000003 2272 17          16640              LDX     X7,D$EXEC,X7        FOR TASK (READ/WRITE DEVICE)
001406   777777 7472 10          16650              STX     X7,C$EXEC,T
                                16660    *
001407   777773 6242 10          16670              EAX     QENTRY,C$LINK,T     LOCATE OURSELVES
                      001410    16680              ENQ     MTASK               QUEUE BLOCK AS A TASK
001410   001225 6212 00                             EAX     QTAIL,MTASK         POINT TO QUEUE
001411   001207 7002 00                             TSX     T,$ENQ              QUEUE IT
                                16690    *
001412   001417 2352 00          16700              LDA     TBLOCK              FIND BLOCK
001413   777776 6352 01          16710              EAA     C$RET,AU            ISOLATE RETURN LOCATION
001414   001417 7552 00          16720              STA     TBLOCK              SAVE IT FOR RETURN
                                16730    *
001415   001270 0732 00          16740              LREG    TREG                ROS
001416   001417 6302 51          16750              RET     TBLOCK,I            AMF
                                16760              INHIB   OFF
                                16770    *
                                16780    *
001417   000000 000000          16790    TBLOCK    ZERO    **,**               <STC1> SAVE LOCATION
```

FIND OUT DISK DRIVE INFORMATION

```
                                    16800           TTLS    FIND OUT DISK DRIVE INFORMATION
                          001420    16810   INQUIRY NULL
                          001420    16820           PRINT   OPTMSP,OPTMSL     ASK FOR DEVICE LIST
001420  002350 6210 00                                EAX     1,OPTMSP          LOC
001421  002647 6270 00                                EAX     7,OPTMSL          LEN
001422  000560 7000 00                                TSX     T,PRINT           DOIT
                                    16830   *
                          001423    16840           INPUT   LINE,LLENG        GET THE LIST
001423  002751 6230 00                                EAX     3,LINE            LOC
001424  003010 6270 00                                EAX     7,LLENG           LEN
001425  000610 7000 00                                TSX     T,INPUT
                                    16850   *
001426  002166 7000 00  16860                         TSX     T,GETDEV          PROCESS DEVICE LIST OF NUMBERS
001427  002160 2340 00  16870                         SZN     COMFLG            DID LINE END IN COMMA
001430  001442 6010 00  16880                         TNZ     GETNUM            NO, PROCESS IT
                                    16890   *
                          001431    16900   CONTIN  NULL                      PROMPT FOR CONTINUATION OF LIST (",," END)
                          001431    16910           PRINT   CONMSP,CONMSL
001431  002727 6210 00                                EAX     1,CONMSP          LOC
001432  002734 6270 00                                EAX     7,CONMSL          LEN
001433  000560 7000 00                                TSX     T,PRINT           DOIT
                                    16920   *
                          001434    16930           INPUT   LINE,LLENG
001434  002751 6230 00                                EAX     3,LINE            LOC
001435  003010 6270 00                                EAX     7,LLENG           LEN
001436  000610 7000 00                                TSX     T,INPUT
                                    16940   *
001437  002166 7000 00  16950                         TSX     T,GETDEV          FIND OUT THE STORY
001440  002160 2340 00  16960                         SZN     COMFLG            LINE END IN COMMA?
001441  001431 6000 00  16970                         TZE     CONTIN            YESSIR, ASK FER MORE
                                    16980   *
                          001442    16990   GETNUM  NULL
001442  002346 7000 00  17000                         TSX     T,INFORM          LET OPERATOR KNOW MAPPING/MATING
                                    17010   *
                          001443    17020           PRINT   DEVMSP,DEVMSL     PROMPT NUMBER OF PACKS
001443  002711 6210 00                                EAX     1,DEVMSP          LOC
001444  002726 6270 00                                EAX     7,DEVMSL          LEN
001445  000560 7000 00                                TSX     T,PRINT           DOIT
                                    17030   *
                          001446    17040           INPUT   LINE,LLENG        GET ASNWER
001446  002751 6230 00                                EAX     3,LINE            LOC
001447  003010 6270 00                                EAX     7,LLENG           LEN
001450  000610 7000 00                                TSX     T,INPUT
                                    17050   *
001451  003125 4500 00  17060                         STZ     BCOUNT            CLEAR TALLY
001452  000000164400    17070                         TCT                       GET RID OF LEADING BLANKS
001453  002752003010    17080                         ADSC9   LIN,,LLENG
001454  003132000000    17090                         ARG     BLKTBL
001455  003125000000    17100                         ARG     BCOUNT
001456  003125 7270 00  17110                         LXL     X7,BCOUNT         GRAB NUMBER OF LEADING BLANKS
                                    17120   *
001457  003127 4500 00  17130                         STZ     NCOUNT            CLEAR TALLY
```

```
                                        FIND OUT DISK DRIVE INFORMATION

001460  000000164417    17140           TCT     (,,,X7)         SCAN THRU END OF NUMERIC STRING
001461  002752003010    17150           ADSC9   LIN,,LLENG
001462  003172000000    17160           ARG     NUMTBL
001463  003127000000    17170           ARG     NCOUNT
001464  003127 7260 00  17180           LXL     X6,NCOUNT       GRAB STRING LENGTH
                        17190   *
001465  000000305457    17200           DTB     (,RL,,X7)       CONVERT INPUT TO BINARY NUMBER
001466  002752030016    17210           NDSC9   LIN,,X6,NS
001467  003126000004    17220           NDSC9   COPCNT,,EIS9
                        17230   *
                000470  17240           PRINT   GRPMSP,GRPMSL   ASK FOR GROUP MAPPING
001470  003025 6210 00                  EAX     1,GRPMSP        LOC
001471  003110 6270 00                  EAX     7,GRPMSL        LEN
001472  000560 7000 00                  TSX     T,PRINT         DOIT
                000473  17250           INPUT   LINE,LLENG      GET THE ANSWER
001473  002751 6230 00                  EAX     3,LINE          LOC
001474  003010 6270 00                  EAX     7,LLENG         LEN
001475  000610 7000 00                  TSX     T,INPUT
                        17260   *
001476  003125 4500 00  17270           STZ     BCOUNT          STRIP LEADING BLANKS
001477  000000164400    17280           TCT
001500  002752003010    17290           ADSC9   LIN,,LLENG
001501  003132000000    17300           ARG     BLKTBL
001502  003125000000    17310           ARG     BCOUNT          COUNT BLANKS
001503  003125 7270 00  17320           LXL     X7,BCOUNT
                        17330   *
001504  003131 4500 00  17340           STZ     CCOUNT
001505  000000164417    17350           TCT     (,,,X7)         FIND LENGTH OF FIRST STRING
001506  002752003010    17360           ADSC9   LIN,,LLENG
001507  003332000000    17370           ARG     CHRTBL
001510  003131000000    17380           ARG     CCOUNT
001511  003131 7260 00  17390           LXL     X6,CCOUNT       GET NUMBER OF CHARACTERS
                        17400   *
                000040  17410   BLANK   BOOL    040             ASCII BLANK
001512  040000160457    17420           MVT     (,RL,,X7),,BLANK  STUFF THE SOURCE GROUP ID
001513  002752000016    17430           ADSC9   LIN,,X6
001514  002067020002    17440           ADSC6   PACGRP,SOURCE,TWO
001515  003272000000    17450           ARG     ASCBCD
001516  003131 7460 00  17460           STX     X6,CCOUNT       ADVANCE PTR IN X7
001517  003131 0270 00  17470           ADLX    X7,CCOUNT
                        17480   *
001520  000001 3350 07  17490           LCA     ONE,DL          CONVERT CHRTBL TO COMPLEMENT OF ITSELF
001521  003332 6210 00  17500           EAX     X1,CHRTBL
001522  100200 5202 01  17510           RPT     32,ONE          SO IT STOPS AFTER ID
001523  000000 6550 11  17520           ERSA    ,X1
                        17530   *
001524  003125 4500 00  17540           STZ     BCOUNT
001525  000000164417    17550           TCT     (,,,X7)         FIND STRING END
001526  002752003010    17560           ADSC9   LIN,,LLENG
001527  003332000000    17570           ARG     CHRTBL
001530  003125000000    17580           ARG     BCOUNT          LENGTH COUNTER
                        17590   *
```

```
                                                  FIND OUT DISK DRIVE INFORMATION

    001531  003332 6210 00  17600          EAX     X1,CHRTBL       REVERT CHRTBL BACK TO ITS FORMER SELF
    001532  100200 5202 01  17610          RPT     32,ONE
    001533  000000 6550 11  17620          ERSA    ,X1
                            17630    *
    001534  003125 7260 00  17640          LXL     X6,BCOUNT
    001535  003125 7460 00  17650          STX     X6,BCOUNT       ADVANCE X7 PTR
    001536  003125 0270 00  17660          ADLX    X7,BCOUNT
                            17670    *
    001537  003131 4500 00  17680          STZ     CCOUNT
    001540  000000164417    17690          TCT     (,,,X7)         FIND LENGTH OF 2ND STRING
    001541  002752003010    17700          ADSC9   LIN,,LLENG
    001542  003332000000    17710          ARG     CHRTBL
    001543  003131000000    17720          ARG     CCOUNT          LENGTH COUNTER
    001544  003131 7260 00  17730          LXL     X6,CCOUNT
                            17740    *
    001545  040000160457    17750          MVT     (,RL,,X7),,BLANK  CONVERT & MOVE ID
    001546  002752000016    17760          ADSC9   LIN,,X6
    001547  002067220002    17770          ADSC6   PACGRP,DESTIN,TWO
    001550  003272000000    17780          ARG     ASCBCD
                            17790    *
                  001551    17800  AWAIT   NULL
                  001551    17810          PRINT   GOMSP,GOMSL     WAIT FOR GREEN LIGHT
    001551  002735 6210 00                 EAX     1,GOMSP         LOC
    001552  002750 6270 00                 EAX     7,GOMSL         LEN
    001553  000560 7000 00                 TSX     T,PRINT         DOIT
                            17820    *
                  001554    17830          INPUT   LINE,LLENG      GOT A FISH ON THE LINE
    001554  002751 6230 00                 EAX     3,LINE          LOC
    001555  003010 6270 00                 EAX     7,LLENG         LEN
    001556  000610 7000 00                 TSX     T,INPUT
                            17840    *
    001557  003125 4500 00  17850          STZ     BCOUNT          CLEAR TALLY
    001560  000000164400    17860          TCT                     SEE WHAT HE SAY - STRIP LEADING BLANKS FIRST
    001561  002752000174    17870          ADSC9   LIN,,LLEN
    001562  003132000000    17880          ARG     BLKTBL
    001563  003125000000    17890          ARG     BCOUNT
                            17900    *              SHIFT FIRST TWO BYTES TO LOWER CASE
                  040040    17910  CCASE   BOOL    040040          LOWER CASE SHIFT MASK
    001564  040040 2350 03  17920          LDA     CCASE,DU
    001565  002752 2550 00  17930          ORSA    LIN             DON'T TRY IF GUY USED PRECEDING BLANKS
                            17940    *
    001566  003125 7270 00  17950          LXL     X7,BCOUNT       FIND STARTING LOCATION
    001567  000000106417    17960          CMPC    (,,,X7)         DID WE GET THE GREEN LIGHT?
    001570  002752000002    17970          ADSC9   LIN,,TWO
    001571  003124000002    17980          ADSC9   GO,,TWO
    001572  001551 6010 00  17990          TNZ     AWAIT           DON'T ACCEPT ANYTHING BUT THE REAL THING
                            18000    *
    001573  002074 7000 00  18010          TSX     T,VALID8        VALIDATE PACK MATCHES
    001574  001551 7100 00  18020          TRA     AWAIT           INVALIDATION--WAIT FOR RETRY ADVISE
                            18030    *
    001575  002026 7000 00  18040          TSX     T,STRTQ         INITIATE TASK QUEUE (ONE EACH FOR ORIGINALS)
                            18050    *
```

```
                                        FIND OUT DISK DRIVE INFORMATION

                    001576  18060      PRINT   SRTMSP,SRTMSL   LET 'EM KNOW WE'RE WORKING ON IT
001576  003111 6210 00                 EAX     1,SRTMSP        LOC
001577  003115 6270 00                 EAX     7,SRTMSL        LEN
001600  000560 7000 00                 TSX     T,PRINT         DOIT
001601  002020 2350 00  18070          LDA     INTRVL          PERIODICALLY REITERATE
001602  500001 0010 00  18080          MME     M$STI           SET TIMER
                        18090  *               INIT LINE LENGTH COUNTDOWN
001603  000111 2270 03  18100          LDX     X7,TTYSIZ-SEVEN,DU
001604  001761 7470 00  18110          STX     X7,TTYLFT       SAVE CHARACTERS LEFT ON LINE
```

MAIN TASK PROCESSING LOOP

```
                                  18120          TTLS    MAIN TASK PROCESSING LOOP
                          001605  18130  MAIN    NULL
                          001605  18140         DEQ     MTASK            GET ONE FROM THE QUEUE
    001605  001225 6210 00                      EAX     QTAIL,MTASK      POINT TO QUEUE
    001606  001215 7000 00                      TSX     T,$DEQ           REMOVE IT
    001607  001613 6010 00  18150               TNZ     PROCES           THERE IS ONE AND WE GOT IT
                               18160  *          "NO TASK, WAIT FER SUMPIN'
    001610  000001 2250 03  18170               LDX     X5,ONE,DU        PAUSE FOR ONE TRAP
    001611  500005 0010 00  18180               MME     M$PAU
    001612  001605 7100 00  18190               TRA     MAIN             TRY, TRY, TRY AGAIN
                               18200  *
                          001613  18210  PROCES  NULL
    001613  000004 7000 34  18220               TSX     T,P$EXEC,QENTRY*
                               18230  *
    001614  002021 2340 00  18240               SZN     ACTIVE           ANY TASKS CURRENTLY ACTIVE?
    001615  001605 6010 00  18250               TNZ     MAIN             YUP, GO FOR MORE...
                               18260  *
    001616  003126 2340 00  18270               SZN     COPCNT           ANY MORE PASSES NEEDED?
    001617  001551 6010 00  18280               TNZ     AWAIT            YES INDEEDY
                          001620  18290  COMA    NULL                     DYING, GO COMATOSE
                          001620  18300         DEQ     DEVQ             GRAB A DEVICE BLOCK
    001620  001226 6210 00                      EAX     QTAIL,DEVQ       POINT TO QUEUE
    001621  001215 7000 00                      TSX     T,$DEQ           REMOVE IT
    001622  001631 6000 00  18310               TZE     R.I.P.           NO MORE DEVICES, START THE DEATH DIRGE
                               18320  *
    001623  000001 7200 14  18330               LXL     FRNO,D$FRN,QENTRY  GET FRN OF DEVICE
    001624  000116 6260 00  18340               EAX     TRAP,T$TRAP      SET TRAP BLOCK PTR
    001625  000002 4500 16  18350               STZ     T$RET,TRAP       CLEAR FOR ACTION
                               18360  *
    001626  500105 0010 00  18370               MME     M$CLO            CLOSE THAT TURKEY
    001627  000205 7000 00  18380               TSX     T,WAIT           GIVE IT A CHANCE
    001630  001620 7100 00  18390               TRA     COMA             STAY IN A COMA
                               18400  *
                          001631  18410  R.I.P.  NULL                     REST IN PIECES
    001631  000000 2240 03  18420               LDX     X4,ZERO,DU       NORMAL TERMINATION
    001632  500000 0010 00  18430               MME     M$TER            AMF
```

```
                                        READ & WRITE DEVICE ROUTINES

                                18440           TTLS    READ & WRITE DEVICE ROUTINES
                                18450   *
    001633  000000011007
                        001634  18460           EVEN
                        001634  18470   READEV  NULL                    READ FROM ONE DEVICE
                        001634  18480           SAVE                    SAVE RETURN ADDRESS
                                                IFE     '','',2         IF NO REGISTERS SPECIFIED, SAVE T
    001634  000122 7400 56                      STX     T,$PDL,ID       SAVE T
    001635  000005 2270 14  18490               LDX     X7,P$INFO,QENTRY  FIND THE DEVICE BLOCK
                                18500   *
    001636  001745 7000 00  18510               TSX     T,CHKSTS        CHECK STATUS OF PRIOR OPERATION
    001637  001715 7100 00  18520               TRA     HUH             OOPS! SEE IF FINISHED
    001640  001677 7100 00  18530               TRA     REWRIT          TRY AGAIN
                                18540   *
    001641  000001 1060 03  18550               CMPX    X6,S$DEF,DU     EOF?
    001642  001651 6010 00  18560               TNZ     GOODRD          NOPE, PROCEDE MYSTRO
                                18570   *
                        001643  18580   TSKEND  NULL
                        001643  18590           ENQ     LTASK           SAVE TASK BLOCK FOR NEXT PASS
    001643  001227 6210 00                      EAX     QTAIL,LTASK     POINT TO QUEUE
    001644  001207 7000 00                      TSX     T,$ENQ          QUEUE IT
                                18600   *
    001645  002021 2350 00  18610               LDA     ACTIVE          DECREMENT COUNT OF ACTIVE TASKS
    001646  000001 1750 07  18620               SBA     ONE,DL          BY ONE
    001647  002021 7550 00  18630               STA     ACTIVE
                        001650  18640           RETURN
                                                IFE     '','',2         IF NO TRANSFER SPECIFIED, DO A TRA THRU THE PDL
    001650  000122 7100 55                      TRA     $PDL,DIC        TRANSFER VIA PDL
                        001651  18650   GOODRD  NULL
    001651  000007 2350 14  18660               LDA     P$BLOCK,QENTRY  MOVE TO NEXT CHUNK ADDRESS
    001652  002023 0750 00  18670               ADA     SECDEL          SECTOR DELTA
    001653  000007 7550 14  18680               STA     P$BLOCK,QENTRY
                                18690   *
                        001654  18700   REREAD  NULL                    GET DOWN
    001654  000001 7200 17  18710               LXL     FRNO,D$FRN,X7   GET FRN FROM DEVICE BLOCK
    001655  000000 2220 03  18720               LDX     FRN2,ZERO,DU    TO MEMORY
    001656  000007 6210 14  18730               EAX     X1,P$BLOCK,QENTRY  PTR TO RELATIVE SECTOR ADDRESS
    001657  000004 2350 17  18740               LDA     D$MATE,X7       SWAP INFO PTR
    001660  000005 7550 14  18750               STA     P$INFO,QENTRY   TO REUSE TRAP BLOCK
    001661  000001 6260 14  18760               EAX     TRAP,P$STW1,QENTRY  GET TRAP BLOCK FROM TASK BLOCK
    001662  001400 6270 00  18770               EAX     X7,TRLINK       REPAIR P$EXEC
    001663  000003 7470 16  18780               STX     X7,T$LINK,TRAP  FOR TRAP PROCESSING
    001664  000006 6230 14  18790               EAX     X3,P$BUF,QENTRY  USE TASK'S BUFFER (SWAPPED BETWEEN MATES)
    001665  002022 6270 00  18800               EAX     X7,RECCNT       SET PTR TO NUMBER OF WORDS
    001666  000002 4500 16  18810               STZ     T$RET,TRAP      CLEAR TRAP RETURN
    001667  000000 2240 03  18820               LDX     FLAGS,ZERO,DU   SET NO FLAGS - BEFORE ITS TIME
    001670  500131 0010 00  18830               MME     M$COP
                                18840   *
                        001671  18850           RETURN
                                                IFE     '','',2         IF NO TRANSFER SPECIFIED, DO A TRA THRU THE PDL
    001671  000122 7100 55                      TRA     $PDL,DIC        TRANSFER VIA PDL
                                18860   *
```

READ & WRITE DEVICE ROUTINES

```
                                 18870  *              MATING PROCESS FOR READ (I.E., WRITE)
                                 18880  *
                          001672 18890         EVEN
                          001672 18900  WRIDEV  NULL
                          001672 18910         SAVE                    SOA
                                               IFE     '','',2         IF NO REGISTERS SPECIFIED, SAVE T
001672  000122 7400 56                         STX     T,$PDL,ID       SAVE T
001673  000005 2270 14 18920                   LDX     X7,P$INFO,QENTRY  FIND DEVICE BLOCK
                                 18930  *
001674  001745 7000 00 18940                   TSX     T,CHKSTS        CHECK OUT THE STATUS
001675  001715 7100 00 18950                   TRA     HUH
001676  001654 7100 00 18960                   TRA     REREAD          ONE MORE TIME
                                 18970  *
                          001677 18980  REWRIT  NULL
001677  000000 2200 03 18990                   LDX     FRN0,ZERO,DU    FROM MEMORY
001700  000001 7220 17 19000                   LXL     FRN2,D$FRN,X7   GRAB FRN
001701  000004 2350 17 19010                   LDA     D$MATE,X7       SWAP INFO PTR
001702  000007 6230 14 19020                   EAX     X3,P$BLOCK,QENTRY  PTR TO RELATIVE SECTOR ADDRESS
001703  000005 7550 14 19030                   STA     P$INFO,QENTRY   TO REUSE TRAP BLOCK
001704  000001 6260 14 19040                   EAX     TRAP,P$STW1,QENTRY  TRAP BLOCK FROM TASK BLOCK
001705  001400 6270 00 19050                   EAX     X7,TRLINK       REPAIR P$EXEC FOR
001706  000003 7470 16 19060                   STX     X7,T$LINK,TRAP  TRAP PROCESSING
001707  000006 6210 14 19070                   EAX     BUFP,P$BUF,QENTRY  BUF PTR
001710  002022 6270 00 19080                   EAX     X7,RECCNT       SET PTR TO SECTOR (RELATIVE)
001711  000002 4500 16 19090                   STZ     T$RET,TRAP      CLEAR TRAP RETURN
001712  000000 2240 03 19100                   LDX     FLAGS,ZERO,DU   NO FLAGS
001713  500131 0010 00 19110                   MME     M$COP
                                 19120  *
                          001714 19130         RETURN
                                               IFE     '','',2         IF NO TRANSFER SPECIFIED, DO A TRA THRU THE PDL
001714  000122 7100 55                         TRA     $PDL,DIC        TRANSFER VIA PDL
                                 19140  *
                          001715 19150  HUH     NULL
001715  000007 7260 14 19160                   LXL     X6,P$BLOCK,QENTRY  CHECK LAST BLOCK ADDRESS
001716  454740 1060 03 19170                   CMPX    X6,ENDLOC,DU    END OF DISK?
001717  001643 6000 00 19180                   TZE     TSKEND          YEP, FERGIT MESSAGE
                                 19190  *
001720 2 00000 5074 17 19200                   AWDX    ,X7,AR2         ADDRESS DEVICE BLOCK IN EIS
001721  000000100500   19210                  MLR     (AR)            PUT DEVICE NUMBER INTO MESSAGE
001722 2 00001000002   19220                  ADSC9   D$DEV,,TWO,AR2
001723  002660000002   19230                  ADSC9   PRBDEV,,TWO
                                 19240  *
001724  000001 2360 14 19250                   LDQ     P$STW1,QENTRY   FLASH THE STATUS
                          001725 19260         OPRINT  PRSTAT,TWELVE
001725  002663 2210 03                         LDX     X1,PRSTAT,DU    STUFF LOCATION FIRST
001726  000655 7410 00                         STX     X1,TALLY
001727  001440 2210 03                         LDX     X1,TWELVE*64+32,DU  GRAB LENGTH OF NIBBLE STRING
001730  000655 4410 00                         SXL     X1,TALLY
001731  000650 7000 00                         TSX     T,OPRINT        STUFF IT!
                                 19270  *
001732  000007 2360 14 19280                   LDQ     P$BLOCK,QENTRY  ALSO SEND BLOCK NUMBER
001733  000000 6360 06 19290                   EAQ     ,QL             UPPER HALF HAS SIX NIBBLES
```

```
                                                READ & WRITE DEVICE ROUTINES

                    001734  19300               OPRINT  PRBLOK,SIX
001734  002672 2210 03                          LDX     X1,PRBLOK,DU    STUFF LOCATION FIRST
001735  000655 7410 00                          STX     X1,TALLY
001736  000640 2210 03                          LDX     X1,SIX*64+32,DU  GRAB LENGTH OF NIBBLE STRING
001737  000655 4410 00                          SXL     X1,TALLY
001740  000650 7000 00                          TSX     T,OPRINT        STUFF IT!
                        19310   *
                    001741  19320               PRINT   PROBMP,PROBML   INFORMATION MESSAGE
001741  002650 6210 00                          EAX     1,PROBMP        LOC
001742  002674 6270 00                          EAX     7,PROBML        LEN
001743  000560 7000 00                          TSX     T,PRINT         DOIT
001744  001643 7100 00  19330                   TRA     TSKEND          KILL TASK
```

ROUTINE TO CHECK DEVICE STATUS RETURN

```
                                19340            TTLS    ROUTINE TO CHECK DEVICE STATUS RETURN
                         000001 19350  RETRY     EQU     1                RETURN OFFSET FOR RETRY ON BUSY
                         000002 19360  GOOD      EQU     2                GOOD STATUS RETURN OFFSET
                         000000 19370  ERROR     EQU     0                BAD STATUS RETURN OFFSET
                                19380  *
                         000004 19390  EMAX      EQU     4                MAX NUMBER OF CONSECUTIVE ERRORS ALLOWED
                                19400  *
                                19410  *
                         001745 19420  CHKSTS    NULL
001745  000001 2260 14         19430            LDX     X6,P$STW1,QENTRY  GET STATUS RETURN FROM TRAP BLOCK
001746  000777 3660 03         19440            ANX     X6,B$MASLQ,DU
001747  000002 6000 10         19450            TZE     GOOD,T           TAKE GOOD RETURN
                                19460  *
001750  000400 1060 03         19470            CMPX    X6,S$RER,DU      IS ERROR RECOVERABLE?
001751  001756 6010 00         19480            TNZ     NRCOV            NOPE, UNLESS EOF
                                19490  *
001752  000005 0540 17         19500            AOS     D$ERRS,X7        INCREMENT CONSECUTIVE ERROR COUNT
001753  000005 7250 17         19510            LXL     X5,D$ERRS,X7     SEE IF TOO MANY
001754  000004 1050 03         19520            CMPX    X5,EMAX,DU
001755  000001 6020 10         19530            TNC     RETRY,T          NOPE, REISSUE IT
                                19540  *
                         001756 19550  NRCOV     NULL                     DO NONRECOVERABLE ERROR BIT
001756  000001 1060 03         19560            CMPX    X6,S$DEF,DU      IS IT AN EOF?
001757  000002 6000 10         19570            TZE     GOOD,T           YEP, DO GOODER
001760  000000 7100 10         19580            TRA     ERROR,T          WE GOT PROBLEMS
```

OUTPUT PERIODIC PROCESSING NOTIFICATION (TRO HANDLING)

```
                                    19590          TTLS    OUTPUT PERIODIC PROCESSING NOTIFICATION (TRO HANDLING)
                          000120    19600  TTYSIZ  EQU     80                  LENGTH OF TTY LINE
001761  000000000000              19610  TTYLFT  DEC     0                   CHARACTERS REMAINING ON LINE
                                    19620  *
                          001762    19630  TRO     NULL                        TIMER RUNOUT FAULT HANDLING
                                    19640          INHIB   ON                  KISS
001762  002010 7532 00            19650          SREG    TRREG               SOS
001763  000010 0342 00            19660          LDAC    TROFLT              CLEAN FLT VECTOR & REMEMBER WHERE FROM
001764  002005 7552 00            19670          STA     RESUME
                                    19680  *
001765  002020 2352 00            19690          LDA     INTRVL              RESET PERIODIC TIMER FOR INFORMING
001766  500001 0012 00            19700          MME     M$STI
                                    19710  *
001767  001761 2272 00            19720          LDX     X7,TTYLFT           DECREMENT CHARACTERS LEFT ON LINE
001770  000001 1272 03            19730          SBLX    X7,ONE,DU
001771  001761 7472 00            19740          STX     X7,TTYLFT
001772  002000 6012 00            19750          TNZ     TRNORM              STILL SOME LEFT
                                    19760  *
001773  000120 2272 03            19770          LDX     X7,TTYSIZ,DU        START NEW LINE COUNTDOWN
001774  001761 7472 00            19780          STX     X7,TTYLFT
                          001775    19790          PRINT   CRLFMP,CRLFML       & SLEW CARRIAGE
001775  003121 6212 00                           EAX     1,CRLFMP            LOC
001776  003123 6272 00                           EAX     7,CRLFML            LEN
001777  000560 7002 00                           TSX     T,PRINT             DOIT
                                    19800  *
                          002000    19810  TRNORM  NULL                        NORMALLY JUST HAVE A PERIOD
                          002000    19820          PRINT   PERMSP,PERMSL       PUT OUT A DOT
002000  003116 6212 00                           EAX     1,PERMSP            LOC
002001  003120 6272 00                           EAX     7,PERMSL            LEN
002002  000560 7002 00                           TSX     T,PRINT             DOIT
002003  002010 0732 00    19830                  LREG    TRREG               ROS
002004  002005 6302 00    19840                  RET     RESUME              BACK TO THE SALT MINES!
                          19850                  INHIB   OFF
                                    19860  *
                          002005    19870  RESUME  BSS     1                   RETURN HOLDER
002006  000002710004
                          002010    19880          EIGHT
                          002010    19890  TRREG   BSS     8
                                    19900  *
002020  000003523000              19910  INTRVL  DEC     960000              HACK EVERY 15 SECONDS
```

ROUTINE TO INITIATE READ TASKS ON ALL DEVICES

```
                                19920              TTLS    ROUTINE TO INITIATE READ TASKS ON ALL DEVICES
                         002021 19930    ACTIVE    BSS     1                ACTIVE TASK COUNTER
                         000100 19940    SECSIZ    EQU     64               SECTOR SIZE IN WORDS
                         000050 19950    SECTRK    EQU     40               SECTORS PER TRACK
                         000023 19960    HEADS     EQU     19               NUMBER OF HEADS
                         000012 19970    ALLTRK    EQU     10               NUMBER OF ALLOCATION UNITS/TRACK
                         001453 19980    CYLIND    EQU     811              NUMBER OF CYLINDERS/PACK
                         005000 19990    BLKSIZ    EQU     SECSIZ*SECTRK
                         454740 20000    ENDLOC    EQU     ALLTRK*HEADS*CYLIND-ALLTRK  LAST LOCATION
002022  000000 005000          20010    RECCNT    ZERO    ,BLKSIZ          NUMBER OF WORDS TO XFER
002023  000000000000           20020    SECDEL    DEC     0                RECCNT IN SECTORS
                               20030    *
002024  001634 7170 00         20040    TRAREA    XED     READEV           INSTRUCTION FOR TRAP BLOCKS
002025  001605 7100 00         20050    TRAMAI    TRA     MAIN             BARF-PROOF CODING WORD
                               20060    *
                               20070    *
                         002026 20080    STRTQ     NULL
                         002026 20090              SAVE
                                                   IFE     '','',2          IF NO REGISTERS SPECIFIED, SAVE T
002026  000122 7400 56                             STX     T,$PDL,ID        SAVE T
                               20100    *          WALK THE DEVICE CHAIN
002027  001226 2240 00         20110              LDX     QENTRY,DEVQ      IN THE BEGINNING...
002030  001634 6270 00         20120              EAX     X7,READEV        LOCATE PROCESSING ROUTINE FOR READ
002031 1 00000 5074 14         20130              AWDX    ,QENTRY,AR1      USE ADDR REG PTR FOR EIS WORD OFFSETS
                               20140    *
                         002032 20150    SLOOP     NULL
002032  002066 6000 00         20160              TZE     SDONE            NO MORE IN QUEUE
                               20170    *
002033 1 00003 1071 00         20180              CMPX    X7,D$EXEC,,AR1   IS THIS A READ DEVICE
002034  002063 6010 00         20190              TNZ     SNEXT            NOPE, TRY THE NEXT DUDE
                               20200    *
                         002035 20210              DEQ     LTASK            GET A TASK BLOCK FROM LIMBO
002035  001227 6210 00                             EAX     QTAIL,LTASK      POINT TO QUEUE
002036  001215 7000 00                             TSX     T,$DEQ           REMOVE IT
002037  000005 7414 14         20220              SAR     AR1,P$INFO,X4    STUFF PTR TO DEVICE BLOCK IN TRAP BLOCK
002040  000001 4500 14         20230              STZ     P$STW1,X4        ENSURE GOOD INITIAL STATUS BEFORE READ
                               20240    *
002041  002024 2350 00         20250              LDA     TRAREA           FILL IN TRA ROUTINE
002042  000004 7550 14         20260              STA     P$EXEC,X4        FOR TASKING
                               20270    *
002043  002022 2360 00         20280              LDQ     RECCNT           GET #WORDS
002044  000400 5060 07         20290              DIV     SECSIZ*FOUR,DL   GET #SECTORS
002045  002023 7560 00         20300              STQ     SECDEL           SAVE IT
002046  002023 2350 00         20310              LDA     SECDEL
002047  000000 5310 00         20320              NEG                      COMPLEMENT TO START LOW ONE
002050  002023 0750 00         20330              ADA     SECDEL           START AT BLOCK ONE (AVOID HEADER CRUMP)
002051  000007 7550 14         20340              STA     P$BLOCK,X4       START BEHIND
                               20350    *
002052  002025 2350 00         20360              LDA     TRAMAI           KEEP FROM BARFING ON 1ST SHOT
002053  000003 7550 14         20370              STA     P$RET,X4         1ST TIMES A CHARM
                               20380    *
                         002054 20390              ENQ     MTASK            QUEUE THE TASK BLOCK
```

```
                                                ROUTINE TO INITIATE READ TASKS ON ALL DEVICES

002054  001225 6210 00                          EAX     QTAIL,MTASK     POINT TO QUEUE
002055  001207 7000 00                          TSX     T,$ENQ          QUEUE IT
                              20400     *
002056  003126 2350 00        20410             LDA     COPCNT          DECREMENT NUMBER OF COPIES TO BE DONE
002057  002066 6000 00        20420             TZE     SDONE           NO MORE TO BE DONE
002060  000001 1750 07        20430             SBA     ONE,DL
002061  003126 7550 00        20440             STA     COPCNT
002062  002021 0540 00        20450             AOS     ACTIVE          INCREMENT NUMBER OF ACTIVE TASKS
                              20460     *
                    002063    20470     SNEXT   NULL
002063 1 00000 7615 00        20480             LAR     AR1,D$LINK,,AR1  FIND THE NEXT DEVICE IN LIST
002064 1 00000 6241 00        20490             EAX     X4,,,AR1        SET INDICATOR
002065  002032 7100 00        20500             TRA     SLOOP           AGAIN
                              20510     *
                    002066    20520     SDONE   NULL                    ADIOS, AUF WIEDERSEHEN, BYTE IT
                    002066    20530             RETURN
                                                IFE     '','',2         IF NO TRANSFER SPECIFIED, DO A TRA THRU THE PDL
002066  000122 7100 55                          TRA     $PDL,DIC        TRANSFER VIA PDL
```

DEVICE PAIR VALIDATION

```
                                20540          TTLS    DEVICE PAIR VALIDATION
                         000002 20550  PACNUM  EQU     2               WORD OFFSET OF PACK ID IN PACK LABEL (GCOS3)
                         002067 20560  PACGRP  BSS     1               GROUP ID HOLDER
                         000000 20570  SOURCE  EQU     0               BYTE IN HOLDER OF SOURCE ID
                         000002 20580  DESTIN  EQU     2               BYTE IN HOLDER OF DESTINATION ID
                         002070 20590  LASTPT  BSS     1               QENTRY PLACE HOLDER
002071 000000000000      20600  LBLREC  DEC     0               RECORD NUMBER OF PACK LABEL (GCOS3)
002072 000000000100      20610  LRECLN  DEC     64              LENGTH OF LABEL IN WORDS
                         002073 20620  RDEVNM  BSS     1               MEMORY OF READ DEVICE'S NUMBER (IN PACK LABEL)
                                20630  *
                                20640  *
                         002074 20650  VALID8  NULL
                         002074 20660          SAVE                    HOLD OUR PLACE
                                               IFE     '','',2         IF NO REGISTERS SPECIFIED, SAVE T
002074 000122 7400 56                          STX     T,$PDL,ID       SAVE T
002075 001227 2230 00  20670                    LDX     X3,LTASK        FIND FIRST WAITING TASK
002076 000015 6000 00  20680                    TZE     ABORTV          EAT SHIT & DIE!
002077 000006 6230 13  20690                    EAX     X3,P$BUF,X3     USE ONE BUFFER
002100 001226 6240 00  20700                    EAX     QENTRY,DEVQ     START AT FRONT OF DEVICE QUEUE
                                20710  *
                         002101 20720  VALOOP  NULL
002101 000000 2240 14  20730                    LDX     QENTRY,,QENTRY  FIND NEXT ENTRY
002102 002153 6000 00  20740                    TZE     VALID           NO MORE, EVERYTHING KOSER, I GUESS
                                20750  *
002103 002070 7440 00  20760                    STX     QENTRY,LASTPT   REMEMBER LIKE AN ELEPHANT
002104 000001 7200 14  20770                    LXL     FRNO,D$FRN,QENTRY  GET PACK FRN
002105 002071 6210 00  20780                    EAX     X1,LBLREC       POINT TO LABEL
002106 000000 2220 03  20790                    LDX     FRN2,ZERO,DU    READ LABEL INTO MEMORY
002107 000000 2240 03  20800                    LDX     FLAGS,ZERO,DU   NOTHING SPECIAL
002110 000116 6260 00  20810                    EAX     TRAP,T$TRAP     USE SERIAL TRAPPING
002111 002072 6270 00  20820                    EAX     X7,LRECLN       READ LABEL ONLY
002112 000002 4500 16  20830                    STZ     T$RET,TRAP      CLEAR THE WAY...
002113 500131 0010 00  20840                    MME     M$COP           GET IT
                                20850  *
                         002114 20860          WAIT                    WAIT FER THAT DUDE
002114 000205 7000 00                          TSX     T,WAIT          WAIT FOR TRAP TO COME IN
002115 002070 2240 00  20870                    LDX     QENTRY,LASTPT   REGATHER OUR THOUGHTS
                                20880  *
002116 000000 7270 13  20890                    LXL     X7,,X3          FIND THE BUFFER..
002117 0 00000 5074 17 20900                    AWDX    ,X7,ARO         FOR EIS
                                20910  *
002120 000003 2210 14  20920                    LDX     X1,D$EXEC,QENTRY  IS THIS A READ DEVICE?
002121 001634 1010 03  20930                    CMPX    X1,READEV,DU
002122 002133 6010 00  20940                    TNZ     WRITDV          NOPE, CHECK NUMBER ALSO..
                                20950  *
002123 000000100500    20960                    MLR     (AR)            SAVE DEVICE'S NUMBER ID
002124 0 00002220004   20970                    ADSC6   PACNUM,TWO,FOUR,ARO
002125 002073020004    20980                    ADSC6   RDEVNM,,FOUR
                                20990  *
002126 000000106500    21000                    CMPC    (AR)            SEE IF CORRECT PACK GROUP
002127 0 00002020002   21010                    ADSC6   PACNUM,,TWO,ARO
002130 002067020002    21020                    ADSC6   PACGRP,SOURCE,TWO
```

```
                                                DEVICE PAIR VALIDATION

    002131  002143 6010 00  21030              TNZ     INVALD          NOT VALID, CALL OUT THE MOUNTIES
                            21040    *
    002132  002101 7100 00  21050              TRA     VALOOP          OK, SO FAR - CHECK MORE..
                            21060    *
                    002133  21070    WRITDV  NULL                    CHECK OUT WRITE DEVICE
    002133  000000106500    21080              CMPC    (AR)            IS DEVICE NUMBER RIGHT?
    002134 0 00002220004    21090              ADSC6   PACNUM,TWO,FOUR,AR0
    002135  002073020004    21100              ADSC6   RDEVNM,,FOUR
    002136  002143 6010 00  21110              TNZ     INVALD          NOPE, BLOW THE WHISTLE
                            21120    *
    002137  000000106500    21130              CMPC    (AR)            CHECK PACK GROUP
    002140 0 00002020002    21140              ADSC6   PACNUM,,TWO,AR0
    002141  002067220002    21150              ADSC6   PACGRP,DESTIN,TWO
    002142  002101 6000 00  21160              TZE     VALOOP          SO FAR, SO GOOD, CONTINUE..
                            21170    *
                    002143  21180    INVALD  NULL
    002143 1 00000 5074 14  21190              AWDX    ,QENTRY,AR1     USE EIS ENTRY PTR
    002144  000000100500    21200              MLR     (AR)            INSERT DEVICE NUMBER INTO INVALID MSG
    002145 1 00001000002    21210              ADSC9   D$DEV,,TWO,AR1
    002146  003023000002    21220              ADSC9   VALDEV,,TWO
                            21230    *
                    002147  21240              PRINT   VALMSP,VALMSL   BITCH, BITCH, BITCH
    002147  003011 6210 00                     EAX     1,VALMSP        LOC
    002150  003024 6270 00                     EAX     7,VALMSL        LEN
    002151  000560 7000 00                     TSX     T,PRINT         DOIT
                    002152  21250              RETURN                  TAKE BAD EXIT
                                               IFE     '','',2         IF NO TRANSFER SPECIFIED, DO A TRA THRU THE PDL
    002152  000122 7100 55                     TRA     $PDL,DIC        TRANSFER VIA PDL
                            21260    *
                    002153  21270    VALID   NULL
    002153  000122 2200 54  21280              LDX     T,$PDL,DI       WHERE DID WE COME FROM?
    002154  000001 7100 10  21290              TRA     ONE,T           OK EXIT
```

ROUTINE TO SCAN INPUT FOR DEVICE NUMBERS

```
                                21300           TTLS    ROUTINE TO SCAN INPUT FOR DEVICE NUMBERS
002155  000000000000            21310   DEVCNT  DEC     0               COUNT OF DEVICES GIVEN
                        002156  21320   MATER   BSS     1               WORK CELL FOR DEVICE PAIRING
                        002157  21330   WORK    BSS     1               WHO KNOWS?
                        002160  21340   COMFLG  BSS     1               COMMA LAST TOKEN FLAG
002161  054000000000            21350   COMMA   TEXT    ','             GUESS!
002162  000000000002            21360   FRNNOW  DEC     2               CURRENT FRN (NEEDED?)
                        002163  21370   REMAIN  BSS     1               CHARACTERS UNSCANNED YET IN LINE BUFFER
                        002164  21380   CR      CR                      <CR> = END OF LINE
002164  015177177177                    21390           OCT     015177177177
002165  000000 000000           21390   BUFPTR  ZERO    **,**           WHERE
                                21400   *
                                21410   *
                                21420   *
                        002166  21430   GETDEV  NULL
                        002166  21440           SAVE                    SOA
                                        IFE     '','',2                 IF NO REGISTERS SPECIFIED, SAVE T
002166  000122 7400 56                  STX     T,$PDL,ID               SAVE T
002167  000174 2350 07  21450           LDA     LLEN,DL                 STARTING LENGTH OF BUFFER
002170  002163 7550 00  21460           STA     REMAIN                  FRESH LINE TO SCAN
002171  000000 2360 07  21470           LDQ     ZERO,DL                 STARTING OFFSET PTR IN BUFFER
002172  002160 5540 00  21480           STC1    COMFLG                  INDICATE LAST TOKEN NOT COMMA
                                21490   *
                        002173  21500   SCAN    NULL                    SCANNER OF THE LINE
002173  003130 4500 00  21510           STZ     TCOUNT                  CLEAR TALLY
002174  000000164446    21520           TCT     (,RL,,QL)               FIND A TOKEN
002175  002752000005    21530           ADSC9   LIN,,A
002176  003232000000    21540           ARG     TKNTBL                  ',' OR NUMBER
002177  003130000000    21550           ARG     TCOUNT
                                21560   *
002200  003130 0360 00  21570           ADLQ    TCOUNT                  INCREMENT OFFSET PTR
002201  003130 1350 00  21580           SBLA    TCOUNT                  DECREMENT BYTES REMAINING
002202  777777 3760 07  21590           ANQ     B$MASKH,DL              ISOLATE OFFSET (<121)
002203  777777 3750 07  21600           ANA     B$MASKH,DL              ISOLATE LENGTH (<121)
                                21610   *
002204  000000106406    21620           CMPC    (,,,QL)                 COMMA?
002205  002752000001    21630           ADSC9   LIN,,ONE
002206  002161000001    21640           ADSC9   COMMA,,ONE
002207  002215 6000 00  21650           TZE     COMMAS                  YEP, PROCESS IT
                                21660   *
002210  000000106406    21670           CMPC    (,,,QL)                 END OF LINE <CR>
002211  002752000001    21680           ADSC9   LIN,,ONE
002212  002164000001    21690           ADSC9   CR,,ONE
002213  002221 6010 00  21700           TNZ     NUMBER                  NO, MUST BE DEVICE NUMBER
                                21710   *
                        002214  21720           RETURN                  EXIT ON END OF LINE
                                        IFE     '','',2                 IF NO TRANSFER SPECIFIED, DO A TRA THRU THE PDL
002214  000122 7100 55                  TRA     $PDL,DIC                TRANSFER VIA PDL
                                21730   *
                        002215  21740   COMMAS  NULL
002215  000001 0760 07  21750           ADQ     ONE,DL                  DON'T REPROCESS THIS GUY
002216  000001 1350 07  21760           SBLA    ONE,DL
```

```
                                                ROUTINE TO SCAN INPUT FOR DEVICE NUMBERS

    002217  002160 4500 00  21770            STZ     COMFLG          MARK COMMA AS LAST TOKEN
    002220  002173 7100 00  21780            TRA     SCAN            GO FOR MORE
                            21790    *
                    002221  21800    NUMBER  NULL
    002221  002160 5540 00  21810            STC1    COMFLG          UNMARK COMMA AS LAST TOKEN
                            21820    *
    002222  003127 4500 00  21830            STZ     NCOUNT          CLEAR TALLY
    002223  000000164446    21840            TCT     (,RL,,QL)       FIND TOKEN LENGTH
    002224  002752000005    21850            ADSC9   LIN,,A
    002225  003172000000    21860            ARG     NUMTBL          WHILE IN NUMERIC SET
    002226  003127000000    21870            ARG     NCOUNT
                            21880    *
    002227  002163 7550 00  21890            STA     REMAIN          REMEMBER HOW MANY LEFT
                    002230  21900            GETD    DEVLNG          GET A DEVICE BLOCK
    002230  000006 2350 07                   LDA     DEVLNG,DL       GET THIS SIZE BLOCK
    002231  001010 7000 00                   TSX     T,$GET          CALL GET ROUTINE
                    002232  21910            ENQ     DEVQ            LINK THE BLOCK TO THE DEVICE QUEUE
    002232  001226 6210 00                   EAX     QTAIL,DEVQ      POINT TO QUEUE
    002233  001207 7000 00                   TSX     T,$ENQ          QUEUE IT
                            21920    *
    002234  003127 7210 00  21930            LXL     X1,NCOUNT       GRAB TOKEN LENGTH
                            21940    *
    002235 1 00000 5074 14  21950            AWDX    ,X4,AR1         USE AR1 AS EIS PTR
                            21960    *
                    000060  21970    ZEROES  BOOL    060             ASCII ZERO
    002236  060100101446    21980            MRL     (,RL,,QL),(AR),ZEROES  FILL IN DEVICE NUMBER FOR CLOSE
    002237  002752000011    21990            ADSC9   LIN,,X1
    002240 1 00001000002    22000            ADSC9   D$DEV,,EIS9/TWO,AR1
                            22010    *
    002241  060000101446    22020            MRL     (,RL,,QL),,ZEROES
    002242  002752000011    22030            ADSC9   LIN,,X1
    002243  002345400002    22040            ADSC9   DEVNAM+ONE,TWO,TWO  FILL NAME FOR OPEN
                            22050    *               STUFF DEVICE NUMBER IN CASE OF OPEN FAILURE
    002244  060000101446    22060            MRL     (,RL,,QL),,ZEROES
    002245  002752000011    22070            ADSC9   LIN,,X1
    002246  002707000002    22080            ADSC9   UNADEV,,TWO
                            22090    *
                            22100    *        "PRELIMINARY SETUP OF DEVICE BLOCK
    002247 1 00005 4501 00  22110            STZ     D$ERRS,,AR1     ZILCH ERROR COUNT
    002250  002156 2200 00  22120            LDX     X0,MATER        SHOULD WE MATE
    002251  002156 0340 00  22130            LDAC    MATER           GRAB MATE PTR & CLEAR
    002252  002157 7550 00  22140            STA     WORK            SAVE MATE IN CASE OF BACK OUT
    002253  002271 6010 00  22150            TNZ     INIWRI          YEP, MUST BE WRITE DEVICE
                            22160    *
                    002254  22170    INIREA  NULL
                    002254  22180            GETD    BLKSIZ          GET A BUFFER FOR THIS ONE & ITS MATE
    002254  005000 2350 07                   LDA     BLKSIZ,DL       GET THIS SIZE BLOCK
    002255  001010 7000 00                   TSX     T,$GET          CALL GET ROUTINE
    002256  002165 4440 00  22190            SXL     X4,BUFPTR       STUFF IT IN DCW WORD SKELETON
                            22200    *
                    002257  22210            GETD    TASKLN          GET A TRAP BLOCK FOR THE DEVICE PAIR
    002257  000010 2350 07                   LDA     TASKLN,DL       GET THIS SIZE BLOCK
```

```
                                        ROUTINE TO SCAN INPUT FOR DEVICE NUMBERS

002260  001010 7000 00                  TSX     T,$GET          CALL GET ROUTINE
002261  002165 2350 00  22220           LDA     BUFPTR          PUT BUFFER ADDR INTO TRAP BLOCK
002262  000006 7550 14  22230           STA     P$BUF,X4        FOR USE BY EITHER SPOUSE
                002263  22240           ENQ     LTASK           MAKE TASK BLOCK CERTIFIABLE
002263  001227 6210 00                  EAX     QTAIL,LTASK     POINT TO QUEUE
002264  001207 7000 00                  TSX     T,$ENQ          QUEUE IT
                        22250   *
002265  001634 6200 00  22260           EAX     XO,READEV       SET ROUTINE PTR IN BLOCK
002266 1 00003 7401 00  22270           STX     XO,D$EXEC,,AR1
002267  002156 7414 00  22280           SAR     AR1,MATER       MARK MATE NEXT (WRITE DEVICE)
002270  002275 7100 00  22290           TRA     OPENUP          TRY TO OPEN DEVICE FILE
                        22300   *
                002271  22310   INIWRI  NULL
002271 1 00004 7551 00  22320           STA     D$MATE,,AR1     HERE COMES THE BRIDE..
002272  000004 7414 01  22330           SAR     AR1,D$MATE,AU   PITY THE GROOM
                        22340   *
002273  001672 6200 00  22350           EAX     XO,WRIDEV       SET PROCESS ROUTINE ADDRESS
002274  000003 7400 14  22360           STX     XO,D$EXEC,X4
                        22370   *
                002275  22380   OPENUP  NULL
002275  000116 6260 00  22390           EAX     TRAP,T$TRAP     SET TRAP BLOCK PTR FOR MME
                002276  22400           OPEN    (ZERO,DL),PERCAT,,B$RWA,TWO
002276  000000 7200 07                  LXL     FRNO,ZERO,DL    GET FRN
                                        IFE     '','',2         CHECK FOR NO TAG
002277  002342 6210 00                  EAX1    PERCAT
002300  000002 6270 00                  EAX     X7,TWO
002301  027000 2240 03                  LDX     FLAGS,*SET,DU   GET ACCESSES
002302  000002 4500 16                  STZ     T$RET,TRAP
002303  500101 0010 00                  MME     M$OPE
002304  000205 7000 00                  TSX     T,WAIT          WAIT FOR TRAP TO COME IN
002305  000000 7200 16  22410           LXL     FRNO,T$STW1,TRAP  DID WE GET IT?
002306  002325 6000 00  22420           TZE     DEVNA           NOPE, INFORM & BACK OUT
                        22430   *
002307  002155 0540 00  22440           AOS     DEVCNT          INCREMENT DEVICE COUNT
002310 1 00001 4401 00  22450           SXL     FRNO,D$FRN,,AR1  REMEMBER THE FRN
                        22460   *
002311  000000 2240 03  22470           LDX     X4,ZERO,DU      MAN W/O A COUNTRY
002312  150000 2350 07  22480           LDA     M$DSE,DL        DISABLE EXEC ERROR RECOVERY
002313  000012 0750 03  22490           ADA     DEVDR,DU
002314  000002 4500 16  22500           STZ     T$RET,TRAP
002315  500132 0010 00  22510           MME     M$DRI
002316  000205 7000 00  22520           TSX     T,WAIT          WAIT FOR RETURN
                        22530   *
                002317  22540   SCANOV  NULL                    RESCAN AFTER NUMBER
002317  002163 2350 00  22550           LDA     REMAIN          RECOUP HOW MANY LEFT
002320  003127 0760 00  22560           ADQ     NCOUNT          PASS THIS OVER NEXT TIME
002321  003127 1750 00  22570           SBA     NCOUNT
002322  777777 3750 07  22580           ANA     B$MASKH,DL      ISOLATE
002323  777777 3760 07  22590           ANQ     B$MASKH,DL
002324  002173 7100 00  22600           TRA     SCAN            GO FOR MORE
                        22610   *
                002325  22620   DEVNA   NULL                    DEVICE NOT ALLOCATED
```

```
                                        ROUTINE TO SCAN INPUT FOR DEVICE NUMBERS

                    002325  22630               PRINT   UNABLE,UNABLL
002325  002675 6210 00                          EAX     1,UNABLE        LOC
002326  002710 6270 00                          EAX     7,UNABLL        LEN
002327  000560 7000 00                          TSX     T,PRINT         DOIT
002330  000656 7170 00  22640                   XED     ABORT           *** DBUG ***
                        22650   *
002331  000000 6220 14  22660                   EAX     X2,,X4          SAVE PTR TO BLOCK
                    002332  22670               DEQ     DEVQ            BACK OUT DEVICE BLOCK
002332  001226 6210 00                          EAX     QTAIL,DEVQ      POINT TO QUEUE
002333  001215 7000 00                          TSX     T,$DEQ          REMOVE IT
002334  000000 6240 12  22680                   EAX     X4,,X2          RETRIEVE BLOCK PTR
                    002335  22690               REL                     RELEASE IT
002335  001110 7000 00                          TSX     T,$REL
002336  002157 2350 00  22700                   LDA     WORK            RESTORE PRIOR MATE
002337  002156 7550 00  22710                   STA     MATER
                        22720   *
002340  002163 2350 00  22730                   LDA     REMAIN          RECOUP HOW MANY CHARACTERS LEFT
002341  002317 7100 00  22740                   TRA     SCANOV
                        22750   *
                        22760   *
002342  120105122103    22770   PERCAT  UASCI   2,PERCAT                 PERCAT CATALOG
002343  101124040040
002344  115064065061    22780   DEVNAM  UASCI   2,M4510001              FIRST DEVICE NAME
002345  060060060061
```

OUTPUT DEVICE MAP/MATING INFORMATION TO USER

```
                                22790              TTLS    OUTPUT DEVICE MAP/MATING INFORMATION TO USER
                                22800    *          "TBD
                         002346 22810    INFORM     NULL
    002346   000000 7100 10      22820               TRA     ,T
```

```
                                    HANDLE TERMINAL RESPONSES

                          22830             TTLS    HANDLE TERMINAL RESPONSES
                   002347 22840    TYTERM   NULL
   002347  000000 7100 10 22850             TRA     ,T              STUBBY DUDE!
```

TERMINAL BREAK HANDLING??

```
                    22860           TTLS    TERMINAL BREAK HANDLING??
            002350  22870   BREAK   NULL
```

MESSAGES TO THE USER

```
                                22880              TTLS    MESSAGES TO THE USER
002350  000000002351            22890   OPTMSP     DATA    OPTMS           SEQUENCE OF DEVICES PROMPT
002351  015012012012            22900   OPTMS      TEXT    '@^^^INPUT THE PLUG NUMBERS ON THE DEVICES TO BE USED FOR'
002352  151156160165
002353  164040164150
002354  145040160154
002355  165147040156
002356  165155142145
002357  162163040157
002360  156040164150
002361  145040144145
002362  166151143145
002363  163040164157
002364  040142145040
002365  165163145144
002366  040146157162
002367  015012164150            22910              TEXT    '@^THE PACK COPY.  THE INPUT SHOULD BE A SIMPLE LIST OF NUMBERS,'
002370  145040160141
002371  143153040143
002372  157160171056
002373  040040164150
002374  145040151156
002375  160165164040
002376  163150157165
002377  154144040142
002400  145040141040
002401  163151155160
002402  154145040154
002403  151163164040
002404  157146040156
002405  165155142145
002406  162163054000
002407  015012163145            22920              TEXT    '@^SEPARATED BY COMMAS.  THE ORDER OF INPUT WILL DETERMINE THE'
002410  160141162141
002411  164145144040
002412  142171040143
002413  157155155141
002414  163056040040
002415  164150145040
002416  157162144145
002417  162040157146
002420  040151156160
002421  165164040167
002422  151154154040
002423  144145164145
002424  162155151156
002425  145040164150
002426  145000000000
002427  015012165163            22930              TEXT    '@^USE OF EACH DEVICE.  ODD ORDINAL POSITIONS WILL BE USED FOR'
002430  145040157146
002431  040145141143
002432  150040144145
```

MESSAGES TO THE USER

```
002433  166151143145
002434  056040040157
002435  144144040157
002436  162144151156
002437  141154040160
002440  157163151164
002441  151157156163
002442  040167151154
002443  154040142145
002444  040165163145
002445  144040146157
002446  162000000000
002447  015012160141    22940          TEXT    '@^PACKS TO BE COPIED; EVEN ORDINAL POSITIONS WILL BE USED FOR'
002450  143153163040
002451  164157040142
002452  145040143157
002453  160151145144
002454  073040145166
002455  145156040157
002456  162144151156
002457  141154040160
002460  157163151164
002461  151157156163
002462  040167151154
002463  154040142145
002464  040165163145
002465  144040146157
002466  162000000000
002467  015012164150    22950          TEXT    '@^THE DUPLICATES TO BE CREATED.'
002470  145040144165
002471  160154151143
002472  141164145163
002473  040164157040
002474  142145040143
002475  162145141164
002476  145144056000
002477  015012012040    22960          TEXT    '@^^  EXAMPLE:'
002500  040145170141
002501  155160154145
002502  072000000000
002503  015012012040    22970          TEXT    '@^^     1,2,3,4,5,6'
002504  040040040040
002505  061054062054
002506  063054064054
002507  065054066000
002510  015012040040    22980          TEXT    '@^   RESULT: DEVICES 1,3,&5 WOULD BE USED FOR ORIGINAL PACKS'
002511  040162145163
002512  165154164072
002513  040144145166
002514  151143145163
002515  040061054063
002516  054046065040
```

MESSAGES TO THE USER

```
002517  167157165154
002520  144040142145
002521  040165163145
002522  144040146157
002523  162040157162
002524  151147151156
002525  141154040160
002526  141143153163
002527  015012040040    22990    TEXT    '@'    DEVICES 2,4,&6 WOULD BE USED FOR THE COPY PACKS'
002530  040040040040
002531  040040040040
002532  040144145166
002533  151143145163
002534  040062054064
002535  054046066040
002536  167157165154
002537  144040142145
002540  040165163145
002541  144040146157
002542  162040164150
002543  145040143157
002544  160171040160
002545  141143153163
002546  015012040040    23000    TEXT    '@'    THE ACTUAL READ WRITE MAPPING WOULD BE AS FOLLOWS:'
002547  040040040040
002550  040040040040
002551  040164150145
002552  040141143164
002553  165141154040
002554  162145141144
002555  040167162151
002556  164145040155
002557  141160160151
002560  156147040167
002561  157165154144
002562  040142145040
002563  141163040146
002564  157154154157
002565  167163072000
002566  015012040040    23010    TEXT    '@'    DATA READ FROM DEVICE 1 IS WRITTEN TO DEVICE 2'
002567  040040040040
002570  040040040040
002571  040040040040
002572  144141164141
002573  040162145141
002574  144040146162
002575  157155040144
002576  145166151143
002577  145040061040
002600  151163040167
002601  162151164164
002602  145156040164
```

MESSAGES TO THE USER

```
002603  157040144145
002604  166151143145
002605  040062000000
002606  015012040040    23020          TEXT    '@^                DATA READ FROM DEVICE 3 IS WRITTEN TO DEVICE 4'
002607  040040040040
002610  040040040040
002611  040040040040
002612  144141164141
002613  040162145141
002614  144040146162
002615  157155040144
002616  145166151143
002617  145040063040
002620  151163040167
002621  162151164164
002622  145156040164
002623  157040144145
002624  166151143145
002625  040064000000
002626  015012040040    23030          TEXT    '@^                DATA READ FROM DEVICE 5 IS WRITTEN TO DEVICE 6.'
002627  040040040040
002630  040040040040
002631  040040040040
002632  144141164141
002633  040162145141
002634  144040146162
002635  157155040144
002636  145166151143
002637  145040065040
002640  151163040167
002641  162151164164
002642  145156040164
002643  157040144145
002644  166151143145
002645  040066056000
002646  015012077077    23040                 TEXT    '@^??'
002647  000000000276    23050    OPTMSL       DATA    *-OPTMS
                        23060    *
002650  000000002651    23070    PROBMP       DATA    PROBM
002651  015012151156    23080    PROBM        TEXT    '@^INCOMPLETE COPY ON DEVICE '
002652  143157155160
002653  154145164145
002654  040143157160
002655  171040157156
002656  040144145166
002657  151143145040
002660  040040040040    23090    PRBDEV       TEXT    '    '
002661  163164141164    23100                 TEXT    'STATUS= '
002662  165163075040
002663  040040040040    23110    PRSTAT       TEXT    '              '
002664  040040040040
002665  040040040040
```

```
                                        MESSAGES TO THE USER

    002666  073040142154    23120            TEXT    '; BLOCK NUMBER  '
    002667  157143153040
    002670  156165155142
    002671  145162040040
    002672  040040040040    23130    PRBLOK  TEXT    '      '
    002673  040040000000
    002674  000000000023    23140    PROBML  DATA    *-PROBM
                            23150    *
    002675  000000002676    23160    UNABLE  DATA    UNABL
    002676  015012165156    23170    UNABL   TEXT    '@^UNABLE TO ALLOCATE DESIRED DEVICE '
    002677  141142154145
    002700  040164157040
    002701  141154154157
    002702  143141164145
    002703  040144145163
    002704  151162145144
    002705  040144145166
    002706  151143145040
    002707  040040040040    23180    UNADEV  TEXT    '    '          BE INFORMATIVE
    002710  000000000012    23190    UNABLL  DATA    *-UNABL
                            23200    *
    002711  000000002712    23210    DEVMSP  DATA    DEVMS           QUERY OF TOTAL NUMBER OF PACKS
    002712  015012012150    23220    DEVMS   TEXT    '@^^HOW MANY ORIGINAL PACKS TO ARE TO BE COPIED?'
    002713  157167040155
    002714  141156171040
    002715  157162151147
    002716  151156141154
    002717  040160141143
    002720  153163040164
    002721  157040141162
    002722  145040164157
    002723  040142145040
    002724  143157160151
    002725  145144077000
    002726  000000000014    23230    DEVMSL  DATA    *-DEVMS
                            23240    *
                            23250    *               CONTINUATION PROMPT
                            23260    *
    002727  000000002730    23270    CONMSP  DATA    CONMS           ASK FOR CONTINUATION DATA
    002730  015012012143    23280    CONMS   TEXT    '@^^CONTINUE..'
    002731  157156164151
    002732  156165145056
    002733  056000000000
    002734  000000000004    23290    CONMSL  DATA    *-CONMS
                            23300    *
                            23310    *               MESSAGE TO WAIT ON MOUNTS
                            23320    *
    002735  000000002736    23330    GOMSP   DATA    GOMS
    002736  015012012166    23340    GOMS    TEXT    =@^^VERIFY PACKS MOUNTED THEN TYPE 'GO'..=
    002737  145162151146
    002740  171040160141
    002741  143153163040
```

MESSAGES TO THE USER

```
002742  155157165156
002743  164145144040
002744  164150145156
002745  040164171160
002746  145040047147
002747  157047056056
002750  000000000012     23350   GOMSL   DATA    *-GOMS
                         23360   *
                         23370   *               LINE BUFFER FOR TTY INPUT
                         23380   *
002751  000000002752     23390   LINE    DATA    LIN
              002752     23400   LIN     BSS     30                  BUFFER-IN
              000174     23410   LLEN    EQU     EIS9**-EIS9*LINE
003010  000000000037     23420   LLENG   DATA    *-LINE
                         23430   *
                         23440   *               INVALIDATION MESSAGE
                         23450   *
003011  000000003012     23460   VALMSP  DATA    VALMS
003012  007007007007     23470   VALMS   OCT     007007007007    FOR WHOM THE BELL TOLLS..
003013  015012166141     23480   TEXT    TEXT    '@^VALIDATION ERROR ON DEVICE '
003014  154151144141
003015  164151157156
003016  040145162162
003017  157162040157
003020  156040144145
003021  166151143145
003022  040000000000
003023  040040040040     23490   VALDEV  TEXT    '    '          PROBLEM CHILD DEVICE NUMBER
003024  000000000012     23500   VALMSL  DATA    *-VALMS
                         23510   *
                         23520   *               GROUP MAPPING QUERY
                         23530   *
003025  000000003026     23540   GRPMSP  DATA    GRPMS
003026  015012151156     23550   GRPMS   TEXT    '@^INPUT THE PACK GROUP MAPPING IN THE FOLLOWING FORM..'
003027  160165164040
003030  164150145040
003031  160141143153
003032  040147162157
003033  165160040155
003034  141160160151
003035  156147040151
003036  156040164150
003037  145040146157
003040  154154157167
003041  151156147040
003042  146157162155
003043  056056000000
003044  015012040040     23560           TEXT    '@^    <READ PACK GROUP ID>,<WRITE PACK GROUP ID>'
003045  040040074162
003046  145141144040
003047  160141143153
003050  040147162157
```

MESSAGES TO THE USER

```
003051  165160040151
003052  144076054074
003053  167162151164
003054  145040160141
003055  143153040147
003056  162157165160
003057  040151144076
003060  015012012012    23570          TEXT    '@^^^FOR EXAMPLE,'
003061  146157162040
003062  145170141155
003063  160154145054
003064  015012012040    23580          TEXT    =@^^    TO COMPRESS FROM PACK GROUP 'T' TO PACK GROUP 'S' TYPE=
003065  040040040164
003066  157040143157
003067  155160162145
003070  163163040146
003071  162157155040
003072  160141143153
003073  040147162157
003074  165160040047
003075  164047040164
003076  157040160141
003077  143153040147
003100  162157165160
003101  040047163047
003102  040164171160
003103  145000000000
003104  015012040040    23590          TEXT    =@^     'T,S'=
003105  040040040040
003106  047164054163
003107  047000000000
003110  000000000062    23600  GRPMSL  DATA    *-GRPMS
                        23610  *
003111  000000003112    23620  SRTMSP  DATA    SRTMS
003112  015012143157    23630  SRTMS   TEXT    '@^COPYING'
003113  160171151156
003114  147000000000
003115  000000000003    23640  SRTMSL  DATA    *-SRTMS
                        23650  *
003116  000000003117    23660  PERMSP  DATA    PERMS
003117  056000000000    23670  PERMS   TEXT    '.'
003120  000000000001    23680  PERMSL  DATA    *-PERMS
                        23690  *
003121  000000003122    23700  CRLFMP  DATA    CRLFM
003122  015012000000    23710  CRLFM   TEXT    '@^'
003123  000000000001    23720  CRLFML  DATA    *-CRLFM
```

```
                                        EIS CONVERSION TABLES AND TALLY CELLS

                              23730             TTLS    EIS CONVERSION TABLES AND TALLY CELLS
                              23740     *
                              23750     *               GREEN LIGHT MESSAGE FROM OPERATOR
                              23760     *
 003124  147157000000         23770     GO      TEXT    'GO'
                              23780     *
                              23790     *               TALLY COUNTERS FOR <TCT> SCANS
                              23800     *
 003125  000000000000         23810     BCOUNT  DEC     0               PRECEDING BLANKS
 003126  000000000000         23820     COPCNT  DEC     0               NUMBER OF ORIGINAL PACKS
 003127  000000000000         23830     NCOUNT  DEC     0               LENGTH OF NUMERIC STRING
 003130  000000000000         23840     TCOUNT  DEC     0               DISTANCE TO TOKEN START
 003131  000000000000         23850     CCOUNT  DEC     0               CHARACTER COUNT FOR STRING LENGTHS
                              23860     *
                              23870     *               EIS CONVERSION TABLES FOR <TCT> SCANS
                              23880     *
                    003132    23890     BLKTBL  NULL                    SCAN TABLE FOR STRIPPING LEADING BLANKS
                              23900             DUP     1,8
 003132  777777777777         23910             DEC     -1              STOP ON ALL BUT BLANKS
 003133  777777777777                       DEC     -1              STOP ON ALL BUT BLANKS
 003134  777777777777                       DEC     -1              STOP ON ALL BUT BLANKS
 003135  777777777777                       DEC     -1              STOP ON ALL BUT BLANKS
 003136  777777777777                       DEC     -1              STOP ON ALL BUT BLANKS
 003137  777777777777                       DEC     -1              STOP ON ALL BUT BLANKS
 003140  777777777777                       DEC     -1              STOP ON ALL BUT BLANKS
 003141  777777777777                       DEC     -1              STOP ON ALL BUT BLANKS
 003142  000777777777         23920             OCT     000777777777    BLANK, NON-BLANKS
                              23930             DUP     1,23
 003143  777777777777         23940             DEC     -1
 003144  777777777777                       DEC     -1
 003145  777777777777                       DEC     -1
 003146  777777777777                       DEC     -1
 003147  777777777777                       DEC     -1
 003150  777777777777                       DEC     -1
 003151  777777777777                       DEC     -1
 003152  777777777777                       DEC     -1
 003153  777777777777                       DEC     -1
 003154  777777777777                       DEC     -1
 003155  777777777777                       DEC     -1
 003156  777777777777                       DEC     -1
 003157  777777777777                       DEC     -1
 003160  777777777777                       DEC     -1
 003161  777777777777                       DEC     -1
 003162  777777777777                       DEC     -1
 003163  777777777777                       DEC     -1
 003164  777777777777                       DEC     -1
 003165  777777777777                       DEC     -1
 003166  777777777777                       DEC     -1
 003167  777777777777                       DEC     -1
 003170  777777777777                       DEC     -1
 003171  777777777777                       DEC     -1
                              23950     *
```

EIS CONVERSION TABLES AND TALLY CELLS

```
                                23960   *               NUMERIC SCAN TABLE
                                23970   *
                        003172  23980   NUMTBL  NULL                    SCAN TABLE TO PROCEDE TO NUMERIC ENDING
                                23990           DUP     1,12
    003172  777777777777      24000           DEC     -1              STOP IF NON-NUMERIC
    003173  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003174  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003175  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003176  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003177  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003200  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003201  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003202  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003203  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003204  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003205  777777777777                      DEC     -1              STOP IF NON-NUMERIC
                                24010           DUP     1,2
    003206  000000000000      24020           DEC     0               NUMBERS IN ASCII
    003207  000000000000                      DEC     0               NUMBERS IN ASCII
    003210  000000 777777      24030           ZERO    ,-1             NUMBERS IN ASCII, UPPER ONLY
                                24040           DUP     1,17
    003211  777777777777      24050           DEC     -1              STOP IF NON-NUMERIC
    003212  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003213  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003214  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003215  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003216  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003217  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003220  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003221  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003222  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003223  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003224  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003225  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003226  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003227  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003230  777777777777                      DEC     -1              STOP IF NON-NUMERIC
    003231  777777777777                      DEC     -1              STOP IF NON-NUMERIC
                                24060   *
                                24070   *               EIS SCAN TABLE FOR TOKEN STARTS
                                24080   *
                        003232  24090   TKNTBL  NULL
                                24100           DUP     1,3
    003232  000000000000      24110           DEC     0               BREEZE THRU NON-TOKEN STARTS
    003233  000000000000                      DEC     0               BREEZE THRU NON-TOKEN STARTS
    003234  000000000000                      DEC     0               BREEZE THRU NON-TOKEN STARTS
    003235  000015000000      24120           OCT     000015000000    STOP ON <CR>
                                24130           DUP     1,7
    003236  000000000000      24140           DEC     0               BREEZE THRU NON-TOKEN STARTS
    003237  000000000000                      DEC     0               BREEZE THRU NON-TOKEN STARTS
    003240  000000000000                      DEC     0               BREEZE THRU NON-TOKEN STARTS
    003241  000000000000                      DEC     0               BREEZE THRU NON-TOKEN STARTS
```

EIS CONVERSION TABLES AND TALLY CELLS

```
003242  000000000000                    DEC     0               BREEZE THRU NON-TOKEN STARTS
003243  000000000000                    DEC     0               BREEZE THRU NON-TOKEN STARTS
003244  000000000000                    DEC     0               BREEZE THRU NON-TOKEN STARTS
003245  054000000000    24150           OCT     054000000000    COMMA, NON-TOKEN
                        24160           DUP     1,2
003246  777777777777    24170           DEC     -1              NUMBER RANGE
003247  777777777777                    DEC     -1              NUMBER RANGE
003250  777777 000000   24180           ZERO    -1,0            NUMBERS, NON-NUMERICS
                        24190           DUP     1,17
003251  000000000000    24200           DEC     0               NON-TOKENS
003252  000000000000                    DEC     0               NON-TOKENS
003253  000000000000                    DEC     0               NON-TOKENS
003254  000000000000                    DEC     0               NON-TOKENS
003255  000000000000                    DEC     0               NON-TOKENS
003256  000000000000                    DEC     0               NON-TOKENS
003257  000000000000                    DEC     0               NON-TOKENS
003260  000000000000                    DEC     0               NON-TOKENS
003261  000000000000                    DEC     0               NON-TOKENS
003262  000000000000                    DEC     0               NON-TOKENS
003263  000000000000                    DEC     0               NON-TOKENS
003264  000000000000                    DEC     0               NON-TOKENS
003265  000000000000                    DEC     0               NON-TOKENS
003266  000000000000                    DEC     0               NON-TOKENS
003267  000000000000                    DEC     0               NON-TOKENS
003270  000000000000                    DEC     0               NON-TOKENS
003271  000000000000                    DEC     0               NON-TOKENS
                        24210   *
                        24220   *               TABLE FOR ASCII TO BCD CONVERSIONS (ALPHANUMERICS ONLY)
                        24230   *
                003272  24240   ASCBCD  NULL
                        24250           DUP     1,8
003272  037037037037    24260           OCT     037037037037
003273  037037037037                    OCT     037037037037
003274  037037037037                    OCT     037037037037
003275  037037037037                    OCT     037037037037
003276  037037037037                    OCT     037037037037
003277  037037037037                    OCT     037037037037
003300  037037037037                    OCT     037037037037
003301  037037037037                    OCT     037037037037
003302  020037037037    24270           OCT     020037037037    BLANK, ETC
                        24280           DUP     1,3
003303  037037037037    24290           OCT     037037037037
003304  037037037037                    OCT     037037037037
003305  037037037037                    OCT     037037037037
003306  000001002003    24300           OCT     000001002003
003307  004005006007    24310           OCT     004005006007
003310  010011037037    24320           OCT     010011037037
003311  037037037037    24330           OCT     037037037037
003312  037021022023    24340           OCT     037021022023
003313  024025026027    24350           OCT     024025026027
003314  030031041042    24360           OCT     030031041042
003315  043044045046    24370           OCT     043044045046
```

EIS CONVERSION TABLES AND TALLY CELLS

```
003316  047050051062    24380            OCT     047050051062
003317  063064065066    24390            OCT     063064065066
003320  067070071037    24400            OCT     067070071037
003321  037037037037    24410            OCT     037037037037
003322  037021022023    24420            OCT     037021022023
003323  024025026027    24430            OCT     024025026027
003324  030031041042    24440            OCT     030031041042
003325  043044045046    24450            OCT     043044045046
003326  047050051062    24460            OCT     047050051062
003327  063064065066    24470            OCT     063064065066
003330  067070071037    24480            OCT     067070071037
003331  037037037037    24490            OCT     037037037037
                        24500    *
                        24510    *               STRING SCANNING TABLE
                        24520    *
                003332  24530    CHRTBL  NULL
                        24540            DUP     1,12
003332  777777777777    24550            DEC     -1
003333  777777777777                     DEC     -1
003334  777777777777                     DEC     -1
003335  777777777777                     DEC     -1
003336  777777777777                     DEC     -1
003337  777777777777                     DEC     -1
003340  777777777777                     DEC     -1
003341  777777777777                     DEC     -1
003342  777777777777                     DEC     -1
003343  777777777777                     DEC     -1
003344  777777777777                     DEC     -1
003345  777777777777                     DEC     -1
003346  000000000000    24560            DEC     0,0
003347  000000000000
003350  000000777777    24570            OCT     777777
003351  777777777777    24580            DEC     -1
003352  777000000000    24590            OCT     777000000000
                        24600            DUP     1,5
003353  000000000000    24610            DEC     0
003354  000000000000                     DEC     0
003355  000000000000                     DEC     0
003356  000000000000                     DEC     0
003357  000000000000                     DEC     0
003360  000000000777    24620            OCT     777
003361  777777777777    24630            DEC     -1
003362  777000000000    24640            OCT     777000000000
                        24650            DUP     1,5
003363  000000000000    24660            DEC     0
003364  000000000000                     DEC     0
003365  000000000000                     DEC     0
003366  000000000000                     DEC     0
003367  000000000000                     DEC     0
003370  000000000777    24670            OCT     777
003371  777777777777    24680            DEC     -1
```

INITIALIZATION

```
                                  24690          TTLS    INITIALIZATION
                          003372  24700  INIT    NULL
    003372  001300 2350 00        24710          LDA     SPTLO           SET SPECIAL INTERRUPT TALLY
    003373  000001 7550 00        24720          STA     FVTAL
                                  24730  *
    003374  000020 4500 00        24740          STZ     SPIC            FLAG READINESS
                                  24750  *
    003375  001203 5500 00        24760          SBAR    MEMSIZ          INITIALIZE FROM INIT ON AS ONE BIG MEMORY BLOCK
    003376  001203 2350 00        24770          LDA     MEMSIZ
    003377  000011 7350 00        24780          ALS     9
    003400  001203 7550 00        24790          STA     MEMSIZ
    003401  003372 1750 03        24800          SBA     INIT,DU
    003402  000022 7710 00        24810          ARL     18              GET AMOUNT IN LOWER
    003403  003372 7550 00        24820          STA     INIT            SAVE FOR POSTERITY (OR POSTERIOR)
    003404  002021 4500 00        24830          STZ     ACTIVE          NO TASKS STARTED YET
    003405  001420 7100 00        24840          TRA     INQUIRY         AND AWAY WE GO...
                          003406  24850      THE END
```

CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

2215	COMMAS	21740	21650						
2730	CONMS	23280	23270	23290					
2734	CONMSL	23290	16910						
2727	CONMSP	23270	16910						
1431	CONTIN	16900	16970						
3126	COPCNT	23820	17220	18270	20410	20440			
360	COPR	9080	8850	8990	9000				
355	COPX	9060	8860	8870	8890	8900	8920	8940	8950
61	CORFR	5140	12330						
2164	CR	21380	21690						
3122	CRLFM	23710	23700	23720					
3123	CRLFML	23720	19790						
3121	CRLFMP	23700	19790						
1453	CYLIND	19980	20000						
1	D DEV	5770	19220	21210	22000				
1	D FRN	5780	18330	18710	19000	20770	22450		
5	D ERRS	5810	19500	19510	22110				
3	D EXEC	5790	16640	20180	20920	22270	22360		
0	D LINK	5760	20480						
4	D MATE	5800	18740	19010	22320	22330			
752	DCNAM	12440	12290						
1215	DEQ	15300	18140	18300	20210	22670			
1223	DEQDUN	15390	15360						
2	DESTIN	20580	17770	21150					
2155	DEVCNT	21310	22440						
12	DEVDR	4210	22490						
6	DEVLNG	5840	21900						
2712	DEVMS	23220	23210	23230					
2726	DEVMSL	23230	17020						
2711	DEVMSP	23210	17020						
2325	DEVNA	22620	22420						
2344	DEVNAM	22780	22040						
1226	DEVQ	15470	18300	20110	20700	21910	22670		
757	DFFRN	12470	12320	12330					
536	DRIB	10620	10560						
546	DRIC	10730	10340	10520	10530				
547	DRIF	10740	10420	10430					
550	DRIG	10760	10320	10620	10630	10640	10670	10680	
513	DRIM	10430	10550						
532	DRIP	10580	10500						
525	DRIR	10520	10610						
545	DRIX	10720	10330	10350	10380	10400	10410	10470	10690
542	DRIXT	10670	10480	10590					
760	DTRAP	12480	12260	12290	12330				
4	EIS9	2070	17220	22000	23410				
4	EMAX	19390	19520						
454740	ENDLOC	20000	19170						
1207	ENQ	15120	16020	16680	18590	20390	21910	22240	
50	ERIC	5070	12070	12190	12270				
0	ERROR	19370	19580						
4000	F AP	310	340	350	370	380			
10000	F EX	290	340						

CROSS REFERENCE TABLE

1000	F RD	330	340	350	380									
2000	F WT	320	340	350										
400000	F CAT	230	360	370	380									
10000	F SCH	300	360	370	380									
400	F LIST	430	490											
200	F SAVE	440	490											
4	FLAGS	1720	12290	18820	19100	20800	22400							
4	FOUR	2160	20290	20970	20980	21090	21100							
1204	FPTR	14540	12870	13160	13700	13970	14100							
0	FRNO	1640	7850	12290	18330	18710	18990	20770	22400	22410	22450			
2	FRN2	1690	7910	18720	19000	20790								
1	FVTAL	4740	15850	16090	24720									
1010	GET	12780	15960	21900	22180	22210								
1020	GETO	12860	13440											
2166	GETDEV	21430	16860	16950										
1045	GETJ	13160	12970											
1056	GETM	13280	12880	12920										
1442	GETNUM	16990	16880											
1023	GETR	12900	12960											
1000	GETREG	12740	12790	13090	13100									
1025	GETS	12930	12890											
775	GETSIZ	12720	12840	12950										
1040	GETX	13060	13240											
3124	GO	23770	17980											
2736	GOMS	23340	23330	23350										
2750	GOMSL	23350	17810											
2735	GOMSP	23330	17810											
2	GOOD	19360	19450	19570										
1651	GOODRD	18650	18560											
3026	GRPMS	23550	23540	23600										
3110	GRPMSL	23600	17240											
3025	GRPMSP	23540	17240											
23	HEADS	19960	20000											
1715	HUH	19150	18520	18950										
2346	INFORM	22810	17000											
3372	INIT	24700	4730	14540	24800	24820								
2271	INIWRI	22310	22150											
640	INPR	11460	11270	11350	11360	11370								
610	INPUT	11260	16840	16930	17040	17250	17830							
1420	INQUIR	16810	24840											
2020	INTRVL	19910	18070	19690										
2143	INVALD	21180	21030	21110										
2070	LASTPT	20590	20760	20870										
2071	LBLREC	20600	20780											
2752	LIN	23400	17080	17150	17210	17290	17360	17430	17560	17700	17760	17870	17930	17970
			21530	21630	21680	21850	21990	22030	22070	23390				
2751	LINE	23390	16840	16930	17040	17250	17830	23410	23420					
777777	LINK	6240	13030	13080	13230	13610								
174	LLEN	23410	17870	21450										
3010	LLENG	23420	16840	16930	17040	17080	17150	17250	17290	17360	17560	17700	17830	
2072	LRECLN	20610	20820											
1227	LTASK	15480	18590	20210	20670	22240								

CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

MACRO CROSS REFERENCE TABLE

7	ARGDEF	6700	12260	12290	12330	22400							
1	COPY	7200	12330										
1	CR	7530	21380										
0	CRLF	7490											
4	DEQ	14740	18140	18300	20210	22670							
6	ENQ	14640	16020	16680	18590	20390	21910	22240					
0	FCATL	9490											
0	FCLOS	9160											
0	FCOPY	8770											
0	FDRIV	10220											
0	FOPEN	7750											
0	FOPES	9880											
0	FREAD	8460											
0	FWRIT	8160											
4	GETD	12650	15960	21900	22180	22210							
5	INPUT	11200	16840	16930	17040	17250	17830						
14	ISSUE	6570	7900	8310	8610	8960	9260	9680	10030	10440	10980	11310	12260	12290
			12330	22400									
0	LF	7570											
1	MNAME	11910	16290										
2	OPEN	6940	12290	22400									
2	OPRINT	11550	19260	19300									
1	PAUSE	6380	6520										
1	POP	6130	13430										
11	PRINT	10860	16820	16910	17020	17240	17810	18060	19320	19790	19820	21240	22630
3	QUEUE	14810	15460	15470	15480								
1	REL	13530	22690										
10	RETURN	6030	13110	14260	14470	14490	18640	18850	19130	20530	21250	21720	
8	SAVE	5910	12780	13300	13680	18480	18910	20090	20660	21440			
0	SPL	15610											
0	SPRINT	11740											
0	TXT	11790											
15	WAIT	6460	7900	8310	8610	8960	9260	9680	10030	10440	10980	11310	12260	12290
			12330	20860	22400								
1	WRITE	7400	12260										

USE CROSS REFERENCE TABLE

0	.....	9340
3410	EIGHT	9320

```
THERE WEREN'T ANY WARNING FLAGS IN THIS ASSEMBLY
  3420  IS THE NEXT AVAILABLE LOCATION
    19  K CORE USED IN THIS ASSEMBLY
```

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**B3**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**B3**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**B3**B
770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770 770

03/18/82 14:56:18 PRINTOUT #770