1

```
$JOB            COMPILE LISP 1.5
$DATE           090161
$EXECUTE        IBSFAP
```

```
* M948-508,FMS,DEBUG,20,40,20000,700             ASSEMBLE LISP 1.5     LISPHERE
*      CARDS ROW
*      FAP                                                              LC000200
```

```
       -0 13565 0 10550  ROW     OPSYN   NULL
                                 PCC
                                 FUL
                         * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * LC003500
                         *
                         *
                         *    THIS IS THE 709 SECTION OF THE UPPER VERSION OF RWTML
                         *        SHARE DIST  NO.  709 AND  741
                         *        IT LOADS  BINARY 704 STYLE CARDS AND OCTAL CORRECTION CARDS
                         *    ON LINE
                         *
                         L       HED
                  77721          ORG     -47                 IO POSITION LOAD AT -42
                         *       709 BINARY-OCTAL BOOTSTRAP LOADER
 77721  0 00025 0 77724          IOCD    LOAD,0,21           COMMAND TO LOAD REMAINDER OF LOADER
 77722  0060 00 0 00001          TCOA    1                   DELAY TILL LOADER IN
 77723  0020 00 0 77724          TRA     LOAD
 77724  0762 00 0 01321   LOAD   RCDA                        INITIATE NEXT CARD
 77725  0540 00 0 77747          RCHA    LOAD5
 77726  0060 00 0 77726          TCOA    *                   DELAY TILL CARD IS IN
 77727  0030 00 0 00174          TEFA    CONTIN
 77730 -0500 00 0 77662          CAL     9L
 77731  0100 00 0 77750          TZE     LOAD8               ZERO IMPLIES OCTAL CARD
 77732 -0734 00 6 00000          PDX     ,6                  SET WORD COUNT
 77733  0630 00 0 77746          STP     LOAD4               SET TO CHECK OR IGNORE SUM
 77734  0621 00 0 77735          STA     LOAD2               SET CARD ORIGIN
 77735 -3 00000 4 00000   LOAD2  TXL     ****,4,0            OUT IF TRANSFER CARD
 77736  0774 00 4 00000          AXT     0,4                 SET I4 TO ZERO
 77737  0560 00 4 77664   LOAD3  LDQ     9R+1,4              PICK UP WORD
 77740 -0600 60 0 77735          STQ*    LOAD2               STORE WORD
 77741  0361 60 0 77735          ACL*    LOAD2               ADD TO CHECK SUM
 77742  1 77777 4 77743          TXI     *+1,4,-1            ADVANCE FOR NEXT WORD
 77743  2 00001 2 77737          TIX     LOAD3,2,1           COUNT WORDS TO BE STORED
 77744  0322 00 0 77663          ERA     9R                  COMPARE CHECK SUMS
 77745  0100 00 0 77724          TZE     LOAD                AGREE-LOAD NEXT CARD
 77746  0000 00 0 77724   LOAD4  HTR     LOAD                ERROR-START TO READ NEXT CARD
 77747  0 00030 0 77662   LOAD5  IOCD    9L,0,24             COMMAND TO BRING IN BINARY IMAGE
 77750  0774 00 5 00016   LOAD8  AXT     14,5                14 TO IR1 AND IR 4
                         *
                                 ABS                         RESUME STANDARD PUNCHING
                         *
 77751  0774 00 2 00002   LOAD9  AXT     2,2                 SET TO COUNT FIELD PAIRS
 77752 -0500 00 4 77704          CAL     9L+18,4             ROW
 77753 -0602 00 1 77700          ORS     9L+14,1             ROW UNION
 77754  0560 00 1 77700          LDQ     9L+14,1
 77755  1 00026 2 77765          TXI     LOD11,2,22          SET TO PEEL OFF SIX BITS
 77756  3 00002 4 77760   LOD10  TXH     *+2,4,2             SKIP STORE TILL AFTER ONE-ROW
 77757  0602 00 0 00000          SLW     ****                STORE OCTAL CORRECTION
 77760  2 00001 2 77755          TIX     *-3,2,1             ADVANCE TO NEXT PAIR, THIS HALF
 77761  2 00002 4 77751          TIX     LOAD9,4,2           ADVANCE TO NEXT ROW
 77762 -2 00015 5 77725          TNX     LOAD+1,5,13         OUT AFTER RIGHT HALF
 77763  0762 00 0 01321          RCDA                        START NEXT CARD
 77764  1 00014 5 77751          TXI     LOAD9,5,12          ADVANCE TO RIGHT HALF CARD
 77765  0760 00 0 00000   LOD11  CLM                         CLEAR AC
 77766  0767 00 0 00002          ALS     2
 77767 -0763 00 0 00001          LGL     1                   PEEL OFF BITS
```

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77770  2 00004 2 77766          TIX     LOD11+1,2,4       COUNT COLUMNS PER FIELD
77771  3 00014 4 77773          TXH     *+2,4,12          USE 7-ROW AS FIRST SUM
77772  0361 00 2 77712          ACL     11L+4,2           ADD PREVIOUS SUM
77773  0602 00 2 77712          SLW     11L+4,2           NEW PARTIAL SUM
77774 -2 00002 2 77756          TNX     LOD10,2,2         OUT IF SECOND FIELD OF PAIR
77775  0621 00 0 77757          STA     LOD10+1           STORE ADDRESS OF CORRECTION
77776  1 00054 2 77765          TXI     LOD11,2,44        RETURN TO PEEL OFF 12 BITS
                        *
77777  0 00133 0 77777                  -1,,-STS          LEAD WORD FOR ATOM VERITAS-NUMQUAM-PERIT
                        *
                  77662          ORG     LOAD-34           COMMON STORAGE
77662             COMMON BSS     0
77662              9L    BSS     24                INPUT BUFFER
                  77663   9R     SYN     9L+1              CARD CHECK SUM
                  77706   11L    SYN     9L+20             TEMPORARY FOR OCTAL
                  77724  LOADER SYN     LOAD
                        *
                        * PROPERTY LISTS FOR THE SPECIAL ATOMS NIL AND VERITAS-NUNQUAM-PERIT THE
                        * ZERO AND THE BINARY TRUTH ATOMS RESPECTIVELY
                        *
                  77640         ORG     COMMON-18
77640  0 00137 0 07335  NILSXX         $PNAME,,-*-1
77641  0 00000 0 00136                 -*-1
77642 -0 00000 0 00135          MZE     -*-1
77643 -053143777777             OCT     453143777777      NIL
77644  0 00000 0 00370  NILLOC         $ZERO
                        *
77645  0 00132 0 10742   STS           $APVAL,,-*-1
77646 -0 00130 0 00131          MZE     -*-1,,-*-2
77647  0 00000 0 00001                 1                 IS A CONSTANT ,,1 FOR APPLY
77650  0 00127 0 07335                 $PNAME,,-*-1
77651  0 00000 0 00126                 -*-1
77652 -0 00000 0 00125          MZE     -*-1
77653  546351642554             BCI     1,*TRUE*
                        *
                                        ************************************************
                                        BOOTSTRAP RECORD FOR 709 LISP

                  00144         ORG     100                BEGIN LISP
                                HEAD    B
                        *
                        * BOTTOM       THE BOOTSTRAP RECORD FOR LISP ON SYSTEM AND TEMPORARY TAP
                        *
00144  0 00364 0 00147  BOTTOM IOCD     BOTTOM+3,,BSRECL-2 I-O COMMAND TO READ IN  BOOTSTRAP REC.
00145  0060 00 0 00001          TCOA    1                  WAIT UNTIL RECORD IS READ IN
00146  0020 00 0 00147          TRA     BOTTOM+3           START F LISP
00147  0774 00 4 00003          AXT     3,4                NUMBER OF WORDS IN LOWER MEMORY
00150  0500 00 4 00003          CLA     3,4                MOVE THEM TO ORIGINAL POSITION
00151  0601 00 4 00147          STO     BOTTOM+3,4
00152  2 00001 4 00150          TIX     *-2,4,1
00153  0774 00 4 00366          AXT     BSRECL,4           LENGTH OF BOOTSTRAP RECORD
00154 -0754 00 0 00000          PXD     ,0,                CLEAR THE AC
00155  0361 00 4 00532          ACL     CHKSUM,4           COMPUTE THE CHECK SUM FOR RECORD
00156  2 00001 4 00155          TIX     *-1,4,1
00157  0322 00 0 00532          ERA     CHKSUM             COMPARE WITH THE CHECKSUM ON TAPE
00160  0100 00 0 00162          TZE     *+2                SKIP IF THEY ARE EQUAL
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```
00161  0420 00 0 00001         HPR     1                 THEY DO NOT, STOP
00162  0500 00 0 00201         CLA     STRA              STR TRAP
00163  0601 00 0 00002         STO     2                 SET STR CELL
00164  0500 00 0 00200         CLA     FLTRA             FLOATING POINT TRAP
00165  0601 00 0 00010         STO     8                 SET TRAP CELL
00166  0500 00 0 00367         CLA     SYSTAP            TAPE SPECIFICATION FOR SYSTEM TAPE
00167  0074 00 4 00276         TSX     $(IOS),4          SET UP I-O COMMANDS
00170  0074 00 4 00202         TSX     LRTAPE,4          READ REST OF SYSTEM TAPE
00171  0 77241 0 00537                 LOWREG,,-LOWREG   REST OF CORE
00172  0522 00 0 00352         XEC     $REW              REWIND SYSTAP
00173  0020 00 0 77724         TRA     $LOAD             GO TO READ ANY CORRECTION CARDS
                       *
00174  0500 00 0 00177  CONTIN CLA     ZERO              LOADER RETURNS HERE, GO TO OVERLORD
00175  0601 00 0 00000         STO     0                 SET ZERO CELL
00176  0020 00 0 10230         TRA     OVRLRD            GO. TO OVERLORD
                       *
                       * NORMAL CONTENTS FOR CELLS 0, 2, 10 (OCTAL) RESPECTIVELY
                       *
00177  0 00140 0 77777   ZERO          -1,,-NILSXX       BEGINNING OF ATOM  NIL
00200  0021 00 0 01707   FLTRA TTR     FLAPTR
00201  0021 00 0 17061  STRA   TTR     C$LINK
                  00200  FLAPCX SYN     FLTRA
                  00201  FLAPCY SYN     STRA
                  00177  FLAPCZ SYN     ZERO
                       *
                       *
                       * LRTAPE       LISP READ TAPE PROGRAM FOR BINARY TAPES
                       *
00202  0500 00 4 00001  LRTAPE CLA     1,4               PARAMETER WORD
00203  0634 00 4 00533         SXA     RTRX,4            SAVE INDEX REGISTERS
00204 -0634 00 2 00533         SXD     RTRX,2
00205  0734 00 2 00000   RTTWO PAX     0,2               START ADDRESS
00206  0622 00 0 00207         STD     *+1               COUNT
00207  1 00000 2 00210         TXI     *+1,2,**          END + 1 ADDRESS
00210  0634 00 2 00534         SXA     RTADR,2           INITIALIZE ADDRESS
00211 -0734 00 2 00000         PDX     0,2               COUNT IN IR 2
00212  0500 00 0 00205         CLA     RTTWO             TAG OF 2
00213  0625 00 0 00534         STT     RTADR             SET TAG
00214 -0634 00 0 00534         SXD     RTADR,0           ZERO DECREMENT
00215  0500 00 0 00362         CLA     $LCH              PICK UP CURRENT LOAD CHANNEL INS.
00216  0601 00 0 00535         STO     RTLCH             MAKE IMMUNE FROM OVER WRITING
00217  0500 00 0 00346         CLA     $(IOU)            GET CURRENT I-O UNIT
00220  0601 00 0 00536         STO     RTIOU             MAKE PREVENT OVERWRITING
00221 -0625 00 0 00357         STL     $TCO              WAIT FOR CHANNEL
00222  0522 00 0 00357         XEC     $TCO              TO GO OUT OF OPERATION
00223  0760 00 0 00005         IOT                       TURN OFF I-O CHECK
00224  0761 00 0 00000         NOP
00225 -0774 00 4 00225         AXC     *,4
00226  0522 00 0 00360         XEC     $TRC              TURN OFF INDICATOR
00227  0522 00 0 00356         XEC     $TEF              TURN OFF INDICATOR
00230  0522 00 0 00350   RTRD  XEC     $RDS              SELECT TAPE
00231 -0754 00 0 00000         PXD     0,0               CLEAR AC
00232 -0774 00 4 00274         AXC     RTIOC,4           POINTER TO I-O COMMAND
00233  0522 00 0 00361         XEC     $RCH              RESET AND LOAD CHANNEL
00234  0522 00 0 00535   RTLC  XEC     RTLCH             LOAD CHANNEL
00235  0560 00 0 00532         LDQ     CHKSUM            PICK UP WORD READ IN
```

```
00236 -0600 60 0 00534          STQ*    RTADR           PUT IT AWAY
00237  0361 60 0 00534          ACL*    RTADR           ADD TO CHECK SUM
00240  2 00001 2 00234          TIX     RTLC,2,1        DO ANOTHER LOAD CHANNEL
00241 -0774 00 4 00275          AXC     RTIOD,4         POINTER TO DISCONNECT INSTRUCTION
00242  0522 00 0 00535          XEC     RTLCH           XEC LCH INS.
00243  0322 00 0 00532          ERA     CHKSUM          SUBSTRACT CHECK SUMS
00244  0602 00 0 00532          SLW     CHKSUM          STORE DIFFERECE
00245  0500 00 0 00536          CLA     RTIOU           PICK UP CURRENT IOU
00246  0074 00 4 00276          TSX     $(IOS),4        SET UP I-O COMMANDS
00247 -0625 00 0 00357          STL     $TCO            WAIT FOR CHANNEL TO GO OUT OF OPERATION
00250  0522 00 0 00357          XEC     $TCO
00251  0760 00 0 00005          IOT                     TEST INDICATOR
00252  0020 00 0 00263          TRA     RCK             TRY AGAIN
00253  0520 00 0 00532          ZET     CHKSUM          SKIP IF CHECK SUMS AGREE
00254  0020 00 0 00263          TRA     RCK             TRY AGAIN
00255 -0774 00 4 00263          AXC     RCK,4
00256  0522 00 0 00360          XEC     $TRC            TEST FOR REDUNDANCY
00257  0522 00 0 00356          XEC     $TEF            AND EOF
00260  0534 00 4 00533          LXA     RTRX,4          RESTORE INDEX REGISTERS
00261 -0534 00 2 00533          LXD     RTRX,2
00262  0020 00 4 00002          TRA     2,4             EXIT
                        *
00263 -0534 00 2 00534   RCK    LXD     RTADR,2         DID NOT WORK, SEE IF FIRST OR SECOND
00264 -3 00000 2 00266          TXL     *+2,2,0
00265  0420 00 0 00002          HPR     2               SECOND TRY FAILED, STOP
00266 -0634 00 4 00534          SXD     RTADR,4         MAKE NON-ZERO
00267  0522 00 0 00355          XEC     $BSR            BACK SPACE AND TRY AGAIN
00270  0534 00 4 00533          LXA     RTRX,4          GET CALL WORD IR
00271  0500 00 4 00001          CLA     1,4             CALL PARAMETER
00272 -0734 00 2 00000          PDX     0,2             COUNT TO IR 2
00273  0020 00 0 00230          TRA     RTRD
                        *
00274 -1 00001 0 00532   RTIOC  IOCT    CHKSUM,,1       BRING IN 1 WORD
00275  0 00000 0 00000   RTIOD  IOCD    0,,0            DISCONNECT CHANNEL
                        *
                        *
                        *       (IOS)   INPUT OUTPUT SUPERVISOR A LA BELL LABS BE SYS 3
                        *
00276  0340 00 0 00346   (IOS)  CAS     IOU             CHECK TO SEE IF SAME UNIT AS LAST TIME
00277  0020 00 0 00301          TRA     *+2             NO
00300  0020 00 4 00001          TRA     1,4             YES EXIT
00301  0634 00 4 00325          SXA     IOSX,4          NO, SAVE LINK 1B
00302  0634 00 2 00324          SXA     IOSY,2          SAVE INDEX 2
00303  0601 00 0 00346          STO     IOU             UPDATE IOU
00304  0621 00 0 00350          STA     $RDS            UPDATE ADDRESSES OF TAPE COMMANDS
00305  0621 00 0 00351          STA     $WRS
00306  0621 00 0 00352          STA     $REW
00307  0621 00 0 00355          STA     $BSR
00310  0621 00 0 00353          STA     $WEF
00311  0120 00 0 00313          TPL     *+2             TAPE IN NORMAL DENSITH (BIN=HI, BCD=LO)
00312  0322 00 0 00347          ERA     IOSBB           CHANGE DENSITY BIT
00313  0621 00 0 00354          STA     $SDN
00314  0522 00 0 00354          XEC     $SDN
00315  0774 00 2 00005          AXT     5,2             NUMBER OF COMMANDS TO BE SET
00316 -0734 00 4 00000          PDX     0,4             CHANNEL NUMBER TO R
00317  1 00014 4 00320          TXI     *+1,4,12        TOTAL NUMBER OF COMMANDS - 3
```

```
00320 -0500 00 4 00346   IOSA  CAL     IOU,4              PICK UP PROPER COMMAND
00321  0602 00 2 00363         SLW     COMAND,2           PUT IN PROPER PLACE
00322 -2 00003 4 00324         TNX     IOSY,4,3           DECREMENT BY NUMBER OF CHANNEL
00323  2 00001 2 00320         TIX     IOSA,2,1           LOOP 5 TIMES
00324  0774 00 2 00000   IOSY  AXT     **,2               RESTORE INDEX 2
00325  0774 00 4 00000   IOSX  AXT     **,4               RESTORE LINK IR
00326  0020 00 4 00001         TRA     1,4
                       *
                       *       TAPE COMMANDS FOLLOW
                       *
00327  0031 00 4 00000         TEFC    0,4
00330 -0030 00 4 00000         TEFB    0,4
00331  0030 00 4 00000         TEFA    0,4
00332  0062 00 0 00000         TCOC    **
00333  0061 00 0 00000         TCOB    **
00334  0060 00 0 00000         TCOA    **
00335  0024 00 4 00000         TRCC    0,4
00336 -0022 00 4 00000         TRCB    0,4
00337  0022 00 4 00000         TRCA    0,4
00340  0541 00 4 00000         RCHC    0,4
00341 -0540 00 4 00000         RCHB    0,4
00342  0540 00 4 00000         RCHA    0,4
00343  0545 00 4 00000         LCHC    0,4
00344 -0544 00 4 00000         LCHB    0,4
00345  0544 00 4 00000         LCHA    0,4
00346  0 00000 0 00000  IOU    PZE                        LAST UNIT USED
00347  0 00000 0 00020   IOSBB PZE     16                 BINARY BIT
                               HEAD    0
                       *
                       *       ACTUAL TAPE COMMANDS USED BY PROGRAMS (SHOULD BE UNHEADED)
                       *
00350  0762 00 0 01220   RDS   RTBA    **
00351  0766 00 0 01220   WRS   WTBA    **
00352  0772 00 0 01200   REW   REWA    **
00353  0770 00 0 01200   WEF   WEFA    **
00354  0761 00 0 00000   SDN   NOP                        MAKE A SDN INSTRUCTION FOR 7090
00355  0764 00 0 01200   BSR   BSRA    **
00356  0030 00 4 00000   TEF   TEFA    0,4
00357  0060 00 0 00000   TCO   TCOA    **
00360  0022 00 4 00000   TRC   TRCA    0,4
00361  0540 00 4 00000   RCH   RCHA    0,4
00362  0544 00 4 00000   LCH   LCHA    0,4
00363                    COMAND BSS     0
00363  0 00000 0 00000  SYSPPT PZE                        ADDRESS,,CHANNEL
00364  0 00001 0 01203  SYSPOT         1*512+2*64+3,,1    INITIAL ASSIGNMENT OF A3
00365  0 00000 0 00000  SYSPIT
00366  0 00000 0 00000  SYSTMP
00367  0 00000 0 00000  SYSTAP
00370                    TAPASG BSS     0
                 00276    (IOS) SYN     B$(IOS)
                 77724    LOAD  SYN     LOADER
                 00346    (IOU) SYN     B$IOU
```

```
                                EJECT
                          *     CONSTANT POOL

00370  0 00000 0 00000   ZERO  PZE
00371 +000000000001      Q1    DEC     1
00372 +000000000002      Q2    DEC     2
00373 +000000000003      Q3    DEC     3
00374 +000000000004      Q4    DEC     4
00375 +000000000005      Q5    DEC     5
00376 +000000000006      Q6    DEC     6
00377 +000000000007      Q7    DEC     7
00400 +000000000010      Q8    DEC     8
00401 +000000000011      Q9    DEC     9
00402 +000000000012      Q10   DEC     10
00403 +000000000014     Q12    DEC     12
00404  0 00000 0 00015   Q13           13
00405  0 00000 0 00016   Q14           14
00406 +000000000021      Q17   DEC     17
00407 +000000000024      Q20   DEC     20
00410 +000000000025      Q21   DEC     21
00411  0 00000 0 00026   Q22           22
00412 +000000000044      Q36   DEC     36
00413 +000000000077      Q63   DEC     63
00414 +000000000100      Q64   DEC     64
00415 +000000000200      Q128  DEC     128
00416 +000000000014      QO14  OCT     14
00417 +000000000017      QO17  OCT     17
00420 +000000000020      QO20  OCT     20
00421 +000000000022      QO22  OCT     22
                 00410   QO25  SYN     Q21
00422 +000000000033      QO33  OCT     33
00423 +000000000040      QO40  OCT     40
00424 +000000000041      QO41  OCT     41
00425 +000000000043      QO43  OCT     43
00426 +000000000050      QO50  OCT     50
00427 +000000000060      QO60  OCT     60
00430 +000000000061      QO61  OCT     61
                 00413   QO77  SYN     $Q63
                 00415   QO200 SYN     Q128
00431 +000000003300     QO33Q2 OCT     3300
00432 +001000000000     QO1Q9  OCT     1000000000
00433 +233000000000     Q233Q9 OCT     233000000000
00434 -377000000000     Q777Q9 OCT     777000000000
00435 +200000000000     QO2Q11 OCT     200000000000
00436  0 00000 1 00000  QT1           ,1
00437  0 00000 2 00000   QT2          ,2
00440  0 00000 4 00000   QT4          ,4
00441  0 00000 5 00000  QT5           0,5
00442  0 00001 0 00000   QD1   PZE     ,,1
00443  0 00002 0 00000   QD2   PZE     ,,2
00444  0 00005 0 00000   QD5   PZE     ,,5
00445  0 00006 0 00000   QD6   PZE     ,,6
00446  0 00007 0 00000   QD7   PZE     ,,7
00447  0 00024 0 00000   QD20  PZE     ,,20
00450  0 00025 0 00000   QD21  PZE     ,,21
00451 -1 00000 0 00000  QP5    STR
```

```
00452  600000000000     OBLANK BCI     1, 00000
00453  006060606060     ZBLANK BCI     1,0
00454 +201400000000      QF1   DEC     1.0
00455 -0 00000 0 00000   SBIT  MZE
00456 +377777777777     MAGMSK OCT     377777777777
00457  0 00000 0 77777   AMASK PZE     -1
00460  0 77777 0 00000   DMASK PZE     ,,-1
00461 -3 00000 0 00000  PMASK  TXL     0,0,0
00462  0 77777 0 77777  ADMASK PZE     -1,,-1
00463  0 00000 7 77777  ATMASK PZE     -1,7
00464 -3 77777 0 00000  PDMASK SVN     ,,-1
00465 -3 77777 7 00000  PDTMSK SVN     0,7,-1
00466 -3 00000 7 77777  PTAMSK SVN     -1,7
00467 +000077000000     CNTMSK OCT     000077000000
00470  0 00000 7 00000  TAGMSK PZE     ,7
00471 -3 77777 7 77777  SEVENS SVN     -1,7,-1
00472  606060606060     BLANKS BCI     1,
00473                   BCONAT BSS     0                BEGINNING OF CONSTANT ATOMS
00473  0 00000 0 07335  PNAMEA PZE     PNAME
00474  0 10742 0 00000  APVALD PZE     ,,APVAL
00475  0 10135 0 00000   BIND  PZE     ,,BIN
                 00475   FIXD  SYN     BIND
00476  0 10120 0 00000  FLOATD         ,,$FLOAT
00477  0 10103 0 00000  FSUBRD PZE     ,,FSUBR
00500  0 10076 0 00000  FNARGD PZE     ,,FUNARG
00501  0 10005 0 00000  LABELD PZE     ,,LABEL
00502  0 07775 0 00000  LAMDAD PZE     ,,LAMBDA
00503  0 07462 0 00000   OCTD         ,,$OCT
00504  0 07335 0 00000  PNAMED PZE     ,,PNAME
00505  0 07250 0 00000  QUOTED PZE     ,,QUOTE
00506  0 06733 0 00000   SUBRD PZE     ,,SUBR
00507  0 07110 0 00000  QSPECD PZE     0,,SPECAL
00510  0 06706 0 00000   QSYMD PZE     0,,SYM
00511  0 07676 0 10211                 ERSETO,,PJ36
00512  0 07666 0 07706                 PJ37,,PJ38       LOGAND LOGXOR
00513  0 07604 0 07614                 -II7,,-II8       MAX MIN
00514  0 06657 0 07355                 PLUS,,TIMES
00515  0 06131 0 06130                 H01,,H02         PROTECT INTEGER OBJECTS
00516  0 06133 0 06132                 H03,,H04
00517  0 06135 0 06134                 H05,,H06
00520  0 06137 0 06136                 H07,,H10
00521  0 00000 0 06127   H00A  PZE     H00
00522  0 00000 0 06141   H12A  PZE     H12
00523  0 00000 0 06221   H72A  PZE     H72
00524  0 06140 0 00000   H11D  PZE     ,,H11
00525  0 06143 0 00000   H14D  PZE     ,,H14
00526  0 06162 0 00000   H33D  PZE     ,,H33
00527  0 06163 0 00000   H34D  PZE     ,,H34
00530  0 06167 0 00000   H40D  PZE     ,,H40
00531  0 06223 0 00000   H74D  PZE     ,,H74
                 00531  ECONAT SYN     H74D             END OF CONSTANT ATOMS
```

```
                                    EJECT
00532                       CHKSUM  BSS     5                   THESE CELLS ARE NOT WRITTEN ON TAPE
                                    HEAD    B                   CELLS FOR LRTAPE
                    00533    RTRX   SYN     CHKSUM+1            PROTECTED STORAGE
                    00534    RTADR  SYN     CHKSUM+2
                    00535    RTLCH  SYN     CHKSUM+3
                    00536    RTIOU  SYN     CHKSUM+4
                    00366    BSRECL EQU     CHKSUM-BOTTOM       LENGTH OF BOOTSTRAP RECORD
                    00537    LOWREG SYN     *                   LOWEST REGISTER ON LISP RECORD
                             *
00537  0500 00 4 00001   LWTAPE CLA     1,4                 PARAMETER WORD
00540  0621 00 0 00631           STA     WTIOC               SET UP I-O COMMANDS
00541  0622 00 0 00631           STD     WTIOC
00542  0622 00 0 00561           STD     WTAD                COUNT
00543  0634 00 4 00574           SXA     WTX,4               SAVE LINK IR
00544  0600 00 0 00630           STZ     WTAG                ZERO TEST CELL
00545  0600 00 0 00627           STZ     WERC
00546 -0625 00 0 00357           STL     $TCO
00547  0522 00 0 00357           XEC     $TCO                WAIT FOR CHANNEL
00550  0760 00 0 00005           IOT                         TURN OFF INDICATORS
00551  0761 00 0 00000           NOP
00552 -0774 00 4 00552           AXC     *,4
00553  0522 00 0 00360           XEC     $TRC
00554  0522 00 0 00356           XEC     $TEF
00555  0522 00 0 00351    WTWS   XEC     $WRS                SELECT TAPE
00556 -0774 00 4 00631           AXC     WTIOC,4             POINTER TO IO COMMAND
00557  0522 00 0 00361           XEC     $RCH                RESET AND LOAD CHANNEL
00560  0534 00 4 00631           LXA     WTIOC,4             ADDRESS OF BEGINNING OF BLOCK
00561  1 00000 4 00562    WTAD   TXI     *+1,4,**            END + 1 OF BLOCK
00562  0634 00 4 00565           SXA     WTACL,4             SET CHECKSUM COMPUTE ADDRESS
00563 -0534 00 4 00631           LXD     WTIOC,4             COUNT OF BLOCK
00564 -0754 00 0 00000           PXD     0,0                 CLAER AC
00565  0361 00 4 00000    WTACL  ACL     **,4                COMPUTE CHECKSUM
00566  2 00001 4 00565           TIX     *-1,4,1             LOOP
00567  0602 00 0 00532           SLW     CHKSUM              STOE IN CHECK SUM CELL
00570 -0774 00 4 00632           AXC     WTIOD,4             CHECMSUM WRITE COMMAND
00571  0522 00 0 00362           XEC     $LCH                LOAD CHANNEL
00572 -0774 00 4 00576           AXC     WRCK,4              TEST FOR WRITE REDUNDANCY
00573  0522 00 0 00360           XEC     $TRC
00574  0774 00 4 00000    WTX    AXT     **,4                RESTORE LINK IR
00575  0020 00 4 00002           TRA     2,4                 EXIT
                             *
00576 -0520 00 0 00630    WRCK   NZT     WTAG
00577  0020 00 0 00615           TRA     WAGN                TRY TO WRITE AGAIN
00600 -0625 00 0 00627           STL     WERC                CELL SAYS THERE WAS BAD TAPE TROUBLE
00601 -0534 00 4 00366           LXD     SYSTMP,4            FORM MESSAGE TO OPERATOR
00602  0754 00 4 00000           PXA     0,4
00603  0400 00 0 00420           ADD     $QO20
00604  0767 00 0 00006           ALS     6
00605  0601 00 0 00620           STO     WERM
00606  0500 00 0 00366           CLA     SYSTMP
00607 -0320 00 0 00417           ANA     $QO17
00610 -0602 00 0 00620           ORS     WERM
00611  0074 00 4 01222           TSX     OUTPUT,4            WRITE CHANGE TAPE MESSAGE
00612 -0 00000 0 00364           MZE     BCDOUT
00613  0 00007 0 00620                   WERM,,7
```

```
00614  0420 00 0 00003         HPR     3
00615  0522 00 0 00355  WAGN   XEC     $BSR
00616 -0625 00 0 00630         STL     WTAG
00617  0020 00 0 00555         TRA     WTWS
                       *
00620  606060606060     WERM   BCI     7,       IS BAD, CHANGE IT AND PUSH START.
00621  603162602221
00622  247360233021
00623  452725603163
00624  602145246047
00625  646230606263
00626  215163336060
                       *
00627  0 00000 0 00000  WERC
00630  0 00000 0 00000   WTAG                           CELL NON-ZERO ON SECOND TRY
00631 -1 00000 0 00000   WTIOC IOCT    **,,**          WRITE OUT BLOCK
00632  0 00001 0 00532   WTIOD IOCD    CHKSUM,,1       WRITE OUT CHECK SUM
                       *
                       * TAPDMP       DUMP CODE ON SYSTMP. USED BY OVERLORD
                       *
00633  0634 00 4 00647  TAPDMP SXA     TPDMX,4         SAVE LINK IR
00634  0074 00 4 06311         TSX     TEREAD,4        CLEAN UP READ BUFFER
00635  0500 00 0 00366         CLA     SYSTMP          SPEC. FOR TEMPORARY TAPE
00636  0074 00 4 00276         TSX     $(IOS),4        SET UP I-O COMMANDS
00637  0074 00 4 00537  TPRTY  TSX     LWTAPE,4        WRITE BOOTSTRAP RECORD
00640  0 00366 0 00144                 BOTTOM,,BSRECL
00641  0074 00 4 00537         TSX     LWTAPE,4        WRITE REST OF CODE
00642  0 77241 0 00537                 LOWREG,,-LOWREG
00643  0522 00 0 00353         XEC     $WEF            WRITE AN EOF MARK
00644  0522 00 0 00352         XEC     $REW            REWIND SYSTMP
00645  0520 00 0 00627         ZET     WERC            SEE IF SSYTMP WAS CHANGEDAFTER FIRST
00646  0020 00 0 00637         TRA     TPRTY           RECORD WAS WRITTE  IF SO REWRITE IT
00647  0774 00 4 00000   TPDMX AXT     **,4            RESTORE LINK IR
00650  0020 00 4 00001         TRA     1,4             EXIT
                       *
                       * OVLT         READS A NEW CORE IMAGE IN FROM SYSTMP, USED BY OVERLORD
                       *
00651 -0754 00 4 00000  OVLTXX PXD     0,4             LINK IR TO AC
00652 -0734 00 2 00000         PDX     0,2             PUT IN IR 2 FOR SAFE KEEPING
00653  0500 00 0 00366         CLA     SYSTMP          TERMPORARY TAPE SPEC.
00654  0074 00 4 00276         TSX     $(IOS),4        SET UP I-O COMMANDS
00655  0074 00 4 00202         TSX     LRTAPE,4        READ IN BOOTSTRAP RECORD
00656  0 00366 0 00144                 BOTTOM,,BSRECL
00657  0074 00 4 00202         TSX     LRTAPE,4        READIN RST OF LISP
00660  0 77241 0 00537                 LOWREG,,-LOWREG
00661  0522 00 0 00352         XEC     $REW            REWIND SYSTMP
00662  0020 00 2 00001         TRA     1,2             EXIT
                       *
                       *
00663  0500 00 4 00002   INPUT CLA     2,4
00664  0634 00 4 00675         SXA     INX4,4          SAVE LINK IR
00665  0601 00 0 00673         STO     CALL
00666  0500 00 0 00365         CLA     SYSPIT          INPUT TAPE SPEC.
00667  0074 00 4 00276         TSX     $(IOS),4        SET UP I-O COMMANDS
00670  0522 00 0 01376         XEC     $SWT1           TEST FOR ON-LINE INPUT
00671  0522 00 0 00350         XEC     $RDS            SELECT INPUT TAPE
```

```
00672  0074 00 4 00702         TSX $RTX,4
00673  0 77777 0 00000   CALL      **,,-1
00674  0020 00 0 00677         TRA *+3
00675  0774 00 4 00000   INX4  AXT     **,4              RESTORE LINK IR
00676  0020 00 4 00005         TRA 5,4
00677  0534 00 4 00675         LXA     INX4,4            RESTORE LINK IR
00700 -0120 00 4 00003         TMI 3,4
00701  0020 00 4 00004         TRA 4,4

                       C       HED
                       *
00702  0634 00 4 00725   RTX   SXA     RTXX,4            SAVE LINK IR
00703  0500 00 4 00001         CLA     1,4               GET PARAMETER WORD
00704  0522 00 0 01376         XEC     $SWT1             TEST FOR ON-LINE INPUT
00705  1 00000 0 00710         TXI     H1,,0             IS FROM TAPE
00706  0762 00 0 01321         RCDA
00707  1 00000 0 00741         TXI     RDBCD,,0
00710  0621 00 0 01177   H1    STA     CMMND             SET ADDRESS OF I-O COMMAND
00711 -0774 00 4 00713         AXC     *+2,4             LOCATION TO INDEX REGISTER
00712  0522 00 0 00356         XEC     $TEF              TURN OFFF EOF INDICATOR
00713 -0500 00 0 00727         CAL     H2                PIC UP SWITCH
00714  0601 00 0 00727   H3    STO     H2                SET TO TXH FIRST TIME THROUGH
00715 -0774 00 4 01177         AXC     CMMND,4           LOCATION OF I-O COMMAND
00716  0522 00 0 00361         XEC     $RCH              RESET AND LOAD CHANNEL
00717 -0625 00 0 00357         STL     $TCO              SET UP TCO COMMAND
00720  0522 00 0 00357         XEC     $TCO              WAIT FOR CHANNEL TO GO OUT OF OPERATION
00721 -0774 00 4 00734         AXC     RTXBE,4           LOACTION OF BAD EXIT
00722  0522 00 0 00356         XEC     $TEF              GO IF EOF FOUND
00723 -0774 00 4 00727         AXC     H2,4              LOCATION TO TRY AGAIN
00724  0522 00 0 00360         XEC     $TRC              GO IF REDUNDANCY CHECK FOUND
00725  0774 00 4 00000   RTXX  AXT     **,4              RESTORE LINK IR
00726  0020 00 4 00003         TRA     3,4               GOOD EXIT
00727  3 00000 0 00734   H2    TXH     RTXBE,,0          IS TXL ON SECOND TRY
00730  0522 00 0 00355         XEC     $BSR              BACKSPACE RECORD
00731  0522 00 0 00350         XEC     $RDS              SELECT TAPE
00732  0502 00 0 00727         CLS     H2                PIC UP SWITCH
00733 -3 00000 0 00714         TXL     H3,,0             GO TRY AGAIN
00734  0534 00 4 00725   RTXBE LXA     RTXX,4            LINK IR
00735  0020 00 4 00002         TRA     2,4
00736  0762 00 0 01321   RCD   RCDA                      RESTART AFTER ERROR
00737 -0534 00 1 00757         LXD B2,1          X
00740 -0534 00 2 00761         LXD B3,2          X
00741  0030 00 0 00742   RDBCD TEFA *+1                   TURN OFF END FILE INDICATOR
00742  0604 00 0 01173         STI B50                   SAVE INDICATORS
00743 -0057 00  000003         RIL 3                     TURN INDICATORS 1,2 OFF
00744  0540 00 0 01174         RCHA LR                   READ IN 9 LEFT + RT INTO L,R
00745  0544 00 0 01175         LCHA BLR                  DELEAY, START 8LEFT + RT INTO 8L,8R
00746  0030 00 4 00002         TEFA 2,4                  GO TO END OF FILE RETURN IF EOF ON
00747  0560 00 0 77671   B1    LDQ L                     X
00750 -0600 00 0 77663         STQ LS                    SET LEFT SUM
00751 -0634 00 1 00757         SXD B2,1                  SAVE INDEX REGISTERS
00752 -0634 00 2 00761         SXD B3,2                  X
00753 -0534 00 1 00770         LXD B4,1                  SET DIGIT ROW COUNT
00754  0560 00 0 77672         LDQ R
00755 -0600 00 0 77664         STQ RS                    SET RIGHT SUMP
00756  0074 00 2 01110         TSX C1,2            ENTER CONVERSION LOOP
```

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TD   00757 -3 00000 0 00762   B2    TXL B5             LEAVE CONVERSION LOOP
     00760  0767 00 0 00001         ALS 1
TD   00761 -3 00000 0 01145   B3    TXL C2             INITIALIZE BCD RECORD
     00762  0544 00 0 01174   B5    LCHA LR                   DELAY UNTIL 8 IN, START READING 7
     00763  0560 00 0 77665         LDQ 8L                    USE 8 ROW AS SUM
     00764 -0600 00 0 77663         STQ LS                    X
     00765  0560 00 0 77666         LDQ 8R                    X
     00766 -0600 00 0 77664         STQ RS                    X
     00767  0074 00 2 01110         TSX C1,2           ENTER CONVERSION LOOP
     00770 -3 00010 0 00773   B4    TXL B6,0,8         LEAVE CONVERSION LOOP
     00771  0767 00 0 00003         ALS 3              ADD 8 TIMES 8 ROW
TD   00772 -3 00000 0 01144         TXL C3             X
     00773 -0500 00 0 77671   B6    CAL L              USE 9 ROW AS SUM
     00774  0602 00 0 77663         SLW LS             X
     00775 -0500 00 0 77672         CAL R              X
     00776  0602 00 0 77664         SLW RS             X
     00777 -3 00002 1 01160   B13   TXL B25,1,2               IS IT ZERO OR ONE ROW  YES'
     01000  0544 00 0 01174   B14   LCHA LR                   DELAY, READ IN N RT AND LEFT
     01001 -0054 00  000001         LFT 1                     IS END OF RECORD INDICATOR ON
     01002  0020 00 0 01040         TRA B9                    YES' END OF RECORD
     01003 -0500 00 0 77671   B8    CAL L                     NO' TEST LEFT ROW FOR
     01004 -0320 00 0 77663         ANA LS             ILLEGAL DOUBLE PUNCH
     01005 -0100 00 0 01163         TNZ B17            X
     01006 -0500 00 0 77671   B10   CAL L              FORM LOGICAL SUM
     01007 -0602 00 0 77663         ORS LS             OF LEFT ROWS
     01010 -0500 00 0 77672         CAL R              TEST FOR ILLEGAL
     01011 -0320 00 0 77664         ANA RS             DOUBLE PUNCH
     01012 -0100 00 0 01163         TNZ B17            X
     01013 -0500 00 0 77672   B11   CAL R              FORM LOGICAL SUM OF
     01014 -0602 00 0 77664         ORS RS             RIGHT RWS
     01015 -2 00001 1 01154         TNX B12,1,1        TEST FOR ZONE ROWS
     01016  0074 00 2 01110         TSX C1,2           ENTER CONVERSION LOOP
TD   01017 -3 00000 0 00777         TXL B13            LEAVE CONVERSION LOOP
TD   01020 -3 00000 0 01144         TXL C3             ADD TO BCD RECORD
     01021 -0500 00 0 77665   B7    CAL 8L             ADD 8 LEFT ROW TO
     01022 -0501 00 0 77663         ORA LS             LEFT LOGICAL SUM
     01023  0602 00 0 77665         SLW LDS            X
     01024  0544 00 0 01174         LCHA LR                   DELAY, START READING X-L,R INTO L,R
     01025 -0320 00 0 77667         ANA LZ                    FORM INDICATOR FOR
     01026  0602 00 0 77663         SLW LS             BOTH DIGIT AND ZERO
     01027 -0500 00 0 77666         CAL 8R             ADD 8 RIGHT ROW TO
     01030 -0501 00 0 77664         ORA RS             RIGHT LOGICAL SUM
     01031  0602 00 0 77666         SLW RDS            X
     01032 -0320 00 0 77670         ANA RZ             FORM INDICATOR FOR
     01033  0602 00 0 77664         SLW RS             BOTH DIGIT AND ZERO
     01034  0074 00 2 01110   B40   TSX C1,2                  ENTER CONVERSION LOOP
TD   01035 -3 00000 0 01000         TXL B14            LEAVE CONVERSION LOOP
     01036  0767 00 0 00004         ALS 4              SHIFT TO ZONE POSITION
TD   01037 -3 00000 0 01144         TXL C3             X
     01040 -0500 00 0 77663   B9    CAL LS             SAVE LEFT ZONE SUM
     01041  0602 00 0 77671         SLW L              X
     01042 -0500 00 0 77665         CAL LDS            FORM INDICATOR FOR
     01043  0760 00 0 00006         COM                ZERO AND X AND / OR Y
     01044 -0320 00 0 77667         ANA LZ             IN LEFT ROWS
     01045  0320 00 0 77663         ANS LS             X
     01046 -0500 00 0 77664         CAL RS             SAVE RIGHT ZONE SUM
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      01047  0602 00 0 77672         SLW R              X
      01050 -0500 00 0 77666         CAL RDS            FORM INDICATOR FOR
      01051  0760 00 0 00006         COM                ZERO AND X AND/OR Y
      01052 -0320 00 0 77670         ANA RZ             IN RIGHT ROWS
      01053  0320 00 0 77664         ANS RS             X
      01054  0074 00 2 01110         TSX C1,2           ENTER CONVERSION LOOP
TD    01055 -3 00000 0 01063         TXL B15            LEAVE CONVERSION LOOP
      01056  0602 00 0 77662         SLW TP             MULTIPLY INDICATOR
      01057  0767 00 0 00002         ALS 2              BITS BY TEN
      01060  0361 00 0 77662         ACL TP             X
      01061  0767 00 0 00001         ALS 1              X
TD    01062 -3 00000 0 01144         TXL C3             X
      01063 -0500 00 0 77665   B15   CAL LDS            FORM INDICATOR FOR
      01064 -0501 00 0 77667         ORA LZ             BLANK COLUMNS IN
      01065 -0501 00 0 77671         ORA L              LEFT HALF OF CARD
      01066  0760 00 0 00006         COM                X
      01067  0602 00 0 77663         SLW LS             X
      01070 -0500 00 0 77666         CAL RDS            FORM INDICATOR FOR
      01071 -0501 00 0 77670         ORA RZ             BLANK COLUMNS IN
      01072 -0501 00 0 77672         ORA R              RIGHT HALF OF CARD
      01073  0760 00 0 00006         COM                X
      01074  0602 00 0 77664         SLW RS             X
      01075  0074 00 2 01110         TSX C1,2           ENTER CONVERSION LOOP
TD    01076 -3 00000 0 01104         TXL B16            LEAVE CONVERSION LOOP
      01077  0602 00 0 77662         SLW TP             MULTIPLY INDICATOR
      01100  0767 00 0 00001         ALS 1              BITS BY 3 AND
      01101  0361 00 0 77662         ACL TP             SHIFT TO ZONE POSITION
      01102  0767 00 0 00004         ALS 4              X
TD    01103 -3 00000 0 01144         TXL C3             X
      01104 -0534 00 1 00757   B16   LXD B2,1           RESTORE INDEX REGISTERS
      01105 -0534 00 2 00761         LXD B3,2           AND RETURN TO MAIN
      01106  0441 00 0 01173         LDI B50                  RESTORE INDICATORS
      01107  0020 00 4 00003         TRA 3,4            PROGRAM
      01110 -0634 00 1 01113   C1    SXD C4,1           SAVE ROW COUNT
      01111 -0500 00 4 00001   C9    CAL 1,4            INITIALIZE ADDRESSES
      01112  0401 00 0 01127         ADM C7             X  ADD 6
      01113 -3 00000 0 01117   C4    TXL C6,,**         TRANSFER IO LEFT ROW
      01114  0401 00 0 01127         ADM C7             RIGHT ROW, ADD 6 MORE
      01115  0560 00 0 77664         LDQ RS             OBTAIN RIGHT SUM AND
TD    01116  1 00000 0 01120         TXI C8              SKIP OVER LEFT SUM
      01117  0560 00 0 77663   C6    LDQ LS             OBTAIN LEFT SUM
      01120  0621 00 0 01145   C8    STA C2             SET BCD RECORD ADDRESS
      01121  0621 00 0 01144         STA C3             X
      01122  3 00001 1 01126         TXH C5,1,1         SKIP TEST IF DIGIT ROW
      01123 -0600 00 0 77662         STQ TP             TEST FOR NO SUM
      01124 -0500 00 0 77662         CAL TP             X
      01125  0100 00 0 01150         TZE C11            X
      01126  0534 00 1 01127   C5    LXA C7,1           SET WORD COUNT
      01127 -0754 00 0 00006  C7     PXD     6,0              CONVERT ROW
      01130 -0763 00 0 00001         LGL 1              X
      01131  0767 00 0 00005         ALS 5              X
      01132 -0763 00 0 00001         LGL 1              X
      01133  0767 00 0 00005         ALS 5              X
      01134 -0763 00 0 00001         LGL 1              X
      01135  0767 00 0 00005         ALS 5              X
      01136 -0763 00 0 00001         LGL 1              X
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      01137  0767 00 0 00005         ALS 5               X
      01140 -0763 00 0 00001         LGL 1               X
      01141  0767 00 0 00005         ALS 5               X
      01142 -0763 00 0 00001         LGL 1               X
      01143  0020 00 2 00002         TRA 2,2             EXIT FROM ROW PROCEDURE
      01144  0361 00 1 00000   C3    ACL 0,1             ADD TO BCD RECORD
      01145  0602 00 1 00000   C2    SLW 0,1             STORE IN BCD RECORD
      01146   2 00001 1 01127        TIX C7,1,1          COUNT WORDS
      01147 -0534 00 1 01113         LXD C4,1            RESTORE ROW COUNT
      01150  0502 00 0 01113   C11   CLS C4              INVERT ROW SWITCH AND
      01151  0601 00 0 01113         STO C4               TEST FOR RIGHT ROW DONE
      01152 -0120 00 2 00001         TMI 1,2             TRANSFER IF RIGHT ROW DONE
TD    01153  1 00000 0 01111   C10   TXI C9              GO CONVERT RIGHT ROW
      01154 -0051 00  000002   B12   IIL 2                     CHANGE INDICATOR BIT 17
      01155 -0056 00  000002         LNT 2                     IS THIS TWELVE ROW
      01156  0020 00 0 01165         TRA B100                  CHANGE
      01157  0020 00 0 01034         TRA B40                   NO
      01160 -3 00001 1 01021   B25   TXL B7,1,1          IT IS XERO ROW OR ONE ROW
      01161  0544 00 0 01176         LCHA ZLR
      01162  0020 00 0 01003         TRA B8
      01163 -0760 00 0 00003   B17   SSM                       SET ERROR SIGN
      01164  1 00001 4 01104         TXI     B16,4,1           RESTORE INDEX REGISTERS AND MAKE BAD X
      01165  0060 00 0 01165   B100  TCOA *
      01166  0074 00 2 01110         TSX C1,2
TD    01167 -3 00000 0 01172         TXL B200
      01170  0767 00 0 00004         ALS 4
TD    01171 -3 00000 0 01144         TXL C3
      01172  0020 00 0 01040   B200  TRA B9
      01173  0 00000 0 00000   B50   PZE                       INDICATOR STORAGE
      01174 -3 00002 0 77671   LR    MTH L,0,2
      01175 -3 00002 0 77665   BLR   MTH 8L,0,2
      01176 -3 00002 0 77667   ZLR   MTH LZ,0,2
      01177 -3 77777 0 00000  CMMND  MTH     **,0,-1
                     77662           ORG     COMMON
      77662                   TP     BSS 1               TEMPORARY
      77663                   LS     BSS 1               LEFT SUM
      77664                   RS     BSS 1               RIGHT SUM
      77665                   LDS    BSS 1               LEFT DIGIT SUM
      77666                   RDS    BSS 1               RIGHT DIGIT SUM
      77667                   LZ     BSS 1               LEFT ZERO ROW
      77670                   RZ     BSS 1               RIGHT ZERO ROW
      77671                   L      BSS 1               LEFT ROW
      77672                   R      BSS 1               RIGHT ROW
                     77665    8L     SYN LDS             8 LEFT ROW
                     77666    8R     SYN RDS             8 RIGHT ROW
                     01200           ORG CMMND+1
                            0        HED
                     00000    BCDIN  EQU 0
                     00702    RTX    SYN     C$RTX
                              HEAD    D
                            *
                            *       SPACEX  PROVIDES A VARITY OF SPACES ON OFF LINE PRINTER
                            *
      01200  0522 00 0 01402  SPACEX XEC     $SWT5               TEST FOR NO OFF-LINE OUTPUT
      01201  0020 00 0 01203         TRA     *+2
      01202  0020 00 4 00002         TRA     2,4                 RETURN
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01203  0634 00 4 01206         SXA     SPX,4               SAVE LINK IR
01204  0500 00 0 00364         CLA     SYSPOT              SET UP TAPES
01205  0074 00 4 00276         TSX     $(IOS),4
01206  0774 00 4 00000   SPX   AXT     **,4                RESTORE LINK IR
01207  0500 00 4 00001         CLA     1,4                 GET PARAMETER
01210  0737 00 4 00000         PAC     0,4                 COMPLEMENT INTO IR 4
01211  0522 00 0 00351         XEC     $WRS
01212  0522 00 0 00361         XEC     $RCH
01213  0534 00 4 01206         LXA     SPX,4
01214  0020 00 4 00002         TRA     2,4                 RETURN
01215  2 00001 0 00453  8SPACE IORP    ZBLANK,,1           DOUBLE SPACE
01216  2 00001 0 00453  6SPACE IORP    ZBLANK,,1           DOUBLE SPACE
01217  2 00001 0 00453  4SPACE IORP    ZBLANK,,1           DOUBLE SPACE
01220  2 00001 0 00453  2SPACE IORP    ZBLANK,,1           DOUBLE SPACE
01221  0 00000 0 00000         IOCD    0,,0                DISCONNECT CHANNEL
                        *
                        * OUTPUT       BCD OUTPUT ROUTINE FOR LISP
                        * SWITCHES...
                        *   3  PRINT ON-LINE
                        *   5  DONT WRITE TAPE FOR OFF-LINE PRINTING
                        *
01222  0634 00 4 01245  OUTPUT SXA     WOTX,4              SAVE LINK IR
01223  0500 00 4 00002         CLA     2,4                 GET PARAMETER WORD
01224  0622 00 0 01367         STD     WOTC                SET COUNT OF I-O COMMAND
01225  0400 00 0 00407         ADD     $Q20                END OF BLOCK
01226  0621 00 0 01234         STA     WOTM                SET MOVE LOOP
01227 -0625 00 0 00357         STL     $TCO                WAIT FOR COMPLETION OF LAST OPERATION
01230  0522 00 0 00357         XEC     $TCO
01231  0500 60 4 00001         CLA*    1,4                 GET TAPE SPECIFICATION
01232  0074 00 4 00276         TSX     $(IOS),4            SET UP I-O COMMANDS
01233  0774 00 4 00024         AXT     20,4                MAXIMIUM THAT MAY BE ON 1 RECORD
01234  0500 00 4 00000   WOTM  CLA     **,4                MOVE INTO BUFFER
01235  0601 00 4 01367         STO     WOTB,4
01236  2 00001 4 01234         TIX     WOTM,4,1
01237  0522 00 0 01402         XEC     $SWT5               TEST FOR NO TAPE OUTPUT
01240  0020 00 0 01242         TRA     *+2                 IS OUTPUT ON TAPE
01241  0020 00 0 01245         TRA     WOTX                TEST FOR ON-LINE OUTPUT
01242  0522 00 0 00351         XEC     $WRS                SELECT TAPE
01243 -0774 00 4 01367         AXC     WOTC,4              POINTER TO I-O COMMAND
01244  0522 00 0 00361         XEC     $RCH                RESET ANF LOAD CHANNEL
01245  0774 00 4 00000   WOTX  AXT     **,4                RESTORE LINK IR
01246  0500 00 4 00001         CLA     1,4                 TEST FOR ON-LINE
01247  0522 00 0 01400         XEC     $SWT3               ON-LINE SENSE SWITCH
01250  0120 00 4 00003         TPL     3,4                 EXIT IF DONE
                        * DM 716A - 48 CARDS - 02-09-59
                        *BCD ON-LINE PRINT ROUTINE FOR 709
                        * MODIFED FOR USE IN LISP 1.5
01251  0634 00 4 01334   WOTON SXA     WOTU,4              PRINT ON LINE
01252  0634 00 2 01335         SXA     WOTV,2              SAVE INDEX REGISTERS
01253  0634 00 1 01336         SXA     WOTW,1
01254  0600 00 0 01340         STZ     WOTT                SET SWITCH
01255  0600 00 0 01341         STZ     WOTS                SET SWITCH TO SKIP FIRST CHARACTER
01256 -0534 00 6 01367         LXD     WOTC,6              COUNT IN  INDEX 4 AND 2
01257  1 01343 4 01260         TXI     *+1,4,WOTB-20       ADD BEGINNING OF BUFFER
01260  0634 00 4 01271         SXA     BC05,4              SET ADDRESS
01261  0766 00 0 01361   BC02  WPDA                  SELECT PRINTER
```

```
01262  0520 00 0 01340         ZET     WOTT              SKIP ON FIRST 72 CHARACTERS
01263  0760 00 0 01371         SPRA    9                 SET UP SECOND HALF OF LINE
01264  0774 00 4 00030         AXT     24,4          CLEAR
01265  0600 00 4 77714         STZ     COMMON+26,4     WORKING
01266  2 00001 4 01265         TIX     *-1,4,1         STORAGE
01267 -0500 00 0 00455   BC03   CAL     BC50          STROBE STARTER
01270  0634 00 2 01274   BC04   SXA     BC01,2        WORKING CELL FOR N
01271  0560 00 2 00000   BC05   LDQ     0,2           PICK UP WORD TO CONVERT
01272  0774 00 2 00006         AXT     6,2           X2 COUNTS 6 CHARACTERS
01273  0602 00 0 77714   BC06   SLW     COMMON+26     STROBE
01274 -0754 00 0 00000   BC07   PXD     **,0
01275 -0763 00 0 00006         LGL     6             LOOK AT
01276 -0520 00 0 01341         NZT     WOTS              SKIP IF NOT FIRST CHARACTER
01277  0500 00 0 00427         CLA     $QO60             GET BCD BLANK FOR LEADNING CHARACTER
01300  0767 00 0 00001         ALS     1               ONE CHARACTER
01301  0734 00 1 00000         PAX     ,1
01302 -0500 00 0 77714         CAL     COMMON+26     STROBE
01303 -2 00140 1 01305         TNX     *+2,1,96      NOT 0
01304 -0602 00 4 77707         ORS     COMMON+21,4   0
01305  3 00136 1 01320         TXH     BC08,1,94     BLANK
01306 -2 00076 1 01311         TNX     *+3,1,62      NOT 11
01307 -0602 00 4 77711         ORS     COMMON+23,4   11
01310 -2 00002 1 01320         TNX     BC08,1,2
01311 -2 00036 1 01314         TNX     *+3,1,30      NOT 12
01312 -0602 00 4 77713         ORS     COMMON+25,4   12
01313 -2 00002 1 01320         TNX     BC08,1,2
01314 -2 00022 1 01317         TNX     *+3,1,18      NOT 8 COMBINATION
01315  1 00002 1 01316         TXI     *+1,1,2
01316 -0602 00 4 77667         ORS     COMMON+5,4    8 COMBINATION
01317 -0602 00 5 77707         ORS     COMMON+21,5   NUMBER
01320  0771 00 0 00001   BC08   ARS     1             MOVE STROBE
01321 -0625 00 0 01341         STL     WOTS              SET SWITCH
01322  2 00001 2 01273         TIX     BC06,2,1      BACK FOR NEXT CHARACTER
01323  0534 00 3 01274         LXA     BC01,3        N
01324 -2 00001 2 01330         TNX     BC15,2,1      OUT IF N WORDS DONE
01325 -0100 00 0 01270         TNZ     BC04          BACK FOR REST OF HALF-CARD
01326 -3 00000 4 01330         TXL     BC15,4,0      RIGHT-HALF DONE
01327  1 77777 4 01267         TXI     BC03,4,-1     BACK FOR RIGHT HALF
01330  0540 00 0 01342   BC15   RCHA    BC49
01331 -0625 00 0 01340         STL     WOTT              SET SWITCH FOR SECOND HALF LINE
01332  3 00001 1 01261         TXH     BC02,1,1      BACK FOR MORE WORDS
01333  0060 00 0 01333         TCOA    *
01334  0774 00 4 00000   WOTU   AXT     **,4              RESTORE INDEX REGISTERS
01335  0774 00 2 00000   WOTV   AXT     **,2
01336  0774 00 1 00000   WOTW   AXT     **,1
01337  0020 00 4 00003         TRA     3,4               EXIT
                        *
01340  0 00000 0 00000   WOTT                           NON-ZERO ON SECOND HALF LINE
01341  0 00000 0 00000   WOTS                           ZERO FOR FIRST CHARACTER
01342  0 00030 0 77664   BC49   IOCD    COMMON+2,,24
                 01274   BC01   SYN     BC07
                 00455   BC50   SYN     $SBIT
                        *
01367                    WOTB   BES     20                OUTPUT BUFFER
01367  2 00000 0 01343   WOTC   IORP    WOTB-20,,**       WRITE RECORD FROM BUFFER
01370  0 00000 0 00000         IOCD    0,,0              DISCONNECT CHANNEL
```

```
                 00364  BCDOUT SYN     SYSPOT
                 00363  PPTOUT SYN     SYSPPT
                        *

01371  0762 00 0 01321  PSHLDB RCDA
01372  0540 00 0 01375         RCHA *+3
01373  0544 00 0 00000         LCHA 0
01374  0021 00 0 00001         TTR 1
01375 -1 00003 0 00000         IOCT 0,,3
                               HEAD    0
                        * $SWTN COMMANDS                  ALL SWT COMMANDS ARE EXECUTED
                        * NOTE....     SWT COMMANDS MAY BE SIMULATED BY MAKING DOWN SWITCHES
                        *      ZET     $ZERO
                        *              AND UP SWITCHES
                        *      NZT     $ZERO
                        *
01376  0760 00 0 00161   SWT1  SWT     1
01377  0760 00 0 00162   SWT2  SWT     2
01400  0760 00 0 00163   SWT3  SWT     3
01401  0760 00 0 00164   SWT4  SWT     4
01402  0760 00 0 00165   SWT5  SWT     5
01403  0760 00 0 00166   SWT6  SWT     6
                        *
                        * SENSE LIGHT AND TEST INSTRUCTIONS TO BE EXECUTED OF DUMMYED
                        *
01404  0760 00 0 00141   SLN1  SLN     1
01405  0760 00 0 00142   SLN2  SLN     2
01406  0760 00 0 00143   SLN3  SLN     3
01407  0760 00 0 00144   SLN4  SLN     4
01410  0760 00 0 00140   SLF   SLF
01411 -0760 00 0 00141   SLT1  SLT     1
01412 -0760 00 0 00142   SLT2  SLT     2
01413 -0760 00 0 00143   SLT3  SLT     3
01414 -0760 00 0 00144   SLT4  SLT     4

                               HEAD    D
                        *     C043 786 R. DALEY  ... GETTM ... READ CLOCK ROUTINE FOR 709 ......
                        *  RECODED AND SQUEEZED BY 0. 4. EDWARDS
01415  0762 00 0 01361   GETTM RPRA
01416  0634 00 1 01510         SXA     EXA,1
01417  0634 00 2 01511         SXA     EXB,2              ..
01420  0634 00 4 01473         SXA     EXC,4              ..
01421  0774 00 2 00041         AXT     33,2              SET UP FOR LOOP
01422  0600 00 2 77723         STZ     COMMON+33,2       ZERO CARD IMAGE AND WORKING STORAGE
01423  2 00001 2 01422         TIX     *-1,2,1           LOOP
01424  0540 00 0 01515         RCHA    SKP27             SET PRINTER TO SKIPPING FIRST 27 WORDS
01425  0760 00 0 01367         SPRA    7                  SENSE TIME CLOCK
01426  0760 00 0 01371         SPRA    9                  SET ECHO ENTRIES
01427 -0140 00 0 01431         TNO     *+2               SKIP IF OVERFLOW LIGHT OFF
01430 -0625 00 0 77667         STL     COMMON+5          OVERFLOW LIGHT ON, MAKE COMMON+4 =/ 0
01431  0544 00 0 01520         LCHA    ONWD               9 RIGHT ECHO
01432  0774 00 4 00011         AXT     9,4                ROW COUNT
01433  0544 00 0 01516         LCHA    SKP3               IOCPN ZERO,,3  IOCT COMMON,,1
01434  0560 00 0 77662   LOAD  LDQ     COMMON
01435  0774 00 2 00002         AXT     2,2                ..
01436 -0754 00 0 00000  CONV   PXD     ,0
```

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01437  0774 00 1 00006         AXT     6,1               ..
01440  0767 00 0 00005         ALS     5                 ..
01441 -0763 00 0 00001         LGL     1                 ..
01442  2 00001 1 01440         TIX     *-2,1,1           ..
01443 -0602 00 2 77665         ORS     COMMON+3,2        ..
01444 -0500 00 2 77667         CAL     COMMON+5,2        ..
01445  0361 00 2 77665         ACL     COMMON+3,2        ..
01446  0602 00 2 77667         SLW     COMMON+5,2        ..
01447  2 00001 2 01436         TIX     CONV,2,1          ..
01450  0544 00 0 01517         LCHA    SKP1             IOCPN ZERO,,1  IOCT COMMON,,1
01451  2 00001 4 01434         TIX     LOAD,4,1          COUNTS ROWS
01452  0544 00 0 01513         LCHA    ZERO             IOCD 0,,0  DISCONNECT PRINTER
01453  0560 00 0 77665         LDQ     COMMON+3          DATE
01454 -0754 00 0 00000         PXD     ,0
01455 -0763 00 0 00006         LGL     6                 ..
01456 -0100 00 0 01460         TNZ     *+2               ..
01457 -0500 00 0 00427         CAL     OCT60            INSERT BLANK
01460 -0763 00 0 00014         LGL     12                ..
01461 -0501 00 0 00430         ORA     OCT61            INSERT / BETWEEN MONTH AND DAY
01462  0767 00 0 00022         ALS     18                ..
01463  0602 00 0 77665         SLW     COMMON+3          ..
01464 -0754 00 0 00000         PXD     ,0
01465 -0763 00 0 00006         LGL     6                 ..
01466 -0100 00 0 01470         TNZ     *+2               ..
01467 -0500 00 0 00427         CAL     OCT60            INSERT BLANK
01470 -0763 00 0 00014         LGL     12                ..
01471 -0501 00 0 00427         ORA     OCT60            PROVIDE BLANK AS LAST CHARACTER
01472 -0501 00 0 77665         ORA     COMMON+3          ..
01473  0774 00 4 00000   EXC   AXT     **,4              RESTORE LINK IR
01474  0602 60 4 00001         SLW*    1,4               STORE DATE IN REGISTER SPECIFIED
01475 -0754 00 0 00000         PXD     ,0
01476  0560 00 0 77666         LDQ     COMMON+4          TIME
01477 -0763 00 0 00006         LGL     6                 ..
01500 -0100 00 0 01502         TNZ     *+2               ..
01501 -0500 00 0 00427         CAL     OCT60            BLANK
01502 -0763 00 0 00036         LGL     30                ..
01503 -0501 00 0 00431         ORA     OCT33            PROVIDE DECIMAL POINT
01504  0602 60 4 00002         SLW*    2,4              STORE TIME
01505  0767 00 0 00010         ALS     8                TURN ON OVER FLOW
01506 -0520 00 0 77667         NZT     COMMON+5         LEAVE ON IF COMMON+5 IS NON ZERO
01507  0140 00 0 01510         TOV     *+1              TURN OFF OVER FLOW LIGHT
01510  0774 00 1 00000   EXA   AXT     0,1               RESTORE IRS
01511  0774 00 2 00000   EXB   AXT     0,2               ..
01512  0020 00 4 00003         TRA     3,4               EXIT........
01513  0 00000 0 00000   ZERO  PZE     0                 ..
01514  0 00000 0 00000         PZE
01515 -1 00033 2 77670   SKP27 IOCTN   COMMON+6,,27
01516 -0 00002 2 01513   SKP3  IOCPN   ZERO,,2           SKIP TWO WORDS
01517 -0 00001 2 01513   SKP1  IOCPN   ZERO,,1           SKIP ONE WORD
01520 -1 00001 0 77662   ONWD  IOCT    COMMON,,1         TRANSMIT ONE WORD TO COMMON
                  00427   OCT60 SYN     $QO60
                  00430   OCT61 SYN     $QO61            BCD /
                  00431   OCT33 SYN     QO33Q2           BCD .0
                        *  TIME  PRINTS THE DATE AND TIME .
01521  0634 00 4 01531   TIME  SXA     TIR,4             SAVE LINK IR
01522  0074 00 4 01415         TSX     GETTM,4           GET TIME FROM ON-LINE CLOCK
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01523  0 00000 0 01535                TR+2              STORE DATE
01524  0 00000 0 01536                TR+2+1            STORE TIME
01525  0074 00 4 01222         TSX    OUTPUT,4          PRINT OUT DATE AND TIME
01526  0 00000 0 00364                BCDOUT            ON BCD OUTPUT TAPE
01527  0 00021 0 01533                TR,,17
01530 -0754 00 0 00000         PXD    0,0
01531  0774 00 4 00000   TIR   AXT    **,4              RESTORE LINK IR
01532  0020 00 4 00001         TRA    1,4               RETURN
01533  006063302560      TR    BCI    1,0 THE
01534  633144256074            BCI    9,TIME (           ) HAS COME, THE WALRUS SAID, TO TALK
01535  606060606060
01536  606060606060
01537  346030216260
01540  234644257360
01541  633025606621
01542  435164626062
01543  213124736063
01544  466063214342
01545  604626604421            BCI    7, OF MANY THINGS .....   -LEWIS CARROLL-
01546  457060633031
01547  452762603333
01550  333333606060
01551  404325663162
01552  602321515146
01553  434340606060
                      0        HED
                 01521   TIME  SYN    D$TIME
                 01415   GETTM SYN    D$GETTM

01554  0420 00 0 00007  PAUSEF HPR 7
01555  0020 00 4 00001         TRA 1,4


                       *
                       * ERROR        PROCESSES ALL LISP ERRORS. NORMALLY GIVES ERROR NUMBERS,
                       *               ERROR LOCATION, LISP PRINT OF AC AND BACK TRACE OFALL
                       *               FUNCTIONS ENTERED ON PUSH DOWN LIST.
                       *
01556  0 00000 0 00000   ERAC                           PLACE TO STORE MACHINE REGISTERS
01557  0 00000 0 00000   ERMQ
01560  0 00000 0 00000   ERIND
01561  0 00000 0 00000   ERX                            INDEX 1,,INDEX 2
01562  3 00000 0 01563   ERROR TXH    *+1,,**           INDEX 4
01563 -0520 00 0 11664         NZT    ERNULL            SEE IF ERROR PROGRAM IS TO BE EXECUTED
01564  0522 00 0 11665         XEC    EREXIT            NORMAL SETTING GOES TO EVALQUOTE
01565 -0600 00 0 01557         STQ    ERMQ              SAVE MACHINE REGISTERS
01566  0604 00 0 01560         STI    ERIND
01567  0634 00 1 01561         SXA    ERX,1
01570 -0634 00 2 01561         SXD    ERX,2
01571  0441 00 0 10340         LDI    SYSIND            PICK UP SYSTEM INDICATORS
01572  0055 00  000010         SIR    ERRORI            SET ERROR HAS OCURRED INDICATOR
01573  0604 00 0 10340         STI    SYSIND            UPDATE SYSTEM INDICATORS CELLS
01574  0601 00 0 01655         STO    ERT               AC TO BE PRINTED
01575  0500 00 4 00001         CLA    1,4
01576  0601 00 0 01661         STO    ERM               PUT IN ERROR MESSAGE
01577 -0535 00 4 01562         LDC    ERROR,4
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01600 -0754 00 4 00000          PXD     0,4
01601  0131 00 0 00000          XCA                     AND CONVERT TO OCTAL
01602  0074 00 4 11021          TSX     OCTALP,4
01603 -0501 00 0 00452          ORA     OBLANK          INSERT LEADING BLANK
01604  0602 00 0 01664          SLW     ERN             PUT IN ERROR MESSAGE
01605  0074 00 4 01222          TSX     OUTPUT,4        WRITE OUT ERROR MESSAGE
01606  0 00000 0 00364                  BCDOUT
01607  0 00011 0 01656                  ERO,,9
01610  0520 00 0 01654          ZET     BACACT          SKIP IF BACK TRACE IS NOT ACTIVE
01611  0020 00 0 01650          TRA     BACER           GO TO SPECIAL ROUTINE
01612 -0625 00 0 01654          STL     BACACT          MAKE BACK TRACE ROUTINE ACTIVE
01613  0500 00 0 01655          CLA     ERT             PICK UP AC ON ENTRANCE
01614  0074 00 4 04604          TSX     $PRINT,4        PRINT IT IN LISP
01615  0054 00  000200          RFT     NOBACT          TEST FOR NO BACK TRACE
01616  0020 00 0 01646          TRA     BACD            GO TO EXIT
01617  0560 00 0 00370          LDQ     $ZERO           ZERO THE ERROR LIST
01620 -0534 00 4 11670          LXD     NUBPDL,4        BEGINNING OF PUSH DOWN LIST
01621  1 77777 4 01622          TXI     *+1,4,-1        PUSH UP BY -1
01622 -0634 00 4 01624          SXD     BEX,4           SET UP ALL DONE TEST INSTRUCTION
01623 -0534 00 4 02317          LXD     $CPPI,4         PICK UP CURRENT PDL COUNTER
01624  3 00000 4 01644   BEX    TXH     BACTD,4,**      GO IF ALL UNSAVED
01625 -0500 00 4 77777          CAL     -1,4            EITHER UNSAVE OR UNWND
01626 -0320 00 0 00461          ANA     $PMASK          DEPENDING ON COMPILED OR
01627  0322 00 0 00451          ERA     $QP5            SYSTEM SUBROUTINE PUT IT THERE
01630  0100 00 0 01633          TZE     *+3             TEST IS FOR STR OP
01631  0074 00 4 02326          TSX     UNSAVE,4        IN LAST WORD OF BLOCK FROM COMPILER
01632  0020 00 0 01634          TRA     *+2
01633  0074 00 4 17330          TSX     C$UNWND,4
01634 -0534 00 4 02317          LXD     $CPPI,4         BEGINNING OF BLOCK JUST UNSAVED
01635  0500 00 4 00000          CLA     0,4             LAST IR 4 WORD
01636  0734 00 4 00000          PAX     0,4             FUNCTION ATOMIC SYMBOL
01637 -0754 00 4 00000          PXD     0,4             PUT IN DECREMENT
01640  0074 00 4 03730          TSX     $CONS,4         ADD TO ERROR LIST
01641  0131 00 0 00000          XCA                     ANSWER TO MQ
01642 -0534 00 4 02317          LXD     $CPPI,4         PUSH DOWN INDICATOR
01643  0020 00 0 01624          TRA     BEX             GO BACK FOR NEXT
01644  0131 00 0 00000   BACTD  XCA                     LIST TO AC
01645  0074 00 4 04604          TSX     $PRINT,4        PRINT THE ERROR LIST
01646  0600 00 0 01654   BACD   STZ     BACACT          DE-ACTIVATE THE BACK TRACE ROUTINE
01647  0522 00 0 11665          XEC     EREXIT          NORMAL SETTING GOES TO EVALQUOTE
                        *
01650  0074 00 4 01222   BACER TSX     OUTPUT,4        WRITE OUT MESSAGE THAT BACK TRACE
01651  0 00000 0 00364                  BCDOUT          CAUSED ANOTHER ERROR
01652  0 00007 0 01667                  BACE,,7
01653  0020 00 0 01646          TRA     BACD            RESET AND RETURN
                 000200  NOBACT BOOL    200             NO BACK TRACE INDICATOR
01654  0 00000 0 00000  BACACT                          NON-ZERO MEANS BACK TRACE ACTIVE
01655  0 00000 0 00000   ERT                            TEMPORARY STORAGE FOR AC
01656  005454546025      ERO   BCI     3,0*** ERROR NUMBER
01657  515146516045
01660  644422255160
01661  0 00000 0 00000   ERM                            ERROR NUMBER IN BCD GOES HERE
01662  603145242567            BCI     2, INDEX 4 =
01663  600460136060
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```
01664  0 00000 0 00000   ERN                              OCATL LOCATION GOES HERE
01665  604623632143             BCI     2, OCTAL. ***
01666  336054545460
01667  005454546021      BACE   BCI     7,0*** ABOVE ERROR TERMINATED BACK-TRACE ***
01670  224665256025
01671  515146516063
01672  255144314521
01673  632524602221
01674  234240635121
01675  232560545454
                         *
                         * FLAPTR AND OCT     GIVE ERROR DIAGNOSTICS FOR FLOATING POINT  TRAP AND
                         *              DIVIDE CHECK INCLUDING LOCATION AND CONTENTS OF AC.
                         *              BOTH MY BE IGNORED BY MAKNG CELL FPTGNR NON-ZERO.
01676  0520 00 0 01706    DCT    ZET     FPTGNR             TEST FOR IGNORE ERROR FLAG
01677  0020 00 4 00001           TRA     1,4                RETURN
01700 -0634 00 4 01562           SXD     $ERROR,4           SAVE IR 4
01701 -0535 00 4 01562           LDC     $ERROR,4           COMPLEMENT LOCATION OF ENTRANCE
01702  0634 00 4 01717           SXA     FLXT,4             SET TRAP ADDRESS
01703 -0634 00 0 01717           SXD     FLXT,0             ZERO THE DECREMENT
01704 -0625 00 0 01765           STL     FPTDV              SET DIVIDE CHECK FLAG
01705  0020 00 0 01722           TRA     FPTA               DO FLOATING POINT TRAP ERROR
                         *
01706  0 00000 0 00000   FPTGNR                            TEST CELL IS NON-ZERO TO IGNORE TRAPS
                         *
01707  0601 00 0 77662   FLAPTR STO     COMMON             SAVE AC
01710  0500 00 0 00000           CLA     0                  GET TRAP LOCATION
01711  0621 00 0 01717           STA     FLXT               SET EXT CELL
01712  0622 00 0 01717           STD     FLXT
01713  0500 00 0 00177           CLA     FLAPCZ             NORMAL CONTENTS OF ZERO
01714  0601 00 0 00000           STO     0
01715  0500 00 0 77662           CLA     COMMON             RESTORE AC
01716  0520 00 0 01706           ZET     FPTGNR             TEST FOR IGNORE TRAP
01717 -3 00000 0 00000   FLXT   TXL     **,,**             IMMEDIATE EXIT INSTRUCTION
01720  0600 00 0 01765           STZ     FPTDV              INDICATE FLAPPING TRAP
01721 -0634 00 4 01562           SXD     $ERROR,4           SAVE LINK IR
01722  0131 00 0 00000   FPTA   XCA                        AC TO MQ
01723  0074 00 4 11021           TSX     OCTALP,4           CONVERT TO OCTAL
01724  0602 00 0 01757           SLW     FPTAC              STORE OCTAL FOR LEFT HALF OF AC
01725  0074 00 4 11021           TSX     OCTALP,4           CONVERT TO OCTAL
01726  0602 00 0 01760           SLW     FPTAD              STORE AWAY IN ERROR MESSAGE
01727  0560 00 0 01717           LDQ     FLXT               GET TRAP CELL CONTENTS
01730 -0773 00 0 00022           RQL     18                 POSITION IN LEFT HALF OF MQ
01731  0074 00 4 11021           TSX     OCTALP,4           CONVERT TO OCTAL
01732 -0501 00 0 00452           ORA     OBLANK             MAKE LAEDING ZERO A BLANK
01733  0602 00 0 01754           SLW     FPTLO              SAVE OCTAL FOR LOCATION OF ERROR
01734 -0774 00 4 01761           AXC     FPTF,4             POINTER TO BEGINNING OF ERROR MESSAGE
01735  0520 00 0 01765           ZET     FPTDV              TEST FOR DIVIDE CHECK ERROR
01736 -0774 00 4 01763           AXC     FPTD,4             DIVIDE CHECK MESSAGE
01737  0500 00 4 00000           CLA     0,4                PICK UP PROPER MESSAGE
01740  0601 00 0 01751           STO     FPTTY              STORE IN MESSAGE
01741  0500 00 4 00001           CLA     1,4
01742  0601 00 0 01752           STO     FPTTY+1
01743  0074 00 4 01222           TSX     OUTPUT,4           WRITE ERROR MESSAGE
01744  0 00000 0 00364                   BCDOUT
01745  0 00010 0 01751                   FPTTY,,8
```

```
01746 -0754 00 0 00000         PXD     0,0                CLAER AC
01747  0074 00 4 01563         TSX     $ERROR+1,4         GO TO ERROR PROGRAM
01750  542760600154            BCI     1,*G  1*           FLOATING POINT TRAP OR DCT
01751  606060606060      FPTTY BCI     3,            AT....
01752  606060606060
01753  216333333333
01754  0 00000 0 00000   FPTLO                            LOCATION OF ERROR
01755  606631633060            BCI     2, WITH AC =
01756  212360136060
01757  0 00000 0 00000   FPTAC                            OCTAL LEFT HALF OF AC
01760  0 00000 0 00000   FPTAD                            OCTAL RIGHT HALF OF AC
01761  002643214760      FPTF  BCI     2,0FLAP TRAP
01762  635121476060
01763  002431653124      FPTD  BCI     2,0DIVIDE CHK
01764  256023304260
                        *
                        * THIS ROUTINE USES $ERROR,$ERRORP11 AND FPTGNR
01765  0 00000 0 00000   FPTDV                            DIVIDE CHECK INDICATOR CELL
                        *
                        *
                        * STRPNT       A DEBUGGING AID WHICH PRINTS THE DECREMENT OF THE AC AS
                        *      A LIST OR DUMPS AC AND IR 4 IN OCTAL WHICH EVER IS APPROPRIATE.
                        *
01766  0520 00 0 02051  STRPNT ZET     STRT               TEST IF ROUNTINE IS ACTIVE.
01767  0020 00 0 02037         TRA     STREX              IT IS THEREFORE EXIT
01770  0634 00 4 02035         SXA     STRX,4             NO, SAVE LINK IR
01771  0601 00 0 02046         STO     STRA               SAVE AC
01772 -0600 00 0 02047         STQ     STRQ               SAVE MQ
01773 -0625 00 0 02051         STL     STRT               SET CELL TO INDAICTE ACTIVE
01774  0560 00 0 00000         LDQ     0                  PICK UP TRAP LOCATION
01775 -0600 00 0 02052         STQ     STRXT              SAVE CONTENTS
01776 -0773 00 0 00022         RQL     18                 ADDRESS PORTION TO LEFT HALF OF MQ
01777  0074 00 4 11021         TSX     OCTALP,4
02000 -0501 00 0 00452         ORA     OBLANK             LEADING BLANK
02001  0602 00 0 02055         SLW     STRM               STORE TRAP ADDRESS IN OCATL
02002  0500 00 0 00177         CLA     FLAPCZ             RESTORE ORIGNAL CONTENTS OF ZERO
02003  0601 00 0 00000         STO     0
02004  0074 00 4 01222         TSX     OUTPUT,4
02005  0 00000 0 00364                 BCDOUT             OUTPUT BCD MESSAGE
02006  0 00005 0 02053                 STRN,,5
02007  0560 00 0 02046   STRO  LDQ     STRA               AC AT TIME OF TRAP
02010  0074 00 4 11021         TSX     OCTALP,4           CONVERT TO OCTAL
02011  0602 00 0 02064         SLW     STRAMA             STORE LEFT HALF IN OCTAL
02012  0074 00 4 11021         TSX     OCTALP,4           CONVERT TO OCTAL
02013  0602 00 0 02065         SLW     STRAMB             RIGHT HALF IN OCTAL
02014  0560 00 0 02035         LDQ     STRX               PICK UP LINK IR
02015 -0773 00 0 00025         RQL     21                 SHIFT TO LEFT OF MQ
02016  0074 00 4 11021         TSX     OCTALP,4           CONVERT TO OCTAL
02017  0771 00 0 00006         ARS     6                  MAKE A HOLE
02020 -0501 00 0 00452         ORA     OBLANK             MAKE LEADING ZERO A BLANK
02021  0602 00 0 02070         SLW     STRMC              PUT IN MESSAGE
02022  0074 00 4 01222         TSX     OUTPUT,4
02023  0 00000 0 00364                 BCDOUT             OUTPUT IN BCD
02024  0 00011 0 02060                 STRMD,,9
02025 -0500 00 0 02046         CAL     STRA               PICK UP AC
02026 -0734 00 4 00000         PDX     0,4
```

```
02027 -0320 00 0 00466         ANA     PTAMSK              MASK OUT ONLY DECREMENT
02030 -0100 00 0 02035         TNZ     STRF                GO IF ANY THING LEFT
02031 -3 00000 4 02035  STRTOP TXL     STRF,4,**           -TFS-1   IF NOT IN LIST STRUCTURE
02032  3 00000 4 02035  STRBTM TXH     STRF,4,**           -BRK  GO TO EXIT IF NOT IN FREE STORAG
02033 -0754 00 4 00000         PXD     0,4                 OTHERWISE
02034  0074 00 4 04604         TSX     $PRINT,4            PRINT AS LISP LIST
02035                   STRF   BSS     0
02035  0774 00 4 00000   STRX  AXT     **,4                DITTO LINK IR
02036  0600 00 0 02051         STZ     STRT                INDICATE ROUTINE IS INACTIVE
02037  0522 00 0 01403   STREX XEC     $SWT6               SHOULD WE GO BACK TO OVERLORD
02040  0020 00 0 02042         TRA     *+2
02041  0020 00 0 10230         TRA     OVRLRD              FIND NEXT OVERLORD DIRECTION CARD
02042 -0754 00 0 00000         PXD     0,0
02043 -0634 00 4 01562         SXD     $ERROR,4
02044  0074 00 4 01563         TSX     $ERROR+1,4
02045  542660600554            BCI     1,*F  5*            STR TRAP ERROR
                        *
                        *
02046  0 00000 0 00000   STRA                               AC STROAGE
02047  0 00000 0 00000   STRQ                               MQ
02050 -3 00000 0 00000   STRD  TXL     **,,**              MASK FOR PREFIX
02051  0 00000 0 00000   STRT                               CELL INDICATES ACTIVE IF NON-ZERO
02052  0 00000 0 00000   STRXT                              STORAGE FOR CONTENTS OF ZERO
02053  006263516063      STRN  BCI     2,0STR TRAP AT
02054  512147602163
02055  0 00000 0 00000   STRM  PZE                          TRAP LOCATION IN OCTAL
02056  604623632143            BCI     2, OCTAL.
02057  336060606060
02060  004623632143      STRMD BCI     4,0OCTAL CONTENTS OF AC
02061  602346456325
02062  456362604626
02063  602123606060
02064  0 00000 0 00000  STRAMA
02065  0 00000 0 00000  STRAMB                              OCTAL CONTENTS OF AC GO HERE
02066  602145246031            BCI     2, AND INDEX 4
02067  452425676004
02070  0 00000 0 00000  STRMC                              OCATL LINK IR CONTENTS GO HERE
                        *
                        * THIS ROUTINE USES $PRINT,OUTPUT,BCDOUT AND OBLANK
                        *
                        *

                                    ERROR1 USER BY APPLY HAS ONE ARGUMENT AND PRINTS IT USING
                                    PRINT

02071 -0634 00 4 01562  ERROR1 SXD $ERROR,4
02072  0074 00 4 01563         TSX $ERROR+1,4
02073  542160600154            BCI     1,*A  1*            APPLIED FUNCTION CALLED ERROR
                        *
                        * SETUP        TAKES  SIZE PARAMETERS AND SETS UP THE DEPENDENT CELLS
                        *              MAINLY IN THE RECLAIMER (GARBAGGE COLLECTOR) AND STRPNT
                        *
                               HEAD    E
                        *
                        *      RESETP  ALTERNATE ENTRANCE TO SETUP TO CHANGE COMPOSITION OF
                        * FREE STRORAGE SLIGHTLY.
```

```
                        *
02074 -0625 00 0 02256  RESETP STL     RST             SET RESETUP SWITCH
02075  0634 00 4 02252         SXA     SUPX,4          SAVE LINK IR
02076  0020 00 0 02147         TRA     RSU             CHANGE GARBAGGE COLLECTOR PARAMETERS
                        *
02077  0634 00 4 02252   SETUP SXA     SUPX,4          SAVE LINK IR
02100  0500 00 0 02303         CLA     $TPG
02101  0601 00 0 02304         STO     $ORG
02102  0400 00 0 02305         ADD     LBINPG
02103  0734 00 4 00000         PAX     0,4
02104  1 77777 4 02105         TXI     *+1,4,-1
02105 -0634 00 4 16526         SXD     C$LBPTP,4       SETUP FOR LAP
02106  0737 00 4 00000         PAC     0,4
02107 -0634 00 4 04016         SXD     BLKETP,4        END OF BLOCK RESERVATION
02110  0400 00 0 00371         ADD     $Q1
02111  0737 00 4 00000         PAC     0,4
02112 -0634 00 4 02317         SXD     $CPPI,4         SET PUSH DOWN CELLS
02113 -0634 00 4 02413         SXD     $CSSI,4
02114 -0634 00 4 11670         SXD     NUBPDL,4        PRIVATE COPY FOR BACKTRACE
02115  0400 00 0 02306         ADD     LPBPDL
02116  0621 00 0 02761         STA     ZPDL            G C ZEROS THE UNUSED PDL
02117  0402 00 0 00407         SUB     $Q20            PROTECTION AGINST COMPILER SAVING
02120  0737 00 4 00000         PAC     0,4             WTH OUT LOOKING
02121 -0634 00 4 02414         SXD     ENDPDL,4        OUT OF PDL TEST
02122  0500 00 0 02274         CLA     $TFS
02123  0402 00 0 02310         SUB     LFREES
02124  0621 00 0 02277         STA     $TBT
02125  0400 00 0 00371         ADD     $Q1
02126  0621 00 0 02276         STA     $BFS
02127  0500 00 0 02307         CLA     LFULWS
02130  0771 00 0 00005         ARS     5
02131  0400 00 0 00371         ADD     $Q1
02132  0601 00 0 02311         STO     $LBT
02133  0500 00 0 02276         CLA     $BFS
02134  0402 00 0 02311         SUB     $LBT
02135  0601 00 0 02300         STO     $BBT
02136  0402 00 0 00371         SUB     $Q1
02137  0601 00 0 02301         STO     $TFW
02140  0500 00 0 02276         CLA     $BFS
02141  0402 00 0 02307         SUB     LFULWS
02142  0601 00 0 02302         STO     $BFW
02143  0402 00 0 02306         SUB     LPBPDL
02144  0402 00 0 02305         SUB     LBINPG
02145  0402 00 0 02303         SUB     $TPG
02146 -0120 00 0 02257         TMI     SETERR          OVER LAPPING STORAGE ERROR
                        *               STRPNT SETUP
02147  0535 00 4 02274   RSU   LAC     $TFS,4
02150  1 77777 4 02151         TXI     *+1,4,-1
02151 -0634 00 4 02031         SXD     STRTOP,4
02152  0535 00 4 02276         LAC     $BFS,4
02153 -0634 00 4 02032         SXD     STRBTM,4
                        *               RECLAIMER SETUP
02154  0534 00 4 02311         LXA     $LBT,4
02155  0634 00 4 02532         SXA     A,4
02156  0534 00 4 02276         LXA     $BFS,4
02157  0634 00 4 02533         SXA     B,4
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02160  0534 00 4 02301         LXA     $TFW,4
02161 -0634 00 4 02645         SXD     C,4
02162 -0634 00 4 02734         SXD     I,4
02163 -0634 00 4 03116         SXD     MONE,4
02164  0534 00 4 02277         LXA     $TBT,4
02165  0634 00 4 02662         SXA     MBTTA,4
02166  0634 00 4 02667         SXA     D,4
02167  0634 00 4 02677         SXA     E,4
02170  0634 00 4 03126         SXA     MLTBT,4
02171  0534 00 4 02274         LXA     $TFS,4
02172  0634 00 4 02713         SXA     F,4
02173  0534 00 4 02276         LXA     $BFS,4
02174  0634 00 4 02746         SXA     SFWLD,4
02175  0534 00 4 02302         LXA     $BFW,4
02176  0634 00 4 02733         SXA     H,4
02177  0535 00 4 02302         LAC     $BFW,4
02200 -0634 00 4 03066         SXD     MRKLST,4
02201 -0634 00 4 03114         SXD     MLBDW,4
02202  0535 00 4 02274         LAC     $TFS,4
02203  1 77777 4 02204         TXI     *+1,4,-1
02204 -0634 00 4 03067         SXD     MRKLST+1,4
02205 -0634 00 4 03111         SXD     MLIST,4
02206  0535 00 4 02276         LAC     $BFS,4
02207 -0634 00 4 02720         SXD     G,4
02210 -0634 00 4 03112         SXD     MLBFA,4
02211 -0535 00 4 02414         LDC     ENDPDL,4
02212  1 00001 4 02213         TXI     *+1,4,1
02213  0634 00 4 03100         SXA     MLEPD,4
02214  0634 00 4 03107         SXA     MLEPE,4
02215  0535 00 4 02300         LAC     $BBT,4
02216 -0634 00 4 03113         SXD     MLBBJ,4
02217  0520 00 0 02256         ZET     RST             SKIP IF INITIAL SETIP
02220  0020 00 0 02252         TRA     SUPX            GO TO EXIT OTERWISE
02221  0535 00 4 02276         LAC     $BFS,4          BOTTOM OF FREE STORAGE
02222  1 77777 4 02223         TXI     *+1,4,-1        SUBSTRACT 1
02223 -0634 00 4 02232         SXD     SUPFS,4         SET DECREMENT
02224  0535 00 4 02275         LAC     $MFS,4          LOWERP
02225 -0754 00 4 00000         PXD     0,4             POINTER TO LWERP IN DECREMENT
02226  0601 00 0 03751         STO     $FREE           SET UP FREE
02227  0400 00 0 00442         ADD     $QD1
02230  0601 00 4 00000         STO     0,4             START MAKING FREE STORAGE
02231  1 00001 4 02232         TXI     *+1,4,1
02232 -3 00000 4 02227  SUPFS  TXL     *-3,4,**        -BFS
02233  0600 00 4 00000         STZ     0,4
02234  0535 00 4 02302         LAC     $BFW,4          BOTTOM FULL WORD SPACR
02235 -0754 00 4 00000         PXD     0,4
02236  0601 00 0 03727         STO     FWORDL          SET UP FULL WORD LIST
02237 -0737 00 4 00000         PDC     0,4             GET IT RUE IN INDEX
02240 -0634 00 4 02243         SXD     SUPFV,4         USE TO CALCULATE LENGTH OF FULL WORD S
02241  0534 00 4 02300         LXA     $BBT,4          TFW + 1
02242  0634 00 4 02245         SXA     SUPFW,4         SET END + 1 ADDRESSS
02243  2 00000 4 02244  SUPFV  TIX     *+1,4,**        LENGHT OF FULL WORD
02244  0402 00 0 00442         SUB     $QD1
02245  0601 00 4 00000  SUPFW  STO     **,4            MAKE LIST
02246  2 00001 4 02244         TIX     *-2,4,1         LOOP
02247  0600 60 0 02245         STZ*    SUPFW           MAKE LAST ENTRY ZERO
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02250  0500 00 0 66430         CLA     $OBLB              BEGINNING OF UNSORTED OBJECT LIST
02251  0074 00 4 02420         TSX     CNSFWL,4
02252  0774 00 4 00000   SUPX  AXT     **,4
02253  0600 00 0 02256         STZ     RST                ZERO RESETUP SWITCH
02254 -0754 00 0 00000         PXD     0,0
02255  0020 00 4 00001         TRA     1,4
02256  0 00000 0 00000   RST                              RESETUP TEST CELL
02257  0074 00 4 01222  SETERR TSX     OUTPUT,4
02260 -0 00000 0 00364         MZE     BCDOUT             PRINT ON-LINE
02261  0 00011 0 02263                 NOSET,,9
02262  0020 00 0 02252         TRA     SUPX               EXIT
02263  004665255143      NOSET BCI     9,0OVERLAPPING PARAMETERS -SETUP- ERROR NUMBER *O  7*
02264  214747314527
02265  604721512144
02266  256325516260
02267  406225636447
02270  406025515146
02271  516045644422
02272  255160544660
02273  600754606060
                       *
                             HEAD    0
                       *
                       *             STORAGE MAP CELLS FOR LISP
                       *
02274  0 00000 0 71651   TFS           UPERML-1           UPPER LIMIT OF FREE STORAGE
02275  0 00000 0 66230   MFS           LOWERP             LOW LIMIT OF PERM. LIST STRUCTURE
02276  0 00000 0 00000   BFS                              BOTTOM OF FREE STORAGE
02277  0 00000 0 00000   TBT                              TOP OF BIT TABLE
02300  0 00000 0 00000   BBT                              BOTTOM OF BIT TABLR
02301  0 00000 0 00000   TFW                              TOP OF FULL WORD SPACE
02302  0 00000 0 00000   BFW                              BOTTOM OF FULL WORD SPACE PROPER
02303  0 00000 0 17462   TPG           TOPROG
02304  0 00000 0 00000   ORG                              ORIGIN OF BINARY PROGRAM IN DECREMENT
02305  0 00000 0 00000  LBINPG                           LENGTH OF BINATY PROGRAM
02306  0 00000 0 00000  LPBPDL                           LENGTH OF PUBLIC PUSH DOWN LIST
02307  0 00000 0 00000  LFULWS                           LENGTH OF FULL WORD SPACE + BIT TABLE
02310  0 00000 0 00000  LFREES                           LENGTH OF FREE STORAGE
02311  0 00000 0 00000   LBT                              LENGTH OF FULL WORD BIT TABLE
                       * SAVE AND UNSAVE                 THE CLOSRD SUBROUTINES THAT CONTROL
                       *             THE PUBLIC PUSH DOWN LIST. THE CALLING SEQUENCES ARE ...
                       *
                       *     TSX     $SAVE,4
                       *     TXL     $ENDN,,END OF BLOCK TO BE SAVED  + 2
                       *     RETURN
                       *             WHERE N IN $ENDN IS THE NUMBER OF ITEMS TO BE SAVED
                       *
                       *     TSX     UNSAVE,4
                       *     RETURN
                       *             THE SAVED ITEMS MUST BE IN A CONTIGOUS BLOCK WITH THE
                       *             THE FIRST ITEM    PZE ATOMIC NAME OF SUBR,,IR 4
                       *             THE SAVE PARAMETER WORD IS ADDED AS THE LAST ITEM ON THE
                       *             BLOCK TO BE SAVED BUT IS NOT UNSAVED.
                       *
02312  0634 00 2 02405   SAVE  SXA     SAVY,2             SAVE INDEX 2 AND 1
02313  0634 00 1 02404         SXA     SAVZ,1
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02314  0601 00 0 02407          STO     SAVT              SAVE THE AC
02315  0500 60 4 00001          CLA*    1,4               AMMOUNT TO SUBTRACT FROM CPPI IN AC
02316  0734 00 1 00000          PAX     0,1               PUT - NUMBER OF ITEMS TO BE SAVED + 1
02317   1 00000 1 02320   CPPI   TXI     *+1,1,**          IN IR 1 AND INCREMENT BE PUSH DOWN CNT
02320 -3 00000 1 02415           TXL     NOPDL,1,**        GO TO NOPDL IF NOT ENOUGH PDL
02321 -0634 00 1 02317           SXD     $CPPI,1           UP DATE PDL COUNTER LOCATION
02322  0500 00 4 00001           CLA     1,4               PARAMETER WORD
02323  0601 00 1 77777           STO     -1,1              PUT ON PUSH DOWN LIST
02324 -0737 00 2 00000           PDC     0,2               LOCATION OF BLOCK TO BE SAVED + 2
02325  0522 00 4 00001           XEC     1,4               JUMP INTO SAVE TABLE
                        *
02326  0634 00 2 02405  UNSAVE  SXA     SAVY,2            SAVE INDEX 2 AND 1
02327  0634 00 1 02404           SXA     SAVZ,1
02330  0601 00 0 02407           STO     SAVT              SAVE THE AC
02331 -0534 00 2 02317           LXD     $CPPI,2           CURRENT PUSH DOWN COUNTER
02332  0500 00 2 77777           CLA     -1,2              LAST SAVE PARAMETER WORD
02333  0621 00 0 02336           STA     SAVJ              SET FETCH AND TXI INSTRUCTIONS
02334  0621 00 0 02342           STA     SAVK
02335 -0634 00 2 02337           SXD     SAVI,2            SET UP TO RESTORE PDL COUNTER
02336  0535 00 1 00000   SAVJ   LAC     **,1              NUMBER TO BE UNSAVED
02337   1 00000 1 02340   SAVI   TXI     *+1,1,**          ADD PUSH DOWN COUNTER
02340 -0634 00 1 02317           SXD     $CPPI,1           UPDATE PDL COUNTER CELL
02341 -0737 00 1 00000           PDC     0,1               LOCATION OF END OF BLOCK + 2
02342   1 00001 4 00000   SAVK   TXI     **,4,1            JUMP TO PUSH DOWN TABLE AND SET IR 4
                        *                                  PROPER EXIT .
                        *
                        *                SAVE AND UNSAVE TABLE TO DO THE ACTUAL MOVING TO AND FROM
                        *                THE PUBLIC PUSHD DOWN LIST.
                        *
02343  0500 00 2 77757   END16 CLA     -17,2
02344  0601 00 1 77757           STO     -17,1
02345  0500 00 2 77760   END15 CLA     -16,2
02346  0601 00 1 77760           STO     -16,1
02347  0500 00 2 77761   END14 CLA     -15,2
02350  0601 00 1 77761           STO     -15,1
02351  0500 00 2 77762   END13 CLA     -14,2
02352  0601 00 1 77762           STO     -14,1
02353  0500 00 2 77763   END12 CLA     -13,2
02354  0601 00 1 77763           STO     -13,1
02355  0500 00 2 77764   END11 CLA     -12,2
02356  0601 00 1 77764           STO     -12,1
02357  0500 00 2 77765   END10 CLA     -11,2
02360  0601 00 1 77765           STO     -11,1
02361  0500 00 2 77766   END9  CLA     -10,2
02362  0601 00 1 77766           STO     -10,1
02363  0500 00 2 77767   END8  CLA     -9,2
02364  0601 00 1 77767           STO     -9,1
02365  0500 00 2 77770   END7  CLA     -8,2
02366  0601 00 1 77770           STO     -8,1
02367  0500 00 2 77771   END6  CLA     -7,2
02370  0601 00 1 77771           STO     -7,1
02371  0500 00 2 77772   END5  CLA     -6,2
02372  0601 00 1 77772           STO     -6,1
02373  0500 00 2 77773   END4  CLA     -5,2
02374  0601 00 1 77773           STO     -5,1
02375  0500 00 2 77774   END3  CLA     -4,2
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02376  0601 00 1 77774         STO     -4,1
02377  0500 00 2 77775   END2  CLA     -3,2
02400  0601 00 1 77775         STO     -3,1
02401  0500 00 2 77776   END1  CLA     -2,2
02402  0601 00 1 77776         STO     -2,1
02403  0500 00 0 02407   END0  CLA     SAVT              RESTORE THE AC
02404  0774 00 1 00000   SAVZ  AXT     **,1              AND INDEX 1 + 2
02405  0774 00 2 00000   SAVY  AXT     **,2
02406  0020 00 4 00002         TRA     2,4               EXIT
                       *
02407  0 00000 0 00000   SAVT                            TEMPORARY STORAGE FOR AC
                       *               TIMING INFORMATION .. SAVE AND UNSAVE 34 + 4N CYCLES
                       *               ON THE 709  (SUBTRACT 5 CYCLES FOR SAVE AND 4 FOR UNSAVE
                       *               ON THE 7090)
                       *

                                   TERPDL
                                   RESETS PUBLIC PUSH DOWN LIST TO ZERO

02410  0500 00 0 02413  TERPDL CLA $CSSI
02411  0622 00 0 02317         STD CPPI
02412  0020 00 4 00001         TRA 1,4
02413  0 00000 0 00000   CSSI
02414 -3 00000 4 02415  ENDPDL TXL     *+1,4,**          OUT OF PDL TEST INSTRUCTION (IS XEC)
02415 -0634 00 4 01562   NOPDL SXD $ERROR,4
02416  0074 00 4 01563         TSX $ERROR+1,4
02417  542760600254            BCI     1,*G  2*          OUT OF PUBLIC PUSH DOWN LIST


                       *
                              HEAD    E

                       *
                       * CNSFWL       USED BY SETUP TO MOVE ALL FULL WORDS ON PERMENENT OBJECTS
                       *               TO THE FULL WORD SPACE.
                       *               ALSO BUCKET SORTS THE PERMENENT OBJECTS.
                       *
02420  0634 00 4 02447  CNSFWL SXA     CNFWX,4           SAVE INDEX REGISTERS
02421  0634 00 2 02450         SXA     CNFWY,2
02422 -0734 00 4 00000         PDX     0,4               POINTER TO OBJECT LIST
02423  0500 00 4 00000   CNMLP CLA     0,4               NEXT WORD ON LIST
02424  0622 00 0 03310         STD     CNXT              POINTER TO NEXT WORD
02425  0734 00 2 00000         PAX     0,2               POINTET TO AN ATOM
02426 -0634 00 2 03313         SXD     CNAT,2            SAVE THE POINTER TO THE ATOM
02427  0500 00 2 00000         CLA     0,2
02430 -0320 00 0 00470         ANA     TAGMSK            TEST FOR NUMBER
02431 -0100 00 0 02452         TNZ     CNNM              MAKE A NUMVER
02432  0500 00 2 00000   CNSLP CLA     0,2               NEXT WORD ON ATOM
02433  0734 00 2 00000         PAX     0,2               CAR OF ATOM, SEARCH FOR FULL WORD
02434  3 06733 2 02436         TXH     *+2,2,$SUBR       SUCH AS $SUBR
02435  3 06732 2 02461         TXH     CMKO,2,$SUBR-1
02436  3 10103 2 02440         TXH     *+2,2,$FSUBR
02437  3 10102 2 02461         TXH     CMKO,2,$FSUBR-1
02440  3 07335 2 02442         TXH     *+2,2,$PNAME
02441  3 07334 2 02476         TXH     CMPNT,2,$PNAME-1
02442 -0734 00 2 00000   CNRS  PDX     0,2               IS NONE OF THE ABOVE SO CDR TO IR 2
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02443  3 00000 2 02432   CNRT  TXH   CNSLP,2,0          GO BACK IF NOT END OF PROPERTY LIST
02444 -0534 00 4 03310  CNNR   LXD   CNXT,4             POINTER TO NEXT OBJECT
02445  3 00000 4 02423          TXH   CNMLP,4,0          GO BACK IF NOT END
02446 -0754 00 0 00000          PXD   0,0                CLAER AC
02447  0774 00 4 00000   CNFWX AXT   **,4               RESTORE INDEX REGISTERS
02450  0774 00 2 00000   CNFWY AXT   **,2
02451  0020 00 4 00001          TRA   1,4                EXIT
                        *
02452  0500 00 2 00000  CNNM   CLA   0,2
02453 -0120 00 0 02444          TMI   CNNR               DONT MOVE NUMBERS WITH MZE PREFIX
02454 -0734 00 4 00000          PDX   0,4
02455  0500 00 4 00000          CLA   0,4
02456  0074 00 4 03710          TSX   $CONSW,4
02457  0622 00 2 00000          STD   0,2
02460  0020 00 0 02444          TRA   CNNR               MAKE UP THE NEW NUMBER
                        *
02461 -0734 00 2 00000   CMKO  PDX   0,2                PUT ONE WORD IN FULL WORD SPACE
02462  0500 00 2 00000          CLA   0,2                GET NEXT WORD ON PROPERTY LIST
02463  0622 00 0 03311          STD   CNX                POINTER TO REST OF OBJECT
02464 -0120 00 0 02474          TMI   CMK                SKIP MOVING TO REST OF OBJECT
02465  0734 00 4 00000          PAX   0,4                SENSED, OTHERWISE GET POINTER TO FULL
02466  0500 00 4 00000          CLA   0,4                WORD AND WORD IT SELF IN AC
02467  0074 00 4 03710          TSX   $CONSW,4           PUT IT IN FULL WORD SPACE
02470  0771 00 0 00022          ARS   18                 MOVE POINTER TO WORD IN FWS TO ADDRESS
02471  0621 00 2 00000          STA   0,2                REPLACE THE ADDRESS
02472 -0534 00 2 03311          LXD   CNX,2              POINTRE TO NEXT WORD ON PROPERTY LIST
02473  0020 00 0 02443          TRA   CNRT               RETURN
                        *
02474  0602 00 2 00000   CMK   SLW   0,2                RESTORE WORD WITH PLUS SIGN
02475  0020 00 0 02442          TRA   CNRS               GO BACK
                        *
02476 -0734 00 2 00000   CMPNT PDX   0,2                PUT PRINT NAME IN FULL WORD SPACE
02477  0500 00 2 00000          CLA   0,2                NEXT WORD ON PROPERTY LIST
02500  0622 00 0 03311          STD   CNX                POINTER TO NEXT WORD ON PROPERTY LIST
02501  0734 00 2 00000          PAX   0,2                POINTET TO PNAME LIST
02502 -0634 00 2 03314          SXD   CNVA,2             SAVE IT
02503  0500 00 2 00000   CMPLP CLA   0,2                FIRST FORD ON PNAME LIST
02504 -0120 00 0 02515          TMI   CMPS               SKIP IF WORD IS FLAGGED
02505  0622 00 0 03312          STD   CNFT               POINTER TO NEXT WORD ON PNAME LIST
02506  0734 00 4 00000          PAX   0,4                POINTER TO FULL WORD
02507  0500 00 4 00000          CLA   0,4                FULL WORD
02510  0074 00 4 03710          TSX   $CONSW,4           PUT IN FULL WORD SPACE
02511  0771 00 0 00022          ARS   18                 POINTER TO WORD
02512  0621 00 2 00000          STA   0,2                RPLACE THE ADDRESS
02513 -0534 00 2 03312          LXD   CNFT,2             POINTER TO NEXT WORD ON PNAME LIST
02514  3 00000 2 02503          TXH   CMPLP,2,0          GO BACK IF NOT END
02515  0500 00 0 03314   CMPS  CLA   CNVA               POINTER TO PNAME LIST
02516  0560 00 0 03313          LDQ   CNAT               ATOM THAT WE ARE WORKING ON
02517  0074 00 4 06417          TSX   BUKSRT,4           PUT ON BUCKET SORTED OBJECT LIST
02520 -0534 00 2 03311          LXD   CNX,2              POINTER TO NEXT WORD ON ATOM
02521  0020 00 0 02443          TRA   CNRT               GO BACK
                        *
                        *
                        *
                        * RECLAIMER    LISP 1.5 STORAGE CONTROL PROGRAM. CODED 1 MARCH 1961
                        *
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02522  0634 00 4 03043  RECLAM SXA     RCX,4              SAVE INDEX REGISTER
02523  0634 00 2 03044         SXA     RCY,2
02524  0634 00 1 03045         SXA     RCZ,1
02525  0604 00 0 03224         STI     RCIND              AND MACHINE REGISTETS
02526  0601 00 0 03306         STO     RCAC
02527 -0600 00 0 03307         STQ     RCMQ
02530  0600 00 0 03225         STZ     RCBE               INITIALIZE BAD EXIT CELL
02531  0560 00 0 03270   RCA   LDQ     RCSGNL             SIGNAL PHASE 1
02532  0774 00 4 00000   A     AXT     **,4               BIT TABLE LENGTH
02533  0600 00 4 00000   B     STZ     **,4               DOTTOM FREE STORAGE
02534  2 00001 4 02533         TIX     *-1,4,1            ZERO THE BIT TABLE
02535 -0534 00 4 02414         LXD     ENDPDL,4           END OF PDL
02536 -0634 00 4 02540         SXD     RCIA,4             SET UP TNX INSTRUCTION
02537 -0534 00 4 02317         LXD     $CPPI,4            CURRENT PUSH DOWN LIST LOC.
02540 -2 00000 4 03103   RCIA  TNX     MLPDE,4,**         AMMOUNT OF PUSH DOWN LIST AVAILABLE
02541 -0634 00 4 03102         SXD     MLPDC,4            SET CELL IN MRKLST
02542  0634 00 4 02760         SXA     ZPDLA,4            LENGTH LEFT BAR FOR ZEROIND PDL
02543 -0774 00 2 66427         AXC     OBLIST,2           POINTER TO OBJECT LICT
02544  0441 00 0 10340         LDI     SYSIND             SYSTEM INDICATORS
02545  0520 00 0 11516         ZET     EVQRTS             SKIP F DURING READ IN THE EVALQUOTE
02546  0056 00  000004        RNT     DEBUGI             SKIP MARKING OBLIST IF IN A DEBUG
02547  0074 00 4 03066         TSX     MRKLST,4           MARK THE LIST
                       *
                       *              TEMLIS MARKER
                       *              TEMLIS IS A LIST IN FREE STORAGE AND FULL WORD SPACE
                       *              OF THE FORM (CONS (CONSW BEG,,END) TEMLIS) AND INDICATES
                       *              PLACES WHERE LIST STRUCTURE MAY BE DURING A GARBAGE
                       *              COLLECTION. USED PRINCIPALLY BY THE COMPILER
                       *
02550  0600 00 0 03273         STZ     TMLM               SET EXIT SWITCH
02551 -0534 00 4 03304         LXD     TEMLIS,4
02552  0500 00 4 00000   TMLJ  CLA     0,4                NEXT WORD ON TEMLIS
02553  0622 00 0 03273         STD     TMLM               SAVE POINTER TO NEXT WORD
02554  0734 00 4 00000         PAX     0,4                POINTER TO FULL WORD
02555  0500 00 4 00000         CLA     0,4                FULL WORD
02556  0734 00 4 00000         PAX     0,4                BEGINNING OF ARRAY
02557 -0634 00 4 02563         SXD     TMLD,4
02560 -0734 00 1 00000         PDX     0,1                END OF ARRAY
02561  1 00001 1 02562         TXI     *+1,1,1            ADD 1
02562  0634 00 1 02565   TMLK  SXA     TMLE,1
02563 -2 00000 1 02577   TMLD  TNX     TMLH,1,**          SUBTRACT BEGINNING , GIVES COUNT IN IR
02564  0634 00 1 03216         SXA     GCPDLC,1           LAST USE IS MARKING PDL, SAVE LENGTH
02565  0441 00 1 00000   TMLE  LDI     **,1               PICK UP WORD
02566  0444 00 0 03274         OFT     TMPTM              SKIP IF NOTAG OR PREFIX
02567  0020 00 0 02576         TRA     TMLG               NOT A LIST, DO NOT MARK
02570 -0046 00 0 00000         PIA                        ITEM TO AC
02571  0621 00 0 02574         STA     TMLF               SAVE ADDRESS
02572 -0734 00 2 00000         PDX     0,2
02573  0074 00 4 03066         TSX     MRKLST,4           MARK THE DECREMENT
02574  0774 00 2 00000   TMLF  AXT     **,2               ADDRESS OF WORD TO IR
02575  0074 00 4 03066         TSX     MRKLST,4           MARK IT
02576  2 00001 1 02565   TMLG  TIX     TMLE,1,1           GET NEXT WORD IN ARRAY
02577 -0534 00 4 03273   TMLH  LXD     TMLM,4             NEXT TEMLIS ITEM
02600  3 00000 4 02552         TXH     TMLJ,4,0           GO IF NOT DONE
02601  0520 00 0 03273         ZET     TMLM               TEST FOR EXIT
02602  0020 00 0 02611         TRA     MPDLF              ALL DONE
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02603 -0535 00 4 02413         LDC     $CSSI,4          BEGINNING OF PDL
02604 -0634 00 4 02563         SXD     TMLD,4           SET UP CELL
02605 -0535 00 1 02317         LDC     $CPPI,1          FIRST FREE CELL ON PDL
02606 -0625 00 0 03273         STL     TMLM             INDICATE LAST USE OF LOOP
02607  0600 00 0 03216         STZ     GCPDLC           PUSH DOWN LENGTH INITIALLY ZERO
02610  0020 00 0 02562         TRA     TMLK             GO MARK PUSH DOWN LIST
02611 -0534 00 4 03305  MPDLF  LXD     ARYLIS,4         START TO MARK ACTIVE ARRAYS
02612 -3 00000 4 02707  MARYB  TXL     RCB,4,0          GO IF NO ARRAYS
02613  0500 00 4 00000         CLA     0,4              NEXT WORD ON ARYLIS
02614  0622 00 0 03226         STD     MARYT            SAVE POINTER TO NEXT WORD
02615  0734 00 4 00000         PAX     0,4              ARYATOM TO AC
02616  0500 00 4 00000  MARYA  CLA     0,4              NEXT WORD ON ATOM
02617  0734 00 4 00000         PAX     0,4
02620 -3 10734 4 02622         TXL     *+2,4,$ARRAY-1   SERCH FOR ARRAY SPECIFICATION
02621 -3 10735 4 02626         TXL     MRKA,4,$ARRAY    GO IF FOUND
02622 -0734 00 4 00000         PDX     0,4              POINTER TO NEXT WORD
02623  3 00000 4 02616         TXH     MARYA,4,0        GO IF NOT END OF ATOM
02624 -0534 00 4 03226  MARYC  LXD     MARYT,4          NEXT WORD ON ARYLIS
02625  0020 00 0 02612         TRA     MARYB
                       *
02626 -0734 00 4 00000  MRKA   PDX     0,4              GET ARRAY SPECIFICATIONS
02627  0500 00 4 00000         CLA     0,4
02630  0734 00 4 00000         PAX     0,4
02631  0500 00 4 00000         CLA     0,4
02632  0734 00 4 00000         PAX     0,4
02633  0500 00 4 00000         CLA     0,4              FIRST SPEC. WORD
02634  0734 00 2 00000         PAX     0,2              END OF ARRAY + 1
02635  0621 00 0 02702         STA     MRKE             END OF ARRAY + 1
02636  0500 00 4 00001         CLA     1,4
02637  0601 00 0 03275         STO     MRKP             SECOND SPEC. WORD  TOTAL L,, LIST L
02640  0734 00 1 00000         PAX     0,1              TOTAL LENGTH
02641 -0634 00 1 02642         SXD     MAA,1            UPDATE TNX INSTRUCTION
02642 -2 00000 2 02624  MAA    TNX     MARYC,2,**       LOCATION OF BEGINNING OF ARRAY
02643  0634 00 2 02644         SXA     MAB,2            PREPARE TO COMPLEMENT
02644 -0774 00 2 00000  MAB    AXC     **,2
02645  1 00000 2 02646  C      TXI     *+1,2,**         TOP FULL WORD
02646  0754 00 2 00000         PXA     0,2              CALCULATE BIT TABLE WORD AND BIT
02647 -0765 00 0 00005         LGR     5                BIT NUMBER IN TO MQ
02650  0734 00 2 00000         PAX     0,2              WORD NUMBER IN IR 2
02651 -0754 00 0 00000         PXD     0,0              ZERO AC
02652 -0763 00 0 00005         LGL     5                BIT NUMBER
02653  0734 00 4 00000         PAX     0,4
02654  3 00036 4 02665         TXH     MBTT,4,30        GO TO MARK BY 32
02655 -0754 00 0 00000         PXD     0,0              ZERO AC
02656 -0501 00 4 03266  MAC    ORA     BIT,4
02657 -2 00001 1 02662         TNX     MBTTA,1,1        DECREMENT COUNT
02660  2 00001 4 02656         TIX     MAC,4,1          RUN BIT COUNT DOWN
02661 -0501 00 0 03266         ORA     BIT              PUT IN ZERO BIT
02662 -0602 00 2 00000  MBTTA  ORS     **,2             TOP BIT TABLE, SET BITS
02663 -2 00001 1 02700         TNX     MRKF,1,1         GO IF DONE
02664  1 77777 2 02665         TXI     *+1,2,-1         DECREMENT BIT WORD BY ONE
02665 -0500 00 0 00471  MBTT   CAL     MONS             ALL ONES TO AC
02666 -2 00040 1 02671  MAE    TNX     MAD,1,32         DECREMENT COUNT BY 32
02667 -0602 00 2 00000  D      ORS     **,2             TOP BIT TABLE, SET ALL BITS
02670  1 77777 2 02666         TXI     MAE,2,-1         DECREMENT BIT TABLE WORD COUNT
02671  0754 00 1 00000  MAD    PXA     0,1              PREPARE TO MARK LAST BITS
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02672  0737 00 1 00000         PAC     0,1             COMPLMENT COUNT
02673 -0754 00 0 00000         PXD     0,0             ZERO AC
02674 -0501 00 1 03226   MAF   ORA     MBITF,1         SET PROPER BIT
02675  1 00001 1 02676         TXI     *+1,1,1         INCREMENT COUNT BY ONE
02676  3 00000 1 02674         TXH     MAF,1,0         GO UNTIL COUNT REACHES ZERO
02677 -0602 00 2 00000   E     ORS     **,2            TOP BIT TABLE, SET BITS
02700 -0534 00 1 03275   MRKF  LXD     MRKP,1          GET LIST LENGTH IF ANY
02701 -3 00000 1 02624         TXL     MARYC,1,0       EXIT IF A NON-LIST ARRAY
02702  0500 00 1 00000   MRKE  CLA     **,1            LIST ITEM
02703 -0734 00 2 00000         PDX     0,2
02704  0074 00 4 03066         TSX     MRKLST,4        MARK IT
02705  2 00001 1 02702         TIX     MRKE,1,1        GET NEXT ITEM
02706  0020 00 0 02624         TRA     MARYC           EXIT
                        *
                        *               ALL MARKING DONE. NOW SWEEP FREE STORAGE.
                        *
02707  0774 00 2 00000   RCB   AXT     0,2             ZERO COUNT IR
02710  0600 00 0 03212         STZ     FSC             INITIALIZE COUNTER
02711  0560 00 0 03271         LDQ     RCSGNM          SWEEPING SIGNAL TO MQ
02712 -0774 00 1 03751         AXC     $FREE,1         INITIALIZE LAST LOC IR
02713 -0774 00 4 00000   F     AXC     **,4            TOP FREE STORAGE
02714  0502 00 4 00000   SFSL  CLS     0,4             PICK UP WORD
02715 -0120 00 0 02724         TMI     SFSC            COLLECT IF SIGN NOW MINUS
02716  0601 00 4 00000         STO     0,4             RESTORE WORD WITH + SIGN
02717  1 00001 4 02720   SFSA  TXI     *+1,4,1         INCREMENT BY ONE
02720 -3 00000 4 02714   G     TXL     SFSL,4,**       LOOP IF LESS THAN BOTTOM FREE STORAGE
02721  0600 00 1 00000         STZ     0,1             ZERO LAST WORD COLLECTED
02722  0634 00 2 03212         SXA     FSC,2           SAVE COUNT
02723  0020 00 0 02730         TRA     SWPFWS
02724 -0754 00 4 00000   SFSC  PXD     0,4             THIS LOCATION
02725  0601 00 1 00000         STO     0,1             STORE POINTER IN LAST WORD COLLECTED
02726 -0734 00 1 00000         PDX     0,1             UP DATE LAST WORD IR
02727  1 00001 2 02717         TXI     SFSA,2,1        UPDATE COUNTER
                        *
                        *               NOW SWEEP FULL WORD SPACE WITH THE BIT TABLE
                        *
02730  0774 00 4 03727  SWPFWS AXT     FWORDL,4        BEGINNING OF FULL WORD LIST
02731  0634 00 4 03057         SXA     SFWA,4          INITIALIZE ADDRESS
02732  0600 00 0 03210         STZ     FWC             ZERO FULL WORD COUNTER
02733 -0774 00 1 00000   H     AXC     **,1            BOTTOM FULL WORD SPACE
02734  1 00000 1 02735   I     TXI     *+1,1,**        TOP FULL WORD SPACE
02735  0754 00 1 00000         PXA     0,1             GET ADDRESS OF BIT TABLE CORRESPONDING
02736 -0765 00 0 00005         LGR     5               TO THE BOTTOM OF FULL WORD SPACE
02737  0734 00 4 00000         PAX     0,4             BIT TABLE WORD
02740  1 00001 4 02741         TXI     *+1,4,1         MAKE INDEXING EASY
02741 -0754 00 0 00000         PXD     0,0             ZERO AC
02742 -0763 00 0 00005         LGL     5               BIT NUMBER
02743  0734 00 2 00000         PAX     0,2             INTO IR 2
02744  1 00001 2 02745         TXI     *+1,2,1         MAKE INDEXING EASY
02745  0535 00 1 02733         LAC     H,1             SET UP IR 1
02746  0441 00 4 00000   SFWLD LDI     **,4            BOTTOM FREE STORAGE, (TBT + 1)
02747  0446 00 0 00471         ONT     MONES           SKIP IF ALL WORDS TO BE SAVED
02750  0020 00 0 03047         TRA     SFWSC           SEARCH FOR THE WORDS TO BE COLLECTED
02751  1 77740 1 02752         TXI     *+1,1,-32       DECREMENT CURRENT LOC IR
02752  2 00001 4 02746   SFWB  TIX     SFWLD,4,1       INDEX THROUGH BIT TABLE
02753  0500 00 0 03210   SFWDN CLA     FWC             ALL DONE, GET FULL WORD COUNTER
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02754  0601 60 0 03057         STO*    SFWA            SET UP LAST CELL COLLECTED
02755  0560 00 0 03272         LDQ     RCSGNN          PASE 3 SIGNAL
02756  0520 00 0 03220         ZET     RCT             TEST FOR OUT OF ARRAY SPACE ENTRANCE
02757  0074 00 4 03165         TSX     RELOC,4         RELOCATE AND COMPACT FULL WORD SPACE
02760  0774 00 4 00000  ZPDLA   AXT     **,4            ZERO UNUSED PDL
02761  0600 00 4 00000  ZPDL    STZ     **,4            ZERO PDL WORD
02762  2 00001 4 02761         TIX     *-1,4,1
02763  0560 00 0 00402         LDQ     CRITWN          CRITACL WORD NUMBER
02764  0600 00 0 03225         STZ     RCBE            INITIALIZE BAD EXIT TEST CELL
02765  0500 00 0 03210         CLA     FWC             NUMBER OF FULL WORDS COLLECTED
02766  0040 00 0 02770         TLQ     RCEA            TRANSFER IF MORE THAN CRITACL COLLECT
02767 -0625 00 0 03225         STL     RCBE            NOT ENOUGH, SIGNAL BAD EXIT
02770  0400 00 0 03222   RCEA  ADD     TFWC            ADD TOTAL OF FULL WORDS COLLECTED
02771  0601 00 0 03222         STO     TFWC            UPDATE COUNTER
02772 -0763 00 0 00004         LGL     4               INCREASE TOLERENCE BY 2 TO THE 4 TH
02773  0500 00 0 03212         CLA     FSC             NUMBER OF FREE STORAGE CELLS PICKED UP
02774  0040 00 0 02776         TLQ     RCEB            TRA IF GREATER THAN CRITACL NUMBER
02775 -0625 00 0 03225         STL     RCBE            NO, SIGNAL BAD EXIT
02776  0400 00 0 03223   RCEB  ADD     TFSC            ADD TOTAL OF FREE COLLECTED TO DATE
02777  0601 00 0 03223         STO     TFSC            UPDATE TOTAL
03000  0500 00 0 03217         CLA     RCC             NUMBER OF RECLAIMATION CYCLES EXECUTED
03001  0400 00 0 00371         ADD     $Q1             INCREMENT BY 1
03002  0601 00 0 03217         STO     RCC             UPDATE TOTAL
03003  0500 00 0 03221         CLA     RLC             NUMBER OF TIMES RELOCATION OF FWS
03004  0520 00 0 03220         ZET     RCT             SKIP IF NO RELOCATION
03005  0400 00 0 00371         ADD     $Q1
03006  0601 00 0 03221         STO     RLC             UPDATE COUNTER
03007 -0520 00 0 03225         NZT     RCBE            SKIP IF BAD EXIT
03010  0020 00 0 03012         TRA     RCED            DO GOOD EXIT
03011  0020 00 0 03014         TRA     RCEC            DO VERBOSE AND BAD EXIT
03012 -0520 00 0 03267   RCED  NZT     VERBOS          SKIP IF TALKATIVE
03013  0020 00 0 03040         TRA     RCEXIT          DO EXIT
03014  0535 00 4 03043  RCEC   LAC     RCX,4           GET EXIT IR4
03015 -0754 00 4 00000         PXD     0,4             AND CONVERT FOR PRINTING
03016  0131 00 0 00000         XCA
03017  0074 00 4 11021         TSX     OCTALP,4
03020 -0501 00 0 00452         ORA     OBLANK
03021  0602 00 0 03201         SLW     RCT1
03022  0500 00 0 03210         CLA     FWC             FULL WORD COUNTER
03023  0074 00 4 04111         TSX     $DECON,4        CONVERT TO BCD DECIMAL
03024  0602 00 0 03210         SLW     RCT4            PUT IN MESSAGE
03025  0500 00 0 03212         CLA     FSC             FREE STORAGE COUNTER
03026  0074 00 4 04111         TSX     $DECON,4        TO DECIMAL
03027  0602 00 0 03212         SLW     RCT5            PUT IN MESSAGE
03030  0500 00 0 03216         CLA     GCPDLC          NUMBER OF ACTIVE REGISTERS ON PDL
03031  0074 00 4 04111         TSX     $DECON,4        TO DECIMAL
03032  0602 00 0 03216         SLW     RCT6            IN MESSAGE
03033  0074 00 4 01222         TSX     OUTPUT,4        WRITE OUT MESSAGE
03034  0 00000 0 00364                 BCDOUT
03035  0 00023 0 03174                 RCTM,,19
03036  0520 00 0 03225         ZET     RCBE            SKIP IF GOOD EXIT
03037  0020 00 0 03152         TRA     RCBEX           DO BAD EXIT
03040  0500 00 0 03306  RCEXIT CLA     RCAC            RESTORE MACHINE REGISTERS
03041  0560 00 0 03307         LDQ     RCMQ
03042  0441 00 0 03224         LDI     RCIND
03043  0774 00 4 00000   RCX   AXT     **,4            AND INDEX REGISTERS
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03044  0774 00 2 00000   RCY   AXT     **,2
03045  0774 00 1 00000   RCZ   AXT     **,1
03046  0020 00 4 00001         TRA     1,4               EXIT
03047  0446 00 2 03267   SFWSC ONT     MBIT,2            CHECK FOR CURRENT BIT
03050  0020 00 0 03055         TRA     SFWC              IS OFF, COLLECT WORD
03051  1 77777 1 03052         TXI     *+1,1,-1          IS ON, DECREMENT CURRENT LOC IR
03052  2 00001 2 03047   SFWD  TIX     SFWSC,2,1         INDEX THROUGH THE BITS
03053  0774 00 2 00040         AXT     32,2              SET UP IR WITH NUMBER OF BITS PER WORD
03054  0020 00 0 02752         TRA     SFWB              EXAMINE NEXT WORD IN BIT TABLE
                       *
03055 -0754 00 1 00000   SFWC  PXD     0,1               COLLECT THIS WORD, POINTER TO THIS WOR
03056  0400 00 0 03210         ADD     FWC               D PLUS NUMBER OF WORDS COLLECTED IN AC
03057  0601 00 0 00000   SFWA  STO     **                SET LAST WORD COLLECTED
03060  0400 00 0 00371         ADD     $Q1               INCREMENT NUMBER OF FULL WORDS COLLECT
03061  0621 00 0 03210         STA     FWC               SAVE FULL WORD COUNTER
03062 -0737 00 1 00000         PDC     0,1               COMPLEMENT CURRENT LOCATION
03063  0634 00 1 03057         SXA     SFWA,1            TO FORM TRUE ADDRESS FOR UPDATE STORE
03064 -0734 00 1 00000         PDX     0,1               CURRENT LOCATION POINTER
03065  1 77777 1 03052         TXI     SFWD,1,-1         DECREMENT CURRENT LOCATION AND RETURN
                       *
                       * MRKLST       THE RECURSIVE SUBROUTINE THAT DOES ALL LIST MARKING
                       *
03066  3 00000 2 03132  MRKLST TXH     MLEXT,2,**        BFW BAR, REJECT POINTERS TO PROGRAM
03067 -3 00000 2 03132         TXL     MLEXT,2,**        TFS BAR - 1, REJECT POINTERS TO LOADER
03070  0634 00 1 03130         SXA     MSRTN,1           SAVE IR 1
03071  0634 00 4 03131         SXA     MRKX,4            SAVE LINK IR
03072  0774 00 1 00001         AXT     1,1               PRESET TO ONE FOR FAST PUSH DOWN ACESS
03073  0020 00 0 03111         TRA     MLIST             DO ACTUAL MARKING
                       *
03074  0502 00 2 00000   MWIN  CLS     0,2               MARK THIS WORD IN FREE STORAGE
03075  0120 00 0 03127         TPL     MOUT              TRANSFER OUT IF ALREADY MARKED
03076  0601 00 2 00000         STO     0,2               CAR OF LIST
03077  0734 00 2 00000         PAX     0,2               CAR TO IR 2
03100  0622 00 1 00000   MLEPD STD     **,1              ENDPDL + 1, SAVE CDR OF LIST ON PDR
03101  1 00001 1 03102         TXI     *+1,1,1           INCREMENT PUSH DOWN COUNTER
03102 -3 00000 1 03111   MLPDC TXL     MLIST,1,**        ENDPDL - C($CPPI) BAR, GO IF NOT NOPDL
03103  0074 00 4 03133   MLPDE TSX     RCERR,4           OUT OF PUSH DOWN LIST, FATAL ERROR
03104  004546604724            BCI     3,0NO PDL -MRKLST-
03105  436040445142
03106  436263406060
03107  0500 00 1 00000   MLEPE CLA     **,1              ENDPDL + 1, GET CDR OF LIST
03110 -0734 00 2 00000         PDX     0,2               PUT IN  IR 2
03111 -3 00000 2 03127   MLIST TXL     MOUT,2,**         TFS BAR - 1, OUT IF NOT IN LISP STORAG
03112 -3 00000 2 03074   MLBFA TXL     MWIN,2,**         BOTTOM FREE STORAGE BAR, IN FREE
03113 -3 00000 2 03127   MLBBJ TXL     MOUT,2,**         BBT BAR  OUT IF POINTER TO BIT TABLE
03114 -3 00000 2 03116   MLBDW TXL     MONE,2,**         BOTTOM FULL WORD BAR, IN FULL WORD
03115  0020 00 0 03127         TRA     MOUT              EXIT , NOT ANY OF THE ABOVE
                       *
03116  1 00000 2 03117   MONE  TXI     *+1,2,**          TOP FULL WORD
03117  0754 00 2 00000         PXA     0,2               CALCULATE BIT TABLE WORD AND BIT
03120 -0765 00 0 00005         LGR     5
03121  0734 00 2 00000         PAX     0,2               BIT TABLE WORD
03122 -0754 00 0 00000         PXD     0,0
03123 -0763 00 0 00005         LGL     5                 BIT TABLE BIT
03124  0734 00 4 00000         PAX     0,4
03125 -0500 00 4 03266         CAL     BIT,4             PICK UP BIT
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03126 -0602 00 2 00000   MLTBT ORS     **,2              TOP BIT TABLE, PUT IN BIT
03127  2 00001 1 03107   MOUT  TIX     MLEPE,1,1         GO BACK IF IN RECURSION
03130  0774 00 1 00000   MSRTN AXT     **,1              OTHERWISE RESTORE IR 1
03131  0774 00 4 00000   MRKX  AXT     **,4              AND LINK IR
03132  0020 00 4 00001   MLEXT TRA     1,4               AND EXIT
                         *
                         * RCERR       RECLAIMER FATAL ERROR DUMP ROUTINE
                         *
03133 -0634 00 4 01562   RCERR SXD     $ERROR,4          SAVE IR 4
03134  0634 00 4 03135         SXA     *+1,4             COMPLEMENT IR 4 TO GET ERROR MESSAGE
03135 -0774 00 4 00000         AXC     **,4
03136  1 00001 4 03137         TXI     *+1,4,1           LOCATION OF ERROR MESSAGE
03137  0634 00 4 03142         SXA     RCFEM,4           BUILD OUTPUT CALL
03140  0074 00 4 01222         TSX     OUTPUT,4          WRITE ERROR MESSAGE ON TAPE
03141  0 00000 0 00364         BCDOUT
03142  0 00003 0 00000   RCFEM         **,,3             WRITE OUT 3 WORDS
03143  0600 00 0 03751         STZ     $FREE
03144  0600 00 0 03727         STZ     FWORDL            ZERO STORAGE LISTS
03145  0441 00 0 10340         LDI     SYSIND            GET SYSTEM INDICATORS
03146  0055 00  000010         SIR     ERRORI            SET ERRIR INDICATOR
03147  0604 00 0 10340         STI     SYSIND            UPDATE REGISTER
03150  0074 00 4 01521         TSX     $TIME,4           PRINT THE CURRENT TO TIME
03151  0020 00 0 10230         TRA     OVRLRD            GET NEXT DIRECTION CARD
                         *
03152  0441 00 0 03224   RCBEX LDI     RCIND             RESTORE MACHINE REGISTERS
03153  0500 00 0 03306         CLA     RCAC
03154  0560 00 0 03307         LDQ     RCMQ
03155  0534 00 4 03043         LXA     RCX,4             AND INDEX REGISTERS
03156  0534 00 2 03044         LXA     RCY,2
03157  0534 00 1 03045         LXA     RCZ,1
03160 -0634 00 4 01562         SXD     $ERROR,4          SAVE IR 4
03161  0601 00 0 01556         STO     $ERAC             SAVE THE CONTENTS OF THE AC
03162 -0754 00 0 00000         PXD     0,0
03163  0074 00 4 01563         TSX     $ERROR+1,4        GO TO ERROR
03164  542723600254            BCI     1,*GC 2*          NOT ENOUGH WORDS COLLECTED -RECLAIMER-
                         *
                         * RELOC       RELOCATES ALL ITEMS IN FULL WORDS SPACE INTO A COMPACTED
                         *             BLOCK TO MAKE BLOCKS OF CONTIGOUS STORAGE AVAILABLE FOR
                         *             ARRAYS.
                         *
03165  0634 00 4 03172   RELOC SXA     RELX,4            SAVE LINK IR
03166  0074 00 4 03133         TSX     RCERR,4           THIS RPUTINE HAS NOT BEEN CODED YET.
03167  004546605125            BCI     3,0NO RELOCATOR
03170  434623216346
03171  516060606060
03172  0774 00 4 00000   RELX  AXT     **,4              RESTORE LINK IR
03173  0020 00 4 00001         TRA     1,4               RETURN TO MAIN PROGRAM
                         *
                         * MESSAGES AND CONSTANTS PLUS STORAGE GO HERE
                         *
03174  002721512221     RCTM  BCI     5,0GARBAGE COLLECTOR ENTERED AT
03175  272560234643
03176  432523634651
03177  602545632551
03200  252460216360
03201  0 00000 0 00000   RCT1                            THE CALL LOCATION IS PUT HERE
```

```
03202  604623632143            BCI     4, OCTAL.
03203  336060606060
03204  606060606060
03205  606060606060
03206  606026644343            BCI     2,  FULL WORDS
03207  606646512462
03210  0 00000 0 00000   RCT4                             NUMBER FULL WORDS COLLECTED
03211  602651252560            BCI     1, FREE
03212  0 00000 0 00000   RCT5                             FREE STORAGE WORDS COLLECTED
03213  606047646230            BCI     3,  PUSH DOWN DEPTH
03214  602446664560
03215  242547633060
03216  0 00000 0 00000   RCT6                             DEPTH ON PUSH DOWN LIST GOES HERE
                 03210   FWC    SYN     RCT4
                 03212   FSC    SYN     RCT5             STORAGE SAVING SYN S
                 03216  GCPDLC SYN     RCT6
03217  0 00000 0 00000   RCC                              TOTAL NUMBER OF RECLAMATION CYCLES
03220  0 00000 0 00000   RCT                              TEST CELL TO SEE IF RELOCATION WAS DON
                 03220  RCRLOC SYN     RCT
03221  0 00000 0 00000   RLC                              NUMBER OF TIMES RELOCATION WAS DONE
03222  0 00000 0 00000   TFWC                             TOTAL FULL WORDS COLLECTED
03223  0 00000 0 00000   TFSC                             TOTAL FREE STORAGE COLLECTED
                 00471   MONES  SYN     SEVENS
                 00471   MONS   SYN     SEVENS
03224  0 00000 0 00000   RCIND                            INDICATOR STORAGE
03225  0 00000 0 00000   RCBE                             TEST CELL FOR BAD EXIT
03226  0 00000 0 00000  MARYT                             TEMPORAY STORAGE
                 00402  CRITWN SYN     $Q10
                        *
                        * BIT TABLES FOR MARKING AND SWEEPING FULL WORD SPACE
                        *
03227 +000000000020             OCT     20
03230 +000000000040             OCT     40,100,200,400,1000,2000,4000,10000,20000,40000,100000
03231 +000000000100
03232 +000000000200
03233 +000000000400
03234 +000000001000
03235 +000000002000
03236 +000000004000
03237 +000000010000
03240 +000000020000
03241 +000000040000
03242 +000000100000
03243 +000000200000             OCT     200000,400000,1000000,2000000,4000000,10000000,20000000
03244 +000000400000
03245 +000001000000
03246 +000002000000
03247 +000004000000
03250 +000010000000
03251 +000020000000
03252 +000040000000             OCT     40000000,100000000,200000000,400000000,1000000000
03253 +000100000000
03254 +000200000000
03255 +000400000000
03256 +001000000000
03257 +002000000000             OCT     2000000000,4000000000,10000000000,20000000000          PAGE 043
```

```
03260 +004000000000
03261 +010000000000
03262 +020000000000
03263 +040000000000            OCT     40000000000,100000000000,200000000000
03264 +100000000000
03265 +200000000000
03266 -000000000000      BIT   OCT     400000000000
                03267    MBIT  SYN     BIT+1
                03226    MBITF SYN     BIT-32
                         *
                         *
03267 -377777777777      VERBOS OCT     777777777777       THIS CELL NON ZERO MAKES THE RECLAIMER
                         *                                 VERY TALKATIVE
03270 +111111111111      RCSGNL OCT     111111111111
03271 +222222222222      RCSGNM OCT     222222222222
03272 +333333333333      RCSGNN OCT     333333333333       PHASE SIGNAL FOR MQ
03273  0 00000 0 00000    TMLM                              TEMPORARY STORAGE
03274 -3 00000 7 00000    TMPTM SVN      ,7                 PREFIX AND TAG MASK
03275  0 00000 0 00000    MRKP                              TEMPORARY STORAGE
                         *
03276  0 74500 0 74501    TEMXX          -*-1,,-*-2         PERMENANT TEMLIS ITEMS
03277  0 00531 0 00473                   BCONAT,,ECONAT
03300  0 74476 0 74477                   -*-1,,-*-2
03301  0 16503 0 16477                   C$PROBE,,C$PROEN   LAP PROTECTED AREA
03302  0 00000 0 74475                   -*-1               END OF TEMLIS
03303  0 03707 0 03304                   BEGBLK,,ENDBLK-1   FUNCTION STORAGE
                         *
```

```
                              EJECT
                         *              STORAGE BLOCK FOR FUNCTIONS ALL OVER THE PACKAGE
                         *
03304                    BEGBLK BSS     0
                         *              RECLAIMER STORAGE TO BE MARKED
03304  0 74502 0 00000   TEMLIS         ,,-TEMXX
03305  0 00000 0 00000   ARYLIS                          LIST OF ACTIVE ARRAYS
03306  0 00000 0 00000    RCAC                           AC STORAGE
03307  0 00000 0 00000    RCMQ                           MQ-STORAGE
                         *              CNSFWL STORAGE
03310  0 00000 0 00000    CNXT                           POINTER TO NEXT WORD ON LINEAR OBJLIST
03311  0 00000 0 00000    CNX                            POINTER TO NEXT WORD ON PROPERTY LIST
03312  0 00000 0 00000    CNFT                           POINTER TO NEXT WORD  ON PNAME LIST
03313  0 00000 0 03313    CNAT           *               POINTER TO FIRST WORD OF CURRENT ATOM
03314  0 00000 0 00000    CNVA                           POINTER TO FIRST WORD OF PNAME LIST
                         ****************************************************
                         *                                THESE CARDS ARE A BLOCK
                               HEAD     A               $ALIST AND RET IR4
03315  0 00000 0 00000   CSV
                               HEAD     0               ARGUMENT REGISTERS
03316  0 00000 0 00000   ALIST                          REFERED TO BY COMPILED FUNCTIONS

                                   REGISTERS FOR FUNCTION ARGUMENTS.  ARG1 ANDARG2 ARE NOT
                                        NORMALLY USED.

03317  0 00000 0 00000    ARG1
03320  0 00000 0 00000    ARG2
03321  0 00000 0 00000    ARG3
03322  0 00000 0 00000    ARG4
03323  0 00000 0 00000    ARG5
03324  0 00000 0 00000    ARG6
03325  0 00000 0 00000    ARG7
03326  0 00000 0 00000    ARG8
03327  0 00000 0 00000    ARG9
03330  0 00000 0 00000    ARG10
03331  0 00000 0 00000   ARG11
03332  0 00000 0 00000   ARG12
03333  0 00000 0 00000   ARG13
03334  0 00000 0 00000   ARG14
03335  0 00000 0 00000   ARG15
03336  0 00000 0 00000   ARG16
03337  0 00000 0 00000   ARG17
03340  0 00000 0 00000   ARG18
03341  0 00000 0 00000   ARG19
03342  0 00000 0 00000   ARG20

                         ************************************************
                               HEAD     R               AND
03343  0 00000 0 10772    EVA1          $AND
03344  0 00000 0 00000    EVA2
03345  0 00000 0 00000    EVA9
                               HEAD     A               APPEND
03346  0 00000 0 10762   AS1            $F1
03347  0 00000 0 00000   CWR1
                               HEAD     A               APPLY
03350  0 00000 0 00000    ASS1
```

```
03351  0 00000 0 00000   ASSL
03352  0 00000 0 00000   ASSA
03353  0 00000 0 00000   AST1
03354  0 00000 0 00000   AST2
03355  0 00000 0 00000   AST3
03356  0 00000 0 00000   AST4
                         HEAD    R                COPY
03357  0 00000 0 10430   CS1             $COPYN
03360  0 00000 0 00000   CS2
                         HEAD    C                CP1
03361  0 00000 0 10440   CR1             $F12
03362  0 00000 0 00000   CR2
03363  0 00000 0 00000   CWRL
                         HEAD    A                EVCON
03364  0 00000 0 10460   ECS1            $COND
03365  0 00000 0 00000   ECS2
03366  0 00000 0 00000   ECS3
03367  0 00000 0 00000   ECS4
                         HEAD    R                EVLIS
03370  0 00000 0 10167   EVLX            EVLISL           LINK IR
03371  0 00000 0 00000   ELA                         ALIST
                         HEAD    A                EVP26
03372  0 00000 0 00000   EVS1                             IR4, BOTTOM OF PROTECTED TEMP. STORAGE
03373  0 00000 0 00000   EVSE
03374  0 00000 0 00000   EVSA
03375 -0 00000 0 00000   EVTRK MZE                        TRACE SWITCH
03376  0 00000 0 00000   EVCDR                            ARG LIST FOR SUBR ARGUMENTS
03411                    EAG11 BES       10               ARGUMENT BLOCK FOR EVAL
03411  0 00000 0 00000   EVTDE                            CDR(E)
03412  0 00000 0 00000   EVD2
                         HEAD    R                GO SPECIAL FORM
03413  0 00000 0 10037   GOX             $GO              LINK IR
                         HEAD    R                LABP
03414  0 00000 0 00000   BFS4
                         HEAD    R                LAMP
03415  0 00000 0 00000   BFS2
03416  0 00000 0 00000   BFS3
                        *
                         HEAD    C                LINK FOR COMPILED FUNCTIONS
03417  0 00000 0 00000  LNKA                             LINK STORAGE FOR AC
03420  0 00000 0 00000  LNKB                             LINK STORAGE FOR MQ
                         HEAD    D                MAPCAR
03421  0 00000 0 07646   RET             $PMAPCA
03422  0 00000 0 00000   L
03423  0 00000 0 00000   F
                         HEAD    R                MAPCON
03424  0 00000 0 07636   MCN5            -$)069B
03425  0 00000 0 00000   MCN4
03426  0 00000 0 00000   MCN3
03427  0 00000 0 00000   MCN2
                         HEAD    R                MAPLIS
03430  0 00000 0 07626   MS1             -$)069A          LINK IR STORAGE
03431  0 00000 0 00000   MS2                         ARGUMENT L
03432  0 00000 0 00000   MS3                         FUNCTIONAL ARGUMENT
03433  0 00000 0 00000   MS4                         FINAL ANSWER
03434  0 00000 0 00000   MS5                         INTERMEDIATE ANSWER
```

```
                                    HEAD    R               OR
03435  0 00000 0 07435   EVR1              $OR
03436  0 00000 0 00000   EVR2
03437  0 00000 0 00000   EVR9
                                    HEAD    A               PAIR
03440  0 00000 0 00000   TEM                               FIRST ARGUMENT
03441  0 00000 0 00000   LIS                               SECOND ARGUMENT
                                    HEAD    P               PRINAR
03442  0 00000 0 00000   PAS3
03443  0 00000 0 00000   PAS4
                                    HEAD    R               PROGRAM FEATURE
03444  0 00000 0 07300   INTRX             $PROG            LINK INDEX REGISTER
03445  0 00000 0 00000   INTB                              CURRENT STATEMENT
03446  0 00000 0 00000   INTGL                             GO LIS,(LIST OF PROGRAM POINTS) + IR2
03447  0 00000 0 00000   INTPL                             PAIR LIST
03450  0 00000 0 00000   INTGS                             GO SWITCH , NON-ZERO IF GO OR RETURN
                                    HEAD    I               READ1
03451  0 00000 0 07226   RS1               $F13
03452  0 00000 0 00000   RS2
03453  0 00000 0 00000  PRINTL                             TEMPORARY STORAGE FOR PRINT OR PUNCH
                                    HEAD    R               SEARCH
03454  0 00000 0 07042   SRS1              $SRCH           IR4
03455  0 00000 0 00000   SRS2                              L
03456  0 00000 0 00000   SRS3                              P
03457  0 00000 0 00000   SRS4                              F
03460  0 00000 0 00000   SRS5                              U
                                    HEAD    R               SETQP
03461  0 00000 0 07022   REPS1             $SETQ
03462  0 00000 0 00000   REPV
03463  0 00000 0 00000   REPT1
                                    HEAD    B               SUBLIS
03464  0 00000 0 06726   X1                $F17            IR4 OF SUBLIS
03465  0 00000 0 00000   X2                                CDR(E)
03466  0 00000 0 00000   X3                                CAR(E)
03467  0 00000 0 00000   X4                                SUBLIS(P,CDR(E))
03470  0 00000 0 00000   X5                                CDAR(J)
03471  0 00000 0 00000   P
03472  0 00000 0 00000   E
                                    HEAD    R               SUBST
03473  0 00000 0 00000   SXT
03474  0 00000 0 00000   SZ
03475  0 00000 0 00000   SX
03476  0 00000 0 00000   SY
03477  0 00000 0 00000   ST
                                    HEAD    Q               ADD, ETC.
03500  0 00000 0 00000   AMIR                              IR 4 STRAGE
03501  0 00000 0 00000   AMIND                             INDICATOR REGISTER STORAHE
03502  0 00000 0 00000   AMLIS                             LIST STORAGE
03503  0 00000 0 00000   AMQ                               TYPE STORAGE
                        *                                 ARRAY MAKE PROGRAM
03504  0 00000 0 00000   AFAT                              ARRAY ATOM GOES HERE
03505  0 00000 0 00000   ATMP                              TEMPORARY STORAGE
                                    HEAD    S               EVALQUOTE STORAGE
03506  0 00000 0 00000   EVQAN
03507                               BSS     100             EVALQUOTE BUFFER
03653 -0 00000 0 00000   EVQB       MZE                     TEST CELL FOR READ IN
```

```
                                HEAD    F
                              *         CHARACTER FUNCTIONS
03654                          BBPNT BSS     1                 POINTER TO REMAINDER OF LIST
03655                          PIND  BSS     1
                              *         MKNO
03656  0 00000 0 00000         MKT1                            TEMP STORAGE TYPE (FIX OR FLD)
03657                                BSS     25                ROOM FOR MORE STORAGE
03710                         ENDBLK BSS     0
```

```
                                EJECT
                                HEAD    0
                              * CONSW       PUTS FILL WORDS IN FULL WORD SPACE
                              *
03710  0634 00 4 03724   CONSW SXA     CSWX,4              SAVE LINK IR
03711 -0534 00 4 03727   FWLOR LXD     FWORDL,4            PICK UP FULL WORD LIST
03712 -3 00000 4 04031         TXL     FWLOUT,4,0          TEST FOR NO MORE
03713 -0600 00 0 03726         STQ     CSWQ                SAVE MQ
03714  0560 00 4 00000         LDQ     0,4                 PICK UP POINTER TO NEXT WORD ON FWL
03715 -0620 00 0 03727         SLQ     FWORDL              UP DATE FULL WORD LIST POINTER
03716  0601 00 4 00000         STO     0,4                 PUT AC IN FULL WORD AREA
03717 -0754 00 4 00000         PXD     0,4                 POINTER TO AC
03720 -0534 00 4 03727         LXD     FWORDL,4            POINTER TO NEXT AVAILABLE WORD
03721  3 00000 4 03723  LOWARY TXH     CSWO,4,**           BOTTOM FULL WORD SPACE, TEST FOR ARY
03722 -0634 00 4 03721         SXD     *-1,4               AVAILABLE LOCATION AND UPDATE SAME
03723  0560 00 0 03726   CSWO  LDQ     CSWQ                RESTORE MQ
03724  0774 00 4 00000   CSWX  AXT     **,4                RESTORE LINK IR
03725  0020 00 4 00001         TRA     1,4                 EXIT
03726  0 00000 0 00000   CSWQ                             TEMPORARY STORAGE FOR MQ
03727  0 00000 0 00000  FWORDL                            POINTER TO FULL WORD LIST
                              *
                              * CONS        BASIC LISP FUNCTION PUTS A WORD IN FREE STORAGE
                              *
03730  0634 00 4 03747   CONS  SXA     CNSX,4              SAVE LINK IR
03731 -0534 00 4 03751         LXD     $FREE,4             GET FREE STORAGE LIST POINTER
03732  3 00000 4 03734         TXH     *+2,4,0             SKIP IF NOT OUT OF FREE STORAGE
03733  0074 00 4 04037         TSX     FROUT,4             OUT OF FREE STORAGE
03734  0771 00 0 00022         ARS     18                  DECREMENT TO ADDRESS
03735  0621 00 4 00000         STA     0,4                 PUT ADDRESS AWY
03736  0500 00 4 00000         CLA     0,4                 GET POINTER TO NEXT WORD IN FREE
03737  0622 00 0 03751         STD     FREE                PUT IN FREE
03740 -0620 00 4 00000         SLQ     0,4                 PUT DECREMENT AWAY
03741 -0754 00 4 00000         PXD     0,4                 POINTER TO WORD
03742  0774 00 4 00000   CNTR1 AXT     **,4                LOW ORDER 15 BITS OF CONS COUNTER KEPT
03743  2 00001 4 03746         TIX     *+3,4,1             DECREMENT COUNT BY 1
03744  0074 00 4 03752         TSX     ARREST,4            COUNT EXHAUSTED, RELOAD OR STOP
03745  0774 00 4 77777         AXT     -1,4                RELOAD NUMBER
03746  0634 00 4 03742         SXA     CNTR1,4             PUT IN COUNTER
03747  0774 00 4 00000   CNSX  AXT     **,4                RESTORE LINK IR
03750  0020 00 4 00001         TRA     1,4                 EXIT
03751  0 00000 0 00000   FREE                             POINTER TO FREE STORAGE LIST
                              *
03752 -0520 00 0 11671  ARREST NZT     TCOUNT              SKIP IF COUNS COUNTER ON
03753  0020 00 4 00001         TRA     1,4                 OTERWISE RETURN
03754  0601 00 0 04107         STO     CNTM                SAVE AC
03755  0500 00 0 04106         CLA     CNTS                GET REST OF COUNTER
03756  0100 00 0 03763         TZE     AWHOA               GO TO ERROR CALL IF EXHAUSTED
03757  0402 00 0 04110         SUB     CTG                 DECREMENT BY 32,768
03760  0601 00 0 04106         STO     CNTS                UPDATE COUNTER
03761  0500 00 0 04107         CLA     CNTM                RESTORE AC
03762  0020 00 4 00001         TRA     1,4                 E7IT TO RELOAD CETR1
                              *
03763  0634 00 0 11671   AWHOA SXA     TCOUNT,0            DESACTIVATE THE CONS COUNTER
03764  0500 00 0 04100         CLA     CNTST               PICK UP  INITIAL COUNT
03765  0560 00 0 00475         LDQ     $FIXD               PICK UP $FIX
03766 -0634 00 4 01562         SXD     $ERROR,4            SAVE LINK IR
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03767  0774 00 4 00010         AXT     8,4               8 SPARE CONSES FOR $MKNO
03770  0634 00 4 03742         SXA     CNTR1,4
03771  0074 00 4 12636         TSX     $MKNO,4           MAKE THE COUNT A NUMBER
03772  0074 00 4 01563         TSX     $ERROR+1,4        GO TO ERROT
03773  542660600154            BCI     1,*F  1*          CONS COUNTER TRAP
                       *
                       * SPEAK        TURNS THE CONTENTS OF THE CONS COUNTER INTO A FIXED POINT
                       *              NUMBER.
                       *
03774  0500 00 0 00457  SPEAK CLA     $AMASK            GET ADDRESS MASK
03775 -0320 00 0 03742         ANA     CNTR1             PICK UP 15 LOW ORDER BITS
03776 -0501 00 0 04106         ORA     CNTS              OR IN REST OF COUNT
03777  0601 00 0 04107         STO     CNTM              SAVE CURRENT VALUE
04000  0500 00 0 04100         CLA     CNTST             PICK UP INITIAL VALUE
04001  0402 00 0 04107         SUB     CNTM              SUBSTRACT CURRENT VALUE TO GET NUMBER
04002  0560 00 0 00475         LDQ     $FIXD             OF CONSES.  PUT $FIX IN MQ
04003  0020 00 0 12636         TRA     $MKNO             MAKE THE RESULT A NUMBER
                       *
                       * BLOCKR       BLOCK RESERVATION ROUTING USED IN DECLARING ARRAYS.
                       *
04004  0634 00 4 04026 BLOCKR SXA     BLKX,4            SAVE LINK IR
04005 -0625 00 0 04056         STL     NROOM             SET UP TOO BIG TEST CELL
04006  0621 00 0 04022         STA     BLKB              BE RESERVED
04007 -0534 00 4 02304         LXD     $ORG,4            ADDRESSOF FIRST REGISTER AVAIALABER
04010  0754 00 4 00000  BKOR  PXA     0,4               ADDRESS OF FIRST REGISTER FOR ARRAYS
04011  0401 00 0 04022         ADM     BLKB              ADDRESS OF END OF BLOCK
04012  0621 00 0 04023         STA     BLKC              INITIALIZE STZ LOOP TO CLEAN OUT BLOCK
04013  0734 00 4 00000         PAX     0,4
04014  0402 00 0 00371         SUB     $Q1
04015  0621 00 0 04030         STA     BLKBB
04016 -3 00000 4 04044 BLKETP TXL     BLKOUT,4,**       BOTTOM BIT TABLE AR, GO IF WONT FIT
04017 -0634 00 4 02304         SXD     $ORG,4            UPDATE ORG
04020  0500 00 4 77777         CLA     -1,4              POINTER TO NEXT WORD ON FULL WORD LIST
04021  0622 00 0 03727         STD     FWORDL            UPDATE FULL WORD LIST
04022  0774 00 4 00000  BLKB  AXT     **,4              LENGTH OF BLOCK
04023  0600 00 4 00000  BLKC  STZ     **,4              ZEROP THE BLOCK
04024  2 00001 4 04023         TIX     *-1,4,1
04025  0500 00 0 04030         CLA     BLKBB             GET ANSWER
04026  0774 00 4 00000  BLKX  AXT     **,4              RESTORE LINK IR
04027  0020 00 4 00001         TRA     1,4
04030  0 00000 0 00000 BLKBB                            ANSWER STORED HERE
                       *
                       *              VAROUIS ENTRANCES TO THE RECLAIMER
                       *
                       *              FWLOUT - OUT OF FULL WORD LIST
04031  0601 00 0 03726 FWLOUT STO     CSWQ              SAVE FULL WORD
04032 -0754 00 0 00000         PXD     0,0               ZERO AC
04033  0600 00 0 03220         STZ     RCRLOC            SIGNAL NO RELOCATION IS NECESSARY
04034  0074 00 4 02522         TSX     RECLAM,4          DO THE WORK
04035  0500 00 0 03726         CLA     CSWQ              RESTORE AC
04036  0020 00 0 03711         TRA     FWLOR             RETURN TO CONSW
                       *              FROUT - OUT OF REE STORAGE
04037  0634 00 4 04042  FROUT SXA     FRX,4             SAVE LINK IR
04040  0600 00 0 03220         STZ     RCRLOC            SIGNAL NO RELOCATION NECESSARY
04041  0074 00 4 02522         TSX     RECLAM,4          DO THE WORK
04042  0774 00 4 00000  FRX   AXT     **,4              RESTORE LINK OR
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04043  0020 00 4 77776          TRA     -2,4              NON-STANDARD EXIT
                        *                BLKOUT - OUT OF FULL WORD SPACE FOR ARRAYS
04044 -0625 00 0 03220  BLKOUT   STL     RCRLOC            SIGNAL RELOCATION NECESSARY
04045 -0754 00 0 00000           PXD     0,0               CLEAR AC
04046 -0520 00 0 04056           NZT     NROOM             FALL THROUGH ON SECOND CONSECUTIVE ENT
04047  0020 00 0 04026           TRA     BLKX              EXIT FROM BLOCKR ROUTINE
04050  0074 00 4 02522           TSX     RECLAM,4          DO THE WORK
04051  0500 00 0 03727           CLA     FWORDL            PICK UP POINTER TO FIRST AVAILABLE WOR
04052  0622 00 0 03721           STD     LOWARY            SET UP LOWARY
04053  0737 00 4 00000           PAC     0,4               COMPLEMENT INTO IR 4
04054  0600 00 0 04056           STZ     NROOM             SET UP TOO BIG TEST CELL
04055  0020 00 0 04010           TRA     BKOR              DO BLOCK RESERVATION
04056  0 00000 0 00000  NROOM
                        *
                        *
                        * COUNT          A FUNCTION OF 1 ARGUMENT ( AFIXED POINT NUMBER) TURNS ON
                        *                THE CONS COUNTRE AND LOADS IT WITH THAT NUMBER
                        *                A LOAD OF NIL  SIMPLY LEAVES THE PREVIOUS CONTENTS IN THE
                        *                COUNTER
                        *
04057 -0625 00 0 11671   COUNT   STL     TCOUNT            ACTIVATE THE CONS COUNTER
04060 -0100 00 0 04064           TNZ     CNTA              GO IF ARUGMENT S NOT NULL
04061  0500 00 0 04107           CLA     CNTM              OLD VALUE OF CNTR1
04062  0621 00 0 03742           STA     CNTR1             PUT IT THERE
04063  0020 00 0 04076           TRA     CNTB              CLEAR AC AND EXIT
04064  0634 00 4 04074   CNTA    SXA     CNTX,4            RELOAD COUNTER WITH FIXED POINT ARG.
04065  0634 00 2 04075           SXA     CNTY,2            SAVE IDNEX REGISTERS
04066 -0734 00 2 00000           PDX     0,2               ARGUMENT TO INDEX 2
04067  0074 00 4 13075           TSX     FIXVAL,4          EVALUATE AS A FIXED POINT NUMBER
04070  0601 00 0 04100           STO     CNTST             SET INITIAL VALUE CELL
04071  0621 00 0 03742           STA     CNTR1             LOW ORDER 15 BITS TO CNTR1
04072 -0320 00 0 00465           ANA     PDTMSK            MASK OUT LOW ORDER 15 BITS
04073  0601 00 0 04106           STO     CNTS              STORE REMAINDER IN HIGH ORDER CELL
04074  0774 00 4 00000   CNTX    AXT     **,4              RESTORE INDEX REGISTERS
04075  0774 00 2 00000   CNTY    AXT     **,2
04076 -0754 00 0 00000   CNTB    PXD     0,0               GIVE VALUE OF NIL
04077  0020 00 4 00001           TRA     1,4               EXIT
04100  0 00000 0 00000   CNTST                             INTAL VALUE OF COUNT
                        *
                        * UNCONT        DEACTIVATE THE CONS COUNTER
                        *
04101  0634 00 0 11671  UNCONT  SXA     TCOUNT,0          DEACTIVATE THE CONS COUNTER
04102  0500 00 0 03742           CLA     CNTR1             GET CURENT CONTENST OF COUNTER
04103  0621 00 0 04107           STA     CNTM              SAVE IN TEMP STORAGE
04104 -0754 00 0 00000           PXD     0,0               GIVE VALUE OF NULL
04105  0020 00 4 00001           TRA     1,4               EXIT
                        *
04106  0 00000 0 00000   CNTS                              HIGH ORDER BITS OF CONS COUNTER
04107  0 00000 0 00000   CNTM                              TEMPORARY STORAGE
04110  0 00000 1 00000   CTG           ,1                 LOW ORDER BIT OF HIGH ORDER 20 BITS
                        *
                        *
                        E       HED
                        *       DECON AND NUMNAM
                        *
                        *       DECON TAKES A DECIMAL NUMBER (+ OR -) AS INPUT IN THE AC AND
```

```
                        *       GIVES AS OUTPUT THE BCD REPRESENTATION OF THAT NUMBER.  LO ORDER
                        *       BITS ARE IN AC. HI ORDER BITS IN MQ.  LEADING ZEROS ARE
                        *       SUPPRESSED.  IF THERE ARE NO HI ORDER BITS, MQ IS ZERO.  THE
                        *       P BIT AND SIGN OF AC WILL AGREE.
                        *
                        *       NUMNAM TAKES AS INPUT A POINTER TO A DECIMAL INTEGER (+ OR 0) AND
                        *       CAUSES THE BCD REPRESENTATION OF THAT NUMBER TO BE PRINTER, WITH
                        *       LEADING ZEROS SUPPRESSED.


04111  0600 00 0 77662   DECON STZ     DETS1             SIGNAL FOR DECON EXIT
04112  0600 00 0 77664         STZ     DELOD             SET LO ORDER DIGITS TO ZERO
04113  0634 00 4 04176         SXA     DEIR4,4           SAVE IR4
04114  0020 00 0 04121         TRA     DE7

04115 -0625 00 0 77662  NUMNAM STL     DETS1             SIGNAL FOR NUMNAM EXIT
04116  0634 00 4 04176         SXA     DEIR4,4           SAVE IR4
04117 -0734 00 4 00000         PDX     ,4                PLACE INPUT NUMBER IN AC
04120  0500 00 4 00000         CLA     0,4
04121 -0625 00 0 77663   DE7   STL     DETS2             SIGNAL FOR NO HI- ORDER DIGITS
04122  0601 00 0 77667         STO     DEINP             SAVE INPUT FOR SIGN TEST
04123  0760 00 0 00012         DCT                       SHUT OFF DIVIDE CHECK LIGHT
04124  0761 00 0 00000         NOP
04125 -0130 00 0 00000         XCL                       NUMBER TO MQ
04126  0774 00 4 00044         AXT     36,4              INDEX FOR SHIFTING
04127  0600 00 0 77665   DE4   STZ     DEDIG             DEDIG WILL RECIEVE DIGITS

04130 -0754 00 0 00000   DE1   PXD     ,0
04131  0221 00 0 00402         DVP     $Q10              PUT ANOTHER DIGIT IN DEDIG
04132  0767 00 4 00044         ALS     36,4
04133 -0602 00 0 77665         ORS     DEDIG
04134 -0600 00 0 77666         STQ     DEMQ              IF QUOTIENT ZERO, CONVERSION
04135 -0520 00 0 77666         NZT     DEMQ                IS DONE
04136  0020 00 0 04144         TRA     DE2
04137  2 00006 4 04130         TIX     DE1,4,6

04140  0500 00 0 77665         CLA     DEDIG             STORE LO ORDER DIGITS
04141  0601 00 0 77664         STO     DELOD
04142  0600 00 0 77663         STZ     DETS2             SIGNAL THAT HI ORDER DIGITS EXIST
04143  1 00036 4 04127         TXI     DE4,4,30          RESTORE SHIFT INDEX AND LOOP AGAIN

04144  0560 00 0 77667   DE2   LDQ     DEINP             SEE IF MINUS SIGN NEEDED
04145  0162 00 0 04157         TQP     DEV
04146  2 00006 4 04154         TIX     DEQ,4,6

                        *       MINUS SIGN BEGINS A NEW WORD
04147  0500 00 0 77665         CLA     DEDIG             STORE LO ORDER DIGITS
04150  0601 00 0 77664         STO     DELOD
04151  0600 00 0 77663         STZ     DETS2             SIGNAL THAT HI ORDER DIGITS EXIST
04152  0600 00 0 77665         STZ     DEDIG             CLEAR DIGITS REGISTER
04153  0774 00 4 00044         AXT     36,4              RESTORE SHIFT INDEX
04154  0500 00 0 00423   DEQ   CLA     DEMIN             INSERT MINUS SIGN
04155  0767 00 4 00044         ALS     36,4
04156 -0602 00 0 77665         ORS     DEDIG
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04157  0760 00 0 00012  DEV    DCT
04160  0074 00 4 01676         TSX     $DCT,4             MACHINE ERROR
04161  0520 00 0 77662         ZET     DETS1              SEE WHICH EXIT TO USE
04162  0020 00 0 04200         TRA     DE5

                        *       DECON EXIT
04163 -0500 00 0 77665         CAL     DEDIG              PICK UP DIGITS
04164 -3 00006 4 04170         TXL     DEJ,4,6            TRANSFER IF FULL WORD OF DIGITS
04165 -0765 00 4 00052         LGR     42,4               INSERT LEADING BLANKS
04166 -0500 00 0 00472         CAL     BLANKS
04167 -0763 00 4 00052         LGL     42,4
04170  0560 00 0 77664  DEJ    LDQ     DELOD              LO ORDER DIGITS OR ZERO -
04171 -0520 00 0 77663         NZT     DETS2                SEE WHICH
04172 -0130 00 0 00000         XCL                        LO ORDER DIGITS TO AC
04173 -0760 00 0 00001         PBT                        SIGN AND P BIT MUST AGREE
04174  0020 00 0 04176         TRA     *+2
04175 -0760 00 0 00003         SSM
04176  0774 00 4 00000  DEIR4  AXT     **,4               RESTORE IR4 AND EXIT
04177  0020 00 4 00001         TRA     1,4

                        *       NUMNAM EXIT
04200 -0500 00 0 77665  DE5    CAL     DEDIG              INSERT TRAILING SEVENS INTO
04201  0560 00 0 00471         LDQ     SEVENS               DIGITS WORD
04202 -0765 00 4 00052         LGR     42,4
04203  0131 00 0 00000         XCA
04204  0074 00 4 05110         TSX     $PRIN2,4           PRINT WORD OF DIGITS
04205  0520 00 0 77663         ZET     DETS2              SEE IF ANOTHER WORD MUST
04206  0020 00 0 04211         TRA     DEY                  BE PRITNER
04207 -0500 00 0 77664         CAL     DELOD              PRINT LO ORDER DIGITS
04210  0074 00 4 05110         TSX     $PRIN2,4

04211  0534 00 4 04176  DEY    LXA     DEIR4,4            RESTORE IR4,  CLEAR AC, AND EXIT
04212 -0754 00 0 00000         PXD     ,0
04213  0020 00 4 00001         TRA     1,4



                 00423  DEMIN  SYN     $QO40               BCD MINUS SIGN
A    04214              DEORG  BSS
                 77662         ORG     COMMON
77662                   DETS1  BSS     1                  ZERO MEANS DECON EXIT
77663                   DETS2  BSS     1                  ZERO MEANS HI ORDER DIGITS
77664                   DELOD  BSS     1                  LO ORDER DIGITS
77665                   DEDIG  BSS     1                  CURRENT DIGITS
77666                   DEMQ   BSS     1                  MQ FOR ZERO TEST
77667                   DEINP  BSS     1                  INPUT NUMBER
                 04214         ORG     DEORG

                        *       THIS ROUTINE USES COMMON, SEVENS, $PRIN2, BLANKS, AND $Q10
                        *

                        R       HED
                                 MAPLIS       NEW, FASTER VERSION WITH OPEN SAVE AND CONS
                        *
04214  0100 00 4 00001  MAPLIS TZE     1,4                NULL(L) = NIL
04215 -0634 00 4 03430         SXD     MS1,4              SAVE LINK IR
```

```
04216 -0534 00 4 02317         LXD     $CPPI,4       GET PDL POINTER
04217  1 77772 4 04220         TXI     *+1,4,-6           SAVE TOTAL OF 6 ITEMS
04220  0522 00 0 02414         XEC     $ENDPDL            TEST FOR OUT OF PUSH DOWN LIST
04221 -0634 00 4 02317         SXD     $CPPI,4       UPDATE PDL POINTER LOCATION
04222  0601 00 0 03317         STO     $ARG1         SAVE AC
04223  0500 00 0 03430         CLA     MS1           START SAVING    LINK IR
04224  0601 00 4 77772         STO     -6,4
04225  0500 00 0 03431         CLA     MS2           L ARGUMENT
04226  0601 00 4 77773         STO     -5,4
04227  0500 00 0 03432         CLA     MS3           FUNCTIONAL ARGUMENT
04230  0601 00 4 77774         STO     -4,4
04231  0500 00 0 03433         CLA     MS4           FINAL ANSWER
04232  0601 00 4 77775         STO     -3,4
04233  0500 00 0 03434         CLA     MS5           INTERMEDIATE ANSWER
04234  0601 00 4 77776         STO     -2,4
04235  0500 00 0 04344         CLA     MS6                SAVE MARKER
04236  0601 00 4 77777         STO     -1,4
04237  0500 00 0 03317         CLA     $ARG1         SAVING ALL DONE, RESTORE AC
04240  0601 00 0 03431         STO     MS2           PUT L ARGUMENT AWAY
04241 -0600 00 0 03432         STQ     MS3           PUT FUNCTION ARGUMENT AWAY
04242  0162 00 0 04334         TQP     CMP           IF TRANSFER, F NOT A TXL, SO GO TO COMPAT
04243  0074 00 4 03432         TSX     MS3,4         EXECUTE FUNCTIONAL ARGUMENT
04244 -0534 00 4 03751   MAIN  LXD     $FREE,4       START OPEN CONS
04245  3 00000 4 04247         TXH     *+2,4,0       TEST FOR OUT OF FREE STORAGE
04246  0074 00 4 04037         TSX     $FROUT,4      GO IF NO MORE FS
04247  0771 00 0 00022         ARS     18            PUT F(L) IN ADDRESS
04250  0560 00 4 00000         LDQ     0,4           GET NEXT REGISTER ON FSL
04251 -0620 00 0 03751         SLQ     $FREE         UPDATE FREE
04252  0601 00 4 00000         STO     0,4           CONS(F(L),NIL)
04253 -0634 00 4 03433         SXD     MS4,4         FINAL ANSWER
04254 -0634 00 4 03434         SXD     MS5,4         INT. ANSWER
04255  0534 00 4 03742         LXA     $CNTR1,4           PICK UP CONS COUNTER
04256  2 00001 4 04261         TIX     *+3,4,1            DECREMENT BY 1
04257  0074 00 4 03752         TSX     ARREST,4           GO IF OUT OF COUNTER
04260  0774 00 4 77777         AXT     -1,4               RELOAD OF -1 FOR COUNTER
04261  0634 00 4 03742         SXA     $CNTR1,4           RESTORE CONS COUNTER
04262 -0534 00 4 03431   MLOP1 LXD     MS2,4         MAUN LOOP,  GET L
04263  0500 00 4 00000         CLA     0,4           TAKE CDR(L)
04264 -0734 00 4 00000         PDX     0,4
04265  3 00000 4 04306         TXH     MPRG1,4,0     IF NOT NULL GO ON TO MAIN PROGRAM
04266  0500 00 0 03433         CLA     MS4           ALL DONE, PICK UP FINAL ANSWER
04267 -0534 00 4 02317         LXD     $CPPI,4       START OPEN UNSAVE BY GETTING PDL POINTER
04270  0560 00 4 77776         LDQ     -2,4
04271 -0600 00 0 03434         STQ     MS5
04272  0560 00 4 77775         LDQ     -3,4
04273 -0600 00 0 03433         STQ     MS4
04274  0560 00 4 77774         LDQ     -4,4
04275 -0600 00 0 03432         STQ     MS3
04276  0560 00 4 77773         LDQ     -5,4
04277 -0600 00 0 03431         STQ     MS2
04300  0560 00 4 77772         LDQ     -6,4
04301 -0600 00 0 03430         STQ     MS1
04302  1 00006 4 04303         TXI     *+1,4,6            RESTORE PDL COUNTER
04303 -0634 00 4 02317         SXD     $CPPI,4       SET CPPI
04304 -0534 00 4 03430         LXD     MS1,4         PICK UP LINK IR
04305  0020 00 4 00001         TRA     1,4           RETURN
```

```
                        *
04306 -0754 00 4 00000   MPRG1 PXD     0,4           MAIN PROGRAM  PUT L IN AC
04307  0601 00 0 03431         STO     MS2           SAVE IN L ARGUMENT REGISTER
04310 -0534 00 4 03432         LXD     MS3,4         SEE IF FUNCTIONAL ARG IS S EXPRESSION
04311  3 00012 4 04340         TXH     CMP1,4,10     GO IF S EXPRESSION
04312  0074 00 4 03432         TSX     MS3,4         EXECUTE FUNCTION ARGUMENT (TXL INS.)
04313 -0534 00 4 03751   MAIN1 LXD     $FREE,4       START OPEN CONS
04314  3 00000 4 04316         TXH     *+2,4,0       TEST FOR OUT OF FREE STORAGE
04315  0074 00 4 04037         TSX     $FROUT,4      GO IF OUT
04316  0560 00 4 00000         LDQ     0,4           PICK UP POINTER TO NEXT FREE REGISTER
04317 -0620 00 0 03751         SLQ     $FREE         UPDATE FREE
04320  0771 00 0 00022         ARS     18            ITEM TO ADDRESS
04321  0601 00 4 00000         STO     0,4           CONS(F(L),NIL)
04322 -0754 00 4 00000         PXD     0,4           ANSWER TO AC
04323  0534 00 4 03742         LXA     $CNTR1,4           PICK UP CONS COUNTER
04324  2 00001 4 04327         TIX     *+3,4,1            DECREMENT BY 1
04325  0074 00 4 03752         TSX     ARREST,4           GO IF OUT OF COUNTER
04326  0774 00 4 77777         AXT     -1,4               RELOAD OF -1 FOR COUNTER
04327  0634 00 4 03742         SXA     $CNTR1,4           RESTORE CONS COUNTER
04330 -0534 00 4 03434         LXD     MS5,4         PICK UP LAST ANSWER
04331  0622 00 4 00000         STD     0,4           CONCATENATE THE ANSWERS BY RPLACD
04332  0601 00 0 03434         STO     MS5           UPDATE INT. ANSWER
04333  0020 00 0 04262         TRA     MLOP1         GO TO HEAD OF MAIN LOOP
                        *
04334 -0620 00 0 04336   CMP   SLQ     *+2           COMPAT CALL FOR S EXPRESSION FUN. ARG.
04335  0074 00 4 12007         TSX     COMPAT,4
04336  0 00000 0 00001                 1,,**         FUNCTION OF 1 ARGUMENT
04337  0020 00 0 04244         TRA     MAIN          GO BACK TO MAIN PROGRAM
                        *
04340 -0634 00 4 04342   CMP1  SXD     *+2,4         ANOTHER COMPAT CALL
04341  0074 00 4 12007         TSX     COMPAT,4
04342  0 00000 0 00001                 1,,**
04343  0020 00 0 04313         TRA     MAIN1         RETURN TO MAIN PROGRAM
                        *
04344 -3 03436 0 02371   MS6   TXL     $END5,,MS5+2       SAVE 5 ITEMS

                              FUNCTION COPY
                              COPY(L)= (L=0 YIELDS 0, CAR(L)=-1 YIELDS L,
                                 OTHERWISE CONS(COPY(CAR(L)),COPY(CDR(L))))
                        R     HED
04345  0100 00 4 00001   COPY  TZE 1,4               L=0
04346 -0634 00 4 03357         SXD CS1,4
04347 -0734 00 4 00000         PDX 0,4               L
04350 -0634 00 4 04377         SXD CT1,4             L
04351  0500 00 4 00000         CLA 0,4               CWR(L)
04352  0734 00 4 00000         PAX 0,4               CAR(L)
04353 -3 77776 4 04357         TXL C1,4,-2           CAR(L)=-1
04354  0500 00 0 04377         CLA CT1
04355 -0534 00 4 03357         LXD CS1,4
04356  0020 00 4 00001         TRA 1,4
04357  0074 00 4 02312   C1    TSX $SAVE,4
04360 -3 03362 0 02377         TXL     $END2,,CS2+2  SAVE 2 ITEMS
04361 -0534 00 4 04377         LXD CT1,4             L
04362  0500 00 4 00000         CLA 0,4               CWR(L)
04363  0601 00 0 03360         STO CS2
04364 -0320 00 0 00460         ANA DECM              CDR(L)
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04365  0074 00 4 04345         TSX COPY,4            COPY(CDR(L))
04366  0534 00 4 03360         LXA CS2,4             CAR(L)
04367  0601 00 0 03360         STO CS2               COPY(CDR(L))
04370 -0754 00 4 00000         PXD 0,4
04371  0074 00 4 04345         TSX COPY,4            COPY(CAR(L))
04372  0560 00 0 03360         LDQ CS2
04373  0074 00 4 03730         TSX $CONS,4
04374  0074 00 4 02326         TSX UNSAVE,4
04375 -0534 00 4 03357         LXD CS1,4
04376  0020 00 4 00001         TRA 1,4
04377  0 00000 0 00000   CT1
                00460   DECM  SYN     $DMASK

                              FUNCTION SEARCH
                              SEARCH(L,P,F,U)=(L=0 YIELDS U,P(L) YIELDS F(L),
                                  OTHERWISE SEARCH (CDR(L),P,F,U))

                      R       HED
04400 -0634 00 4 03454  SEARCH SXD     SRS1,4
04401  0074 00 4 02312         TSX $SAVE,4
04402 -3 03462 0 02371         TXL     $END5,,SRS5+2 SAVE 5 ITEMS
04403 -0600 00 0 03456         STQ SRS3              P
04404  0100 00 0 04445   SR3   TZE     SR4
04405  0601 00 0 03455         STO SRS2              L
04406  0560 00 0 03321         LDQ $ARG3             F
04407 -0600 00 0 03457         STQ SRS4
04410  0560 00 0 03322         LDQ $ARG4             U
04411 -0600 00 0 03460         STQ SRS5
04412 -0534 00 4 03456         LXD SRS3,4
04413  3 00012 4 04416         TXH *+3,4,10
04414  0074 00 4 03456         TSX SRS3,4
04415  0020 00 0 04421         TRA *+4
04416 -0634 00 4 04420         SXD *+2,4
04417  0074 00 4 12007         TSX COMPAT,4
04420  0 00000 0 00001             1,,**
04421  0100 00 0 04435         TZE SR1               NOT P(L)
04422  0500 00 0 03455         CLA SRS2              L
04423 -0534 00 4 03457         LXD SRS4,4
04424  3 00012 4 04427         TXH *+3,4,10
04425  0074 00 4 03457         TSX SRS4,4
04426  0020 00 0 04432         TRA *+4
04427 -0634 00 4 04431         SXD *+2,4
04430  0074 00 4 12007         TSX COMPAT,4
04431  0 00000 0 00001             1,,**
04432  0074 00 4 02326         TSX UNSAVE,4
04433 -0534 00 4 03454         LXD SRS1,4
04434  0020 00 4 00001         TRA 1,4
04435  0500 00 0 03460   SR1   CLA SRS5              I YIELDS
04436  0601 00 0 03322         STO $ARG4             U
04437  0500 00 0 03457         CLA SRS4
04440  0601 00 0 03321         STO $ARG3             F
04441 -0534 00 4 03455         LXD SRS2,4            L
04442  0500 00 4 00000         CLA 0,4
04443 -0320 00 0 00460         ANA DECM              CDR(L)
04444  0020 00 0 04404         TRA     SR3
04445  0074 00 4 02326   SR4   TSX     UNSAVE,4
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04446 -0534 00 4 03322          LXD $ARG4,4
04447  3 00012 4 04452          TXH     SRCMPT,4,10
04450 -0534 00 4 03454          LXD     SRS1,4
04451  0020 00 0 03322          TRA     $ARG4
                         *
04452  0600 00 0 03321  SRCMPT  STZ     $ARG3
04453  0560 00 0 03321          LDQ     $ARG3
04454  0074 00 4 03730          TSX     $CONS,4
04455  0131 00 0 00000          XCA
04456  0500 00 0 03322          CLA     $ARG4
04457 -0534 00 4 03454          LXD     SRS1,4
04460  0020 00 0 14663          TRA     $APPLY

                                     FUNCTION EQUAL
                                     EQUAL(L1,L2)=(L1=L2 YIELDS1,L1=OVL2=0 YIELDS 0,
                                     CAR(L1)=-1VCAR(L2)=-1 YIELDS 0, OTHERWISE
                                         EQUAL(CAR(L1,(CARL2))AEQUAL(CDR(L1),CDR(L2)))

                         L       HED
                         * EQUAL         A FUNCTION OF 2 ARGUMENTS DETERMINES WETHER 2 LIST
                         *               STRUCTURES ARE EQUIVELENT. REPROGRAMMED 5 OCTOBER 1960
                         *               TO MAKE USE OF THE NUMBER CONVENTIONS CURRENTLY IN USE.
                         *
04461 -0634 00 4 04600   EQUAL  SXD     EQXR,4              SAVE LINK IR
04462 -0600 00 0 04602          STQ     EQL2                SAVE ARGUMENT 2
04463  0601 00 0 04601          STO     EQL1                SAVE ARGUMENT 1
04464  0402 00 0 04602   EQLP   SUB     EQL2                EQ TEST
04465  0100 00 0 04516          TZE     EQT                 TWO LIST ARE EQ. EXIT TRUE
04466 -0520 00 0 04601          NZT     EQL1                SKIP IF L1 NON NULL
04467  0020 00 0 04521          TRA     EQF                 L1 NULL BUT NOT EQ L2, EXIT FALSE
04470 -0520 00 0 04602          NZT     EQL2                NULL TEST L2
04471  0020 00 0 04521          TRA     EQF                 L2 NULL BUT NOT EQ  L1, EXIT FALSE
04472 -0534 00 4 04602          LXD     EQL2,4              PICK UP LIST 2
04473  0500 00 4 00000          CLA     0,4                 GET NEXT ELEMENT
04474  0622 00 0 04602          STD     EQL2                SAVE CDR OF LIST 2
04475  0734 00 4 00000          PAX     0,4                 CAR OF LIST 2
04476  3 77776 4 04524          TXH     EQA,4,-2            GO IF ATOM
04477 -0754 00 4 00000          PXD     0,4                 CAR OF LIST TO DECREMENT OF AC
04500  0131 00 0 00000          XCA                         SWITCH TO MQ
04501 -0534 00 4 04601          LXD     EQL1,4              PICK UP LIST 1
04502  0500 00 4 00000          CLA     0,4                 GET NEXT ELEMENT
04503  0622 00 0 04601          STD     EQL1                SAVE CDR OF LIST 1
04504  0734 00 4 00000          PAX     0,4                 CAR OF LIST TO IR 4
04505  3 77776 4 04521          TXH     EQF,4,-2            GO TO FALSE EXIT IF THIS IS AN ATOM
04506 -0754 00 4 00000          PXD     0,4                 CAR OF LIST TO DECREMENT OF AC
04507  0074 00 4 02312          TSX     $SAVE,4             SAVE CALL
04510 -3 04604 0 02375          TXL     $END3,,EQL2+2       SAVE 3 ITEMS
04511  0074 00 4 04461          TSX     $EQUAL,4            TEST FOR EQUALITY IN CAR DIRECTION
04512  0074 00 4 02326          TSX     UNSAVE,4            UNSAVE CALL
04513  0100 00 0 04521          TZE     EQF                 WHOLE LIST IS FALSE IF CAR DIRECTION F
04514  0500 00 0 04601          CLA     EQL1                PICK UP REST OF LIST 1
04515  0020 00 0 04464          TRA     EQLP                TEST EQUALITY IN CDR DIRECTION
                         *
04516  0500 00 0 00442  EQT    CLA     $QD1                TRUE EXIT, PICK UP 1 IN DECREMENT
04517 -0534 00 4 04600          LXD     EQXR,4              RESTORE LINK IR
04520  0020 00 4 00001          TRA     1,4
```

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                        *
04521 -0754 00 0 00000   EQF   PXD     0,0               FALSE EXIT, CLEAR AC
04522 -0534 00 4 04600         LXD     EQXR,4            RESTORE LINK IR
04523  0020 00 4 00001         TRA     1,4
                        *
04524  0560 00 0 04601  EQA    LDQ     EQL1
04525 -0774 00 4 04527         AXC     EQAR,4
04526  0634 00 4 04574         SXA     EQPX,4
04527  0020 00 0 04542  EQAR   TRA     EQPE
04530  0100 00 0 04521         TZE     EQF
04531  0020 00 0 04516         TRA     EQT
                        *
                        *       EQP TESTS FOR EQ BETWEEN LISTS AND NUMERICAL EQUALITY BETWEEN
                        *       NUMBERS.   USES A TOLERENCE  IN TESTIONG FLOATION PT NUMBERS
                        *
04532  0040 00 0 04537  EQP    TLQ     EQPF
04533  0131 00 0 00000         XCA
04534  0040 00 0 04537         TLQ     EQPF
04535  0500 00 0 00442  EQPTX  CLA     $QD1
04536  0020 00 4 00001         TRA     1,4
04537  0634 00 4 04574  EQPF   SXA     EQPX,4
04540 -0734 00 4 00000         PDX     0,4
04541  0500 00 4 00000         CLA     0,4
04542 -0734 00 4 00000  EQPE   PDX     0,4
04543 -0320 00 0 00470         ANA     TAGMSK
04544  0100 00 0 04573         TZE     EQPFX
04545  0601 00 0 04576         STO     EQPT
04546  0500 00 4 00000         CLA     0,4
04547  0131 00 0 00000         XCA
04550 -0734 00 4 00000         PDX     0,4
04551  0500 00 4 00000         CLA     0,4
04552 -0734 00 4 00000         PDX     0,4
04553 -0320 00 0 00470         ANA     TAGMSK
04554 -0320 00 0 04576         ANA     EQPT
04555  0100 00 0 04573         TZE     EQPFX
04556 -0320 00 0 00436         ANA     $QT1
04557  0601 00 0 04576         STO     EQPT
04560  0500 00 4 00000         CLA     0,4
04561  0601 00 0 04577         STO     EQPS
04562  0131 00 0 00000         XCA
04563  0402 00 0 04577         SUB     EQPS
04564  0534 00 4 04574         LXA     EQPX,4
04565  0100 00 0 04535         TZE     EQPTX
04566  0520 00 0 04576         ZET     EQPT
04567  0020 00 0 04573         TRA     EQPFX
04570  0760 00 0 00003         SSP
04571  0402 00 0 14623         SUB     FLOTOL
04572 -0120 00 0 04535         TMI     EQPTX
04573 -0754 00 0 00000  EQPFX  PXD     0,0
04574  0774 00 4 00000  EQPX   AXT     **,4
04575  0020 00 4 00001         TRA     1,4
04576  0 00000 0 00000  EQPT                            TEST CELL NON 0 YIELDS FIX
04577  0 00000 0 00000  EQPS                            STORAGE
04600  0 00000 0 10241   EQXR          $F8               INDEX REGISTER STORAGE
04601  0 00000 0 00000   EQL1                            LIST 1 STORAGE
04602  0 00000 0 00000   EQL2                            LIST 2 STORAGE
```

```
04603  0 00000 0 00000   EQTS                          TEST CELL  0 FIX, NON 0 FLO
                         *
                         *  EQUAL USES $SAVE,$QD1,UNSAVE,$EQUAL AND FIXFLO

                                   PRINT                 MAY 14,1959


                                   PRINT(L)=(CAR(L)=-1 YIELDS PRIN1(L),1 YIELDS
                                   (PRIN2(LPAR2),PRINT(CAR(L)),(CDR(L)=0YIELDS
                                   PRIN2(RPAR2),1 YIELDS(PRIN2(COMMA2),PRINT
                                   (CDR(L))))))

                                   THE LIST L IS PRINTED IN THE RESTRICTED NOTATION

                                   PRINT REQUIRES THE SUBROUTINES PRIN1,PRIN2,
                                   TERPRI,MISPH2(OR UASPH2) ALL HEADED BY P
                                   AND SAVE,UNSAVE,ERROR UNHEADED

                         T      HED

                                   PRINT MASTERMINDER

04604  0634 00 4 04614  PRINT  SXA     PRPS1,4            SAVE LINK IR
04605 -0534 00 4 02317          LXD     $CPPI,4            SAVE CURRENT CONTENTS OF CPPI
04606 -0634 00 4 05307          SXD     PCPPI,4
04607  0600 00 0 05310          STZ     WALLPC             ZERO WALL PAPER COUNTER
04610  0601 00 0 03453          STO     PRINTL         SAVE THE ARGUMENT
04611  0074 00 4 04620          TSX PRIN0,4
04612  0074 00 4 05214   PRTT1  TSX TERPRI,4
04613  0500 00 0 03453          CLA     PRINTL         RESTORE THE ARGUMENT
04614  0774 00 4 00000   PRPS1  AXT     **,4               RESTORE LINK IR
04615  0020 00 4 00001          TRA     1,4
04616  0500 00 0 04673   PRNIL  CLA     PRBLW              PICK UP NIL REPRESENTATION
04617  0020 00 0 05110          TRA     $PRIN2         PUT IN PRINT LINE AND EXIT
04620 -0634 00 4 04674   PRIN0  SXD PS1,4
04621  0100 00 0 04616          TZE     PRNIL              PRINT THE NULL LIST
04622 -0734 00 4 00000          PDX 0,4
04623 -0634 00 4 04702          SXD L1,4
04624  0500 00 4 00000          CLA 0,4
04625  0601 00 0 04701          STO CWRL
04626  0734 00 4 00000          PAX 0,4
04627 -3 77776 4 04633          TXL     XA1,4,-2
04630  0500 00 0 04702          CLA L1
04631 -0534 00 4 04674          LXD PS1,4
04632  0020 00 0 04703          TRA $PRIN1
04633  0500 00 0 04677  XA1    CLA     LPAR2
04634  0074 00 4 05110          TSX $PRIN2,4
04635  0500 00 0 04701          CLA CWRL
04636  0074 00 4 02312          TSX $SAVE,4
04637 -3 04677 0 02377          TXL     $END2,,PS2+2       SAVE 2 ITEMS
04640  0622 00 0 04675   A3     STD     PS2                SAVE LIST
04641  0734 00 4 00000          PAX     0,4                CAR TO IR 4
04642 -3 00000 4 04667          TXL PRP2,4,0
04643 -0754 00 4 00000          PXD 0,4
04644  0074 00 4 04620          TSX PRIN0,4
04645 -0534 00 4 04675   A4     LXD PS2,4
```

```
04646 -3 00000 4 04656          TXL     A6,4,0              EXIT IF NULL
04647  0500 00 4 00000          CLA     0,4                 TEST FOR ATOM
04650  0734 00 4 00000          PAX     0,4
04651 -3 77776 4 04662          TXL     A2,4,-2             GO TO A2 IF NOT AN ATOM
04652  0500 00 0 04672          CLA     DOT                 OTHERWISE PRINT IN DOT NOTATION
04653  0074 00 4 05110          TSX     $PRIN2,4            PUT IN PRINT LINE
04654  0500 00 0 04675          CLA     PS2                 CDR OF LIST
04655  0074 00 4 04703          TSX     $PRIN1,4            PRINT AS ATOM
04656  0074 00 4 02326   A6     TSX     UNSAVE,4
04657  0500 00 0 04676          CLA RPAR2
04660 -0534 00 4 04674          LXD PS1,4
04661  0020 00 0 05110          TRA $PRIN2
04662  0500 00 0 04700   A2     CLA COMM2
04663  0074 00 4 05110          TSX $PRIN2,4
04664 -0534 00 4 04675          LXD PS2,4
04665  0500 00 4 00000          CLA 0,4
04666  0020 00 0 04640          TRA A3

04667  0500 00 0 04673   PRP2   CLA PRBLW
04670  0074 00 4 05110          TSX $PRIN2,4
04671  0020 00 0 04645          TRA A4
04672 -203360777777       DOT   OCT     603360777777        .
04673 -053143777777       PRBLW OCT     453143777777        NIL
04674  0 00000 0 07320    PS1            $F4
04675  0 00000 0 00000    PS2
04676 +347777777777       RPAR2 OCT 347777777777
04677 -347777777777       LPAR2 OCT 747777777777
04700 -207777777777       COMM2 OCT 607777777777            BLANK    INSTEAD OF A COMMA
04701  0 00000 0 00000    CWRL
04702  0 00000 0 00000    L1


                          T      HED


                                        SUBROUTINE(PRIN1(L))
                                 /      CAR(L)   N=-1 YIELDS ERROR
                                        ST = L
                                 A1     CDR(L) = 0 YIELDS ERROR
                                        L = CDR(L)
                                        CAR(L) = PNAME YIELDS GO(A3)
                                        CAR(L) N= FLOAT YIELDS GO(A1)
                                        L = CAR(CDR(L))
                                        VAL = FLONAM(L)
                                        REPLACD(CONS(PNAME,CONS(VAL,CDR(ST))),ST)
                                        L = CDR(ST)
                                 A3     L= CAR(CDR(L))
                                 A2     PRIN2(CWR(CAR(L))
                                        L = CDR(L)
                                                    L=0 YIELDS RETURN
                                 */     GO(A2)

04703 -0634 00 4 05072   PRIN1 SXD PR1,4
04704  0601 00 0 05071          STO PRSS                    SAVE OBJECT
04705 -0734 00 4 00000          PDX ,4
04706  0500 00 4 00000          CLA ,4
```

```
04707  0625 00 0 05103         STT     PTTGR
04710 -0320 00 0 00457         ANA ADDM
04711  0402 00 0 00457         SUB ADDM
04712  0100 00 0 04720         TZE PR3                 CAR(L) N=-1 YIELDS ERROR
04713 -0634 00 4 01562   PR2   SXD $ERROR,4
04714  0074 00 4 05214         TSX TERPRI,4
04715 -0754 00 0 00000         PXD     0,0
04716  0074 00 4 01563         TSX $ERROR+1,4
04717  544760600154            BCI     1,*P  1*        TRIED TO PRINT NON-OBJECT -PRIN1-
               00457   ADDM    SYN     $AMASK
04720  0520 00 0 05103  PR3    ZET     PTTGR
04721  0020 00 0 04733         TRA     PR3N
04722  0500 00 4 00000         CLA     0,4             FIRST WORD OF ATOM
04723  0020 00 0 04726         TRA     *+3
04724 -3 07334 4 04726  PR3P   TXL     *+2,4,$PNAME-1
04725 -3 07335 4 04750         TXL     PA3,4,$PNAME
04726 -0734 00 4 00000         PDX     0,4             CDR
04727 -3 00000 4 05056         TXL     PR5,4,0         UNPRINTABLE
04730  0500 00 4 00000         CLA     0,4             NEXT WORD
04731  0734 00 4 00000         PAX     0,4
04732  0020 00 0 04724         TRA     PR3P            EXAMINE WORD
04733 -0534 00 4 05071  PR3N   LXD     PRSS,4
04734  0500 00 4 00000         CLA     0,4
04735 -0734 00 4 00000         PDX     0,4
04736  0634 00 4 05102         SXA     PTPNT,4
04737  0500 00 0 05103         CLA     PTTGR
04740 -0320 00 0 00437         ANA     $QT2
04741 -0100 00 0 04764         TNZ     PR4F
04742  0500 00 0 05103         CLA     PTTGR
04743 -0320 00 0 00440         ANA     $QT4
04744 -0100 00 0 04767         TNZ     LUCY
04745 -0754 00 4 00000         PXD     0,4
04746  0074 00 4 04115         TSX     NUMNAM,4
04747  0020 00 0 04762         TRA     PR4E
                       *
04750 -0734 00 4 00000   PA3   PDX     0,4             FOUND A PNAME
04751  0500 00 4 00000         CLA     0,4
04752  0734 00 4 00000         PAX     0,4             POINTER TO PRINT LIST
04753  0500 00 4 00000   PR4   CLA     0,4             POINTRE TO PRINT LIST
04754  0622 00 0 05073         STD     L               SAVE REST OF LIST IF ANY
04755  0734 00 4 00000         PAX     0,4             POINTER TO FIRST FULL FULL WORD
04756  0500 00 4 00000         CLA     0,4             FULL WORD
04757  0074 00 4 05110         TSX     $PRIN2,4        PRINT IT
04760 -0534 00 4 05073         LXD     L,4             PICK UP REST OF LIST
04761  3 00000 4 04753         TXH     PR4,4,0         PRINT MORE IF MORE
04762 -0534 00 4 05072   PR4E  LXD     PR1,4           EXIT BY RESTORING LINK IR
04763  0020 00 4 00001         TRA     1,4             EXIT
04764 -0754 00 4 00000  PR4F   PXD     0,4
04765  0074 00 4 05500         TSX     FLONAM,4
04766  0020 00 0 04762         TRA     PR4E
                       *
                       *       PRINT THE NUMBER OCTALLY
04767  0534 00 2 05102   LUCY  LXA     PTPNT,2         GET POINTER TO NUMBER
04770  0560 00 2 00000         LDQ     0,2
04771  0162 00 0 04776         TQP     BETTY           TEST FOR NEGATIVE NUMBER
04772  0500 00 0 05100         CLA     MISGN           IF SO, PRINT -
```

```
04773  0074 00 4 05110         TSX     $PRIN2,4
04774  0500 00 2 00000         CLA     0,2                REMOVE MINUS SIGN
04775 -0130 00 0 00000         XCL
04776 -0520 00 2 00000   BETTY NZT     0,2                TEST IF NUMBER ALL ZEROS
04777  0020 00 0 05053         TRA     MARIE
                        *       LOOK FOR NON-ZERO DIGIT ON LEFT
05000 -0754 00 0 00000         PXD     ,0
05001  0774 00 2 00014         AXT     12,2               IR2 COUNTS ZEROS ON RIGHT
05002 -0763 00 0 00003         LGL     3
05003  1 77777 2 05004         TXI     *+1,2,-1           COUNT VACATED POSITIONS
05004  0100 00 0 05002         TZE     *-2
                        *       A NON-ZERO DIGIT HAS APPEARED ON THE LEFT
05005 -0501 00 0 00414         ORA     $Q64               PUT IN OVERFLOW FLIPPER
05006  0140 00 0 05007         TOV     *+1                SHUT OFF OVERFLOW LIGHT
05007 -0600 00 0 05074   GRETA STQ     TONI               TEST IF ALL DIGITS ARE SPREAD
05010  0162 00 0 05012         TQP     *+2                TEST FOR NON-ZERO SIGN BIT
05011  1 77777 2 05015         TXI     FIFI,2,-1          SOME DIGITS NOT SPREAD, SO CONTINUE
05012 -0520 00 0 05074         NZT     TONI
05013  0020 00 0 05032         TRA     DEBBY              TRA IF ALL NON-ZERO DIGITS SPREAD
05014  1 77777 2 05015         TXI     *+1,2,-1
05015  0767 00 0 00003   FIFI  ALS     3                  SPREAD ONE DIGIT
05016 -0763 00 0 00003         LGL     3
05017 -0140 00 0 05007         TNO     GRETA              SEE IF FULL WORD OF DIGITS
05020 -0600 00 0 05074         STQ     TONI               PRIT THE WORD
05021  0074 00 4 05110         TSX     $PRIN2,4
05022  0500 00 0 00371         CLA     $Q1                PUT IN OVERFLOW FILPPER
05023  0560 00 0 05074         LDQ     TONI
05024  0140 00 0 05025         TOV     *+1                SHUT OFF OVERFLOW LIGHT
05025  0162 00 0 05027         TQP     *+2                TEST FOR NON-ZERO SIGN BIT
05026  1 77777 2 05015         TXI     FIFI,2,-1
05027  0520 00 0 05074         ZET     TONI               SEE IF ALL DIGIS SPREAD
05030  1 77777 2 05015         TXI     FIFI,2,-1
05031  0020 00 0 05036         TRA     VICKI
                        *       FORM WORD FOR PRINTING
05032  0560 00 0 00471   DEBBY LDQ     SEVENS             PUT 77S IN RIGHT END OF WORD
05033 -0763 00 0 00006         LGL     6                    OVERFLOW SIGNALS LEFT END OF WORD
05034 -0140 00 0 05033         TNO     *-1
05035  0074 00 4 05110         TSX     $PRIN2,4
                        *       PRINT Q AND SCALE FACTOR IF ANY
05036  3 00000 2 05041   VICKI TXH     MICKY,2,0          CONTINUE IF 0 SCALE FACTOR
05037  0500 00 0 05101         CLA     BCIQ
05040  0020 00 0 05054         TRA     PATSY
05041 -3 00011 2 05046   MICKY TXL     SANDY,2,9          TRA IF SCALE FACTOR LESS THAN 10
                        *       OCTAL SCALE FACTOR MORE THAN 10
05042 -0754 00 2 00000         PXD     ,2
05043  0400 00 0 05075         ADD     BQ10               FORM SCALE FACTOR FOR PRINTING
05044 -0760 00 0 00003         SSM
05045  0020 00 0 05054         TRA     PATSY
                        *       OCTAL SCALE FACTOR LESS THAN 10
05046 -0754 00 2 00000   SANDY PXD     ,2
05047  0767 00 0 00006         ALS     6
05050  0400 00 0 05076         ADD     BQ0
05051 -0760 00 0 00003         SSM
05052  0020 00 0 05054         TRA     PATSY
05053  0500 00 0 05077   MARIE CLA     BCI0Q              PRINT Q0
05054  0074 00 4 05110   PATSY TSX     $PRIN2,4
```

```
05055  0020 00 0 04762         TRA     PR4E

                               GENERATE A PRINT NAME FOR AN OBJECT WITHOUT ONE.

                               THE PRINT NAME IS OF THE FORM LDDDDD WHERE THE D,S ARE THE
                               OCTAL DIGITS OF THE 2,S COMPLMENT OF THE FIRST WORD OF
                                THE PROPERTY LIST OF THE OBJECT.

05056 -0535 00 4 05071  PR5     LDC     PRSS,4
05057 -0754 00 4 00000          PXD     0,4
05060  0131 00 0 00000          XCA
05061  0074 00 4 11021          TSX     OCTALP,4
05062 -0501 00 0 05070          ORA     PRC1
05063 -0760 00 0 00003          SSM                     FIX SIGN TO AGREE WITH P BIT FOR PRIN2
05064 -0760 00 0 00001          PBT
05065  0760 00 0 00002          CHS
05066 -0534 00 4 05072          LXD     PR1,4           RESTORE LINK IR
05067  0020 00 0 05110          TRA     $PRIN2          PUT IN PRINT LINE AND EXIT

05070  430000000000      PRC1  BCI     1,L00000        L SYMBOL
05071  0 00000 0 00000  PRSS                           STORAGE FOR POINTER TO OBJECT
05072  0 00000 0 00000   PR1
05073  0 00000 0 00000   L
05074                    TONI  BSS     1
05075 +100066777777      BQ10  OCT     100066777777    USED TO FORM BCI Q1N
05076 +100077777777      BQ0   OCT     100077777777    USED TO FORM BCI QN
05077 +005077777777      BCI0Q OCT     005077777777    BCI 0Q
05100 -007777777777      MISGN OCT     407777777777    BCI -
05101 -107777777777      BCIQ  OCT     507777777777
05102                    PTPNT BSS     1
05103  0 00000 0 00000  PTTGR                          TEST CELL FOR NUMBER FLAGS

                               PRIN2    PRINTS UP TO 6 CHARACTERS IN ONE WORD WHEN THE
                               CHARACTERS ARE JUSTIFIED TO THE LEFT AND FOLLOWED BY THE
                               ILLEGAL CHARACTER WHOSE OCTAL FORM IS 77


05104 -0634 00 4 05255  PRINT2 SXD PR9,4
05105 -0734 00 4 00000         PDX 0,4                  BRING BCD WORD TO AC
05106  0500 00 4 00000         CLA 0,4
05107  0020 00 0 05112         TRA     *+3
05110  3 00000 0 05341  PRIN2  TXH     $PUN2,,0        SWITCH TO PUNCH OUT ROUTINE
05111 -0634 00 4 05255         SXD     PR9,4
05112 -0634 00 2 05254         SXD PR8,2
05113 -0634 00 1 05253         SXD PR7,1
05114 -0534 00 4 05256         LXD WORDS,4              ROOM LEFT IN OUTPUT RECORD
05115 -3 00000 4 05245         TXL INIT,4,0             CAN BE ZERO ONLY IF ROUTINE NOTUSED
05116  0774 00 1 00001  COMB4 AXT 1,1
05117  0601 00 0 05262         STO TEMP
05120 -0500 00 0 05262         CAL TEMP
05121 -0340 00 0 00471         LAS SEVENS               WORD OF ALL 77-S CAUSES NO ACTION
05122  0020 00 0 05124         TRA *+2
05123  0020 00 0 05155         TRA NOJOB
05124 -0320 00 0 05260  SHIFL ANA RCHM    IS THE RIGHT CHARACTER 77
05125  0402 00 0 05260         SUB RCHM
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05126 -0100 00 0 05133         TNZ JUST                  NOT 77
05127 -0500 00 0 05262         CAL TEMP
05130  0771 00 0 00006         ARS 6
05131  0602 00 0 05262         SLW TEMP
05132  1 00001 1 05124         TXI SHIFL,1,1
05133 -0500 00 0 05262   JUST  CAL TEMP
05134  0020 00 1 05143         TRA LSHIF+1,1
05135  0767 00 0 00006         ALS 6
05136  0767 00 0 00006         ALS 6
05137  0767 00 0 00006         ALS 6
05140  0767 00 0 00006         ALS 6
05141  0767 00 0 00006         ALS 6
05142  0602 00 0 05262   LSHIF SLW TEMP
05143  0560 00 0 05262         LDQ TEMP
05144 -0500 00 0 05261         CAL PART
05145 -0534 00 2 05257         LXD PARTS,2
05146 -0763 00 0 00006   COMB  LGL 6
05147  0602 00 0 05261         SLW PART
05150 -2 00001 2 05162         TNX WFULL,2,1
05151  1 00001 1 05152   COMB5 TXI *+1,1,1
05152 -3 00006 1 05146         TXL COMB,1,6
05153 -0634 00 2 05257   COMB1 SXD PARTS,2
05154 -0634 00 4 05256         SXD WORDS,4
05155 -0534 00 1 05253   NOJOB LXD PR7,1
05156 -0534 00 2 05254         LXD PR8,2
05157 -0534 00 4 05255         LXD PR9,4
05160 -0754 00 0 00000         PXD 0,0
05161  0020 00 4 00001         TRA 1,4
05162  0602 00 4 05307   WFULL SLW REC,4
05163 -2 00001 4 05166         TNX RECFL,4,1
05164  0774 00 2 00006   COMB3 AXT 6,2
05165  0020 00 0 05151         TRA COMB5                 /
05166 -0600 00 0 05262   RECFL STQ TEMP
05167  0500 00 0 05310         CLA     WALLPC            GET MAX NUMBER OF LINES PER LIST
05170  0400 00 0 00371         ADD     $Q1
05171  0340 00 0 05311         CAS     BRKOUT            COMPARE WITH MAX NUMBER
05172  0020 00 0 05174         TRA     *+2               NO, GO ON
05173  0020 00 0 05207         TRA     PRTB              = BREAKOUT
05174  0601 00 0 05310         STO     WALLPC            PUT AWAY
05175  0074 00 4 01222         TSX OUTPUT,4
05176  0 00000 0 00364  PRINTD     BCDOUT
05177  0 00024 0 05263             REC-20,,20
05200  0560 00 0 05262         LDQ TEMP
05201 -0534 00 4 00447         LXD QD20,4
05202 -0500 00 0 00472         CAL BLNKA
05203  0602 00 0 05261         SLW PART
05204 -0534 00 4 00447         LXD QD20,4
05205 -0534 00 2 00444         LXD QD5,2
05206  0020 00 0 05151         TRA COMB5
05207 -0534 00 4 05307   PRTB  LXD     PCPPI,4           PUSH DOWN COUNTER
05210 -0634 00 4 02317         SXD     $CPPI,4           RESTORE TO ENTRACE VALUE
05211 -0534 00 1 05253         LXD     PR7,1             RESTORE INDEX 1 AND 2
05212 -0534 00 2 05254         LXD     PR8,2
05213  0020 00 0 04612         TRA     PRTT1             BREAKOUT
05214 -0634 00 2 05254  TERPRI SXD PR8,2
05215 -0634 00 4 05255         SXD PR9,4
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05216 -0534 00 2 05257         LXD PARTS,2
05217 -0534 00 4 05256         LXD WORDS,4
05220 -0500 00 0 05261         CAL PART
05221  0560 00 0 00472         LDQ BLANK
05222 -0763 00 0 00006   TER1  LGL 6
05223  2 00001 2 05222         TIX TER1,2,1
05224  0602 00 4 05307   TER3  SLW REC,4
05225 -2 00001 4 05230         TNX TER2,4,1
05226 -0500 00 0 00472         CAL BLANK
05227  0020 00 0 05224         TRA TER3
05230  0074 00 4 01222   TER2  TSX OUTPUT,4
05231  0 00000 0 00364  PRINTC     BCDOUT
05232  0 00024 0 05263             REC-20,,20
05233 -0534 00 4 00447         LXD QD20,4
05234 -0634 00 4 05256         SXD WORDS,4
05235 -0534 00 2 00444         LXD QD5,2
05236 -0634 00 2 05257         SXD PARTS,2
05237 -0534 00 2 05254         LXD PR8,2
05240 -0534 00 4 05255         LXD PR9,4
05241  0500 00 0 00472         CLA BLNKA
05242  0601 00 0 05261         STO PART
05243 -0754 00 0 00000         PXD 0,0
05244  0020 00 4 00001         TRA 1,4
05245 -0534 00 4 00447   INIT  LXD QD20,4
05246  0560 00 0 00472         LDQ BLNKA
05247 -0600 00 0 05261         STQ PART
05250  0774 00 2 00005         AXT 5,2
05251 -0634 00 2 05257         SXD PARTS,2
05252  0020 00 0 05116         TRA COMB4
                        *
05253  0 00000 0 00000   PR7
05254  0 00000 0 00000   PR8
05255  0 00000 0 00000   PR9
05256  0 00000 0 00000   WORDS
05257  0 00000 0 00000   PARTS                          ROOM IN PARTIAL WORD
05260 +000000000077      RCHM  OCT 77
05261  0 00000 0 00000   PART
05262  0 00000 0 00000   TEMP
05307                    REC   BES 20
05307  0 00000 0 00000   PCPPI                          PUSHDOWN COUNTER STORAGE
05310  0 00000 0 00000  WALLPC                          NUMBER OF LINES IN THIS LIST SO FAR
05311 +000000000031     BRKOUT DEC     25              MAXIMUM NUMBER OF LINES IN ANY LIST
                 00444   QD5   SYN     $QD5
                 00447   QD20  SYN     $QD20
                 00472   BLANK SYN     BLANKS
                 00472   BLNKA SYN     BLANKS
                        *
                        * BCDAD1       A CONVERT TABLE FOR ADDING 1 TO A 6 DIGIT BCD NUMBER
                        *              USED BY LOADING BCD NUMBER INTO AC AND DOING
                        *      CVR     BCDAD1,,6
                        *
05312  0 00000 0 05312   ADT   PZE     ADT             0
05313  0 10000 0 05312  BCDAD1 PZE     ADT,,1*4096     1
05314  0 20000 0 05312         PZE     ADT,,2*4096
05315  0 30000 0 05312         PZE     ADT,,3*4096     3
05316  0 40000 0 05312         PZE     ADT,,4*4096     4
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05317  0 50000 0 05312          PZE     ADT,,5*4096        5
05320  0 60000 0 05312          PZE     ADT,,6*4096        6
05321  0 70000 0 05312          PZE     ADT,,7*4096        7
05322  1 00000 0 05312          PON     ADT                8
05323  1 10000 0 05312          PON     ADT,,1*4096        9
05324  0 00000 0 05313          PZE     BCDAD1             10
                        *
                        * PUNCH         WRITES OUT A LIST ON TH SYSTEM PERFIAL PUNCH TAPE
                        *               (SYSPPT) IN A FORM SUTABLE FOR PUNCHING IN BCD.
                        *
05325  0634 00 4 05337   PUNCH SXA     PNCHX,4            SAVE LINK IR
05326 -0625 00 0 05461          STL     PUNACT             ACTVTE PUNCH ROUTINE
05327 -0734 00 4 00000          PDX     0,4                ARGUMENT TO IR 4
05330  0502 00 0 05110          CLS     $PRIN2             SE SWITCH TO
05331  0601 00 0 05110          STO     $PRIN2             GO TO PUNCH ROUTINE
05332 -0754 00 4 00000          PXD     0,4                ARGUMENT TO AC
05333  0601 00 0 03453          STO     PRINTL          SAVE THE ARGUMENT
05334  0074 00 4 04620          TSX     $PRIN0,4           USES PRINT ROUTINE
05335  0074 00 4 05421          TSX     TERPUN,4           TERMINATE PUNCHING
05336  0500 00 0 03453          CLA     PRINTL          RESTORE THE ARGUMENT
05337  0774 00 4 00000   PNCHX  AXT     **,4               RESTORE LINK IR
05340  0020 00 4 00001          TRA     1,4                EXIT
                        *
                        * PUN2          PUNCH EQUIVELENT OF PRIN 2
                        *
05341  0634 00 4 05364   PUN2   SXA     PNX,4              SAVE INDEX REGISTERS
05342  0634 00 2 05365          SXA     PNY,2
05343  0634 00 1 05366          SXA     PNZ,1
05344  0774 00 4 00014   PWRDS  AXT     12,4               NUMBER OF WORDS LEFT IN BUFFER
05345  0774 00 2 00006   PPRTS  AXT     6,2                CHARACTER POSITION
05346  0774 00 1 00006          AXT     6,1                MAXIMUM NUMBER OF CHARACTERS
05347  0131 00 0 00000          XCA                        ARGUMENT TO MQ
05350 -0754 00 0 00000   PLP    PXD     0,0                CLEAR AC
05351 -0763 00 0 00006          LGL     6                  CHARACTER TO MQ
05352  0340 00 0 05457          CAS     PSS                COMPARE WITH 77
05353  0761 00 0 00000          NOP                        GREATER, (IMPOSSIBLE)
05354  0020 00 0 05361          TRA     POUT               = , GO TO EXIT
05355  0522 00 2 05455          XEC     PCNT,2             LESS THAN, SHIFT CHARACTER
05356 -0602 00 4 05476          ORS     POUP,4             PUT IN OUTPUT LINE
05357 -2 00001 2 05370          TNX     PRPLP,2,1          GO IF LAST CHARACTER IN WORD
05360  2 00001 1 05350   PGRA   TIX     PLP,1,1            GET NEXT CHARACTER
05361  0634 00 2 05345   POUT   SXA     PPRTS,2            SAVE INDEX 2 N 4
05362  0634 00 4 05344          SXA     PWRDS,4
05363 -0754 00 0 00000          PXD     0,0                CLEAR AC
05364  0774 00 4 00000   PNX    AXT     **,4               RESTORE INDEX REGISTERS
05365  0774 00 2 00000   PNY    AXT     **,2
05366  0774 00 1 00000   PNZ    AXT     **,1
05367  0020 00 4 00001          TRA     1,4                EXIT
                        *
05370  0774 00 2 00006   PRPLP AXT     6,2                RELOAD CHARACTER COUNT
05371  2 00001 4 05360          TIX     PGRA,4,1           GO IF WORD COUNT NOT EXAUSTED
05372  0500 00 0 05455          CLA     PCNT               GET CARD NUMBER IN BCD
05373  0114 06 0 05313          CVR     BCDAD1,,6          ADD 1 IN BCD
05374  0601 00 0 05455          STO     PCNT
05375 -0600 00 0 05460          STQ     PNCQ               SAVE CONTENTS OF MQ
05376  0560 00 0 00370          LDQ     $ZERO              ZERO MQ
```

```
05377 -0765 00 0 00006         LGR     6                 SHIFT LOW ORDER DIGITS
05400  0361 00 0 05456         ACL     PLIS              ADD BCD NAME OF CARD
05401  0602 00 0 05476         SLW     POUP              PUT IN ID FIELD
05402 -0600 00 0 05477         STQ     POUP+1
05403  0074 00 4 01222         TSX     OUTPUT,4          GO TO OUTPUT
05404  0 00000 0 00363                 PPTOUT            PUNCH OUT TAPE
05405  0 00016 0 05462                 POUP-12,,14       14 WORDS OUT
05406 -0046 00 0 00000         PIA                       SAVE INDICATORS IN AC
05407  0441 00 0 10340         LDI     SYSIND            PICK UP SYSTEM INDICATORS
05410  0055 00  000040         SIR     PPTIND            SET PUNCH TAPE INDICATOR
05411  0604 00 0 10340         STI     SYSIND            UPDATE SYSTEM INDICATORS
05412  0044 00 0 00000         PAI                       RESTORE INDICATORS
05413  0774 00 4 00014         AXT     12,4              NUMBER OF WORDS FROM CC 1 TO 72
05414  0600 00 4 05476         STZ     POUP,4            ZERO OUTPUT BUFFER
05415  2 00001 4 05414         TIX     *-1,4,1
05416  0774 00 4 00014         AXT     12,4              RELOAD WORD COUNT
05417  0560 00 0 05460         LDQ     PNCQ              RESTORE CONTENTS OF MQ
05420  0020 00 0 05360         TRA     PGRA              CONTINUE WORK
                       *
                       * TERPUN       FILLS OUT BUFFER WITH BLANKS AND PUNCHES OUT LAST CARD
                       *              OPERATES ONLY IF PUNCH ROUTINE IS CURRENTLY ACTIVE
                       *
05421 -0520 00 0 05461  TERPUN NZT     PUNACT            SKIP IF PUNCH ROUTINE IS CURRENTLY ACT
05422  0020 00 4 00001         TRA     1,4               IMMEDIATE EXIT
05423  0600 00 0 05461         STZ     PUNACT            DE ACTIVATE THE PUNCH ROUTINE
05424  0634 00 4 05364         SXA     PNX,4             SAVE INDEX REGISTERS
05425  0634 00 2 05365         SXA     PNY,2
05426  0634 00 1 05366         SXA     PNZ,1
05427  0500 00 0 05110         CLA     $PRIN2
05430  0602 00 0 05110         SLW     $PRIN2            RESTORE PRIN2 SWITCH
05431  0534 00 4 05344         LXA     PWRDS,4           PICK UP WORD COUNT
05432  0534 00 2 05345         LXA     PPRTS,2           CHARACTER COUNT
05433  0774 00 1 00001         AXT     1,1               CONSTANT 1
05434  0560 00 0 00472         LDQ     BLANKS            BLANK MQ
05435 -0754 00 0 00000   TPLP  PXD     0,0               CLEAR AC
05436 -0763 00 0 00006         LGL     6                 1 INTO AC
05437  0522 00 2 05455         XEC     PCNT,2            SHIFT INTO POSITIN
05440 -0602 00 4 05476         ORS     POUP,4            PUT IN OUTPUT LINE
05441  2 00001 2 05435         TIX     TPLP,2,1          FILL OUT THIS WORD
05442 -2 00001 4 05370         TNX     PRPLP,4,1         GO IF LAST WORD IN BUFFER
05443  0500 00 0 00472         CLA     BLANKS            BLANK AC
05444  0601 00 4 05476         STO     POUP,4            BLANK REST OF BUFFER
05445  2 00001 4 05444         TIX     *-1,4,1
05446  0020 00 0 05370         TRA     PRPLP             GO PUNCH IT OUT
                       *               COSTANTS, STORAGE AND SHIFT TABLE
05447  0767 00 0 00036         ALS     30
05450  0767 00 0 00030         ALS     24
05451  0767 00 0 00022         ALS     18
05452  0767 00 0 00014         ALS     12
05453  0767 00 0 00006         ALS     6
05454  0761 00 0 00000         NOP
05455  0 00000 0 00000   PCNT  PZE                       BASE OF SHIFT TABLE AND CARD COUNT
05456  433162470000      PLIS  BCI     1,LISP00          CARD ID
05457 +000000000077      PSS   OCT     77                CHARACTER THAT TERMINATES A PNAME
05460  0 00000 0 00000   PNCQ
05461  0 00000 0 00000  PUNACT                           NON-ZERO IF PUNCH ROUTINE ACTIVE
```

```
05462                          BSS     12
05476 +000000000000      POUP  OCT     0,0               OUTPUT BUFFER
05477 +000000000000

                                   FLONAM                MAY 14,1559
                                       FORMS THE BCD LIST  FOR A FLOATING NUMBER IN THE ACC

                           T       HED
05500  0634 00 4 05666   FLONAM SXA     FLNX,4
05501 -0734 00 4 00000          PDX     0,4
05502  0500 00 4 00000          CLA     0,4
05503 -0100 00 0 05512          TNZ     FLNA
05504  0534 00 4 05666          LXA     FLNX,4
05505  0131 00 0 00000          XCA
05506  0500 00 0 05706          CLA     FLZPZ             0.0
05507  0162 00 0 05110          TQP     $PRIN2
05510  0402 00 0 05731          SUB     C0                -0,0
05511  0020 00 0 05110          TRA     $PRIN2
05512  0634 00 2 05667    FLNA  SXA     FLNY,2
05513  0634 00 1 05670          SXA     FLNZ,1
05514  0774 00 1 00001          AXT     1,1               SET UP BUFFER IRS
05515  0774 00 2 00044          AXT     36,2
05516  0600 00 0 05703          STZ     FLOPB-3
05517  0600 00 0 05704          STZ     FLOPB-2
05520  0600 00 0 05705          STZ     FLOPB-1
05521  0601 00 0 77667          STO     COMMON+5
05522  0131 00 0 00000          XCA
05523 -0754 00 0 00000          PXD     ,0                CLEAR ACC. AND SIGN.
05524  0765 00 0 00000    FL73  LRS     0                 SIGN TO MQ
05525  0763 00 0 00010          LLS     8                 CHARACTERSITIC.
05526  0402 00 0 00415          SUB     A128              128
05527 -0600 00 0 77662          STQ     COMMON            SAVE MANTISSA.
05530  0131 00 0 00000          XCA                       MULTIPLY BY
05531  0200 00 0 05720          MPY     LOG2              LOG BASE 10 OF 2.
05532  0601 00 0 77664          STO     COMMON+2
05533  0120 00 0 05542          TPL     FL75
05534  0402 00 0 05717    FL74  SUB     A1                1
05535  0601 00 0 77664          STO     COMMON+2
05536  0131 00 0 00000          XCA
05537  0760 00 0 00006          COM
05540  0760 00 0 00003          SSP
05541  0131 00 0 00000          XCA
05542  0200 00 0 05721    FL75  MPY     LOG10             LOG BASE 2 OF 10/4.
05543  0765 00 0 00041          LRS     33
05544  0621 00 0 05555          STA     FL76A
05545 -0600 00 0 77672          STQ     COMMON+8
05546  0774 00 4 00007          AXT     7,4
05547  0560 00 0 05722          LDQ     C7
05550  0200 00 0 77672    FL76  MPY     COMMON+8
05551  0400 00 4 05732          ADD     C0+1,4
05552  0131 00 0 00000          XCA
05553   2 00001 4 05550         TIX     FL76,4,1
05554  0200 00 0 77662          MPY     COMMON            MANTISSA.
05555  0774 00 4 00000    FL76A AXT     **,4
05556  0765 00 4 00042          LRS     34,4
05557  0100 00 0 05564          TZE     FL77
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05560  0221 00 0 05716         DVP     A1-1              10.
05561  0500 00 0 77664         CLA     COMMON+2
05562  0400 00 0 05717         ADD     A1                1.
05563  0601 00 0 77664         STO     COMMON+2
05564  0774 00 4 00010   FL77  AXT     8,4
05565 -0200 00 4 05717   FL78  MPR     A1,4              10 TO DEC. PLACES.
05566  0340 00 4 05717         CAS     A1,4
05567  0761 00 0 00000         NOP                       GREATER.
05570  0020 00 0 05572         TRA     FL79              EQUAL.
05571  0020 00 0 05576         TRA     FL80              LESS.
05572  0500 00 0 05717   FL79  CLA     A1                ROUDING CAUSED CARRY.
05573  0400 00 0 77664         ADD     COMMON+2
05574  0601 00 0 77664         STO     COMMON+2          EXP+1.
05575  0500 00 4 05720         CLA     A1+1,4            10 TO THE DEC. PL.-1.
05576  0601 00 0 77672   FL80  STO     COMMON+8
05577 -0754 00 0 00000         PXD     ,0
05600  0560 00 0 77664         LDQ     COMMON+2          ENTER DEC EXP.
05601  0221 00 0 05716         DVP     A1-1              10
05602 -0600 00 0 77671         STQ     COMMON+7
05603  0634 00 4 05621         SXA     FL82,4
05604  0074 00 4 05673         TSX     INBCD,4
05605 -0754 00 0 00000         PXD     ,0
05606  0560 00 0 77671         LDQ     COMMON+7
05607  0221 00 0 05716         DVP     A1-1
05610  0100 00 0 05612         TZE     *+2
05611  0074 00 4 05673         TSX     INBCD,4
05612  0500 00 0 77664         CLA     COMMON+2
05613  0100 00 0 05617         TZE     FL81
05614  0120 00 0 05617         TPL     FL81
05615  0500 00 0 00423         CLA     ONEMI             MINUS SIGN
05616  0074 00 4 05673         TSX     INBCD,4
05617  0500 00 0 00410   FL81  CLA     ONEE
05620  0074 00 4 05673         TSX     INBCD,4
05621  0774 00 4 00000   FL82  AXT     **,4
05622  0600 00 0 05702         STZ     FLZET
05623  0500 00 0 77672   FL65  CLA     COMMON+8
05624  0765 00 0 00043   FL67  LRS     35
05625  0221 00 0 05716         DVP     A1-1              10.
05626 -0600 00 0 77672         STQ     COMMON+8          FRACTIONAL PART.
05627 -0520 00 0 05702         NZT     FLZET
05630  0100 00 0 05635         TZE     FL01
05631 -0602 00 0 05702         ORS     FLZET
05632  0634 00 4 05634         SXA     *+2,4             SAVE IR4.
05633  0074 00 4 05673         TSX     INBCD,4           ENTER DIGIT.
05634  0774 00 4 00000         AXT     **,4              RESTORE.
05635  2 00001 4 05623   FL01  TIX     FL65,4,1
05636 -0754 00 0 00000         PXD     0,0
05637 -0520 00 0 05702         NZT     FLZET
05640  0074 00 4 05673         TSX     INBCD,4
05641  0500 00 0 00422         CLA     A33               DEC. POINT.
05642  0074 00 4 05673         TSX     INBCD,4           ENTER.
05643 -0754 00 0 00000         PXD     0,0
05644  0074 00 4 05673         TSX     INBCD,4
05645  0560 00 0 77667         LDQ     COMMON+5
05646 -0500 00 0 00427         CAL     ONEBL             BLANK
05647  0162 00 0 05651         TQP     FL70              FOR PLUS.
```

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05650 -0500 00 0 00423         CAL     ONEMI              NEGATIVE.
05651  0074 00 4 05673   FL70  TSX     INBCD,4            INSERT BLANK OR MINUS.
05652 -0754 00 2 00000         PXD     0,2
05653 -0737 00 2 00000         PDC     0,2
05654  0560 00 0 00471         LDQ     ONES                FILL OUT LAST WORD WITH 77S
05655 -0500 00 1 05706         CAL     FLOPB,1
05656 -0763 00 2 00000         LGL     0,2
05657 -0130 00 0 00000         XCL
05660  0131 00 0 00000         XCA
05661  0074 00 4 05110         TSX     $PRIN2,4
05662 -2 00001 1 05666         TNX     FLNX,1,1
05663  0500 00 1 05706         CLA     FLOPB,1
05664  0074 00 4 05110         TSX     $PRIN2,4
05665  2 00001 1 05663         TIX     *-2,1,1
05666  0774 00 4 00000   FLNX  AXT     **,4
05667  0774 00 2 00000   FLNY  AXT     **,2
05670  0774 00 1 00000   FLNZ  AXT     **,1
05671 -0754 00 0 00000         PXD     0,0
05672  0020 00 4 00001         TRA     1,4
                        *
05673 -0320 00 0 00413   INBCD ANA     A77
05674  0767 00 2 00044         ALS     36,2
05675 -0602 00 1 05706         ORS     FLOPB,1
05676  2 00006 2 05701         TIX     *+3,2,6
05677  1 00001 1 05700         TXI     *+1,1,1
05700  0774 00 2 00044         AXT     36,2
05701  0020 00 4 00001         TRA     1,4
                        *
05702  0 00000 0 00000   FLZET
05706                    FLOPB BES     3
05706  606060600000     FLZPZ  VFD     H24/ 0.0,012/7777
05707 +000575360400             DEC     100000000
05710 +000046113200             DEC     10000000
05711 +000003641100             DEC     1000000
05712 +000000303240             DEC     100000
05713 +000000023420             DEC     10000
05714 +000000001750      THSND  DEC     1000
05715 +000000000144             DEC     100
05716 +000000000012             DEC     10
05717 +000000000001      A1     DEC     1
05720 +115040465025      LOG2   OCT     115040465025       LOG BASE 10 OF 2.
05721 +324464741127      LOG10  OCT     324464741127       LOG BASE 2 OF 10-4.
05722 +000001601225      C7     OCT     1601225
05723 +000007762664      C6     OCT     7762664
05724 +000132240566      C5     OCT     132240566
05725 +001164125106      C4     OCT     1164125106
05726 +007066267024      C3     OCT     7066267024
05727 +036577252307      C2     OCT     36577252307
05730 +130562064437      C1     OCT     130562064437
05731  2 00000 0 00000   C0     TIX     0,0,0
                 00422   A33    SYN     $QO33
                 00413   A77    SYN     $Q63
                 00415   A128   SYN     $Q128
                 00420   ONEPL  SYN     $QO20
                 00410   ONEE   SYN     $QO25
                 00423   ONEMI  SYN     $QO40
```

```
                    00427   ONEBL SYN     $QO60
                    00471   ONES  SYN     SEVENS
                           *
                                 READ

                                   READ = SELECT(RD.,LPAR,READ1.,
                                                  LITER,INTERN.,
                                                  NUM,INTERN.,
                                                  RPAR,ERROR.,
                                                  1,ERROR)


                                 READ1

                                 READ1 = SELECT(RD.,RPAR,0.,
                                                LPAR,CONS(READ1,READ1).,
                                                LITER,CONS(INTERN,READ1).,
                                                NUMB,CONS(INTERN,READ1))

                                I      HED
05732  0634 00 4 05734   READ  SXA     REDS1,4           SAVE LINK IR
05733  0074 00 4 06026         TSX     $RD,4             GET FIRST ITEM
05734  0774 00 4 00000   REDS1 AXT     **,4              RSTORE LINK IR
05735  0340 00 0 06022   REDIS CAS     RLPAR             DISPATCH ON TYPE OF ITEM READ
05736  0020 00 0 05740         TRA     *+2
05737  0020 00 0 05757         TRA     READ1             WAS (
05740  0340 00 0 06023         CAS     RRPAR
05741  0020 00 0 05743         TRA     *+2
05742  0020 00 0 05747         TRA     REDER
05743  0340 00 0 06024         CAS     RDOT
05744  0020 00 4 00001         TRA     1,4
05745  0020 00 0 05747         TRA     REDER
05746  0020 00 4 00001         TRA     1,4
05747 -0634 00 4 01562   REDER SXD     $ERROR,4          MUST BE AN ERROR
05750  0601 00 0 03452         STO     RS2               SAVE TYPE
05751  0074 00 4 01222         TSX     OUTPUT,4          WRITE OUT INPUT BUFFER
05752  0 00000 0 00364                 BCDOUT
05753  0 00016 0 06351                 CELL-15,,14
05754  0500 00 0 03452         CLA     RS2               GET TYPE
05755  0074 00 4 01563         TSX     $ERROR+1,4        GOT O ERROR
05756  545160600154            BCI     1,*R  1*          CONTEXT ERROR
                           *
05757 -0634 00 4 03451   READ1 SXD     RS1,4             SAVE LINK IR
05760  0074 00 4 06026         TSX     $RD,4             GET NEXT ITEM
05761  0340 00 0 06023         CAS     RRPAR
05762  0020 00 0 05764         TRA     *+2
05763  0020 00 0 06003         TRA     RP1               WAS )  RETURN WITH NIL
05764  0074 00 4 02312         TSX     $SAVE,4
05765 -3 03454 0 02377         TXL     $END2,,RS2+2      SAVE 2 ITEMS
05766  0340 00 0 06024         CAS     RDOT
05767  0020 00 0 05771         TRA     *+2
05770  0020 00 0 06006         TRA     RP2               WAS .
05771  0340 00 0 06022         CAS     RLPAR
05772  0020 00 0 05774         TRA     *+2
05773  0074 00 4 05757         TSX     READ1,4
05774  0601 00 0 03452         STO     RS2               SAVE RESULTS
```

```
05775  0074 00 4 05757          TSX     READ1,4             GET NEXT ITEM
05776  0131 00 0 00000          XCA                         PUT IN MQ
05777  0500 00 0 03452          CLA     RS2                 FIRST ITEM
06000  0074 00 4 02326          TSX     UNSAVE,4
06001 -0534 00 4 03451          LXD     RS1,4               RESTORE LINK IR
06002  0020 00 0 03730          TRA     $CONS               CONSTRUCT A LIST
                         *
06003 -0754 00 0 00000   RP1     PXD     0,0                 WAS )  RETURN WITH NIL
06004 -0534 00 4 03451          LXD     RS1,4
06005  0020 00 4 00001          TRA     1,4
                         *
06006  0074 00 4 06026   RP2     TSX     $RD,4               WAS .  GET NEXT ITEM
06007  0074 00 4 05735          TSX     REDIS,4             DISPATCH ON IT
06010  0601 00 0 03452          STO     RS2                 SAVE RESULTS
06011  0074 00 4 06026          TSX     $RD,4               GET NEXT ITEM
06012  0340 00 0 06023          CAS     RRPAR               SHOULD BE )
06013  0020 00 0 05747          TRA     REDER               GO TO ERROR IF NOT
06014  0020 00 0 06016          TRA     *+2
06015  0020 00 0 05747          TRA     REDER
06016  0500 00 0 03452          CLA     RS2                 GET ITEM READ
06017  0074 00 4 02326          TSX     UNSAVE,4
06020 -0534 00 4 03451          LXD     RS1,4               RESTORE LINK IR
06021  0020 00 4 00001          TRA     1,4                 RETURN WITH IT
                         *
                  00505  RLTR    SYN     QUOTED              SYMBOL FLAG
                  00476   RNUMB  SYN     FLOATD              FLOAT (USED TO SIGNIFY ANY KIND NUMBER
                         *
                         I       HED

                                     RD(A)

                                     READS BCD LISTS FROM CARDS (SW 1 DOWN) OR TAPE 4 (SW1 UP)

06022  0 00531 0 00000   RLPAR           ,,$H74D
06023  0 00527 0 00000   RRPAR           ,,$H34D
06024  0 00526 0 00000   RDOT            ,,$H33D
06025                    RDVAL  BSS      0
06025  0 00000 0 00001  LRCIS           1                   CARD IMAGE EMPTY TEST CELL
06026  0500 00 0 06415  RD      CLA     RDLST
06027  0100 00 0 06032          TZE     RDAA                GO IF NOT
06030  0600 00 0 06415          STZ     RDLST               OTHERWISE ZERO
06031  0020 00 4 00001          TRA     1,4                 AND EXIT
06032  0634 00 4 06063   RDAA    SXA     RDX,4               SAVE INDEX REGISTERS
06033  0634 00 2 06070          SXA     RDY,2
06034  0634 00 1 06067          SXA     RDZ,1
06035  0604 00 0 06414          STI     RDIND               SAVE THE INDICATORS
06036  0441 00 0 00370          LDI     $ZERO
06037  0774 00 2 00006   RDPTS   AXT     6,2                 SET UP IR 2 AND 1
06040  0774 00 1 00014   RDWDS   AXT     12,1
06041  0074 00 4 06172   RDGC    TSX     GET,4               GET THE FIRST CHARACTER
06042  0734 00 4 00000          PAX     0,4                 TYPE TO INDEX REGISTER
06043  0020 00 4 06053          TRA     RDJT1,4             DISPATCH ON TYPE
06044  0020 00 0 06072          TRA     RDDLR               $
06045  0020 00 0 06122          TRA     RDLT
06046  0020 00 0 06123          TRA     RDNM                NUMBER
06047  0020 00 0 06041          TRA     RDGC                ,
```

```
06050  0020 00 0 06062         TRA     RDPU            (
06051  0020 00 0 06062         TRA     RDPU            )
06052  0020 00 0 06062         TRA     RDPU            .
06053  0074 00 4 01222   RDJT1 TSX     OUTPUT,4        ILLEGAL CHARACTER
06054  0 00000 0 00364                 BCDOUT
06055  0 00017 0 06353                 RDPB,,15
06056 -0754 00 0 00000         PXD     0,0             CLEAR AC
06057 -0634 00 4 01562         SXD     $ERROR,4        SAVE IR 4
06060  0074 00 4 01563         TSX     $ERROR+1,4      GO TO ERROR ROUTINE
06061  545160600354            BCI     1,*R  3*
06062  0500 00 4 06025  RDPU   CLA     RDVAL,4
06063  0774 00 4 00000   RDX   AXT     **,4
06064  0634 00 2 06037   RDFIN SXA     RDPTS,2         SAVE INDEX REGISTERS
06065  0634 00 1 06040         SXA     RDWDS,1
06066  0441 00 0 06414         LDI     RDIND           RESTORE INDICATORS
06067  0774 00 1 00000   RDZ   AXT     **,1            RESTORE INDEX REGISTERS
06070  0774 00 2 00000   RDY   AXT     **,2
06071  0020 00 4 00001         TRA     1,4             EXIT
                        *
06072  0055 00  000003   RDDLR SIR     3               SET FIRST CHARCTER AND LITERAL INDICAT
06073  0074 00 4 06172         TSX     GET,4           IS NEXT CHARACTER A $
06074  0734 00 4 00000         PAX     0,4             IF SO INDICATES A LITERAL STRING
06075  0500 00 0 06416         CLA     GTVAL           SET VALUE OF GET
06076  0601 00 0 06413         STO     RDDDC
06077  3 00006 4 06110         TXH     RDDD,4,6        GO IF A $
06100  0634 00 4 06106         SXA     RDT,4           NOT SO DO A REGULAR D
06101  0500 00 0 06412         CLA     RDDLS           $
06102  0601 00 0 06416         STO     GTVAL
06103  0074 00 4 06241         TSX     PUT,4           PUT IN OUTPUT BUFFER
06104  0500 00 0 06413         CLA     RDDDC           LAST VALUE OF GET
06105  0601 00 0 06416         STO     GTVAL
06106  0774 00 4 00000   RDT   AXT     **,4            TYPE OF LAST CHARACTER
06107  0020 00 4 06137         TRA     RDJT2,4         DISPATCH ON TYPE
                        *
06110  0074 00 4 06172   RDDD  TSX     GET,4           IS A LITERAL STRING
06111  0500 00 0 06416         CLA     GTVAL           USE THIS ITEM AS A DELIMITER
06112  0601 00 0 06413         STO     RDDDC
06113  0074 00 4 06172   RDDDL TSX     GET,4           GET NEXT CHARACTER
06114  0500 00 0 06413         CLA     RDDDC           GET DELIMITER
06115  0340 00 0 06416         CAS     GTVAL           COMAPRE WITH CHARACTER JUST READ
06116  0020 00 0 06120         TRA     *+2             NO
06117  0020 00 0 06142         TRA     RDXT            YES, EXIT
06120  0074 00 4 06241         TSX     PUT,4           NO, PUT AWAY THE CHARACTER
06121  0020 00 0 06113         TRA     RDDDL           GET NEXT CHARACTER
                        *
06122  0055 00  000002   RDLT  SIR     2               SET LITERAL INDICATOR
06123  0055 00  000001   RDNM  SIR     1               SET FIRST CHARACTER INDICATOR
06124  0074 00 4 06241   RDNN  TSX     PUT,4           PUT THE CHARACTER AWAY
06125  0074 00 4 06172         TSX     GET,4           GET NEXT CHARACTER
06126  0734 00 4 00000         PAX     0,4
06127  0020 00 4 06137         TRA     RDJT2,4         DISPATCH ON TYPE
06130  0020 00 0 06124         TRA     RDNN            $
06131  0020 00 0 06124         TRA     RDNN            LITERAL
06132  0020 00 0 06124         TRA     RDNN            NUMBER
06133  0020 00 0 06142         TRA     RDXT            ,
06134  0020 00 0 06140         TRA     RDPS            (
```

```
06135  0020 00 0 06140         TRA     RDPS            )
06136  0020 00 0 06164         TRA     RDPD            .
06137  0020 00 0 06053  RDJT2  TRA     RDJT1           ILLEGAL CHARACTER
                        *
06140  0500 00 4 06025  RDPS   CLA     RDVAL,4         SETUP RDLST CELL
06141  0601 00 0 06415         STO     RDLST
06142  0534 00 4 06246  RDXT   LXA     PUTMC,4         CHARACTER COUNT
06143 -0754 00 0 00000         PXD     0,0             CLEAR AC
06144  3 00005 4 06162         TXH     TPF,4,5         GO IF LAST WORD COMPLETED
06145  0560 00 0 00471         LDQ     SEVENS          GET 77 S
06146  0522 00 4 06327         XEC     PTSFT-1,4       PROPER SHIFT
06147  0774 00 4 00006         AXT     6,4             RESET CHARACTER COUNT
06150  0634 00 4 06246         SXA     PUTMC,4
06151  0534 00 4 06254         LXA     PUTPC,4         WORD COUNT
06152 -0602 00 4 06335         ORS     RDPNB,4         PUT IN PNAME BUFFER
06153 -0754 00 0 00000         PXD     0,0             CLEAR AC
06154  0622 00 4 06343  TPFA   STD     PUTVL+6,4       CHIP OFF PNMAE SAUSAGE
06155  0500 00 0 06335         CLA     PUTVL           GET VALUE
06156 -0774 00 4 06062         AXC     RDPU,4          SET UP TRASNFER TO EXIT
06157  0056 00  000002         RNT     2               TEST LITERAL INDICATOR
06160  0020 00 0 06543         TRA     $NUTRN          MAKE IT A NUMBER
06161  0020 00 0 06420         TRA     INTRN1          MAKE IT AN OBJECT
                        *
06162  0534 00 4 06254  TPF    LXA     PUTPC,4         CORRECT PART COUNT
06163  1 00001 4 06154         TXI     TPFA,4,1
                        *
06164  0054 00  000002  RDPD   RFT     2               TEST FOR LITERAL
06165  0020 00 0 06140         TRA     RDPS            FIRST . TERMONATES A LITERAL
06166  0054 00  000020         RFT     20              TEST FOR FIRST DOT IN A NUMBER
06167  0020 00 0 06140         TRA     RDPS            SECOND . TERMINATES A NUMBER
06170  0055 00  000020         SIR     20              SET DOT INDICATOR
06171  0020 00 0 06124         TRA     RDNN
                        *
06172  0634 00 4 06220  GET    SXA     GTX,4           SAVE LINK IR
06173  0520 00 0 06025         ZET     LRCIS           TEST FOR NEW CARD NEEDED
06174  0020 00 0 06227         TRA     GTGCD           GET A NEW CAERD
06175 -0754 00 0 00000  GETGO  PXD     0,0             CLEAR AC
06176  0560 00 1 06370         LDQ     CELL,1          GET NEXT WORD
06177 -0763 00 0 00003         LGL     3               HIGH ORDER BITS
06200  0734 00 4 00000         PAX     0,4
06201 -0763 00 0 00003         LGL     3               CHARACTER
06202  0340 00 0 00416         CAS     $QO14           IS IT ILLEGAL MINUS SIGN
06203  0020 00 0 06205         TRA     *+2             NO
06204  0500 00 0 00423         CLA     $QO40           YES GET LEGAL ONE
06205  0601 00 0 06416         STO     GTVAL           VALUE OF GET FOR PUT
06206 -0320 00 0 00377         ANA     $Q7             MASK OUT HIGH ORDER BIT
06207  0621 00 0 06213         STA     GTPT
06210 -0600 00 1 06370         STQ     CELL,1          UPDATE WORD
06211 -2 00001 2 06222         TNX     GTPC,2,1        UPDATE PART COUNT
06212  0560 00 4 06352  GTMC   LDQ     GTTBL,4         GET TABLE ENTRY
06213 -0763 00 0 00000  GTPT   LGL     **              SHIFT PROPER ITEM TO AC
06214  0522 00 0 06213         XEC     GTPT
06215  0522 00 0 06213         XEC     GTPT
06216 -0754 00 0 00000         PXD     0,0             CLEAR AC
06217 -0763 00 0 00003         LGL     3               TYPE NOW IN AC
06220  0774 00 4 00000  GTX    AXT     **,4            RESTORE LINK IR
```

```
06221  0020 00 4 00001         TRA     1,4
                       *
06222  0774 00 2 00006   GTPC  AXT     6,2             RELOAD PART COUNT
06223  2 00001 1 06212         TIX     GTMC,1,1        GO IF NEW WORD NOT NEEDED
06224 -0625 00 0 06025         STL     LRCIS           GET NEW CARD
06225  0774 00 1 00014         AXT     12,1            ERELOAD IR 1
06226  0020 00 0 06212         TRA     GTMC            GO BACJ
                       *
06227  0074 00 4 00663   GTGCD TSX     $INPUT,4
06230  0 00000 0 00000                 $BCDIN
06231  0 00034 0 06354                 LWPO,,28        GET NEXT BCD CARD
06232  0020 00 0 06234         TRA     *+2             IGNORE REDUNDNACY ERROR
06233  0020 00 0 06236         TRA     GTEOF           EOF RETURN
06234  0600 00 0 06025         STZ     LRCIS           SET SWITCH THAT CARD IS PRESENT
06235  0020 00 0 06175         TRA     GETGO           NO GO ON
                       *
06236 -0754 00 0 00000   GTEOF PXD     0,0             CLEAR AC
06237  0074 00 4 01562         TSX     $ERROR,4        GO TO ERROR
06240  545160600454            BCI     1,*R  4*        EOF ON READ IN
                       *
06241  0054 00  000040   PUT   RFT     40              TEST TO SEE IF TOOMUCH PNAME
06242  0020 00 0 06270         TRA     PTTFA           GO TO ERROR COMMENT
06243  0634 00 4 06256         SXA     PUTX,4          SAVE LINK IR
06244  0056 00  000010         RNT     10              TEST FOR FIRST TIME THRU
06245  0020 00 0 06276         TRA     PUTZB           ZERO PNAME BUFFER
06246  0774 00 4 00006   PUTMC AXT     6,4             CHARACTER COUNT
06247  0500 00 0 06416         CLA     GTVAL           GET CHARACTER
06250  0560 00 0 00370         LDQ     $ZERO
06251  0522 00 4 06330         XEC     PTSFT,4         PROPER SHIFT TO CHARACTER
06252 -2 00001 4 06260         TNX     PTRFP,4,1       DECREMENT CHARACTER COUNT
06253  0634 00 4 06246         SXA     PUTMC,4         UPDATE COUNT CELL
06254  0774 00 4 00005   PUTPC AXT     5,4             NUMBER OF WORDS IN PNAME
06255 -0602 00 4 06335   PUTGA ORS     RDPNB,4         PUT CHARACTER IN
06256  0774 00 4 00000   PUTX  AXT     **,4            RESTORE LINK IR
06257  0020 00 4 00001         TRA     1,4             EXIT
06260  0774 00 4 00006   PTRFP AXT     6,4             RELOAD PART COUNT
06261  0634 00 4 06246         SXA     PUTMC,4
06262  0534 00 4 06254         LXA     PUTPC,4         WORD COUNT
06263 -0602 00 4 06335         ORS     RDPNB,4
06264  2 00001 4 06266         TIX     *+2,4,1         DECREMENT WORD COUNT
06265  0055 00  000040         SIR     40              INDICATE PNAME BUFFER FULL
06266  0634 00 4 06254         SXA     PUTPC,4         UPDATE COUNTER
06267  0020 00 0 06256         TRA     PUTX            GO ON
                       *
06270  0074 00 4 01222   PTTFA TSX     OUTPUT,4        TOO MANY CHARACTER
06271  0 00000 0 00364                 BCDOUT          WRITE OUT PNAME SO FAR
06272  0 00006 0 06327                 RDPNB-6,,6
06273 -0754 00 0 00000         PXD     0,0             CLEAR AC
06274  0074 00 4 01562         TSX     $ERROR,4        GO TO ERROR
06275  545160600554            BCI     1,*R  5*
                       *
06276  0055 00  000010   PUTZB SIR     10              SET SWITCH
06277  0774 00 4 00005         AXT     5,4             FIX UP BUFFER
06300  0634 00 4 06254         SXA     PUTPC,4         AND PART COUNT
06301  0600 00 4 06335         STZ     RDPNB,4
06302  2 00001 4 06301         TIX     *-1,4,1
```

```
06303  0500 00 0 06335         CLA     PUTVL              RELINK THE WORDS
06304  0774 00 4 00005         AXT     5,4
06305  0402 00 0 00442         SUB     $QD1               SET POINTERS
06306  0622 00 4 06343         STD     PUTVL+6,4
06307  2 00001 4 06305         TIX     *-2,4,1
06310  0020 00 0 06246         TRA     PUTMC
                       *
06311 -0625 00 0 06025  TEREAD  STL     LRCIS              SET SWITCH TO GET A NEW CARD
06312  0500 00 0 00376         CLA     $Q6                SET CELLS
06313  0621 00 0 06037         STA     RDPTS
06314  0621 00 0 06246         STA     PUTMC
06315  0500 00 0 00403         CLA     $Q12
06316  0621 00 0 06040         STA     RDWDS
06317  0600 00 0 06415         STZ     RDLST
06320 -0754 00 0 00000         PXD     0,0                CLEAR AC
06321  0020 00 4 00001         TRA     1,4                EXIT
                       *
06322 -0763 00 0 00036         LGL     30
06323 -0763 00 0 00030         LGL     24
06324 -0763 00 0 00022         LGL     18
06325 -0763 00 0 00014         LGL     12
06326 -0763 00 0 00006         LGL     6
06327  0761 00 0 00000         NOP
06330                   PTSFT  BSS     0
06335                   RDPNB  BES     5
06335  0 71442 0 00000   PUTVL         ,,-*-1             VALUE OF RDA
06336  0 71441 0 71450                 -RDPNB+5,,-*-1     FOR INTERN OF NUTRN
06337  0 71440 0 71447                 -RDPNB+4,,-*-1
06340  0 71437 0 71446                 -RDPNB+3,,-*-1
06341  0 71436 0 71445                 -RDPNB+2,,-*-1
06342  0 00000 0 71444                 -RDPNB+1
06343 -260430000000            OCT     660430000000,466666660000,660760000000,566666660000
06344 -066666660000
06345 -260760000000
06346 -166666660000
06347 -260120000000            OCT     660120000000,566666660000,550650000000
06350 -166666660000
06351 -150650000000
06352 -155555550000      GTTBL OCT     555555550000
06353  006060606060      RDPB  BCI     1,0
06354  0 00000 0 00000   LWPO
06355  0 00000 0 00000   LWCKS
06370                    CELL  BES     10
06404                    LWDPB BES     12
06404                          BSS     6                  ROOM FOR ID AND LOOK AHEAD BITS
06412  000000000053      RDDLS BCI     1,00000$
06413  0 00000 0 00000   RDDDC
06414  0 00000 0 00000   RDIND                            INDICATOR STORAGE
06415  0 00000 0 00000  RDLST
06416  0 00000 0 00000  GTVAL
                       *
```

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                        I       HED
                        *
                        * INTERN       CHANGED AND MODIFIED TO INCLUDE EXTERNAL ENTRACES AND
                        *              THE BUCKET SORT
                        *
06417 -0600 00 0 06534  BUKSRT STQ     BSRT              ATOM TO BE PLACED (CNSFWL ENTRANCE)
06420  0601 00 0 06533  INTRN1 STO     $VALUE            EXTERNAL ENTRANCE FROM APPLY
06421  0634 00 4 06525  INTERN SXA     ITRX,4            ENTRANCE FROM READ
06422  0634 00 2 06526         SXA     ITRY,2            SAVE IR 2
06423 -0534 00 4 06533         LXD     $VALUE,4          PICK UP POINTER TO PNAME LIST
06424  0500 00 4 00000         CLA     0,4               GET FIRST WORD OF PNAME
06425  0734 00 4 00000         PAX     0,4
06426 -0500 00 4 00000         CAL     0,4               GET FIRST WORD IN LOGICAL AC
06427  0765 00 0 00043         LRS     35                PUT IN MQ AND BIT 35 OF AC
06430  0221 00 0 06535         DVP     BUCKNO            DIVIDE BY NUMBER OF BUCKETS
06431  0760 00 0 00012         DCT                       CHECK DIVISION
06432  0074 00 4 01676         TSX     $DCT,4            DIVIDE ERROR
06433  0734 00 4 00000         PAX     0,4               REMAIDNER TO IR 4
06434  0500 00 4 66427         CLA     BUCKET,4          PICK UP BUCKET
06435  0634 00 4 06522         SXA     BUCK,4            SAVE THE REMAINDER
06436  0734 00 4 00000         PAX     0,4
06437 -0634 00 4 06540         SXD     O5,4              SET UP WORD
06440  0520 00 0 06534         ZET     BSRT              TEST FOR CNSFWL ENTRANCE
06441  0020 00 0 06530         TRA     INTAD             YES, GO
06442 -0634 00 4 06536         SXD O1,4
06443 -0534 00 4 06536   O4    LXD O1,4                  NEXT OBJECT
06444 -3 00000 4 06504         TXL OUT,4,0               END OF OBJLIST
06445  0500 00 4 00000         CLA ,4
06446  0622 00 0 06536         STD O1
06447  0734 00 4 00000         PAX ,4                    OBJECT M/C NAME
06450 -0634 00 4 06537         SXD O2,4                  PRESERVE IT
06451  0500 00 4 00000         CLA ,4
06452 -0734 00 4 00000   O3    PDX ,4                    ADDRESS PART IS -1
06453 -3 00000 4 06443         TXL O4,4,0                END OF PROPERTY LIST
06454  0500 00 4 00000         CLA ,4
06455  0734 00 4 00000         PAX ,4
06456 -3 07334 4 06452         TXL O3,4,$PNAME-1         NO
06457  3 07335 4 06452         TXH O3,4,$PNAME           NO
06460 -0734 00 4 00000         PDX ,4                    YES IT IS
06461  0500 00 4 00000         CLA ,4
06462  0734 00 4 00000         PAX ,4                    U
06463 -0534 00 2 06533         LXD $VALUE,2              V
06464 -3 00000 2 06443   O7    TXL     O4,2,0
06465  0500 00 4 00000         CLA     0,4
06466  0622 00 0 06542         STD Q4                    CDR(U)
06467  0734 00 4 00000         PAX ,4                    CAR(U)
06470  0500 00 2 00000         CLA ,2
06471  0622 00 0 06541         STD Q2                    CDR(V)
06472  0734 00 2 00000         PAX ,2
06473  0500 00 4 00000         CLA ,4                     CWR(CAR(U))
06474  0402 00 2 00000         SUB ,2                    -CWR(CAR(V))
06475 -0100 00 0 06443         TNZ O4                    NOT THE SAME,NEXT OBJECT
06476 -0534 00 4 06542         LXD Q4,4                  CDR(U)
06477 -0534 00 2 06541         LXD Q2,2
06500  3 00000 4 06464         TXH O7,4,0                IF NOT YET END OF NAME
06501  3 00000 2 06443         TXH O4,2,0                IF U,V OF DIFFERENT LENGTH,NEXT
```

```
06502  0500 00 0 06537         CLA O2
06503  0020 00 0 06525         TRA     ITRX
06504  0500 00 0 06533   OUT   CLA $VALUE
06505  0074 00 4 07343         TSX $CP1,4
06506  0560 00 0 00370         LDQ     $ZERO
06507  0074 00 4 03730         TSX $CONS,4
06510  0131 00 0 00000         XCA
06511  0500 00 0 00504         CLA OPNA
06512  0074 00 4 03730         TSX $CONS,4
06513  0131 00 0 00000         XCA                             INTO MQ
06514  0500 00 0 00460         CLA     $DMASK                  ATOM SYMBOL
06515  0074 00 4 03730         TSX     $CONS,4                 MAKE IT AN ATOM
06516  0560 00 0 06540   INTCN LDQ     O5                      LIST OF ATOMS IN BUCKET
06517  0622 00 0 06540         STD     O5                      SAVE ATOM AS ANSWER
06520  0074 00 4 03730         TSX     $CONS,4                 ATTACH TO BEGINNING OF LIST
06521  0771 00 0 00022         ARS     18                      PUT IN ADDRESS
06522  0774 00 4 00000   BUCK  AXT     **,4                    BUCKET NUMBER
06523  0621 00 4 66427         STA     BUCKET,4                PUT IN PROPER BUCJET
06524  0500 00 0 06540         CLA     O5                      ATOM AS ANSWER
06525  0774 00 4 00000   ITRX  AXT     **,4                    RESTORE LINK IR
06526  0774 00 2 00000   ITRY  AXT     **,2
06527  0020 00 4 00001         TRA     1,4                     EXIT
06530  0500 00 0 06534   INTAD CLA     BSRT                    PICK UP ATOM
06531  0600 00 0 06534         STZ     BSRT                    ZERO LOCATION
06532  0020 00 0 06516         TRA     INTCN                   PLACE ATOM IN BICKET
06533  0 00000 0 00000   VALUE                                 POINTER TO PNAME LIST
06534  0 00000 0 00000   BSRT                                  ATOM IN CNSFWL WENTRANCE
06535  0 00000 0 00177  BUCKNO PZE     127                     NUMBER OF BUCKETS
                        *
06536  0 00000 0 00000   O1
06537  0 00000 0 00000   O2
06540  0 00000 0 00000   O5
                 00504   OPNA  SYN     PNAMED
06541  0 00000 0 00000   Q2
06542  0 00000 0 00000   Q4

                        T       HED
06543  0634 00 4 06617   NUTRN SXA     NX4,4                   SAVE IDNEX REGISVERS
06544  0634 00 2 06616         SXA     NX2,2
06545  0634 00 1 06615         SXA     NX1,1
06546  0774 00 1 00006         AXT 6,1
06547 -0534 00 4 06533         LXD $VALUE,4
06550  0500 00 4 00000   NA1   CLA 0,4
06551 -0734 00 4 00000         PDX 0,4
06552  0734 00 2 00000         PAX 0,2
06553  0500 00 2 00000         CLA 0,2
06554  0601 00 1 07333         STO BUFFER+6,1
06555 -3 00000 4 06566         TXL NA2,4,0
06556  2 00001 1 06550         TIX NA1,1,1
06557 -0634 00 4 01562   NE    SXD $ERROR,4
06560  0074 00 4 01222         TSX OUTPUT,4
06561  0 00000 0 00364             BCDOUT
06562  0 00016 0 06351             I$CELL-15,,14
06563 -0754 00 0 00000         PXD     0,0                     CLEAR AC
06564  0074 00 4 01563         TSX $ERROR+1,4
06565  545160600654            BCI     1,*R  6*                NUMBER TO LARGE IN CONVERSION
```

```
06566  0500 00 0 00472   NA2   CLA BLANKS
06567  0601 00 1 07334         STO BUFFER+7,1
06570  0500 00 0 06621         CLA     KBPOS              PARAMETER FOR NUMBR
06571  0074 00 4 06622         TSX     $NUMBR,4           NUMBER TO MQ
06572  0100 00 0 06557         TZE     NE                 OUT-OF-RANGE ERROR
06573 -0120 00 0 06612         TMI     NA7                TRA IF FLOATING NUMBER
06574 -0760 00 0 00001         PBT                        TEST FOR OCTAL NUMBER
06575  0020 00 0 06601         TRA     NA3                TRA IF OCTAL
06576  0500 00 0 00503         CLA     $OCTD              OCTAL SIGNAL FOR $MKNO
06577  0131 00 0 00000         XCA
06600  0020 00 0 06614         TRA     NA8
06601  0131 00 0 00000   NA3   XCA                        NUMBER TO AC
06602  0560 00 0 00475         LDQ     $FIXD              FIX TO MQ
06603 -0120 00 0 06614         TMI     NA8
06604  0340 00 0 00402         CAS     $Q10               TEST FOR 0 THRU 9
06605  0020 00 0 06614         TRA     NA8
06606  0020 00 0 06614         TRA     NA8
06607  0361 00 0 00521         ACL     $H00A              FORM PRINT OBJECT
06610  0767 00 0 00022         ALS     18
06611  0020 00 0 06615         TRA     NX1
06612  0500 00 0 00476   NA7   CLA     FLOATD             FLOAT SIGNAL FOR $MKNO
06613  0131 00 0 00000         XCA                        NUMBER TO AC
06614  0074 00 4 12636   NA8   TSX     $MKNO,4            MAKE A NUMBER
06615  0774 00 1 00000   NX1   AXT     **,1               RESTORE INDEX REGISTERS
06616  0774 00 2 00000   NX2   AXT     **,2
06617  0774 00 4 00000   NX4   AXT     **,4
06620  0020 00 4 00001         TRA     1,4
06621  0 00001 0 07325   KBPOS PZE     BUFFER,,1


                         F     HED

                             NUMBR CONVERTS PACKET BCD CHARACTERS TO A NUMBER WHICH
                             APPEARS IN MQ.   DBC CONVERSIONS ARE FOLLOWED.  OCTAL
                             NUMBERS ARE SIGNALLED BY Q AND MAY BE FOLLOWED BY A
                             SCALE FACTOR.

                             ROUTINE STOLEN FROM UADBC1


06622  0634 00 1 07155   NUMBR SXA PX1,1          SAVE INDEX REGISTERS
06623  0634 00 2 07156         SXA PX2,2
06624  0634 00 4 07157         SXA PX4,4
06625  0602 00 0 77665         SLW T
06626  0737 00 2 00000         PAC ,2             IR2 HAS WORD COUNT
06627 -0737 00 1 00000         PDC ,1             IR1 WILL GET CHARACTER COUNT
06630  0771 00 0 00021         ARS 17
06631  0601 00 0 77666         STO N
06632  0767 00 0 00001         ALS 1
06633  0400 00 0 77666         ADD N
06634  0737 00 4 00000         PAC ,4
06635  0560 00 2 00000         LDQ 0,2            PUT BCD WORD IN MQ
06636 -0763 00 4 77772         LGL -6,4           SHIFT OUT EXTRA CHARACTERS
06637 -0600 00 0 77662         STQ MQ             SAVE FIRST BATCH OF CHARACTERS
06640  1 00007 1 06641         TXI *+1,1,7
```

```
                                    LOOK AT CHARACTERS UNTIL A Q OR NON-OCTAL CHARACTER APPEARS.

06641 -0754 00 0 00000  CY3    PXD     ,0
06642 -0763 00 0 00006         LGL 6
06643  0402 00 0 00400         SUB Q8              TEST FOR OCTAL DIGIT
06644  0120 00 0 06651         TPL CY4
06645  2 00001 1 06641   CY2   TIX CY3,1,1        GET NEXT CHARACTER
06646  1 77777 2 06647         TXI *+1,2,-1
06647  0560 00 2 00000         LDQ 0,2
06650  1 00005 1 06641         TXI CY3,1,5
06651  0400 00 0 00400   CY4   ADD Q8
06652  0340 00 0 00426         CAS Q
06653  0020 00 0 06666         TRA DECNO
06654  0020 00 0 07170         TRA OCTNO           IF Q, NUMBER IS OCTAL
06655  0340 00 0 00423         CAS MINUS           IF CHARACTER IS MINUS, PLUS OR DASH,
06656  0020 00 0 06666         TRA DECNO             LOOK AT MORE CHARACTERS,
06657  0020 00 0 06645         TRA CY2               OTHERWISE NUMBER IS DECIMAL
06660  0340 00 0 00420         CAS PLUS
06661  0020 00 0 06666         TRA DECNO
06662  0020 00 0 06645         TRA CY2
06663  0340 00 0 00416         CAS DASH
06664  0020 00 0 06666         TRA DECNO
06665  0020 00 0 06645         TRA CY2

06666  0535 00 2 77665   DECNO LAC T,2             IR2 HAS WORD COUNT
06667 -0535 00 1 77665         LDC T,1             IR1 WILL GET CHARACTER COUNT
06670  0560 00 0 77662         LDQ MQ              RESTORE FIRST GRUOP OF CHARACTERS
06671 -0754 00 0 00000         PXD     ,0
06672  0602 00 0 77662   BN2   SLW BN              REGISTERS
06673  0602 00 0 77663   EX2   SLW EXPN
06674  0602 00 0 77666   INTN  SLW N
06675 -0534 00 4 00402         LXD Q10,4           SET DECIMAL COUNT TO ZERO
06676 -0500 00 0 06766         CAL SW1             RESET SWITCHES FOR
06677  0630 00 0 07033         STP CM2              FIXED POINT
06700  0630 00 0 07106         STP CM6              X
06701  0630 00 0 07011         STP EXS              EXP
06702  0630 00 0 07035         STP CM3              POINT
06703  0630 00 0 07020         STP CX3              DECIMAL NUMBER
06704 -0500 00 0 06674         CAL INTN            INITIALIZE CONVERSION
06705  1 00010 1 06720         TXI BN3,1,8         FIX INITIAL CHARACTER COUNT
06706  0502 00 0 07035   PT1   CLS CM3             INVERT SWITCH TO SIGNAL DECIMAL POINT
06707  0601 00 0 07035         STO CM3
06710 -0500 00 0 06743         CAL CV3
06711  0621 00 0 06760         STA CV5             ROUTINE TO COUNT
06712  0621 00 0 06763         STA CV6             DECIMAL PLACES
06713  1 00001 4 06760         TXI CV5,4,1
06714  1 77777 4 06743   PT3   TXI CV3,4,-1        COUNT DECIMAL PLACES
06715  0502 00 0 07011   EX1   CLS EXS             INVERT SWITCH TO SIGNAL EXPONENT
06716  0601 00 0 07011         STO EXS
06717 -0500 00 0 06673         CAL EX2             SET UP EXPONENT CONVERSION
06720  0621 00 0 06751   BN3   STA CV7             STORE CONVERSION
06721  0621 00 0 06753         STA CV8             ADDRESS
06722  0621 00 0 06757         STA CV9
06723 -0500 00 0 06714         CAL PT3             INITIAL CONVERSION
06724  0621 00 0 06760         STA CV5             WITHOUT DECIMAL COUNT
06725  0621 00 0 06763         STA CV6
```

```
      06726 -0500 00 0 06753   PL1   CAL CV8
      06727  0622 00 0 06755   MN3   STD CV10
      06730  0140 00 0 06760         TOV CV5
TD    06731 -3 00000 0 06760         TXL CV5
      06732  0500 00 0 07033   BN1   CLA CM2            INVERT SWITCHES TO SIGNAL FIXED POINT
      06733  0630 00 0 07033         STP CM2
      06734  0630 00 0 07106         STP CM6
      06735 -0500 00 0 06672         CAL BN2            SET UP B CONVERSION
TD    06736 -3 00000 0 06720         TXL BN3
      06737  0500 00 0 00455   MN1   CLA PBIT           START NEGATIVE ACCUMULATION WITH NEG. ZERO
      06740  0601 60 0 06751         STO* CV7
      06741 -0500 00 0 06742         CAL MN2            OP CODE TO MAKE CVIO A SUB INSTRUCTION
      06742 -3 40200 0 06727   MN2   TXL MN3,0,258*64
      06743 -0754 00 0 06714  CV3    PXD     PT3,0
      06744 -0763 00 0 00006         LGL 6
      06745  0340 00 0 00402         CAS TEN            TEST FOR DIGIT
TD    06746 -3 00000 0 06765         TXL CM
TD    06747 -3 00000 0 07007         TXL CV2
      06750  0602 00 0 77664         SLW CH             PERFORM CODED
      06751  0500 00 0 77666   CV7   CLA N              MULTIPLICATION
      06752  0767 00 0 00002         ALS 2              BY TEN AND ADD
      06753  0400 00 0 77666   CV8   ADD N
      06754  0767 00 0 00001         ALS 1
      06755  0400 00 0 77664   CV10  ADD CH
      06756  0140 00 0 06764         TOV OVF            TEST FOR OVERFLOW
      06757  0601 00 0 77666   CV9   STO N
      06760  2 00001 1 06743   CV5   TIX CV3,1,1        COUNT CHARACTERS
      06761  1 77777 2 06762         TXI CV4,2,-1       OBTAIN NEXT BCD
      06762  0560 00 2 00000   CV4   LDQ 0,2            WORD AND RESTORE
      06763  1 00005 1 06743   CV6   TXI CV3,1,5        CHARACTER COUNT
      06764  1 00001 4 06760   OVF   TXI CV5,4,1        COUNT DECIMAL OVERFLOWS
      06765  0340 00 0 00423   CM    CAS MINUS
TD    06766 -3 00000 0 07007   SW1   TXL CV2
TD    06767 -3 00000 0 06737         TXL MN1
      06770  0340 00 0 00422         CAS POINT
TD    06771 -3 00000 0 07007         TXL CV2
TD    06772 -3 00000 0 06706         TXL PT1
      06773  0340 00 0 00410         CAS E
TD    06774 -3 00000 0 07007         TXL CV2
TD    06775 -3 00000 0 06715         TXL EX1
      06776  0340 00 0 00421         CAS B
TD    06777 -3 00000 0 07007         TXL CV2
TD    07000 -3 00000 0 06732         TXL BN1
      07001  0340 00 0 00420         CAS PLUS
TD    07002 -3 00000 0 07007         TXL CV2
TD    07003 -3 00000 0 06726         TXL PL1
      07004  0340 00 0 00416         CAS DASH           DASH TREATED LINK MINUS
      07005  0020 00 0 07007         TRA CV2
      07006  0020 00 0 06737         TRA MN1
      07007  0500 00 0 77666   CV2   CLA N
      07010  0100 00 0 07161         TZE STZ            SEE IF ZERO FIXED OR FLOATING
TD    07011 -3 00000 0 07020   EXS   TXL CX3            SWITCH - TXH INDICATES EXPONENT
      07012 -0500 00 0 00455         CAL PBIT           PREPARE TRUE
      07013  0400 00 0 77663         ADD EXPN           DECIMAL EXPONENT
      07014  0767 00 0 00022         ALS 18
      07015  0622 00 0 07017         STD CM4
```

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      07016  0500 00 0 77666         CLA N
      07017  1 00000 4 07036  CM4    TXI     CM5,4,0
TD    07020 -3 00000 0 07033   CX3   TXL CM2            SWITCH - TXH INDICATE OCTAL
                                        SCALE OCTAL NUMBER
      07021  0500 00 0 77662         CLA BN             MULTIPLY SCALE FACTOR BY 3
      07022  0767 00 0 00001         ALS 1               FOR NUMBER OF SHFITS NEEDED
      07023  0400 00 0 77662         ADD BN
      07024  0621 00 0 07026         STA CX5
      07025  0500 00 0 77666         CLA N
      07026  0767 00 0 00000   CX5   ALS **
      07027 -0760 00 0 00001         PBT                ALLOW FOR P BIT
      07030  0020 00 0 07126         TRA ISTOR
      07031 -0760 00 0 00003         SSM
      07032  0020 00 0 07126         TRA ISTOR

TD    07033 -3 00000 0 07035   CM2   TXL CM3            SWITCH - INVERTED TO TXH INDICATES FIXED POINT
TD    07034 -3 00000 0 07036         TXL CM5
TD    07035 -3 00000 0 07126   CM3   TXL ISTOR          SWITCH - TXH INDICATES POINT
      07036  0621 00 0 07243   CM5   STA FL1            35 BIT INTEGER
      07037  0771 00 0 00017         ARS 15
      07040 -0501 00 0 07244         ORA FL2
      07041  0300 00 0 07244         FAD FL2
      07042  0120 00 0 07045         TPL CMF1
      07043  0302 00 0 07243         FSB FL1
TD    07044 -3 00000 0 07046         TXL CMF2
      07045  0300 00 0 07243   CMF1  FAD FL1
      07046 -0600 00 0 77670   CMF2  STQ RESID
      07047 -3 00000 4 07106         TXL     CM6,4,0
      07050  3 00046 4 07071   SW2   TXH CM7,4,38       TEST FOR NEGATIVE EXP
      07051  0634 00 4 07052         SXA *+1,4          COMPUTE ABSOLUTE VALUE OF EXPONENT
      07052 -0774 00 4 00000         AXC **,4
      07053  0601 00 0 77667         STO DATUM
      07054  0560 00 4 07244         LDQ ONE,4          COMPUTE FLOATING
      07055  0260 00 0 77667         FMP DATUM          BINARY REPRESENTATION
      07056  0601 00 0 77665         STO T              OF INTEGER TIMES THE
      07057 -0600 00 0 77666         STQ T+1            POWER OF TEN GIVEN
      07060  0560 00 4 07244         LDQ ONE,4          BY THE TRUE EXPONENT
      07061  0260 00 0 77670         FMP RESID
      07062  0300 00 0 77666         FAD T+1
      07063  0300 00 0 77665         FAD T
      07064  0361 00 0 07241         ACL EXC1
      07065 -0760 00 0 00001         PBT
TD    07066 -3 00000 0 07106         TXL CM6
      07067 -0754 00 0 00000  CM8    PXD     ,0
      07070  0020 00 0 07155         TRA PX1            NUMBER OUT OF RANGE, EXIT WITH 0 IN AC
      07071 -3 77717 4 07067   CM7   TXL CM8,4,-49      TEST FOR ILLEGAL EXP
      07072  0161 00 0 07073   CM13  TQO CM13+1
      07073  0241 00 4 07244         FDP ONE,4          COMPUTE FLOATING
      07074 -0600 00 0 77665         STQ T              BINARY EQUIVALENT
      07075  0300 00 0 77670         FAD RESID          OF INTEGER TIMES
      07076  0241 00 4 07244         FDP ONE,4          POWER OF TEN GIVEN
      07077  0161 00 0 07067         TQO CM8
      07100 -0600 00 0 77666         STQ T+1            BY TRUE EXPONENT
      07101  0500 00 0 77666         CLA T+1
      07102  0300 00 0 77665         FAD T
      07103  0361 00 0 07242         ACL EXC2
```

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      07104 -0760 00 0 00001         PBT
TD    07105 -3 00000 0 07067         TXL CM8
TD    07106 -3 00000 0 07131   CM6   TXL FSTOR          SWITCH - TXH INDICATES FIXED POINT
      07107  0601 00 0 77665         STO T
      07110  0767 00 0 00002         ALS 2
      07111 -0760 00 0 00003         SSM                DETERMINE SHIFT
      07112  0771 00 0 00035         ARS 29             NECESSARY TO POSITION
      07113  0400 00 0 00415         ADD Q128           NUMBER AS INDICATED
      07114  0400 00 0 77662         ADD BN             BY B
      07115  0120 00 0 07117         TPL SHIFT
      07116 -0100 00 0 07067         TNZ CM8
      07117  0621 00 0 07125   SHIFT STA CM12
      07120  0500 00 0 77665         CLA T              REMOVE CHARACTERISTICS
      07121  0763 00 0 00010         LLS 8              FROM FLOATING NUMBER
      07122  0767 00 0 00002         ALS 2
      07123  0771 00 0 00012         ARS 10
      07124  0763 00 0 00010         LLS 8
      07125  0765 00 0 00000  CM12   LRS     **
      07126  0131 00 0 00000   ISTOR XCA                 RESULT TO MQ
      07127 -0500 00 0 06766   ISTO1 CAL SW1            SET FIXED POINT INDICATOR SWITCH
      07130  0020 00 0 07133         TRA XT3
      07131  0131 00 0 00000   FSTOR XCA                 RESULT TO MQ
      07132  0500 00 0 06766         CLA SW1            SET FLOAT INDICATOR SWITCH
      07133  0630 00 0 07153   XT3   STP XT1
      07134  2 00001 1 07137         TIX XT2,1,1        IF NO SIGNIFICANT CHARACTERS
      07135  1 77777 2 07136         TXI *+1,2,-1        LEFT IN WORD, MOVE TO  NEXT WORD
      07136  0774 00 1 00006         AXT 6,1
      07137 -0754 00 1 00000   XT2   PXD ,1             SET POSITION INDICATORS
      07140  0402 00 0 00446         SUB QD7
      07141  0602 00 0 77665         SLW T
      07142 -0500 00 0 07020         CAL CX3                    P BIT IN OUTPUT INDICATES OCTAL
      07143 -0320 00 0 00455         ANA $SBIT
      07144 -0602 00 0 77665         ORS T
      07145  0760 00 0 00006         COM
      07146  0630 00 0 77665         STP T
      07147  0634 00 2 07150         SXA *+1,2
      07150 -0774 00 2 00000         AXC **,2
      07151  0754 00 2 00000         PXA ,2
      07152  0361 00 0 77665         ACL T
TD    07153 -3 00000 0 07155   XT1   TXL *+2            SET SIGN + FOR FIXED.
      07154 -0760 00 0 00003         SSM                 - FOR FLOATING
      07155  0774 00 1 00000   PX1   AXT ,1             RESTORE INDEX REGISTERS
      07156  0774 00 2 00000   PX2   AXT ,2
      07157  0774 00 4 00000   PX4   AXT ,4
      07160  0020 00 4 00001         TRA 1,4            EXIT

                                   WE GET HERE IF NUMBER IS ZERO.
                                   WE HERE DECIDE WHETHER WE ARE FACED WITH A FIXED OR FLOATING
                                    ZERO.

      07161  0560 00 0 07033   STZ   LDQ CM2                    TXH (+) IF B
      07162  0162 00 0 07126         TQP ISTOR
      07163  0560 00 0 07035         LDQ CM3                    TXH (+) IF DECIMAL POINT FOUND
      07164  0162 00 0 07131         TQP FSTOR
      07165  0560 00 0 07011         LDQ EXS                    TXH (+) IF E FOUND
      07166  0162 00 0 07131         TQP FSTOR
```

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      07167  0020 00 0 07126         TRA ISTOR

                                         PROCESS OCTAL NUMBER

      07170  0535 00 2 77665   OCTNO LAC T,2             IR2 HAS WORD COUNT
      07171 -0535 00 1 77665         LDC T,1             IR1 WILL GET CHARACTER COUNT
      07172  0560 00 0 77662         LDQ MQ              RESTORE FIRST GROUP OF CHARACTERS
      07173 -0754 00 0 00000         PXD     ,0
      07174  0621 00 0 06751         STA CV7             SET SIGNAL FOR OCTAL NUMBER
      07175  1 00010 1 07203         TXI OCT9,1,8        FIX CHARACTER COUNT
      07176 -0754 00 0 00000  OCT1   PXD     ,0
      07177 -0763 00 0 00003         LGL 3
      07200 -0100 00 0 07211         TNZ OCT8
      07201  0500 00 0 77666         CLA N
      07202 -0763 00 0 00003         LGL 3
      07203  0601 00 0 77666   OCT9  STO N               ALLOW FOR BOTH P BIT AND MINUS SIGN
      07204 -0602 00 0 77666         ORS N
      07205  2 00001 1 07176   OCT6  TIX OCT1,1,1
      07206  1 77777 2 07207         TXI OCT2,2,-1
      07207  0560 00 2 00000   OCT2  LDQ 0,2             NEW PACKED WORD
      07210  1 00005 1 07176         TXI OCT1,1,5
      07211 -0763 00 0 00003   OCT8  LGL 3
      07212  0340 00 0 00426         CAS Q               TEST FOR OCTAL SCALE FACTOR
      07213  0020 00 0 07226         TRA OCT3
      07214  0020 00 0 07232         TRA OCT10
      07215  0340 00 0 00423         CAS MINUS
TD    07216 -3 00000 0 07226         TXL OCT3
TD    07217 -3 00000 0 07230         TXL OCT5
      07220  0340 00 0 00420         CAS PLUS
TD    07221 -3 00000 0 07226         TXL OCT3
TD    07222 -3 00000 0 07205         TXL OCT6
      07223  0340 00 0 00416         CAS DASH            DASH TREATED LINK -
TD    07224 -3 00000 0 07226         TXL OCT3
TD    07225 -3 00000 0 07230         TXL OCT5
      07226  0560 00 0 77666   OCT3  LDQ N
TD    07227  1 00000 0 07127         TXI ISTO1
      07230  0500 00 0 00455   OCT5  CLA PBIT            SET NEGATIVE SIGN
TD    07231 -3 00000 0 07203         TXL OCT9
      07232  0500 00 0 07020   OCT10 CLA CX3             SET SWITCH FOR OCTAL SCALE FACTOR
      07233  0630 00 0 07020         STP CX3
      07234  0600 00 0 77662         STZ BN              CLEAR SCALE FACTOR CELL
      07235 -0500 00 0 06766         CAL SW1             SET EXPONENT SWITCH TO OFF
      07236  0630 00 0 07011         STP EXS
      07237 -0500 00 0 06672         CAL BN2             SET UP Q CONVERSION
      07240  0020 00 0 06720         TRA BN3



                     00400   Q8     SYN $Q8
                     00402   Q10    SYN $Q10
                     00415   Q128   SYN $Q128
                     00446   QD7    SYN $QD7
                     00455   PBIT   SYN $SBIT
                     00427   BLANK  SYN $QO60
                     00423   MINUS  SYN $QO40
                     00422   POINT  SYN $QO33
```

```
                00410   E     SYN $QO25
                00421   B     SYN $QO22
                00426   Q     SYN $QO50
                00420   PLUS  SYN $QO20
                00416   DASH  SYN $QO14
07241 +043000000000     EXC1  DEC 35B8          CHARACTERISTIC=35
07242 +335000000000     EXC2  DEC 221B8         CHAR.=COMPL. 35
07243 +233000000000     FL1   DEC 155B8
07244 +252000000000     FL2   DEC 170B8
07245 +141500000000           OCT 141500000000,144620000000,147764000000,153470400000
07246 +144620000000
07247 +147764000000
07250 +153470400000
07251 +156606500000           OCT 156606500000,161750220000,165461132000,170575360400
07252 +161750220000
07253 +165461132000
07254 +170575360400
07255 +173734654500           OCT 173734654500,177452013710,202564416672,205721522451
07256 +177452013710
07257 +202564416672
07260 +205721522451
07261 +211443023471           OCT 211443023471,214553630410,217706576512,223434157116
07262 +214553630410
07263 +217706576512
07264 +223434157116
07265 +226543212741           OCT 226543212741,231674055532,235425434430,240532743536
07266 +231674055532
07267 +235425434430
07270 +240532743536
07271 +243661534466           OCT 243661534466,247417031702,252522640262,255647410336
07272 +247417031702
07273 +252522640262
07274 +255647410336
07275 +261410545213           OCT 261410545213,264512676456,267635456171,273402374714
07276 +264512676456
07277 +267635456171
07300 +273402374714
07301 +276503074077           OCT 276503074077,301623713116,304770675742,310473426555
07302 +301623713116
07303 +304770675742
07304 +310473426555
07305 +313612334311           OCT 313612334311,316755023373,322464114135,325601137164
07306 +316755023373
07307 +322464114135
07310 +325601137164
07311 +330741367021           OCT 330741367021,334454732313,337570120775,342726145174
07312 +334454732313
07313 +337570120775
07314 +342726145174
07315 +346445677216           OCT 346445677216,351557257061,354713132676,360436770626
07316 +351557257061
07317 +354713132676
07320 +360436770626
07321 +363546566774           OCT 363546566774,366700324573,372430204755,375536246150
07322 +366700324573
07323 +372430204755
```

```
07324 +375536246150
                00402   TEN    SYN Q10
                07244   ONE    SYN FL2
07325                   REORG  BSS 0
                77662          ORG COMMON
77662                   BN     BSS 1
                77662   MQ     SYN BN
77663                   EXPN   BSS 1
77664                   CH     BSS 1
77665                   CHD    BSS 1
                77665   T      SYN CHD
77666                   N      BSS 1
77667                   DATUM  BSS 1
77670                   RESID  BSS 1
                07325          ORG REORG                  RESTORE ORIGIN
07325                  BUFFER  BSS 14


                        R      HED

                                   FUNCTION CP1
                                   CP1(L)=(L=0 YIELDS 0.
                                          OTHERWISE CONS(CONSW(CWR(CAR(L)))),CP1(CDR(L))))

                        C      HED
07343  0100 00 4 00001   CP1   TZE 1,4
07344 -0634 00 4 03361         SXD CR1,4
07345 -0734 00 4 00000         PDX ,4
07346  0500 00 4 00000         CLA ,4                     CWR(L)
07347  0601 00 0 03363         STO CWRL
07350  0734 00 4 00000         PAX ,4                     CAR(L)
07351  0500 00 4 00000         CLA ,4                     CWR(CAR(L))
07352  0074 00 4 03710         TSX $CONSW,4
07353  0074 00 4 02312         TSX $SAVE,4
07354 -3 03364 0 02377         TXL     $END2,,CR2+2       SAVE 2 ITEMS
07355  0601 00 0 03362         STO CR2
07356 -0534 00 4 03363         LXD CWRL,4                 CDR(L)
07357 -0754 00 4 00000         PXD ,4                     IN DEC
07360  0074 00 4 07343         TSX CP1,4
07361  0601 00 0 03363         STO CWRL
07362  0560 00 0 03363         LDQ CWRL                   C(MQ)=CP1(CDR(L))
07363  0500 00 0 03362         CLA CR2
07364  0074 00 4 02326         TSX UNSAVE,4
07365 -0534 00 4 03361         LXD CR1,4
07366  0020 00 0 03730         TRA $CONS

                                   SUBST

                                        SUBST(L,V,M) =
                                            (M = 0 YIELDS 0,
                                             EQUAL(M,V) YIELDS COPY(L),
                                                          CAR(M)=-1 YIELDS M
                                             1 YIELDS CONS(SUBST(L,V,CAR(M)),SUBSTL,V,CDR(M))))
```

```
                        R       HED
07367  0601 00 0 03475   SUBST STO     SX
07370 -0600 00 0 03476         STQ     SY
07371  0500 00 0 03321         CLA     $ARG3
07372 -0634 00 4 03473   SUB1  SXD     SXT,4
07373  0601 00 0 03477         STO     ST
07374  0560 00 0 03476         LDQ     SY
07375  0074 00 4 04461         TSX     $EQUAL,4
07376 -0100 00 0 07443         TNZ     SUB4
07377 -0534 00 4 03477         LXD     ST,4
07400  0500 00 4 00000         CLA     0,4
07401  0734 00 4 00000         PAX     0,4
07402  0500 00 0 03477         CLA     ST
07403  3 77776 4 07441         TXH     SUB2,4,-2
07404  0074 00 4 02312         TSX     $SAVE,4
07405 -3 03476 0 02377         TXL     $END2,,SZ+2
07406  0622 00 0 03474         STD     SZ
07407 -0734 00 4 00000         PDX     0,4
07410  0500 00 4 00000         CLA     0,4
07411 -0734 00 4 00000         PDX     0,4
07412  0634 00 4 03474         SXA     SZ,4
07413  0734 00 4 00000         PAX     0,4
07414 -0754 00 4 00000         PXD     0,4
07415  0074 00 4 07372         TSX     SUB1,4
07416  0534 00 4 03474         LXA     SZ,4
07417  0771 00 0 00022         ARS     18
07420  0621 00 0 03474         STA     SZ
07421 -0754 00 4 00000         PXD     0,4
07422  0074 00 4 07372         TSX     SUB1,4
07423 -0534 00 4 03474         LXD     SZ,4
07424  0622 00 0 03474         STD     SZ
07425  0500 00 4 00000         CLA     0,4
07426  0402 00 0 03474         SUB     SZ
07427  0100 00 0 07437         TZE     SUB3
07430 -0534 00 4 03751         LXD     $FREE,4
07431  3 00000 4 07433         TXH     *+2,4,0
07432  0074 00 4 04037         TSX     $FROUT,4
07433  0500 00 4 00000         CLA     0,4
07434  0622 00 0 03751         STD     $FREE
07435  0500 00 0 03474         CLA     SZ
07436  0601 00 4 00000         STO     0,4
07437 -0754 00 4 00000   SUB3  PXD     0,4
07440  0074 00 4 02326         TSX     UNSAVE,4
07441 -0534 00 4 03473   SUB2  LXD     SXT,4
07442  0020 00 4 00001         TRA     1,4
07443  0500 00 0 03475   SUB4  CLA     SX
07444  0020 00 0 07441         TRA     SUB2
                        B       HED

                                    FUNCTION SUBLIS

07445 -0600 00 0 03472  SUBLIS STQ E
07446 -0100 00 0 07451         TNZ SU1
07447  0500 00 0 03472         CLA E                          P=0
07450  0020 00 4 00001         TRA 1,4
07451  0601 00 0 03471   SU1   STO P
```

```
07452  0500 00 0 03472         CLA E
07453 -0100 00 0 07455         TNZ SU2
07454  0020 00 4 00001         TRA 1,4                      E=0
07455 -0634 00 4 03464   SU2   SXD X1,4
07456  0500 00 0 07465         CLA F                        U
07457  0601 00 0 03322         STO $ARG4                    U
07460  0500 00 0 07466         CLA F+1                      F
07461  0601 00 0 03321         STO $ARG3                    F
07462  0560 00 0 07467         LDQ F+2                      P
07463  0500 00 0 03471         CLA P
07464  0020 00 0 04400         TRA SEARCH
07465 -3 00000 0 07470   F     TXL NF,,0                    U
07466 -3 00000 0 07535         TXL NF1,,0                   F
07467 -3 00000 0 07520         TXL NF2,,0                   P
07470 -0534 00 4 03472   NF    LXD E,4                      U
07471  0500 00 4 00000         CLA ,4
07472  0734 00 4 00000         PAX ,4                       CAR(E)
07473 -3 77776 4 07477         TXL SU3,4,-2                 E IS NOT AN OBJECT
07474  0500 00 0 03472         CLA E
07475 -0534 00 4 03464         LXD X1,4
07476  0020 00 4 00001         TRA 1,4
07477  0074 00 4 02312   SU3   TSX $SAVE,4
07500 -3 03471 0 02373         TXL     $END4,,X4+2          SAVE 4 ITEMS
07501  0622 00 0 03465         STD X2
07502  0734 00 4 00000         PAX ,4
07503 -0634 00 4 03466         SXD X3,4                     CAR(E)
07504  0560 00 0 03465         LDQ X2
07505  0500 00 0 03471         CLA P
07506  0074 00 4 07445         TSX SUBLIS,4
07507  0601 00 0 03467         STO X4                       SUBLIS(P,CDR(E))
07510  0560 00 0 03466         LDQ X3
07511  0500 00 0 03471         CLA P
07512  0074 00 4 07445         TSX SUBLIS,4
07513  0560 00 0 03467         LDQ X4
07514  0074 00 4 03730         TSX $CONS,4
07515  0074 00 4 02326         TSX UNSAVE,4
07516 -0534 00 4 03464         LXD X1,4
07517  0020 00 4 00001         TRA 1,4
07520 -0634 00 4 07537   NF2   SXD N1,4                    EQUAL(E,CAAR(J))
07521 -0734 00 4 00000         PDX ,4                       J
07522  0500 00 4 00000         CLA ,4
07523  0734 00 4 00000         PAX ,4                       CAR(J)
07524  0500 00 4 00000         CLA ,4
07525  0622 00 0 03470         STD X5                       CDAR(J)
07526  0734 00 4 00000         PAX ,4
07527 -0634 00 4 07540         SXD N2,4
07530  0560 00 0 07540         LDQ N2                       CAAR(J) IN MQ
07531  0500 00 0 03472         CLA E
07532  0074 00 4 04461         TSX $EQUAL,4
07533 -0534 00 4 07537         LXD N1,4
07534  0020 00 4 00001         TRA 1,4
07535  0500 00 0 03470   NF1   CLA     X5
07536  0020 00 4 00001         TRA 1,4
07537  0 00000 0 00000   N1                                 IR4 OF P OF SEARCH
07540  0 00000 0 00000   N2
```

```
                                    APPEND(L1,L2)=
                                    (L1=0 YIELDS L2,1 YIELDS CONS(CAR(L1),APPEND(CDR(L1),L2))
                          A      HED
07541 -0100 00 0 07544  APPEND TNZ APNP1
07542  0131 00 0 00000        XCA
07543  0020 00 4 00001        TRA 1,4
07544 -0634 00 4 03346   APNP1 SXD AS1,4
07545  0074 00 4 02312        TSX $SAVE,4
07546 -3 03351 0 02377        TXL     $END2,,CWR1+2      SAVE 2 ITEMS
07547 -0734 00 4 00000        PDX 0,4
07550  0500 00 4 00000        CLA 0,4
07551  0601 00 0 03347        STO CWR1
07552 -0320 00 0 00460        ANA DECM
07553  0074 00 4 07541        TSX APPEND,4
07554  0131 00 0 00000        XCA
07555  0534 00 4 03347        LXA CWR1,4
07556 -0754 00 4 00000        PXD 0,4
07557  0074 00 4 02326        TSX UNSAVE,4
07560 -0534 00 4 03346        LXD AS1,4
07561  0020 00 0 03730        TRA $CONS
                 00460   DECM  SYN     $DMASK

                                    PAIR
                          *             RECODED TO MAKE LISTS IN DOT NOTATION

                          A      HED
07562  0634 00 4 07570   PAIR  SXA     PAIRX,4            SAVE LINK IR
07563 -0600 00 0 03441        STQ     LIS                ARG 2
07564  0560 00 0 07572        LDQ     FARG               PICK UP FUNCTIONAL ARGUMENT
07565  0074 00 4 04214        TSX     MAPLIS,4           LET MAPLIST DO THE CONSING
07566  0520 00 0 03441        ZET     LIS                TEST FOR ARG 2 GONE TO END
07567  0020 00 0 07612        TRA     PERF               DID NOT, GO TO ERROR
07570  0774 00 4 00000   PAIRX AXT     **,4               RESTORE LINK IR
07571  0020 00 4 00001        TRA     1,4                EXIT
                          *
07572 -3 00001 0 07573   FARG  TXL     *+1,,1             PAIR FUNCTIONAL ARGUMENT FOR MAPLIST
07573  0634 00 4 07610        SXA     FARGX,4            SAVE LINK IR
07574  0622 00 0 03440        STD     TEM                SAVE ARGUMENT
07575 -0534 00 4 03441        LXD     LIS,4              PICK UP 2ND ARG LIST
07576 -3 00000 4 07615        TXL     PERS,4,0           GO IF NO MORE 2ND ARG
07577  0500 00 4 00000        CLA     0,4                NEXT WORD
07600  0734 00 4 00000        PAX     0,4                CAR
07601  0622 00 0 03441        STD     LIS                SAVE CDR
07602 -0754 00 4 00000        PXD     0,4                CAR INTO DECREMENT
07603  0131 00 0 00000        XCA                        INTO MQ
07604 -0534 00 4 03440        LXD     TEM,4              LIST 1
07605  0500 00 4 00000        CLA     0,4                TAKE CAR OF LIST
07606  0734 00 4 00000        PAX     0,4
07607 -0754 00 4 00000        PXD     0,4
07610  0774 00 4 00000   FARGX AXT     **,4               RESTORE LINK IR
07611  0020 00 0 03730        TRA     $CONS
                          *             FIRST ARG LIST TOO SHORT ERROR
07612 -0634 00 4 01562   PERF  SXD     $ERROR,4           SAVE LINK IR
07613  0074 00 4 01563        TSX     $ERROR+1,4         GO TO ERROR
07614  542660600254           BCI     1,*F  2*           FIRST ARG$ LIST TOO SHORT
                          *             ERROR, SECOND ARG LIST TOO SHORT
```

```
07615 -0634 00 4 01562   PERS  SXD     $ERROR,4           SAVE LINK IR
07616  0074 00 4 01563         TSX     $ERROR+1,4         GO TO ERROR
07617  542660600354            BCI     1,*F  3*           SECOND ARG. LIST TOO SHORT
                       *
                       *
                       *

                                   MAPCAR(L,F) = (L=0 YIELDS 0,
                                                  F(L) YIELDS 0,
                                                  1 YIELDS MAPAR(CDR(L),F))

                       D       HED
07620  0100 00 4 00001  MAPCAR TZE 1,4
07621 -0634 00 4 03421         SXD RET,4
07622  0074 00 4 02312         TSX $SAVE,4
07623 -3 03425 0 02375         TXL     $END3,,F+2         SAVE 3 ITEMS
07624 -0600 00 0 03423         STQ F
07625  0601 00 0 03422   MCPR  STO L
07626 -0534 00 4 03423         LXD F,4
07627  3 00012 4 07632         TXH *+3,4,10
07630  0074 00 4 03423         TSX F,4
07631  0020 00 0 07635         TRA *+4
07632 -0634 00 4 07634         SXD *+2,4
07633  0074 00 4 12007         TSX COMPAT,4
07634  0 00000 0 00001             1,,**
07635 -0534 00 4 03422         LXD L,4
07636  0500 00 4 00000         CLA 0,4
07637 -0734 00 4 00000         PDX ,4
07640 -0754 00 4 00000         PXD ,4
07641 -0100 00 0 07625         TNZ     MCPR
07642  0074 00 4 02326   RTRN  TSX UNSAVE,4
07643 -0534 00 4 03421         LXD RET,4
07644  0020 00 4 00001         TRA 1,4
                                   MAPCON(L,F)=
                                   (L=0 YIELDS 0,,1 YIELDS NCONC(F(L),MAPCON(CDR(L),F)))
                       R       HED
07645  0100 00 4 00001  MAPCON TZE 1,4
07646 -0634 00 4 03424         SXD MCN5,4
07647  0074 00 4 02312         TSX $SAVE,4
07650 -3 03431 0 02373         TXL     $END4,,MCN2+2      SAVE 4 ITEMS
07651  0601 00 0 03426         STO MCN3
07652 -0600 00 0 03425         STQ MCN4
07653 -0534 00 4 03425         LXD MCN4,4
07654  3 00012 4 07657         TXH *+3,4,10
07655  0074 00 4 03425         TSX MCN4,4
07656  0020 00 0 07662         TRA *+4
07657 -0634 00 4 07661         SXD *+2,4
07660  0074 00 4 12007         TSX COMPAT,4
07661  0 00000 0 00001             1,,**
07662  0601 00 0 03427         STO MCN2
07663 -0534 00 4 03426         LXD MCN3,4
07664  0500 00 4 00000         CLA 0,4
07665 -0320 00 0 00460         ANA MCDM
07666  0560 00 0 03425         LDQ MCN4
07667  0074 00 4 07645         TSX MAPCON,4
07670  0131 00 0 00000         XCA
```

```
07671  0500 00 0 03427         CLA MCN2
07672  0074 00 4 02326         TSX UNSAVE,4
07673 -0534 00 4 03424         LXD MCN5,4
07674  0020 00 0 07675         TRA     $NCONC
                 00460   MCDM   SYN     $DMASK

                                FUNCTION NCONC
                                /    L1=0 YIELDS RETURN(L2)
                                     M=L1
                                A2   CDR(M)=0 YIELDS GO A1
                                     M=CDR(M)
                                     GO A2
                                A1   CDR(M)=L2
                                //   RETURN(L1)

                           R    HED
07675 -0100 00 0 07700    NCONC TNZ NCI1
07676  0131 00 0 00000          XCA
07677  0020 00 4 00001          TRA 1,4
07700  0634 00 4 07711    NCI1  SXA     NCS1,4              SAVE LINK IR
07701  0601 00 0 07713          STO NCS3
07702 -0734 00 4 00000     NCI2 PDX 0,4
07703  0500 00 4 00000          CLA 0,4
07704 -0320 00 0 00460          ANA NCDM
07705 -0100 00 0 07702          TNZ NCI2
07706  0131 00 0 00000          XCA
07707  0622 00 4 00000          STD 0,4
07710  0500 00 0 07713          CLA NCS3
07711  0774 00 4 00000    NCS1  AXT     **,4                RESTORE LINK IR
07712  0020 00 4 00001          TRA 1,4
                 00460    NCDM  SYN     $DMASK
07713  0 00000 0 00000    NCS3

                                REMPRP REMOVES THE PROPERTY GIVEN BY THE MQ FROM THE
                                OBJECT GIVEN BY THE AC
07714 -0634 00 4 07744   REMPRP SXD RMPRX,4
07715 -0600 00 0 03320          STQ $ARG2
07716 -0534 00 4 03320          LXD $ARG2,4
07717 -0634 00 4 07732          SXD RMPRT+1,4
07720  1 77777 4 07721          TXI *+1,4,-1
07721 -0634 00 4 07731          SXD RMPRT,4
07722 -0734 00 4 00000          PDX 0,4
07723  0020 00 0 07726          TRA RMPR2
07724  0500 00 0 03320    RMPR1 CLA $ARG2
07725  0601 00 0 03321          STO $ARG3
07726 -0634 00 4 03320    RMPR2 SXD $ARG2,4
07727  0500 00 4 00000          CLA 0,4
07730  0734 00 4 00000          PAX 0,4
07731 -3 00000 4 07733    RMPRT TXL *+2,4,**
07732 -3 00000 4 07737          TXL RMPRE,4,**
07733 -0734 00 4 00000          PDX 0,4
07734  3 00000 4 07724          TXH RMPR1,4,0
07735 -0534 00 4 07744    RMPRO LXD RMPRX,4
07736  0020 00 4 00001          TRA 1,4
07737 -0734 00 4 00000    RMPRE PDX 0,4
07740  0500 00 4 00000          CLA 0,4
07741 -0534 00 4 03321          LXD $ARG3,4
07742  0622 00 4 00000          STD 0,4
07743  0020 00 0 07726          TRA RMPR2
```

```
07744  0 00000 0 00000   RMPRX


                                 PRINAR

                                 USES WOT AND PRINT
                                 CALLING SEQ IS..
                                         TSX PRINAR,4
                                             NOARG
                                             BCDZ NAME OF FUN
                                               (RETURN)
                                 ARGUMENTS NOT ACCEPTABLE TO PRINT WILL CAUSE ERRORS
                           * HAS BEEN CRIPPLED TO PRINT ONLY FIRST 2 ARGUMENTS

                           P      HED
07745  0634 00 4 07774   PRINAR SXA     PAS1,4             SAVE INDEX REGISTERS
07746  0634 00 2 07775          SXA     PAS2,2
07747  0601 00 0 03442          STO PAS3
07750 -0600 00 0 03443          STQ PAS4
07751  0500 00 4 00002          CLA 2,4
07752  0601 00 0 10001          STO PAL1
07753  0500 00 4 00003          CLA 3,4
07754  0601 00 0 10002          STO PAL2
07755  0500 00 4 00001          CLA 1,4
07756  0734 00 2 00000          PAX 0,2
07757  0074 00 4 01222          TSX OUTPUT,4
07760  0 00000 0 00364              BCDOUT
07761  0 00011 0 07777              PAL3,,PAL4-PAL3
07762  0500 00 0 03442          CLA PAS3
07763  0074 00 4 04604          TSX $PRINT,4
07764 -2 00001 2 07767          TNX PAP3,2,1
07765  0500 00 0 03443          CLA PAS4
07766  0074 00 4 04604   PAP2   TSX $PRINT,4
07767  0074 00 4 01222   PAP3   TSX OUTPUT,4
07770  0 00000 0 00364              BCDOUT
07771  0 00001 0 10010              PAL5,,1
07772  0500 00 0 03442          CLA PAS3
07773  0560 00 0 03443          LDQ PAS4
07774  0774 00 4 00000   PAS1   AXT     **,4               RESTORE INDEX REGISYERS
07775  0774 00 2 00000   PAS2   AXT     **,2
07776  0020 00 4 00004          TRA 4,4
07777  006026644523      PAL3   BCD 20 FUNCTION
10000  633146456060
10001  0 00000 0 00000   PAL1
10002  0 00000 0 00000   PAL2
10003  603021626022             BCD 5 HAS BEEN ENTERED, ARGUMENTS..
10004  252545602545
10005  632551252473
10006  602151276444
10007  254563623333
10010                    PAL4   BSS 0
10010  606060606060      PAL5   BCD 1
```

```
                                EJECT

                                    PROP AND SASSOC
                                    SPECIALIZED SEARCH ROUTINES WHICH SHARE STORAGE

                              R     HED

                                    PROP(O,P,U)
                                     = (NULL(O) YIELDS U, CAR(O) = P YIELDS CDR(O),
                                         T YIELDS PROP(CDR(O),P,U))

10011  0634 00 4 10065   PROP  SXA     SAST1,4            SAVE LINK IR
10012  0131 00 0 00000         XCA                        PROPERTY TO AC
10013  0622 00 0 10024         STD SASP1                  SET TXH
10014  0402 00 0 00442         SUB SASQ1
10015  0622 00 0 10023         STD SASP2                  SET TXL
10016  0131 00 0 00000         XCA                        OBJECT TO AC
10017 -0734 00 4 00000   SASL1 PDX 0,4                    L = CDR(L)
                                INSERT TXH INSTRUCTION HERE IF NILL IS NADE NON-ZERO
10020 -3 00000 4 10030         TXL SASP3,4,0              NULL(L)
10021  0500 00 4 00000         CLA 0,4                    CWR(L)
10022  0734 00 4 00000         PAX 0,4                    CAR(L)
10023 -3 00000 4 10017   SASP2 TXL SASL1,4,**
10024  3 00000 4 10017   SASP1 TXH SASL1,4,**
10025 -0320 00 0 00460         ANA SASDM
10026  0534 00 4 10065         LXA     SAST1,4            RESTORE LINK IR
10027  0020 00 4 00001         TRA 1,4

10030 -0754 00 0 00000   SASP3 PXD     0,0                CLEAR
10031 -0534 00 4 03321         LXD     $ARG3,4            INSPECT FUNCTIONAL ARGUMENT
10032  3 00012 4 10035         TXH     *+3,4,10           SKIP IF NOT A TXL
10033  0534 00 4 10065         LXA     SAST1,4
10034  0020 00 0 03321         TRA     $ARG3
10035  0600 00 0 03321         STZ     $ARG3
10036  0560 00 0 03321         LDQ     $ARG3
10037 -0754 00 4 00000         PXD     ,4
10040  0534 00 4 10065         LXA     SAST1,4            RESTORE LINK IR
10041  0020 00 0 14663         TRA     $APPLY

                                    SASSOC(O,A,U)
                                     = (NULL(A) YIELDS U, CAAR(A) YIELDS  CAR(A),
                                         T YIELDS SASSOC(O,CDR(A),U))

10042  0634 00 4 10065  SASSOC SXA     SAST1,4            SAVE LINK IR
10043  0634 00 2 10064         SXA     SAST2,2            SAVE IR 2
10044  0634 00 1 10062         SXA     SAST3,1            SAVE IR 1
10045  0622 00 0 10061         STD SASP7                  SET TXH
10046  0402 00 0 00442         SUB SASQ1
10047  0622 00 0 10060         STD SASP6                  SET TXH
10050  0131 00 0 00000         XCA                        PAIR LIST TO AC
10051 -0734 00 4 00000         PDX     0,4                TO INDEX 4
10052 -3 00000 4 10067   SASP5 TXL SASP4,4,0              NULL(A)
                                INSERT TXH INSTRUCTION HERE IF NILL IS NADE NON-ZERO
10053  0500 00 4 00000         CLA 0,4                    CWR(A)
10054 -0734 00 4 00000         PDX ,4                     CDR(A)
10055  0734 00 2 00000         PAX ,2                     CAR(A)
```

```
10056  0500 00 2 00000         CLA ,2
10057  0734 00 1 00000         PAX     0,1             CAAR(A) TO INDX REGISTER
10060 -3 00000 1 10052   SASP6 TXL     SASP5,1,**      LOOK FOR ITEM
10061  3 00000 1 10052   SASP7 TXH     SASP5,1,**
10062  0774 00 1 00000   SAST3 AXT     **,1            FOUND ITEM, RESTORE IR 1
10063 -0754 00 2 00000         PXD     0,2             POINTER TO WORD
10064  0774 00 2 00000   SAST2 AXT     **,2            RESTORE IR 2
10065  0774 00 4 00000   SAST1 AXT     **,4            RESTORE LINK IR
10066  0020 00 4 00001         TRA     1,4

10067  0534 00 2 10064   SASP4 LXA     SAST2,2         RESTORE IR 2
10070  0534 00 1 10062         LXA     SAST3,1         RESTORE IR 1
10071  0020 00 0 10030         TRA     SASP3           EXECUTE SASSOC EXIT
                 00442   SASQ1 SYN     $QD1
                 00460   SASDM SYN     $DMASK

10072  0100 00 4 00001  SPREAD TZE     1,4             EXIT IF AGLIST IS NULL
10073  0634 00 4 10132         SXA     SPRX,4          SAVE LINK IR
10074 -0734 00 4 00000         PDX     0,4             POINTER TO ARG LIST
10075  0500 00 4 00000         CLA     0,4             FIRST WORD
10076  0560 00 0 00370         LDQ     $ZERO           ZERO THE MQ
10077 -0765 00 0 00022         LGR     18              CAR TO CDR OF MQ
10100  0100 00 0 10131         TZE     NLY             GO IF A  SINGLE ARGUMENT
10101  0734 00 4 00000         PAX     0,4             POINTER TO NEXT WORD
10102  0500 00 4 00000         CLA     0,4             NEXT WORD
10103  0734 00 4 00000         PAX     0,4             POINTER TO ARGUMENT
10104 -0320 00 0 00460         ANA     $DMASK          MASK OUT ALL BUT DECREMENT
10105  0100 00 0 10130         TZE     TWA             GO IF 2 ARGUMENT
10106 -0634 00 4 03320         SXD     $ARG2,4         PUT AWAY
10107  0634 00 2 10126         SXA     SPRY,2          SAVE INDEX 1 AND 2
10110  0634 00 1 10125         SXA     SPRZ,1
10111  0774 00 1 00022         AXT     18,1            20 IS MAX NO OF ARGS
10112 -0734 00 4 00000         PDX     0,4             REST OF ARG LIST TO IR 4
10113 -3 00000 4 10125   SPP1  TXL     SPRZ,4,0        GO IF END OF LIST
10114  0500 00 4 00000         CLA ,4
10115 -0734 00 4 00000         PDX ,4
10116  0734 00 2 00000         PAX ,2
10117 -0754 00 2 00000         PXD ,2
10120  0601 00 1 03343         STO     $ARG20+1,1
10121  2 00001 1 10113         TIX SPP1,1,1
10122 -0634 00 4 01562  SPPERR SXD     $ERROR,4
10123  0074 00 4 01563         TSX $ERROR+1,4
10124  542160600754            BCI     1,*A  7*        TOO MANY ARGUMENTS---SPREAD*()

10125  0774 00 1 00000   SPRZ  AXT     **,1            RESTORE IR 1
10126  0774 00 2 00000   SPRY  AXT     **,2            DITTO IR 2
10127 -0534 00 4 03320         LXD     $ARG2,4         ARG 2
10130 -0754 00 4 00000   TWA   PXD     0,4             PUT IN DECREMENT AC
10131  0131 00 0 00000   NLY   XCA                     ARG 1 AND 2 TO RIGHT REGISTERS
10132  0774 00 4 00000   SPRX  AXT     **,4            RESTORE LINK IR
10133  0020 00 4 00001         TRA     1,4             EXIT
```

```
FUNCTION ATTRIB(O,L)
ATTRIB(O,L)=/ CDR(O)=0 YIELDS (L REPLACES CDR(O))
            ELSE ATTRIB(CDR(O),L)  /
```

```
                        R       HED
10134  0634 00 4 10146  ATTRIB  SXA  AT1,4
10135 -0100 00 0 10140           TNZ      ATRB                GO IF BEGINNING OF LIST
10136  0131 00 0 00000           XCA                          OTHERWISE EXIT WITH ARG 2
10137  0020 00 4 00001           TRA      1,4
10140 -0734 00 4 00000   ATRB    PDX  ,4                      O
10141  0500 00 4 00000           CLA  ,4
10142 -0320 00 0 00460           ANA  DMASK                   CDR(O)
10143 -0100 00 0 10140           TNZ  ATRB
10144  0131 00 0 00000           XCA                          ARG 2 TO AC
10145  0622 00 4 00000           STD  ,4
10146  0774 00 4 00000   AT1     AXT  **,4
10147  0020 00 4 00001           TRA  1,4
                  00460   DMASK  SYN      $DMASK


                                  NOT FUNCTION

                        R       HED
10150  0100 00 0 10153   NOTS    TZE  *+3
10151 -0754 00 0 00000           PXD  ,0
10152  0020 00 4 00001           TRA  1,4
10153  0500 00 0 00442           CLA  NOTC1
10154  0020 00 4 00001           TRA  1,4
                  00442   NOTC1  SYN      $QD1

                                  THE RPLACX FUNCTIONS  REPLACE THE X PART OF THE FIRST ARG
                                  WITH THE SECOND ARGUMENT
                                  THE VALUE OF REPLACA,REPLACD, AND REPLACW IS ZERO
                        S       HED
10155  0634 00 4 10162  RPLACA  SXA  REPL,4
10156 -0734 00 4 00000           PDX  0,4
10157 -0763 00 0 00022           LGL  18
10160  0621 00 4 00000           STA  0,4
10161 -0754 00 4 00000   RPLEX   PXD      0,4                 ARG1 TO AC AS ANSWER
10162  0774 00 4 00000   REPL    AXT      **,4                RESTORE LINK IR
10163  0020 00 4 00001           TRA  1,4
10164  0634 00 4 10162  RPLACD  SXA  REPL,4
10165 -0734 00 4 00000           PDX  0,4
10166 -0620 00 4 00000           SLQ  0,4
10167  0020 00 0 10161           TRA      RPLEX               EXIT
10170  0634 00 4 10162  RPLACW  SXA  REPL,4
10171 -0734 00 4 00000           PDX  0,4
10172 -0600 00 4 00000           STQ  0,4
10173  0020 00 0 10161           TRA      RPLEX               EXIT


                                  OBJECT GENERATOR

10174  0634 00 4 10214  GENSYM  SXA      GENX,4              SAVE LINK IR
10175  0500 00 0 10217           CLA      DIGIT               GET DIGITS
10176  0114 06 0 05313           CVR      BCDAD1,,6           ADD 1 IN BCD
10177  0601 00 0 10217           STO      DIGIT
10200 -0501 00 0 10216           ORA      LETTR
10201  0074 00 4 03710           TSX  $CONSW,4
10202  0560 00 0 00370           LDQ  GENZ
```

```
10203  0074 00 4 03730          TSX $CONS,4
10204  0560 00 0 00370          LDQ GENZ
10205  0074 00 4 03730          TSX $CONS,4
10206  0131 00 0 00000          XCA
10207  0500 00 0 00504          CLA GENPN
10210  0074 00 4 03730          TSX $CONS,4
10211  0131 00 0 00000          XCA
10212  0500 00 0 00460          CLA     GENC
10213  0074 00 4 03730          TSX     $CONS,4
10214  0774 00 4 00000   GENX   AXT     **,4              RESTORE LINK IR
10215  0020 00 4 00001          TRA 1,4
                00370   GENZ   SYN     $ZERO
                00504   GENPN  SYN     PNAMED
                00460   GENC   SYN     $DMASK
10216  270000000000     LETTR  BCI     1,G00000
10217  000000000000     DIGIT  BCI     1,000000

                       *
                       * OVERLORD     THE TAPE HANDLING SECTION OF LISP. RECODED 20 FEBRUARY
                       *              1961 BY D. J. EDWARDS.
                       *
                       * OVERLORD DIRECTION CARDS ARE PUNCHED IN FAP FORMAT WITH THE VARIABLE
                       *              FIELD BEGINNING IN COLUMN 16. DIRECTION CARDS ARE
                       *      ONE     (USE NO TAPES FOR THIS RUN)
                       *      SET     ( SAVE RESULTS ON SYSTMP IF NO ERROR OCCURS)
                       *      TST     (GET NEW CORE IMAGE AFTER OPERATION)
                       *      TEST    (SAVE AS ABOVE)
                       *      FIN     (ALL DONE, STOP MACHINE OR RETURN TO A HIGHER MONITOR)
                       *      SETSET  (AVE RESULTS ON SYSTMP NO MATTER WHAT)
                       *      DEBUG   (SAME AS TEST BUT OBJECTLIST IS NOT SAVED AFTER READ IN)
                       *      SIZE    N1,N2,N3,N4  (GIVES SIZE OF BINPRG, PPDL, FWS AND FREE)
                       *      TAPE    SYSXXX,A7  (ASSIGNS SYSXXX TO UNIT A 7)
                       *      DUMP    BEG,END,TYPE   (MAKES OCTAL DUMP ON SYSPOT ACCORDING TO
                       *                               TYPE, 0 FOR STRAIGHT OCTAL, NON-ZERO FOR
                       *                               LISP (COMPLEMENT) DUMP.)
                       *      REMARK  (LOG AS DIRECTION CARD AND LOKK FOR NEXT DIRECTION CARD)
                       *      EXCISE  I  (I IS COMPILER, INTERPRETER OR BOTH. TURNS ITEM INTO
                       *                  FREE STORAGE OR FULL WOTD SPACE)
                       *
                       *
10220  0604 00 0 10336   OVBGN STI     OVSVI             BEGIN BY SAVING INDICATORS AND
10221  0634 00 4 10511          SXA     OVRLX,4           INDEX REGISTERS
10222  0634 00 2 10512          SXA     OVRLY,2
10223  0634 00 1 10513          SXA     OVRLZ,1
10224  0441 00 0 10337          LDI     OVIND             PRESET INDICATORS
10225  0604 00 0 10340          STI     SYSIND            AND SYSTEM INDICATORS
10226  0500 00 0 00177          CLA     FLAPCZ            CONTENT OF CELL ZERO
10227  0601 00 0 00000          STO     0                 FIX ANY GLOBERRING THAT MAT BE DONE
                       *
10230  0074 00 4 00663  OVRLRD TSX     $INPUT,4          GET OVERLORD DIRECTION CAR
10231  0 00000 0 00000                  $BCDIN            FROM BCD INPUT TAPE
10232  0 00016 0 10404                  OVBUF,,14         PUT IN OVERLORD CARD BUFFER
10233  0020 00 0 10254          TRA     OVERR             ERROR RETURN
10234  0020 00 0 10260          TRA     OVEOF             END OF FILE RETURN
10235  0560 00 0 10406   OVGOR  LDQ     OVBUF+2           PICK UP OVERLORD DIRECTION
10236 -0500 00 0 10405          CAL     OVBUF+1
```

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10237 -0763 00 0 00006         LGL     6                SHIFT DIRECTION IN LOGICAL AC
10240  0774 00 4 00030         AXT     24,4             TWICE NUMBER OF DIRECTION CARDS
10241 -0340 00 4 10336   OVSRC LAS     OVTBL,4          LOOK UP  DIRECTION
10242  0020 00 0 10244         TRA     *+2              NOT THIS ONE
10243  0020 00 0 10264         TRA     OVPNT            FOUND IT GO PRINT CARD
10244  2 00002 4 10241         TIX     OVSRC,4,2        TRY AGAIN
10245  3 00000 0 10230   OVBSW TXH     OVRLRD,,0        NOT IN TABLE, PRINT FIRST BAD CARD
10246  0502 00 0 10245         CLS     OVBSW            AND GET NEXT CARD.
10247  0601 00 0 10245         STO     OVBSW            FLIP SWITCH
10250  0074 00 4 01222         TSX     OUTPUT,4         PRINT CARD OUT
10251 -0 00000 0 00364         MZE     BCDOUT           ON BCD OUTPUT TAPE, AND ON LINE
10252  0 00017 0 10403                 OVBUF-1,,15
10253  0020 00 0 10230         TRA     OVRLRD           GET NEXT CARD
                        *
10254  0074 00 4 01222   OVERR TSX     OUTPUT,4         WRITE ERROR MESSAGE
10255  0 00000 0 00364                 BCDOUT
10256  0 00011 0 10362                 OVRDM,,9
10257  0020 00 0 10235         TRA     OVGOR            RY TO MAKE SENSE OUT OF CARD
                        *
10260  0074 00 4 01222   OVEOF TSX     OUTPUT,4         WRITE EOF REMARK
10261  0 00000 0 00364                 BCDOUT
10262  0 00007 0 10373                 OVALF,,7
10263  0020 00 0 10472         TRA     OVDN             GO AS IF A FIN CARD READ
                        *
10264  0500 00 0 10245   OVPNT CLA     OVBSW            RESTORE PRINT SWITCH TO TXH
10265  0602 00 0 10245         SLW     OVBSW
10266  0500 00 4 10337         CLA     OVTBL+1,4        PICK UP TRA ADDRESS AND SAVE IT
10267  0621 00 0 10305         STA     OVTRA
10270  0500 00 0 00200         CLA     FLAPCX           SET CELLS IN LOWER CORE
10271  0601 00 0 00010         STO     8
10272  0500 00 0 00201         CLA     FLAPCY
10273  0601 00 0 00002         STO     2
10274  0500 00 0 00177         CLA     FLAPCZ
10275  0601 00 0 00000         STO     0
10276  0074 00 4 01222         TSX     OUTPUT,4         PRINT DIRECTION CARD
10277 -0 00000 0 00364         MZE     BCDOUT           ON BCD OUTPUT TAPE, AND ON ILNE
10300  0 00017 0 10403                 OVBUF-1,,15
10301  0140 00 0 10302         TOV     *+1              TURN OFF AC OVERFLOW LIGHT
10302  0441 00 0 10340         LDI     SYSIND           PICK UP SYSTEM INDICATORS
10303  0057 00  000014         RIR     14               RESET ERROR AND DEBIG INDICATORS
10304  0604 00 0 10340         STI     SYSIND
10305  0020 00 0 00000   OVTRA TRA     **               EXECUTE SPECIFIC OVERLORD PROGRAM
                000010  ERRORI BOOL    10               ERROR INDICATOR
                        *
                        *       DIRECTION CARD TABLE
10306  464525606060             BCI     1,ONE            ** ASSUMING THIS IS THIS
10307  0020 00 0 10526         TRA     OVONE
10310  622563606060             BCI     1,SET
10311  0020 00 0 10451         TRA     OVSET
10312  636263606060             BCI     1,TST
10313  0020 00 0 10423         TRA     OVTST
10314  632562636060             BCI     1,TEST           ** ASSUMING THIS IS THIS
10315  0020 00 0 10423         TRA     OVTST            ** ASSUMING THIS IS THIS
10316  263145606060             BCI     1,FIN
10317  0020 00 0 10472         TRA     OVDN
10320  623171256060             BCI     1,SIZE
```

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10321  0020 00 0 10532          TRA     OVSZE
10322  622563622563             BCI     1,SETSET
10323  0020 00 0 10437          TRA     OVSST
10324  242522642760             BCI     1,DEBUG
10325  0020 00 0 10422          TRA     OVDBG
10326  632147256060             BCI     1,TAPE
10327  0020 00 0 11074          TRA     OVTAP
10330  246444476060             BCI     1,DUMP
10331  0020 00 0 10574          TRA     OVDMP              ** ASSUMING THIS IS THIS
10332  512544215142             BCI     1,REMARK           ** ASSUMING THIS IS THIS
10333  0020 00 0 10230          TRA     OVRLRD
10334  256723316225             BCI     1,EXCISE
10335  0020 00 0 11307          TRA     OVEXS
10336  0 00000 0 00000   OVSVI                             TEMPORARY STORAGE FOR INDICATORS
                 10336   OVTBL SYN     OVSVI              FOR INDEXING DIRECTION CARD TABLE
10337 -1 00000 0 00000   OVIND STR                        PRESET FOR LISP INDICATORS
10340  0 00000 0 00000  SYSIND                            SYSTEM INDICATORES GO HERE
10341  002551514651      OVCEM BCI     7,0ERROR IN SIZE CARD -OVERLORD-  *0 1*
10342  603145606231
10343  712560232151
10344  246040466525
10345  514346512440
10346  606054006001
10347  546060606060
10350  002163632544      OVNSM BCI     9,0ATTEMPT TO OPERATE BEFORE SIZE CARD READ -OVERLORD-
10351  476360634660
10352  464725512163
10353  256022252646
10354  512560623171
10355  256023215124
10356  605125212460
10357  404665255143
10360  465124406060
10361  605446600354             BCI     1, *O 3*
10362  002551514651      OVRDM BCI     9,0ERROR ON INPUT, BUT GOING ON ANYHOW -OVERLORD- *O  5*
10363  604645603145
10364  476463736022
10365  646360274631
10366  452760464560
10367  214570304666
10370  604046652551
10371  434651244060
10372  544660600554
10373  002545246046      OVALF BCI     7,0END OF FILE ON INPUT -OVERLORD- *O  6*
10374  266026314325
10375  604645603145
10376  476463604046
10377  652551434651
10400  244060544660
10401  600654606060
10402  0 00004 0 10406   OVPOS         OVBUF+2,,4         BEGINNING OF VARIABLE FIELD IN DIR
10403  006060606060             BCI     1,0                DOUBLE SPACE PRINT OF DIRECTION CARD
10404                    OVBUF BSS     14                 OVERLORD DIRECTION CARD BUFFER
                        *
                        *       DEBUG   OVERLORD DIRECTION
10422  0055 00  000004  OVDBG  SIR     4                  SET DEBUG INDICATOR
```

```
                        *                               PREFORM OVTST
                        *
                        *
                        *       TEST OR TST OVERLORD DIRECTION
10423  0056 00  000020   OVTST RNT     20                TEST FOR SETUP
10424  0020 00 0 10570          TRA     OVNSZ             ERROR FOR NOO SIZE CARD HAS BEEN READ
10425  0057 00  000100          RIR     TAPIND            RESET TAPE INDICATOR
10426  0054 00  000002          RFT     2                 WRITE TEST
10427  0074 00 4 00633          TSX     TAPDMP,4          DUMP ON SYSTMP
10430  0054 00  000001          RFT     1                 TEST FOR NEW CORE IMAGE
10431  0074 00 4 00651          TSX     OVLT,4            GET ONE
10432  0055 00  000001          SIR     1                 SET READ INDICATOR
10433  0057 00  000002          RIR     2                 TURN OFF WRITE INDICATORS
10434  0604 00 0 10340   OVTA   STI     SYSIND            UPDATE SYSTEM INDICATORS
10435  0074 00 4 11310          TSX     $EVALQ,4          PERFORM THE EVAL QUOTE OPERATOR
10436  0020 00 0 10230          TRA     OVRLRD            GET NEXT OVERLORD DIRECTION CARD
                000004  DEBUGI BOOL    4                 DEBUG INDICATOR
                        *
                        *       SETSET DIRECTION CARD
10437  0056 00  000020   OVSST RNT     20                TEST FOR SIZE
10440  0020 00 0 10570          TRA     OVNSZ             ERROR, NO SIZE
10441  0057 00  000100          RIR     TAPIND            RESET TAPE INDICATOR
10442  0054 00  000002          RFT     2                 TEST FOR SAVE CORE
10443  0074 00 4 00633          TSX     TAPDMP,4          SAVE IT
10444  0054 00  000001          RFT     1                 TEST FOR NEW IMAGE
10445  0074 00 4 00651          TSX     OVLT,4            GET ONE
10446  0055 00  000002          SIR     2                 SET WRITE INDICATOR
10447  0057 00  000001          RIR     1                 RESET READ INDICATOR
10450  0020 00 0 10434          TRA     OVTA              PERFORM EVALQ AND GET NEXT CARD
                        *
                        *       SET     OVERLORD DIRECTION
10451  0056 00  000020   OVSET RNT     20                TEST FOR SIZE
10452  0020 00 0 10570          TRA     OVNSZ             ERROR, NO SIZE CARD
10453  0057 00  000100          RIR     TAPIND            RESET TAPE INDICATOR
10454  0054 00  000002          RFT     2                 CHECK WRITE INDICATOR
10455  0074 00 4 00633          TSX     TAPDMP,4          DUMP ON SYSTMP
10456  0054 00  000001          RFT     1                 TEST FOR NEW CORE IMAGE
10457  0074 00 4 00651          TSX     OVLT,4            GET ONE FROM SYSTMP
10460  0055 00  000002          SIR     2                 SET WRITE INDICATOR
10461  0057 00  000001          RIR     1                 RESET READ INDICATOR
10462  0604 00 0 10340          STI     SYSIND            UPDATE SYSTEM INDICATORS
10463  0074 00 4 11310          TSX     $EVALQ,4          EVALUATE SET
10464  0441 00 0 10340          LDI     SYSIND            GET SYSTEM INDICATORS 101
10465  0056 00  000010          RNT     10                TEST ERROR INDICATOR
10466  0020 00 0 10230          TRA     OVRLRD            OFF, GET NEXT DIRECTION CARD
10467  0051 00  000003          IIR     3                 ON, INVERT READ AND WRITE INDICATORS
10470  0604 00 0 10340          STI     SYSIND
10471  0020 00 0 10230          TRA     OVRLRD            GET NEXT CARD
                        *
                        *       FIN     OVERLORD DIRECTION CARD
                        *
10472  0054 00  000002   OVDN   RFT     2                 TEST WRITE INDICATOR
10473  0074 00 4 00633          TSX     TAPDMP,4          DUMP CORE ON SYSTMP
10474  0057 00  000002          RIR 2
10475  0057 00  000100          RIR     TAPIND            RESET TAPE INDICATOR
10476  0056 00  000040          RNT     PPTIND            SEE IF PUNCH TAPE USED
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10477  0020 00 0 10503          TRA     *+4                SKIP IF NOT USED
10500  0500 00 0 00363          CLA     SYSPPT             TAPE SPEC.
10501  0074 00 4 00276          TSX     $(IOS),4           SET UP I-O COMMANDS
10502  0522 00 0 00353          XEC     $WEF               WRITE EOF ON PPT
10503  0057 00  000040          RIR     PPTIND             RESET INDICATORS
10504  0604 00 0 10340          STI     SYSIND             UPDATE SYSTEM INDICATORS
10505  0500 00 0 00364          CLA     SYSPOT             TAPE SPEC.
10506  0074 00 4 00276          TSX     $(IOS),4           SET UP I-O COMMANDS
10507  0522 00 0 00353          XEC     $WEF               WRITE EOF ON  SYSPOT
10510  0441 00 0 10336          LDI     OVSVI              RESTORE ORIGINAL INDICATORS AND
10511  0774 00 4 00000   OVRLX  AXT     **,4               INDEX REGISTERS
10512  0774 00 2 00000   OVRLY  AXT     **,2
10513  0774 00 1 00000   OVRLZ  AXT     **,1
10514  0500 00 0 10525          CLA     OVTOV              PICK UP RESTART INSTRUCTION
10515  0601 00 0 00000          STO     0                  STORE IN ZERO
10516 -0754 00 0 00000          PXD     0,0                LIGHT THE PANEL
10517  0760 00 0 00006          COM
10520 -0765 00 0 00045          LGR     37
10521  0760 00 0 00006          COM
10522 -0760 00 0 00003          SSM
10523  0420 00 7 77777          HPR     -1,7               STOP
10524  0020 00 0 10523          TRA     *-1                PRESS RESET AND START TO RESTART LISP
10525  0020 00 0 10230  OVTOV   TRA     OVRLRD             TRANSFER TO GET NEXT DIRECTION CARD
               000040  PPTIND  BOOL    40                 PUNCH TAPE INDICATOR
                       *
                       *       ONE     OVERLORD DIRECTION
                       *
10526  0056 00  000020   OVONE  RNT     20                 TEST FOR SIZE
10527  0020 00 0 10570          TRA     OVNSZ              ERROR, NO SIZE CARD READ
10530  0057 00  000003         RIR     3                  RESET READ AND WRITE INDICATORS
10531  0020 00 0 10434          TRA     OVTA               SAVE INDICATORS AND DO EVAL Q
                       *
                       *       SIZE    N1,N2,N3,N4        (OVERLORD DIRECTION CARD)
                       *       N1 = LENGTH OF BINARY PROGRAM, N2 = LENGTH OF PUBLICH PUSH DOWN
                       *       LIST, N3 = LENGTH OF FULL WORD SPACE, N4 = LENGTH OF FREE STORAGE
                       *
10532  0054 00  000002   OVSZE  RFT     2                  TEST FOR DUMP OF CURRENT CORE IMAGE
10533  0074 00 4 00633          TSX     TAPDMP,4           DUMP ON SYSTMP
10534  0500 00 0 10402          CLA     OVPOS              SET TO TRANSLATE NUMBERS ON SIZE CARD
10535  0074 00 4 06622          TSX     $NUMBR,4           LENGTH OF BINARY PROGRAM
10536  0100 00 0 10561          TZE     OVCER              ERROR IF ZERO
10537 -0600 00 0 02305          STQ     LBINPG             SAVE NUMBER
10540  0074 00 4 06622          TSX     $NUMBR,4           LENGTH OF PUBLIC PUSH DOWN LIST
10541  0100 00 0 10561          TZE     OVCER              ZERO IS ERROR
10542 -0600 00 0 02306          STQ     LPBPDL             SAVE NUMBER
10543  0074 00 4 06622          TSX     $NUMBR,4           LENGTH OF FULL WORD SPACE
10544  0100 00 0 10561          TZE     OVCER              ZERO IS ERROR
10545 -0600 00 0 02307          STQ     LFULWS             SAVE NUMBER
10546  0074 00 4 06622          TSX     $NUMBR,4           LENGTH OF FREE STORAGE
10547  0100 00 0 10561          TZE     OVCER              ZERO IS ERROR
10550 -0600 00 0 02310          STQ     LFREES             SAVE NUMBER
10551  0074 00 4 02077          TSX     $SETUP,4           PERFORM SETUP
10552  0441 00 0 10340          LDI     SYSIND             SYSTEM INDICATORS
10553  0054 00  000010         RFT     10                 TEST FOR ERROR IN SETUP
10554  0020 00 0 10561          TRA     OVCER              YES, DO ERROR PROCEDURE
10555  0055 00  000022         SIR     22                 SET SIZE AND WRITE INDICATORS
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10556  0057 00  000001        RIR     1                 RESET READ INDICATORS
10557  0604 00 0 10340        STI     SYSIND            UPDATE SYSTEM INDICATORS
10560  0020 00 0 10230        TRA     OVRLRD            GET NEXT DIRECTION CARD
                      *
10561  0441 00 0 10340  OVCER LDI     SYSIND            GETT SYSTEM INDICATORS
10562  0055 00  000001        SIR     1                 CONVERSION ERROR IN SIZE, SET READ IND
10563  0604 00 0 10340        STI     SYSIND            UPDATE SYSTEM INDICATORS
10564  0074 00 4 01222        TSX     OUTPUT,4          WRITE ERROR MESSAGE
10565 -0 00000 0 00364        MZE     BCDOUT            ON BCD OUTPUT TAPE AND ONLINE
10566  0 00007 0 10341                OVCEM,,7
10567  0020 00 0 10230        TRA     OVRLRD            GET NEXT DIRECTION CARD
                      *
10570  0074 00 4 01222  OVNSZ TSX     OUTPUT,4          WRITE ERROR MESSAGE
10571 -0 00000 0 00364        MZE     BCDOUT            ON BCD OUTPT TAPE AND ONLINE
10572  0 00012 0 10350                OVNSM,,10
10573  0020 00 0 10230        TRA     OVRLRD            GET NEXT DIRECTION CARD
                      *
                      *       DUMP    BEGINNING,END,N    (OVERLORD DIRECTION)
                      *               ALSO AVAILABLE TO LISP
                      *               BEGINNNING IS A NUMBER TO START DUMP AT, END A NUMBER
                      *               (MEANING OBVIOUS) AND N IS A NUMBER IF ZERO GIVES A
                      *               STRAIGHT OCTAL DUMP AND IF NON-ZERO GIVES A COMPLEMENT
                      *               (LISP TYPE) DUMP.
                      *
10574  0634 00 4 10726  OVDMP SXA     OVDX,4            SAVE INDEX REGISTERS
10575  0634 00 2 10727        SXA     OVDY,2
10576  0634 00 1 10730        SXA     OVDZ,1
10577  0600 00 0 11040        STZ     OVDEX             INDICATE OVERLORD ENTRANCE
10600  0601 00 0 10723        STO     OVDC              SAVE AC
10601 -0600 00 0 10724        STQ     OVDQ              SAVE MQ
10602  0604 00 0 10725        STI     OVDI              SAVE SI
10603  0500 00 0 10402        CLA     OVPOS             POSITION OF VARIABLE FIELD
10604  0074 00 4 06622        TSX     $NUMBR,4          BEGINNING OF DUMP
10605  0100 00 0 10770        TZE     ODER              ERROR IN CONVERSION
10606 -0120 00 0 11002        TMI     OVENK             IF FLOATING POINT NUMBER, LOOK AT KEYS
10607 -0600 00 0 11042        STQ     OBEG
10610  0074 00 4 06622        TSX     $NUMBR,4          NUMBER TO END DUMP AT
10611 -0600 00 0 11043        STQ     OEND
10612  0100 00 0 10770        TZE     ODER              CONVERSION ERROR
10613  0074 00 4 06622        TSX     $NUMBR,4          TYPE OF DUMP
10614 -0600 00 0 11046        STQ     OLISD
10615  0100 00 0 10770        TZE     ODER              CONVERSION ERROR
10616  0500 00 0 11043  OVGE  CLA     OEND              END DUMP NUMBER
10617  0400 00 0 00371        ADD     $Q1
10620  0621 00 0 10641        STA     OLDQ              SET ADDRESS
10621  0402 00 0 11042        SUB     OBEG              GIVES COUNT OF WORDS TO BE DUMPED
10622 -0120 00 0 10770        TMI     ODER              NEGATIVE NUMBER YIELDS ERROR
10623  0734 00 1 00000        PAX     0,1               COUNT IN INDEX 1
10624  0534 00 4 11042        LXA     OBEG,4            GET BEGINNING
10625  1 77772 4 10626        TXI     *+1,4,-6          DECREMETN BY 6 (NUMBER OF WORDS / LINE)
10626 -0634 00 4 11042        SXD     OBEG,4            PUT IN DECREMENT FOR OCTAL CONVERSION
10627  0020 00 0 10666        TRA     OVDSH             START THE DUMP
                      *
10630 -0500 00 0 11036  OAXT1 CAL     OVDSF             PICK UP STAR FLAG
10631  0602 00 0 11051  OAXT  SLW     OUP+1             PUT STARS OF BLANKS IN LINE
10632  0774 00 2 00022        AXT     18,2              SET IR 2
```

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10633  0500 00 0 11042          CLA     OBEG              BEGININNING OF LINE
10634  0400 00 0 00445          ADD     $QD6              6 WORDS PER LINE
10635  0622 00 0 11042          STD     OBEG              UPDATE LINE NUMBER
10636  0131 00 0 00000          XCA                       NUMBER TO MQ
10637  0074 00 4 11021          TSX     OCTLP,4           CONVERT TO OCTAL
10640  0602 00 0 11050          SLW     OUP               BEGIN OUTPUT LINE
10641 -0500 00 1 00000   OLDQ    CAL     **,1              PICK UP WORD TO BE DUMPED
10642  0100 00 0 10671          TZE     OSTZ              EASY IF ALL ZERO
10643 -0625 00 0 11037          STL     OVDZS             INDICATE SOMETHING NON-ZERO DUMPED
10644  0520 00 0 11046          ZET     OLISD             SKIP IF STRAIGHT DUMP
10645  0020 00 0 10673          TRA     OLID              DO LISP DUMP
10646 -0130 00 0 00000   ODXCL   XCL                       NUMBER TO MQ
10647  0074 00 4 11021          TSX     OCTLP,4           CONVERT LEFT HALF
10650  0602 00 2 11074          SLW     OUP+20,2          PUT IN OUTPUT LINE
10651  0074 00 4 11021          TSX     OCTLP,4           CONVERT RIGHT HALF
10652  0560 00 0 00472   OBQ     LDQ     BLANKS            BLANKS TO MQ
10653 -0765 00 0 00006          LGR     6                 MAKE A HOLE
10654 -0501 00 0 00452          ORA     OBLANK            INSERT ONE BLANK
10655  0602 00 2 11075          SLW     OUP+21,2          PUT IN OUTPUT LINE
10656 -0600 00 2 11076          STQ     OUP+22,2          DITTO
10657 -2 00001 1 10713          TNX     OVDFN,1,1         EXIT IF DONE
10660  2 00003 2 10641          TIX     OLDQ,2,3          LOOP 6 TIMES
10661 -0520 00 0 11037          NZT     OVDZS             SKIP IF NOT ALL ZEROS
10662  0020 00 0 10630          TRA     OAXT1             GO BACK AND GET STAR FLAG FOR ZEROS
10663  0074 00 4 01222          TSX     OUTPUT,4          WRITE LINE OF DUMP
10664  0 00000 0 00364                  BCDOUT            ON BCDOUT
10665  0 00024 0 11050                  OUP,,20
10666  0600 00 0 11037   OVDSH   STZ     OVDZS             SET SWITCH TO TEST FOR LINE OF ZEROS
10667 -0500 00 0 00472          CAL     BLANKS            BLANK THE FLAG FIELD
10670  0020 00 0 10631          TRA     OAXT              GET NEXT LINE
                        *
10671  0600 00 2 11074   OSTZ    STZ     OUP+20,2          IF ZERO PUT ZERO S IN OUTPUT LINE
10672  0020 00 0 10652          TRA     OBQ               GO AS IF CONVERTED
                        *
10673  0602 00 0 11045   OLID    SLW     ODLT              LISP TYPE (COMPLEMENT DUMP)
10674 -0320 00 0 11047          ANA     OLDM              MASK OUT ALL BUT TAG AND PREFIX
10675  0100 00 0 10700          TZE     ODC               TRANSFER IF LISP
10676 -0500 00 0 11045          CAL     ODLT              HAS PREFIX AND/OR TAG, DUMP STRAIGHT
10677  0020 00 0 10646          TRA     ODXCL             GO TO NORMAL DUMP
10700 -0535 00 4 11045   ODC     LDC     ODLT,4            COMPLEMENT DECREMENT
10701 -0634 00 4 11045          SXD     ODLT,4            STORE
10702  0535 00 4 11045          LAC     ODLT,4            COMPLEMENT ADDRESS
10703  0634 00 4 11045          SXA     ODLT,4            STORE
10704  0560 00 0 11045          LDQ     ODLT              PUT IN MQ
10705  0074 00 4 11021          TSX     OCTLP,4           CONVERT LEFT HALF
10706 -0501 00 0 11044          ORA     ODSAR             OR IN A *
10707  0602 00 2 11074          SLW     OUP+20,2          PUT IN OUTPUT LINE
10710  0074 00 4 11021          TSX     OCTLP,4           CONVERT RIGHT HALF
10711 -0501 00 0 11044          ORA     ODSAR             PUT IN *
10712  0020 00 0 10652          TRA     OBQ               PUT AWAY AS USUAL
                        *
10713 -2 00003 2 10717   OVDFN   TNX     OVDLL,2,3         SKIP IF LINE FILLED OUT
10714 -0500 00 0 00472          CAL     BLANKS            GET BLANKS IN AC
10715  0602 00 2 11074          SLW     OUP+20,2          BLANK REST OF LINE
10716  2 00001 2 10715          TIX     *-1,2,1
10717  0074 00 4 01222   OVDLL   TSX     OUTPUT,4          WRITE LAST OUTPUT LINE
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      10720  0 00000 0 00364                BCDOUT
      10721  0 00024 0 11050                OUP,,20
      10722  0020 00 0 10726         TRA     OVDX                GO TO EXIT
                                *   FOLLOWING 6 SELLS CONTAIN AC, MQ , SI, AND IR S  UPON DUMP ENTRANCE
      10723  0 00000 0 00000    OVDC                             AC CONTENTS
      10724  0 00000 0 00000    OVDQ                             DITTO MQ
      10725  0 00000 0 00000    OVDI                             DITTO SI
      10726  0774 00 4 00000    OVDX  AXT     **,4               RESTORE INDEX REGISTERS
      10727  0774 00 2 00000    OVDY  AXT     **,2
      10730  0774 00 1 00000    OVDZ  AXT     **,1
      10731  0520 00 0 11040         ZET     OVDEX              TEST FOR LISP OR OVERLORD EXIT
      10732  0020 00 4 00001         TRA     1,4                LISP EXIT
      10733  0520 00 0 11041         ZET     OVDEK              TEST FOR ENK MODE
      10734  0020 00 0 11002         TRA     OVENK              GO TO KEEYS
      10735  0020 00 0 10230         TRA     OVRLRD             GO BACK FOR NEXT DIRECTION CARD
                                *
      10736  0634 00 4 10726  DUMPXX SXA     OVDX,4             LISP ENTRANCE
      10737  0634 00 2 10727         SXA     OVDY,2             SAVE INDEX REGISTERS
      10740  0634 00 1 10730         SXA     OVDZ,1
      10741 -0625 00 0 11040         STL     OVDEX              SET FOR LISP EXIT
      10742  0622 00 0 11040         STD     OVDEX              SAVE ARG1
      10743  0500 00 0 03322         CLA     $ARG4              PICK UP ID FOR DUMP
      10744  0074 00 4 04604         TSX     $PRINT,4           PRINT IT
      10745 -0534 00 2 11040         LXD     OVDEX,2            ARG 1
      10746  0074 00 4 13075         TSX     FIXVAL,4           EVALUATE AS FIXED POINT NUMBER
      10747  0601 00 0 11042         STO     OBEG               STORE IN BEGINNING
      10750  0131 00 0 00000         XCA                        ARG 2
      10751 -0734 00 2 00000         PDX     0,2                ARG TO INDEX 2
      10752  0074 00 4 13075         TSX     FIXVAL,4           EVALUATE AS FIXED POINT NUMBER
      10753  0601 00 0 11043         STO     OEND
      10754 -0534 00 2 03321         LXD     $ARG3,2            ARG 3
      10755  0074 00 4 13075         TSX     FIXVAL,4           EVALUATE AS FIXED POINT NUMBER
      10756  0601 00 0 11046         STO     OLISD
      10757  0020 00 0 10616         TRA     OVGE               EXECUTE DUMP
                                *
      10760  0634 00 4 10726  DUMPYY SXA     OVDX,4
      10761  0634 00 2 10727         SXA     OVDY,2
      10762  0634 00 1 10730         SXA     OVDZ,1
      10763 -0625 00 0 11040         STL     OVDEX
      10764 -0600 00 0 11043         STQ     OEND
      10765  0601 00 0 11042         STO     OBEG
      10766  0600 00 0 11046         STZ     OLISD
      10767  0020 00 0 10616         TRA     OVGE
                                *
      10770  0074 00 4 01222    ODER  TSX     OUTPUT,4            WRITE ERROR MESSAGE
      10771 -0 00000 0 00364         MZE     BCDOUT             ON BCD OUTPUT TAPE AND ONLINE
      10772  0 00006 0 10774                ODBAD,,6
      10773  0020 00 0 10726         TRA     OVDX               RESTORE AND EXIT
      10774  002221246024      ODBAD BCI     6,0BAD DUMP ARGUMENTS -OVERLORD- *O 4*
      10775  644447602151
      10776  276444254563
      10777  626040466525
      11000  514346512440
      11001  605446600454
                                *
DI    11002  0420 77 7 77777    OVENK HPR     -1,7,63            STOP FOR KEYS
```

```
11003  0760 00 0 00004         ENK
11004 -0754 00 0 00000         PXD     0,0                CLEAR AC
11005 -0763 00 0 00001         LGL     1                  TYPE OF DUMP IN SIGN BIT
11006  0601 00 0 11046         STO     OLISD              PUT AWAY
11007 -0754 00 0 00000         PXD     0,0                CLEAR AC
11010 -0763 00 0 00021         LGL     17                 BEGINNING
11011  0601 00 0 11042         STO     OBEG
11012 -0754 00 0 00000         PXD     0,0                CLEAR AC
11013 -0763 00 0 00022         LGL     18                 END
11014  0601 00 0 11043         STO     OEND
11015  0601 00 0 11041         STO     OVDEK              SET SWITCH ON EXIT
11016  0600 00 0 11040         STZ     OVDEX              SET OVERLORD EXIT
11017  0100 00 0 10726         TZE     OVDX               EXIT ON ZERO REGUEST
11020  0020 00 0 10616         TRA     OVGE               PROCESS DUMP
                       *
11021 -0754 00 0 00000  OCTLP  PXD     0,0                CONVERT LEFT HALF OF MQ TO OCTAL
11022 -0763 00 0 00003         LGL     3                  CLEAR AC AND DO SHIFT DANCE
11023  0767 00 0 00003         ALS     3
11024 -0763 00 0 00003         LGL     3
11025  0767 00 0 00003         ALS     3
11026 -0763 00 0 00003         LGL     3
11027  0767 00 0 00003         ALS     3
11030 -0763 00 0 00003         LGL     3
11031  0767 00 0 00003         ALS     3
11032 -0763 00 0 00003         LGL     3
11033  0767 00 0 00003         ALS     3
11034 -0763 00 0 00003         LGL     3
11035  0020 00 4 00001         TRA     1,4                EXIT
                       *
               11021  OCTALP  SYN     OCTLP
               00651   OVLT   SYN     OVLTXX
11036  605454545460     OVDSF  BCI     1, ****            STAR FLAG AFTER DUMPING ZEROS
11037  0 00000 0 00000  OVDZS                             SUPPRESSES OUTPUT WHEN DUMPING ZEROS
11040  0 00000 0 00000  OVDEX                             ZERO FOR OVERLORD EXIT NON-ZERO , LISP
11041  0 00000 0 00000  OVDEK                             TEST CELL NON-ZERO FOR ENK MODE
11042  0 00000 0 00000  OBEG                              BEGIN DUMP
11043  0 00000 0 00000  OEND                              END DUMP
11044  540000000000     ODSAR  BCI     1,*00000           A * FOR COMPLEMENT DUMPING
11045  0 00000 0 00000  ODLT                              TEMPORARY STORAGE
11046  0 00000 0 00000  OLISD                             NON-ZERO FOR LISP TYPE DUMP
11047 -3 00000 7 00000  OLDM   SVN     ,4+2+1             MASK FOR TAG AND PREFIX
11050  606060606060     OUP    BCI     2,                 BLANKS FOR BEGINNING OF OUT PUT LINE
11051  606060606060
11052                          BSS     18                 ROOM FOR REST OF LINE
                       *
                       *
                       *       TAPE    SYSXXX,A6          (OVERLORD DIRECTION CARD)
                       *               SYSTAP, SYSTMP, SYSPIT AND SYSPOT ARE CURRENTLY
                       *               RECOGINIZED LISP TAPES. UNIT DESIGNATION IS BY CHANNEL
                       *               (A, B, OR C) AND NUMBER (1 THRU 10).
                       *
11074  0634 00 4 11225  OVTAP  SXA     OVTPX,4            SAVE INDEX REGISTERS
11075  0634 00 2 11226         SXA     OVTPY,2
11076  0634 00 1 11227         SXA     OVTPZ,1
11077  0054 00  000100        RFT     TAPIND             SKIP IF LAST CARD WAS NOT A TAPE CARD
11100  0020 00 0 11107         TRA     OVTJJ              SKIP READ AND WRITE SECTION
```

```
11101  0054 00  000002         RFT     2                 TEST FOR TAPE DUMP ON SYSTMP
11102  0074 00 4 00633         TSX     TAPDMP,4          DO IT
11103  0054 00  000001         RFT     1                 TEST FOR READ
11104  0074 00 4 00651         TSX     OVLT,4            GET NEW IMAGE
11105  0057 00  000001         RIR     1                 RESET READ INDICATOR
11106  0055 00  000002         SIR     2                 SET WRITE INDICATOR
11107  0055 00  000100   OVTJJ SIR     TAPIND            SET TAPE DIRECTION INDICATOR
11110  0604 00 0 10340         STI     SYSIND            UPDATE SYSTEM INDICATORS
11111  0774 00 4 00005         AXT     5,4               NUMBER OF ENTRIES IN TAPE TABLE
11112 -0500 00 0 10406         CAL     OVBUF+2
11113  0560 00 0 10407         LDQ     OVBUF+3           GET TAPE DESIGNATION IN AC AND MQ
11114 -0763 00 0 00023         LGL     19                SHIFT INTO AC
11115 -0765 00 0 00001         LGR     1                 DUMPING Q BIT
11116 -0340 00 4 11243   OVLA  LAS     OVTTB,4           COMPARE WITH TAPE TABLE
11117  0020 00 0 11121         TRA     *+2               NOT THIS ONE
11120  0020 00 0 11143         TRA     OVTAA             THIS IS IT
11121  2 00001 4 11116         TIX     OVLA,4,1          TRY AGAIN
11122  0602 00 0 11131   OVCMP SLW     OVTRM             NOT FOUND, COMPLAIN
11123  0074 00 4 01222         TSX     OUTPUT,4
11124  0 00000 0 00364                 BCDOUT
11125  0 00014 0 11127                 OVTRN,,12
11126  0020 00 0 10230         TRA     OVRLRD            GET NEXT DIRECTION CARD
11127  006062465151      OVTRN BCI     2,0 SORRY,
11130  707360606060
11131  0 00000 0 00000   OVTRM
11132  603162604546            BCI     9, IS NOT A VALID LISP TAPE DESIGNATION -OVERLORD- *O 2*
11133  636021606521
11134  433124604331
11135  624760632147
11136  256024256231
11137  274521633146
11140  456040466525
11141  514346512440
11142  605446600254
11143 -0773 00 0 00006   OVTAA RQL     6                 DUMP THE COMMA
11144 -0754 00 0 00000         PXD     0,0               CLAER AC
11145 -0763 00 0 00006         LGL     6                 CHANELL LETTER IN AC
11146  0044 00 0 00000         PAI                       IN INDICATORS
11147  0774 00 2 00003         AXT     3,2               TRY CHAN. C
11150  0056 00  000003         RNT     3                 SKIP IF C
11151  0774 00 2 00002         AXT     2,2               TRY B
11152  0056 00  000002         RNT     2                 SKIP IF B OR C
11153  0774 00 2 00001         AXT     1,2               IF NO SKIP, MUST BE A
11154 -0763 00 0 00006         LGL     6                 TAPE NUMBER IN AC
11155 -0320 00 0 00417         ANA     $QO17             MASK OUT ALL BUT 4 LOW ORDER BITS
11156  0441 00 0 10410         LDI     OVBUF+4           NEXT WORD IN INDICATORS
11157 -0054 00  770000         LFT     770000            KIP IF LEFT MOST CHARACTER IS A0
11160  0020 00 0 11162         TRA     *+2
11161  0400 00 0 00401         ADD     $Q9               IF LEFT MOST IS 0 ADD 9 TO THE 1
11162  0734 00 1 00000         PAX     0,1               RESULT TO INDEX 1
11163 -3 00000 1 11165         TXL     *+2,1,0           ZERO UNIT DOES NOT GO
11164 -3 00012 1 11174         TXL     OVTPS,1,10        UNITS OVER TEN DON T GO
11165  0500 00 0 00472         CLA     BLANKS
11166  0560 00 0 10407         LDQ     OVBUF+3
11167 -0773 00 0 00030         RQL     24                POSITION TABPE DESIG
11170 -0763 00 0 00014         LGL     12
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11171  0560 00 0 10410         LDQ     OVBUF+4
11172 -0763 00 0 00006         LGL     6                   ALL IN AC
11173  0020 00 0 11122         TRA     OVCMP               GO COMPLAIN
11174 -0501 00 4 11250   OVTPS ORA     OVTCT,4             OR IN BIN OR BCD FOR THAT TAPE
11175 -0501 00 2 11253         ORA     OVCHN,2             OR IN PROPER CHANEL DESIGNATION
11176  0602 00 4 00370         SLW     TAPASG,4            CHANGE TAPE ASSIGNMENT
11177  0560 00 4 11243         LDQ     OVTTB,4             MAKE OUTPUT MESSAGE BY GETTING NAME
11200 -0600 00 0 11234         STQ     OVTPO               PUT INTO MESSAGE
11201  3 00001 4 11216         TXH     OVTXX,4,1           SKIP FOLLOWING IF NOT SYSTAP
11202  0500 00 0 00367         CLA     SYSTAP
11203  0074 00 4 00276         TSX     $(IOS),4            SET UP I-O COMMANDS FOR SYSTAP
11204  0560 00 0 00357         LDQ     $TCO                MAKE PROPER SYSTEM CALL CARD
11205 -0620 00 0 00145         SLQ     BOTTOM+1
11206  0560 00 0 00350         LDQ     $RDS
11207 -0600 00 0 11273         STQ     GCRDB
11210  0560 00 0 00361         LDQ     $RCH
11211 -0620 00 0 11274         SLQ     GCRDC
11212  0560 00 0 00362         LDQ     $LCH
11213 -0620 00 0 11276         SLQ     GCRDD
11214  0766 00 0 01341         WPUA                        PUCH OUT THE 2 CARD CALLER
11215  0540 00 0 11302         RCHA    GCIOC               CHANNEL COMMANDS
11216  0500 00 2 11256   OVTXX CLA     OVCLT,2             TELL WHAT YOU HAVE DONE BY MAKING
11217 -0501 00 1 11270         ORA     OVCTN,1             A MESSAGE
11220  0621 00 0 11231         STA     OVTPP
11221  0625 00 0 11231         STT     OVTPP
11222  0074 00 4 01222         TSX     OUTPUT,4            PRINT OUT THE NEW ASSIGNMENT
11223  0 00000 0 00364                 BCDOUT
11224  0 00005 0 11231                 OVTPP,,5
11225  0774 00 4 00000   OVTPX AXT     **,4                RESTORE INDEX REGISTERS
11226  0774 00 2 00000   OVTPY AXT     **,2
11227  0774 00 1 00000   OVTPZ AXT     **,1
11230  0020 00 0 10230         TRA     OVRLRD              GET NEXT DIRECTION CARD
11231  006060000000      OVTPP BCI     3,0  000IS NOW LISP
11232  316260454666
11233  604331624760
11234  000000000000      OVTPO BCI     2,000000.
11235  336060606060
                        *       TABLES FOR OVTAP
11236  627062474763            BCI     5,SYSPPTSYSPOTSYSPITSYSTMPSYSTAP
11237  627062474663
11240  627062473163
11241  627062634447
11242  627062632147
11243  0 00000 0 00000   OVTTB PZE                         LOW DENS, BCD PPT
11244  0 00000 0 00000         PZE                         LOW DENS, BCD PIT
11245  0 00000 0 00000         PZE                         LOW DENS, BCD POT
11246  0 00000 0 00020         PZE     16                  HI DENS, BIN TMP
11247  0 00000 0 00020         PZE     16                  HI DENS, BIN TMP
11250  0 00003 0 03200   OVTCT PZE     3*512+2*64,,3       CHANNEL C
11251  0 00002 0 02200         PZE     2*512+2*64,,2       B
11252  0 00001 0 01200         PZE     1*512+2*64,,1       A
11253  000000230000      OVCHN BCI     3,000C00000B00000A00
11254  000000220000
11255  000000210000
11256  000000000100      OVCLT BCI     9,00001000009 00008 00007 00006 00005 00004 00003 00002
11257  000000001160
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11260  000000001060
11261  000000000760
11262  000000000660
11263  000000000560
11264  000000000460
11265  000000000360
11266  000000000260
11267  000000000160            BCI     1,00001
11270                   OVCTN  BSS     0
                       *
                       *
                       * SYSTEM CALL CARD PERFORMS A LOAD TAPE SEQUENCE ON THE SYSTAP
                       *
11270  0 00006 0 00011   GCRD  IOCD    9,,6
11271  0060 00 0 00001         TCOA    1
11272  0021 00 0 00011         TTR     9
11273  0762 00 0 01221   GCRDB RTBA    1                 SELECT THE SYSTEM TAPE
11274  0540 00 0 00016   GCRDC RCHA    14
11275  0600 00 0 00001         STZ     1                 STOP IF TAPE DOES NOT LOAD
11276  0544 00 0 00000   GCRDD LCHA    0                 LOAD I-O COMMAND FROM TAPE
11277  0021 00 0 00001         TTR     1                 TRANSFER TO 1
11300 -1 00003 0 00000         IOCT    0,,3              LOAD FIRST 3 WORDS FROM TAPE
                       *                                 SECOND CARD OF CALLER
11301  0000 00 0 00174   GCRDE HTR     CONTIN            BECOMES A TRANSFER CARD
                       *
11302  2 00011 0 11270   GCIOC IORP    GCRD,,9
11303  2 00001 0 11301         IORP    GCRDE,,1          TRANSFER CARD
11304  2 00000 0 11306         IORP    *+2,,0            2 BLANK CARDS
11305  2 00000 0 11306         IORP    *+1,,0
11306  0 00000 0 00000         IOCD    0,,0              DISCONNECT CHANNEL
                       *
                000100  TAPIND BOOL    100
                       *
                       *       EXCISE  DIRECTION CARD TO THROW OUT THE COMPILER AND/OR THE INTER
                       *               PRETER GOES HERE
                       *
11307  0020 00 0 10230   OVEXS TRA     OVRLRD            ROUTINE NOT WRITTEN YET.  8 APRIL 1961
                       *
                       *       EVALQ   A SUCCESSOR TO THE APPLY OPERATOR, THE GRAND NEW
                       *               (AS OF 1 MARCH 1961) THE EVALQUOTE OPERATOR.
                       *
11310  0634 00 4 11416   EVALQ SXA     EVLQX,4           SAVE LINK IR
11311  0634 00 2 11417         SXA     EVLQY,2           SAVE IR 2
11312  0074 00 4 01521         TSX     $TIME,4           PRINT TIME AND DATE
11313  0074 00 4 01222         TSX     OUTPUT,4          WRITE OPENING MESSAGE
11314  0 00000 0 00364                 BCDOUT
11315  0 00014 0 11520                 EVQBM,,12
11316  0600 00 0 11516         STZ     EVQRTS            INITIALIZE TEST CELLS
11317  0600 00 0 03653         STZ     EVQB              DITTO
11320  0774 00 2 00144         AXT     EVQBL,2           LENGTH OF EVAL QUOTE BUFFER
11321  0634 00 2 11437   EVQRD SXA     EVQRX,2           SAVE INDEX 2 INCASE OF READ ERROR
11322  0074 00 4 05732         TSX     $READ,4           READ THE INPUT LISTS
11323  0601 00 0 03506         STO     EVQAN             SAVE THE LIST
11324  0340 00 0 11517         CAS     EVQSP             COMPARE WITH STOP ATOM
11325  0020 00 0 11327         TRA     *+2               IS NOT
11326  1 00001 2 11341         TXI     EVQOP,2,1         SET IR 2 TO PROER VALUE
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11327  0520 00 0 03653         ZET     EVQB              SKIP IF FIRST LIST OF DOUBLET
11330  0020 00 0 11334         TRA     EVQA              IS SECOND LIST
11331 -0625 00 0 03653         STL     EVQB              FLIP SWITCH
11332  0601 00 2 03653         STO     EVQB,2            SAVE FIRST LIST OF DOUBLET IN BUFFER
11333  0020 00 0 11321         TRA     EVQRD             GET NEXT LIST
11334 -0734 00 4 00000   EVQA  PDX     0,4               LIST TO INDEX
11335  0754 00 4 00000         PXA     0,4               MOVE TO ADDRESS
11336  0621 00 2 03653         STA     EVQB,2            SAVE SECOND LIST OF DOUBLET IN BUFFER
11337  0600 00 0 03653         STZ     EVQB              FLIP SWITCH
11340  2 00001 2 11321         TIX     EVQRD,2,1         GET NEXT LIST
11341 -0634 00 2 11410   EVQOP SXD     EVQTH,2           INDEX VALUE OF LAST LIST READ IN
11342  0074 00 4 01521         TSX     $TIME,4           PRINT TIME
11343 -0625 00 0 11516         STL     EVQRTS            SET ERROR RETURN SWITCH
11344  0774 00 2 00144         AXT     EVQBL,2           LENGTH OF BUFFER
11345  0634 00 2 11407   EVQLP SXA     EVQER,2           SAVE IDNEX VALUE
11346  0074 00 4 01200   EVQS  TSX     SPACEX,4          WRITE OUT SOME BLANK LINES
11347  0 00000 0 01216                 6SPACE             3 DOUBLE SPACES
11350  0500 00 2 03653         CLA     EVQB,2            PICK UP FIRST ITEM IN BUFFER
11351  0600 00 2 03653         STZ     EVQB,2            ZERO THE BUFFER ENTRY
11352  0600 00 0 03316         STZ     $ALIST            RESET ALIST
11353 -0734 00 4 00000         PDX     0,4               MAKE AN ATOM TEST
11354  0560 00 0 00370         LDQ     $ZERO
11355 -0765 00 0 00022         LGR     18                SECOND LIST INTO MQ
11356 -0754 00 4 00000         PXD     0,4               FIRST LIST INTO AC
11357  0074 00 4 07745         TSX     PRINAR,4          PRINT HEADING
11360  0 00000 0 00002                 2
11361  602565214350            BCI     2, EVALQUOTE
11362  644663256060
11363 -0774 00 4 11377         AXC     EVQFT,4           SET RETURN INDEX CELL
11364  0634 00 4 11376         SXA     EVQD,4
11365  0774 00 4 14663   EVQMP AXT     $APPLY,4          SET CELL OF PROGRAM TO BE EXECUTED
11366  0634 00 4 11377         SXA     EVQFT,4           INITIALIZE PROGRAM TO BE EXECUTED CELL
11367  0601 00 0 11513         STO     EVQAC             SAVE AC
11370 -0734 00 4 00000         PDX     0,4               FIRST LIST TO IR 4
11371  0500 00 4 00000         CLA     0,4
11372  0734 00 4 00000         PAX     0,4
11373  3 77776 4 11441         TXH     EVQAT,4,-2        TRANSFER IF FIRST LIST IS ATOMIC
11374  0500 00 0 11513   EVQNF CLA     EVQAC             RESTORE AC
11375  0600 00 0 03321  EVQZ   STZ     $ARG3             NULL ALIST FOR APPLY
11376  0774 00 4 00000   EVQD  AXT     **,4              RETURN INDEX REGISTER
11377  0020 00 0 00000   EVQFT TRA     **                PROGRAM TO BE EXECUTED
11400  0601 00 0 03506   EVQE  STO     EVQAN             SAVE ANSWER
11401  0074 00 4 01222         TSX     OUTPUT,4          PRINT END OF EVALQUOTE MESSAGE
11402  0 00000 0 00364                 BCDOUT
11403  0 00005 0 11534                 EVQAM,,5
11404  0500 00 0 03506         CLA     EVQAN             PICK UP ANSWER
11405  0074 00 4 04604         TSX     $PRINT,4          PRINT IT
11406  0600 00 0 03506         STZ     EVQAN             ZERO TEMP STORAGE
11407  0774 00 2 00000   EVQER AXT     **,2              ERRORS COME BACK HERE, RESTORE IR 2
11410 -3 00000 2 11412   EVQTH TXL     EVQDN,2,**        EXIT IF LAST DOUBLET EXECUTED
11411  2 00001 2 11345         TIX     EVQLP,2,1         EXECUTE NEXT DOUBLET
11412  0074 00 4 01521   EVQDN TSX     $TIME,4           ALL DONE, PRINT THE TIME
11413  0074 00 4 01222         TSX     OUTPUT,4          PRINT COLSING MESSAGE
11414  0 00000 0 00364                 BCDOUT
11415  0 00005 0 11541                 EVQME,,5
11416  0774 00 4 00000   EVLQX AXT     **,4              RESTORE LINK IR
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11417  0774 00 2 00000   EVLQY AXT     **,2
11420  0020 00 4 00001         TRA     1,4               EXIT
                        *
                        *       EVALQT  LISP ENTRANCE TO EVALQUOTE
                        *
11421  0634 00 4 11376  EVALQT SXA     EVQD,4            SET RETURN INDEX CELL
11422  0020 00 0 11365         TRA     EVQMP             GO TO MAIN PROGRAM
                        *
                        * ERROR RETURNS CONTROL HERE
                        *
11423  0074 00 4 06311  EVQERR TSX     TEREAD,4          CLEAN UP READ BUFFER
11424  0074 00 4 05214         TSX     TERPRI,4          CLEAN UP PRINT BUFFER
11425  0074 00 4 05421         TSX     TERPUN,4          CLEAN UP PUNCH BUFFER
11426  0074 00 4 02410         TSX     TERPDL,4          RESET PUSH DOWN LIST
11427  0520 00 0 11516         ZET     EVQRTS            SKIP IF IN READ IN SECTION OF EVALQUOT
11430  0020 00 0 11407         TRA     EVQER             EXECUTE NEXT DOUBLET
11431 -0625 00 0 11516         STL     EVQRTS            MOVE TO OPREATE SECTION OF EVALQUOTE
11432  0074 00 4 01222         TSX     OUTPUT,4          MESSAGE THAT READ WAS ERROR TERMINATED
11433  0 00000 0 00364                 BCDOUT
11434  0 00012 0 11546                 EVQRE,,10
11435  0500 00 0 03506         CLA     EVQAN             PICK UP LAST LIST READ IN
11436  0074 00 4 04604         TSX     $PRINT,4
11437  0774 00 2 00000   EVQRX AXT     **,2              RESTORE IR 2 TO RIGHT VALUE
11440  1 00001 2 11341         TXI     EVQOP,2,1         SET IR 2 TO PROER VALUE
                        *
                        * CASE FOR ATOMIC FIRST LIST OF DOUBLET
                        *
11441 -0734 00 4 00000   EVQAT PDX     0,4
11442 -3 00000 4 11374         TXL     EVQNF,4,0         EXIT IF END OF ATOM
11443  0500 00 4 00000         CLA     0,4               NEXT WORD
11444  0734 00 4 00000         PAX     0,4               CAR OF ATOM
11445 -0625 00 0 11515         STL     EVQST             SET SWITCH FOR SUBR OF EXPR
11446 -3 06732 4 11450         TXL     *+2,4,$SUBR-1     LOOK FOR $SUBR
11447 -3 06733 4 11501         TXL     EVQFS,4,$SUBR     TREAT AS FSUBR (ALMOST)
11450 -3 10156 4 11452         TXL     *+2,4,$EXPR-1     LOOK FOR $EXPR
11451 -3 10157 4 11457         TXL     EVQFX,4,$EXPR     TREAT AS FEXPR (ALMOST)
11452  0600 00 0 11515         STZ     EVQST             SET SWITCH FOR FSUBR OR FEXPR
11453 -3 10102 4 11455         TXL     *+2,4,$FSUBR-1    LOOK FOR FSUBR
11454 -3 10103 4 11501         TXL     EVQFS,4,$FSUBR
11455 -3 10141 4 11441         TXL     EVQAT,4,$FEXPR-1  LOOK FOR FEXPR
11456  3 10142 4 11441         TXH     EVQAT,4,$FEXPR
11457 -0734 00 4 00000   EVQFX PDX     0,4               FOUND AN FEXPR
11460  0500 00 4 00000         CLA     0,4
11461  0734 00 4 00000         PAX     0,4               THE EXPRESSION FOR THE FEXPR
11462 -0754 00 4 00000         PXD     0,4               EXPRESSION TO AC
11463  0520 00 0 11515         ZET     EVQST             SKIP IF FEXPR
11464  0020 00 0 11375         TRA     EVQZ              GO TO APPLY CALL FOR EXPR
11465  0601 00 0 03506         STO     EVQAN             SAVE THE EXPRESSION
11466 -0600 00 0 11514         STQ     EVQMQ             SAVE MQ
11467 -0754 00 0 00000         PXD     0,0               CLEAR
11470  0131 00 0 00000         XCA                       MQ AND
11471 -0754 00 0 00000         PXD     0,0               AC
11472  0074 00 4 03730         TSX     $CONS,4           NULL A LIST
11473  0131 00 0 00000         XCA                       INTO MQ
11474  0500 00 0 11514         CLA     EVQMQ             PUT SECOND LIST IN AC
11475  0074 00 4 03730         TSX     $CONS,4           CONS(L,A)
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11476  0131 00 0 00000         XCA                     ANSWER TO ARG 2
11477  0500 00 0 03506         CLA     EVQAN           FEXPR
11500  0020 00 0 11375         TRA     EVQZ            GO TO APPLY FOR FEXPR
                       *
11501 -0734 00 4 00000   EVQFS PDX     0,4             FOUND FSUBR, GET TXL INSTRUCTION
11502  0500 00 4 00000         CLA     0,4
11503  0734 00 4 00000         PAX     0,4
11504  0500 00 4 00000         CLA     0,4
11505  0621 00 0 11377         STA     EVQFT           SAVE ADDRESS
11506 -0754 00 0 00000         PXD     0,0             ZERO
11507  0131 00 0 00000         XCA                     THE MQ AND PUT LIST IN AC
11510  0520 00 0 11515         ZET     EVQST           SKIP IF FSUBR
11511  0074 00 4 10072         TSX     SPREAD,4        SPREAD THE ARGUMENTS
11512  0020 00 0 11376         TRA     EVQD            EXECUTE THE SUBR OR FSUBR
                       *
11513  0 00000 0 00000   EVQAC                         TEMPORARY STORAGE
11514  0 00000 0 00000   EVQMQ                         DITTO
11515  0 00000 0 00000   EVQST                         TEST CELL IS NON-ZERO FOR SUBR OR EXPR
11516  0 00000 0 00000  EVQRTS                        TEST CELL IS ZERO DURING READ IN
                 00144   EVQBL EQU     100             LENGTH OF BUFFER
11517  0 06772 0 00000   EVQSP         ,,$STOP         STOP ATOM
11520  002565214350      EVQBM BCI     7,0EVALQUOTE OPERATOR AS OF 1 MARCH 1961.
11521  644663256046
11522  472551216346
11523  516021626046
11524  266001604421
11525  512330600111
11526  060133606060
11527  603145476463            BCI     5, INPUT LISTS NOW BEING READ.
11530  604331626362
11531  604546666022
11532  253145276051
11533  252124336060
11534  002545246046      EVQAM BCI     5,0END OF EVALQUOTE, VALUE IS ....
11535  266025652143
11536  506446632573
11537  606521436425
11540  603162603333
11541  012545246046      EVQME BCI     5,1END OF EVALQUOTE OPERATOR
11542  266025652143
11543  506446632560
11544  464725512163
11545  465160606060
11546  005125212431      EVQRE BCI     9,0READING TERMINATED BY AN ERROR. LAST LIST READ IN IS
11547  452760632551
11550  443145216325
11551  246022706021
11552  456025515146
11553  513360432162
11554  636043316263
11555  605125212460
11556  314560316260
11557  603333333333            BCI     1, .....
                       *
                       H       HED
                       *       ERRORSET(E,N,SW)
```

```
                        *
                        *       ERRORSET ATTEMPTS TO EVALUATE ITS FIRST ARGUMENT.  IF AN
                        *       ERROR OCCURS DURING THE EVALUATION, OR IF MORE THAN N CONS-S
                        *       OCCUR DURING THE EVALUATION, ERRORSET RETURNS WITH A VALUE OF F
                        *       AFTER RESTORING CONDITIONS TO WHAT THEY WERE BEFORE THE
                        *       ATTEMPTED EVALUATION.  IF THE EVLAUATION SUCCEEDS, ERRORSET
                        *       RETURNS LIST OF THE RESULT.  IF SW * F, ERROR DIAGNOSTICS ARE
                        *       SUPPRESSED, AND IF SW = T, THEY ARE INCLUDED.
                        *
11560 -0634 00 4 11662  ERRSET SXD     HORN,4
11561  0074 00 4 02312         TSX     $SAVE,4
11562 -3 11673 0 02363         TXL     $END8,,HORN+9
11563 -0634 00 2 11663         SXD     HORN+1,2
11564  0634 00 1 11663         SXA     HORN+1,1
11565  0604 00 0 11666         STI     HORN+4
11566 -0734 00 1 00000         PDX     0,1             EXPRESSION TO BE EVALUATED
11567 -0534 00 4 03321         LXD     $ARG3,4         ERROR BYPASS SWITCH
11570  0634 00 4 11664         SXA     ERNULL,4
11571  0131 00 0 00000         XCA
11572 -0734 00 2 00000         PDX     0,2             GET CONS COUNTER LIMIT
11573  0074 00 4 13075         TSX     FIXVAL,4
11574  0601 00 0 11670         STO     HORN+6
11575  0500 00 0 03742         CLA     $CNTR1          GET CURRENT CONS COUNT
11576 -0320 00 0 00457         ANA     $AMASK
11577  0400 00 0 04106         ADD     $CNTS
11600  0402 00 0 11670         SUB     HORN+6          COMPARE WITH THE LIMIT
11601 -0120 00 0 11611         TMI     OBOE            TRA IF COUNTER NEED NOT BE CHANGED
11602 -0760 00 0 00003         SSM                     NEG. NUMBER FOR GARBAGE COLLECTOR
11603  0601 00 0 11667         STO     HORN+5          SAVE (LIMIT - OLD COUNT)
11604  0500 00 0 11670         CLA     HORN+6          SET CONS COUNTER TO LIMIT
11605  0621 00 0 03742         STA     $CNTR1
11606 -0320 00 0 00465         ANA     PDTMSK
11607  0601 00 0 04106         STO     $CNTS
11610  0020 00 0 11612         TRA     *+2
11611  0600 00 0 11667   OBOE  STZ     HORN+5          TAKE LIMIT = OLD COUNT
11612  0560 00 0 00370         LDQ     $ZERO           NULL P-LIST FOR EVALUATION
11613  0502 00 0 02317         CLS     $CPPI           SAVE PUSHDOWN  POINTER
11614  0601 00 0 11670         STO     HORN+6
11615 -0625 00 0 11671         STL     TCOUNT          TURN ON CONS COUNTER
11616  0774 00 4 11625         AXT     BSOON,4         SET UP EXIT IN ERROR
11617  0634 00 4 11665         SXA     EREXIT,4
                        *       ATTEMPT TO PERFORM THE EVALUATION
11620 -0754 00 1 00000         PXD     0,1             EXPRESSION TO BE EVALUATED
11621  0074 00 4 15454         TSX     $EVAL,4
                        *       WE GET HERE IF THE EVALUATION WORKED
11622  0560 00 0 00370         LDQ     $ZERO           FORM LIST OF THE RESULT
11623  0074 00 4 03730         TSX     $CONS,4
                        *       AN ERROR IN THIS CONS ACTS LIKE AN ERROR IN THE EVALUATION
11624  0020 00 0 11643         TRA     SHAWM           RESTORE PARAMETERS AND EXIT
                        *       WE GET HERE IN CASE OF ERROR
11625 -0535 00 4 11670   BSOON LDC     HORN+6,4        UNSAVE ALL RECURSIVE FUNCTIONS
11626 -0634 00 4 11641         SXD     TUBA,4           ENTERED SINCE THE ERROR
11627  0020 00 0 11640         TRA     TUBA-1
11630 -0534 00 4 02317  HARP   LXD     $CPPI,4
11631 -0500 00 4 77777         CAL     -1,4
11632 -0320 00 0 00461         ANA     $PMASK          TEST FOR STR FROM COMPILER
```

```
      11633  0322 00 0 00451         ERA     $QP5
      11634  0100 00 0 11637         TZE     *+3
      11635  0074 00 4 02326         TSX     UNSAVE,4
      11636  0020 00 0 11640         TRA     *+2
      11637  0074 00 4 17330         TSX     C$UNWND,4
      11640 -0535 00 4 02317         LDC     $CPPI,4
      11641  3 00000 4 11630  TUBA   TXH     HARP,4,**
      11642 -0754 00 0 00000         PXD     0,0                RETURN VALUE OF NIL
                               *     RESTORE PARAMETERS FOR EITHER KIND OF EXIT
      11643  0601 00 0 11670   SHAWM STO     HORN+6             SAVE EXIT VALUE
      11644  0500 00 0 03742         CLA     $CNTR1             RESTORE CONS COUNTER
      11645 -0320 00 0 00457         ANA     $AMASK
      11646  0400 00 0 04106         ADD     $CNTS
      11647  0402 00 0 11667         SUB     HORN+5
      11650  0621 00 0 03742         STA     $CNTR1
      11651 -0320 00 0 00465         ANA     PDTMSK
      11652  0601 00 0 04106         STO     $CNTS
      11653  0534 00 1 11663         LXA     HORN+1,1           RESTORE INDICATORS, IR1, AND IR2
      11654 -0534 00 2 11663         LXD     HORN+1,2
      11655  0441 00 0 11666         LDI     HORN+4
      11656  0500 00 0 11670         CLA     HORN+6             PICK UP EXIT VALUE
      11657  0074 00 4 02326         TSX     UNSAVE,4           RESTORE HORN BLOCK
      11660 -0534 00 4 11662         LXD     HORN,4             RESTORE IR4 AND EXIT
      11661  0020 00 4 00001         TRA     1,4
                               *     PROTECTED TEMPORARY STORAGE FOR ERRORSET
                                     HEAD    H
      11662 -0 00000 0 10211   HORN  MZE     ERSETO             (+0) ERRORSET OBJECT IN A, IR4 IN D
      11663 -0 00000 0 00000         MZE                        (+1) IR1 IN A, IR2 IN D
      11664 -0 00000 0 11664  ERNULL MZE     *                  (+2) ZERO MEANS SKIP DIAGNOSTICS
TD    11665 -3 00000 0 11423  EREXIT TXL     EVQERR             (+3) EXIT INSTRUCTION FOR $ERROR
      11666 -0 00000 0 00000         MZE                        (+4) INDICATORS
      11667 -0 00000 0 00000         MZE                        (+5) CONS COUNTER INCREMENT
      11670 -0 00000 0 00000  NUBPDL MZE                        (+6) PDL BACKUP POINT IN D
      11671 -0 00000 0 00000  TCOUNT MZE                        (+7) NON-ZERO ACTIVATES CONS COUNTER
                                     HEAD    0
                       11665   TERA2 SYN     EREXIT
                               *
                                     HEAD    H
                               *
                               *             EXTENDED CAR S AND CDR S FOR THE INTERPRETER
                               *
      11672  0634 00 4 11703  CAAARX SXA     CAX,4              SAVE LINK IR
      11673 -0734 00 4 00000         PDX     0,4
      11674  0500 00 4 00000         CLA     0,4
      11675  0734 00 4 00000         PAX     0,4
      11676  0500 00 4 00000    AA   CLA     0,4
      11677  0734 00 4 00000         PAX     0,4
      11700  0500 00 4 00000    A    CLA     0,4
      11701  0734 00 4 00000         PAX     0,4
      11702 -0754 00 4 00000         PXD     0,4
      11703  0774 00 4 00000    CAX  AXT     **,4               RESTORE LINK IR
      11704  0020 00 4 00001         TRA     1,4                EXIT
                               *
      11705  0634 00 4 11703  CAADRX SXA     CAX,4
      11706 -0734 00 4 00000         PDX     0,4
      11707  0500 00 4 00000         CLA     0,4
```

```
11710 -0734 00 4 00000   AAX   PDX     0,4
11711  0020 00 0 11676         TRA     AA
                        *
11712  0634 00 4 11703  CADARX SXA     CAX,4
11713 -0734 00 4 00000         PDX     0,4
11714  0500 00 4 00000         CLA     0,4
11715  0734 00 4 00000         PAX     0,4
11716  0500 00 4 00000   AD    CLA     0,4
11717 -0734 00 4 00000         PDX     0,4
11720  0020 00 0 11700         TRA     A
11721  0634 00 4 11703  CADDRX SXA     CAX,4
11722 -0734 00 4 00000         PDX     0,4
11723  0500 00 4 00000         CLA     0,4
11724 -0734 00 4 00000   ADX   PDX     0,4
11725  0020 00 0 11716         TRA     AD
                        *
11726  0634 00 4 11703  CAARXX SXA     CAX,4
11727  0020 00 0 11710         TRA     AAX
                        *
11730  0634 00 4 11703  CADRXX SXA     CAX,4
11731  0020 00 0 11724         TRA     ADX
                        *
11732  0634 00 4 11742  CDAARX SXA     CDX,4
11733 -0734 00 4 00000         PDX     0,4
11734  0500 00 4 00000         CLA     0,4
11735  0734 00 4 00000         PAX     0,4
11736  0500 00 4 00000   DA    CLA     0,4
11737  0734 00 4 00000         PAX     0,4
11740  0500 00 4 00000   D     CLA     0,4
11741 -0320 00 0 00460         ANA     $DMASK
11742  0774 00 4 00000   CDX   AXT     **,4
11743  0020 00 4 00001         TRA     1,4
11744  0634 00 4 11742  CDADRX SXA     CDX,4
11745 -0734 00 4 00000         PDX     0,4
11746  0500 00 4 00000         CLA     0,4
11747 -0734 00 4 00000   DAX   PDX     0,4
11750  0020 00 0 11736         TRA     DA
                        *
11751  0634 00 4 11742  CDDARX SXA     CDX,4
11752 -0734 00 4 00000         PDX     0,4
11753  0500 00 4 00000         CLA     0,4
11754  0734 00 4 00000         PAX     0,4
11755  0500 00 4 00000   DD    CLA     0,4
11756 -0734 00 4 00000         PDX     0,4
11757  0020 00 0 11740         TRA     D
                        *
11760  0634 00 4 11742  CDDDRX SXA     CDX,4
11761 -0734 00 4 00000         PDX     0,4
11762  0500 00 4 00000         CLA     0,4
11763 -0734 00 4 00000   DDX   PDX     0,4
11764  0020 00 0 11755         TRA     DD
                        *
11765  0634 00 4 11742  CDARXX SXA     CDX,4
11766  0020 00 0 11747         TRA     DAX
                        *
11767  0634 00 4 11742  CDDRXX SXA     CDX,4
```

```
11770  0020 00 0 11763          TRA     DDX
                       *
                                HEAD    C
11771  0634 00 4 12003   GET    SXA     GETX,4              SAVE LINK IR
11772  0601 00 0 12006          STO     GETL
11773  0500 00 0 12005          CLA FCN31
11774  0601 00 0 03321          STO $ARG3
11775  0500 00 0 12006          CLA GETL
11776  0074 00 4 10011          TSX $PROP,4
11777 -0734 00 4 00000          PDX 0,4
12000  0500 00 4 00000          CLA 0,4
12001  0734 00 4 00000          PAX 0,4
12002 -0754 00 4 00000          PXD 0,4
12003  0774 00 4 00000   GETX   AXT     **,4                RESTORE  LINK IR
12004  0020 00 4 00001          TRA 1,4
12005 -3 00000 0 12003   FCN31  TXL     GETX,,0
12006  0 00000 0 00000   GETL
                       *
                       * COMPAT        FUNCTIONAL ARGUMENT LINKAGE PROGRAM BETWEEN COMPILED
                       *               PROGRAMS AND APPLY FOR S-EXPRESSION FUNCTIONAL ARGUMENTS
                       *
12007  0634 00 4 12026  COMPAT SXA     CX,4                SAVE INDEX REGISTERS
12010  0634 00 2 12027          SXA     CY,2
12011  0601 00 0 03317          STO     $ARG1               SAVE AC
12012 -0600 00 0 03320          STQ     $ARG2               DITTO MQ
12013  0560 00 0 00370          LDQ     $ZERO               END OF ARGUMENT LIST
12014  0500 00 4 00001          CLA     1,4                 ARGUMENTS FOR COMPAT
12015  0622 00 0 12031          STD     CA                  S-EXPRESSION FUNCTIONAL ARGUMENT
12016  0737 00 2 00000          PAC     0,2                 COMPLEMENT NUMBER OF ARGUMENTS
12017 -3 00000 2 12024   CL     TXL     CD,2,0              GO WHEN ALL DONE
12020  0500 00 2 03316          CLA     $ARG1-1,2           PICK UP ARGUMENT
12021  0074 00 4 03730          TSX     $CONS,4             CONS ON TO ARGUMENT LIST
12022  0131 00 0 00000          XCA                         LIST TO MQ
12023  1 00001 2 12017          TXI     CL,2,1              GO BACK FOR NEXT
12024  0500 00 0 12031   CD     CLA     CA                  FUNCTIONAL ARGUMENT
12025  0600 00 0 03321          STZ     $ARG3               ZERO PAIR LIST
12026  0774 00 4 00000   CX     AXT     **,4                RESTORE INDEX REGISTERS
12027  0774 00 2 00000   CY     AXT     **,2
12030  1 77777 4 14663          TXI     $APPLY,4,-1         GO TO APPLY AND ADJUST EXIT INDEX
12031  0 00000 0 00000   CA                                 S-EXPRESSION GOES HERE
                       F        HED
                       *        PACK(CHAR)
                       *
                       *        PACK ADDS ANOTHER CHARACTER TO THE CHARACTER BUFFER BOFFO
                       *
                       *
12032  0771 00 0 00022   PACK   ARS     18                  GET CHARACTER CODE FROM
12033  0402 00 0 00521          SUB     HORG                  LOCATION OF OBJECT
12034 -0765 00 0 00006          LGR     6                   PUT NEW CHARACTER INTO PACKED WORD
12035 -0500 00 0 12603          CAL     CHARS
12036  0140 00 0 12037          TOV     *+1                 SHUT OFF OVERFLOW LIGHT
12037 -0763 00 0 00006          LGL     6
12040  0140 00 0 12044          TOV     B5                  IF WORD FULL, PUT IT IN BUFFER
12041  0602 00 0 12603          SLW     CHARS
12042 -0754 00 0 00000          PXD     ,0                  CLEAR AC FOR EXIT
12043  0020 00 4 00001          TRA     1,4                 EXIT
```

```
12044  0634 00 4 12053   B5     SXA     B1,4              SAVE IR4
12045  0774 00 4 00024   BFLOC  AXT     20,4              ADDRESS HAS INDEX FOR BOFFO
12046  0602 00 4 12631          SLW     BOFFO,4           STORE FULL WORD OF CHARACTERS
12047 -2 00001 4 12056          TNX     B3,4,1            IF BUFFER FULL, TRANSFER
12050  0500 00 0 12417          CLA     A1                WHEN 1 SHIFTS PAST P BIT,
12051  0601 00 0 12603          STO     CHARS               NEW WORD HAS 6 CHARACTERS
12052  0634 00 4 12045          SXA     BFLOC,4           SAVE BUFFER INDEX
12053  0774 00 4 00000   B1     AXT     ,4                RESTORE IR4
12054 -0754 00 0 00000          PXD     ,0                CLEAR AC FOR EXIT
12055  0020 00 4 00001          TRA     1,4               EXIT
12056 -3 00000 4 12061   B3     TXL     B4,4,0            IF MORE THAN 120 CHARS, TRANSFER
12057  0634 00 0 12045          SXA     BFLOC,0           SET INDEX TO SHOW BUFFER FILLED
12060  0020 00 0 12066          TRA     B6
12061  0074 00 4 12147   B4     TSX     $MKNAM,4          FORM OBJECT FOR ERROR PRINTOUT
12062  0074 00 4 06420          TSX     INTRN1,4
12063 -0634 00 4 01562          SXD     $ERROR,4
12064  0074 00 4 01563          TSX     $ERROR+1,4
12065  542330600154             BCI     1,*CH 1*          TOO MANY CHARACTERS IN PRINT NAME
12066  0500 00 0 00471   B6     CLA     SEVENS            BIT 1 IN CHARS WILL MAKE
12067  0601 00 0 12603          STO     CHARS               WORD LOOK FULL
12070  0020 00 0 12053          TRA     B1
                       *        PACK USES $ERROR, $EROR1, AND $Q1




                                SPACE   5
                       *        NUMOB
                       *
                       *        NUMOB MAKES A NUMERICAL OBJECT CORRESPONDING TO THE BCD
                       *        CHARACTERS IN THE BUFFER BOFFO.
                       *
                       *        THIS ROUTINE HAS CORSS-REFERENCES TO THE INNARDS OF NUMBR
                       *
12071  0634 00 4 12134   NUMOB  SXA     GV1,4             SAVE IR4
12072  0140 00 0 12073          TOV     *+1               SHUT OFF OVERFLOW LIGHT
12073 -0500 00 0 12603          CAL     CHARS             SHIFT SEVENS INTO LAST PACKED WORD
12074  0560 00 0 00471          LDQ     SEVENS
12075 -0763 00 0 00006          LGL     6
12076 -0140 00 0 12075          TNO     *-1               DONE WHEN 1 PASSES THROUGH P BIT
12077  0534 00 4 12045          LXA     BFLOC,4           PUT LAST WORD INTO BOFFO
12100  0602 00 4 12631          SLW     BOFFO,4
12101  0500 00 0 12573          CLA     PARAM             INPUT PARAMETER FOR NUMBR IS
12102  0074 00 4 06622          TSX     NUMBR,4             BEGINNING OF BOFFO
12103  0100 00 0 12136          TZE     GV3               ERROR IF ZERO IN AC
12104  0120 00 0 12112          TPL     GV2               TRANSFER IF FIXED POINT OUTPUT
12105  0131 00 0 00000          XCA                       GET NUMBER FROM MQ
12106  0560 00 0 00476          LDQ     FLOS              FLOATING POINT SIGNAL
12107  0074 00 4 12636          TSX     $MKNO,4           FORM OBJECT
12110  0534 00 4 12134          LXA     GV1,4             RESTORE IR4
12111  0020 00 0 12201          TRA     CLEAR             RESET BOFFO AND EXIT
12112 -0760 00 0 00001   GV2    PBT                       OCTAL SIGNAL IN NUMBR OUTPUT
12113  0020 00 0 12121          TRA     GV6               TRA IF NOT OCTAL
12114  0131 00 0 00000          XCA
12115  0560 00 0 00503          LDQ     $OCTD             MAKE OCTAL NUMBER
```

```
12116  0074 00 4 12636          TSX     $MKNO,4
12117  0534 00 4 12134          LXA     GV1,4
12120  0020 00 0 12201          TRA     CLEAR              RESET BOFFO AND EXIT
12121  0131 00 0 00000   GV6    XCA                        BRING THE NUMBER TO THE AC
12122 -0120 00 0 12132          TMI     GV4                TEST FOR DIGITS 0 THRU 9
12123  0340 00 0 00402          CAS     $Q10
12124  0020 00 0 12132          TRA     GV4
12125  0020 00 0 12132          TRA     GV4
12126  0361 00 0 00521          ACL     HORG               FORM OBJECT DIRECTLY
12127  0767 00 0 00022          ALS     18
12130  0534 00 4 12134          LXA     GV1,4              RESTORE IR4
12131  0020 00 0 12201          TRA     CLEAR
12132  0560 00 0 00475   GV4    LDQ     FIXS               FIXED POINT SIGNAL FOR $MKNO
12133  0074 00 4 12636          TSX     $MKNO,4            FORM NUMERICAL OBJECT
12134  0774 00 4 00000   GV1    AXT     ,4                 RESTORE IR4
12135  0020 00 0 12201          TRA     CLEAR              RESET BOFFO AND EXIT
12136  0074 00 4 01222   GV3    TSX     OUTPUT,4
12137  0 00000 0 00364          BCDOUT
12140  0 00004 0 12143          GVA,,4
                        *       BCI     1,*CH 2*           FLOATING POINT NUMBER OUT OF RANGE
12141 -0754 00 0 00000          PXD     0,0
12142  0020 00 0 12134          TRA     GV1
12143  602551514651     GVA    BCI     4, ERROR NUMBER  *CH 2*
12144  604564442225
12145  516060542330
12146  600254606060
                        *
                        *       THIS ROUTINE USES $CONS, $MKNO,$ZERO,$ERROR, AD $EROR1




                                SPACE   5
                        *       MKNAM AND CLEARBUFF
                        *
                        *
                        *       CLEARBUFF STARTS AT CLEAR AND RESETS THE BUFFER BOFFO TO
                        *       THE BEGINNING
                        *
                        *       MKNAM() HAS AS OUTPUT A PNAME LIST STRUCTURE CORRESPONDING
                        *       TO THE CHARACTERS IN THE BUFFER BOFFO.  THE BEGINNING OF
                        *       BOFFO IS RESET.
                        *
                        *       THIS ROUTINE HAS CROSS-REFERENCES TO THE INNARDS OF PACK.
                        *
12147  0634 00 4 12207   MKNAM SXA     BB1,4              SAVE IR4
12150  0634 00 2 12177          SXA     BBIR2,2            SAVE IR2
12151 -0500 00 0 12603          CAL     CHARS              IF C(CHARS) = 1, CHARS CONTAINS
12152 -0340 00 0 12417          LAS     A1                   NO SIGNIFICANT CHARACTERS
12153  0020 00 0 12156          TRA     BB5
12154 -0754 00 0 00000          PXD     ,0
12155  0020 00 0 12167          TRA     BB2                  NO SIGNIFICANT CHARACTERS IN CHARS
12156  0140 00 0 12157   BB5    TOV     *+1                SHUT OFF OVERFLOW LIGHT
12157  0560 00 0 00471          LDQ     SEVNS              SHIFT SEVENS INTO LAST WORD
12160 -0763 00 0 00006          LGL     6                    OF LIST
```

```
12161 -0140 00 0 12160         TNO     *-1
12162  0602 00 0 12574         SLW     T1                PUT P BIT INTO SIGN
12163  0500 00 0 12574         CLA     T1
12164  0074 00 4 03710         TSX     $CONSW,4          FORM POINTER TO LAST WORD OF LIST
12165  0560 00 0 00370         LDQ     ZERO
12166  0074 00 4 03730         TSX     $CONS,4
12167  0534 00 2 12045   BB2   LXA     BFLOC,2           LOC OF LAST SIGNIFICAN BUFFER WORD
12170  3 00023 2 12177   BB4   TXH     BBIR2,2,19        TRA IF BUFFER IS EXHAUSTED
12171  0602 00 0 03654         SLW     BBPNT             SAVE DECREMENT FOR FUTURE USE
12172  0500 00 2 12630         CLA     BOFFO-1,2         GET NEXT WORD OF BUFFER
12173  0074 00 4 03710         TSX     $CONSW,4
12174  0560 00 0 03654         LDQ     BBPNT
12175  0074 00 4 03730         TSX     $CONS,4
12176  1 00001 2 12170         TXI     BB4,2,1           MOVE TO NEXT WORD OF BUFFER
12177  0774 00 2 00000   BBIR2 AXT     **,2              RESTORE IR2
12200  0020 00 0 12202         TRA     BB3               RESET POSITION IN BOFFO
12201  0634 00 4 12207   CLEAR SXA     BB1,4             ENTRANCE FOR CLEARING BUFFER
12202  0560 00 0 12417   BB3   LDQ     A1                RESET CHARS CELL TO 0 CHARACTERS
12203 -0600 00 0 12603         STQ     CHARS
12204  0774 00 4 00024         AXT     20,4              SET INDEX IN PACK FOR FIRST
12205  0634 00 4 12045         SXA     BFLOC,4             BUFFER WORD
12206  0600 00 0 03654         STZ     BBPNT             AVOID UNNECESSARY GARBAGE COLL.
12207  0774 00 4 00000   BB1   AXT     ,4                RESTORE IR4
12210  0020 00 4 00001         TRA     1,4               EXIT
```

```
                               SPACE   5
                        *      ADVANCE, STARTREAD, AND ENDREAD PROGRAMS
                        *
                        *      ADVANCE SETS CURCHAR TO THE NEXT CHARACTER
                        *      STARTREAD READS A NEW RECORD
                        *      ENDREAD MOVES TO THE END OF THE CURRENT RECORD AND
                        *        GIVES ERROR OUTPUT, IF ANNY

12211 -0634 00 4 12220  ADVANC SXD PORK,4                SAVE IR
12212 -0534 00 4 12236         LXD CHPOS,4               FIND NO. OF CHARS. LEFT IN PACKED
12213  2 00006 4 12247         TIX CHOPS,4,6               WORD
12214 -0534 00 4 12237         LXD WDNUM,4               FIND NEW PACKED WORD
12215  2 00001 4 12243         TIX LAMB,4,1              IF NEW RECORD NEEDED, CONTINUE
12216 -0520 00 0 12604         NZT EORTS                 IF NONZERO GIVE EOR AS OUTPUT CHAR-
12217  0020 00 0 12223         TRA VEAL                    ACTER, OTHERWISE READ NEW RECORD
12220  1 00000 0 12276  PORK   TXI STEW,,0               READ A NEW RECORD
12221 -0634 00 4 12220  STREAD SXD PORK,4                SAVE IR4
12222  0020 00 0 12225         TRA *+3
12223 -0520 00 0 12517   VEAL  NZT ERSIG
12224  0020 00 0 12233         TRA JOYCE
12225  0600 00 0 12517         STZ ERSIG                 TURN OFF ERROR SIGNAL
12226  0774 00 4 00014         AXT 12,4                  PUT BLANKS IN ERROR BUFFER
12227 -0500 00 0 00472         CAL BLANKS
12230  0602 00 4 12572   RUTH  SLW ERBFL,4
12231  0602 00 4 12535         SLW ERBFU,4
12232  2 00001 4 12230         TIX RUTH,4,1
12233  0074 00 4 00663   JOYCE TSX $INPUT,4              READ A NEW RECORD
```

```
12234  0 00000 0 00000            $BCDIN
12235  0 00016 0 12536            BUFF-12,,14
12236  1 00000 0 12316  CHPOS  TXI RIBS,,0               ERROR RETURN
12237  1 00000 0 12271  WDNUM  TXI RUMP,,0               EOF RETURN
12240 -0625 00 0 12604         STL EORTS                 SET SIGNAL FOR EOR OUTPUT NEXT TIME
12241  0600 00 0 12635         STZ $CHACT                INITIALIZE CHARACTER COUNT
12242  0774 00 4 00014         AXT 12,4                  SET INDEX FOR START OF INPUT BUFFER
12243 -0634 00 4 12237  LAMB   SXD WDNUM,4
12244  0500 00 4 12552         CLA BUFF,4                PICK UP NEW PACKED WORD FROM
12245  0601 00 0 12572         STO PWORD                   INPUT BUFFER AND STORE IT
12246  0774 00 4 00044         AXT 36,4                  INITIALIZE POSITION IN PACKED WORD
12247 -0634 00 4 12236  CHOPS  SXD CHPOS,4
12250 -0754 00 0 00000         PXD ,0                    PICK OFF ONE CHARACTER
12251  0560 00 0 12572         LDQ PWORD
12252 -0763 00 0 00006  A6     LGL 6
12253 -0600 00 0 12572         STQ PWORD                 SAVE SHIFTED PACKED WORD
12254  0734 00 4 00000         PAX 0,4
12255  3 00014 4 12260         TXH SHANK,4,12            CHECK FOR 8-4 MINUS
12256 -3 00013 4 12260         TXL SHANK,4,11
12257  0774 00 4 00040         AXT 32,4                  CHANGE 8-4 MINUS TO 11 MINUS
12260  1 06127 4 12261   SHANK TXI *+1,4,$H00           POINTER TO NEW CHARACTER OBJECT
12261  0500 00 0 12635   BACON CLA $CHACT                BUMP CHARACTER COUNT
12262  0400 00 0 00371         ADD $Q1
12263  0601 00 0 12635         STO $CHACT
12264 -0754 00 4 00000         PXD ,4                    SET CURCHAR TO NEW CHARACTER
12265  0602 00 0 12634         SLW $CURC                 POINTER IN DECREMENT FOR BIN
12266  0634 00 4 12633         SXA $CURC1,4              POINTER IN ADDRESS FOR APVAL1
12267 -0534 00 4 12220         LXD PORK,4                RESTORE IR4
12270  0020 00 4 00001         TRA 1,4                   RETURN
12271  0534 00 4 00522  RUMP   LXA EOF,4                 END OF FILE CHARACTER
12272  0020 00 0 12314         TRA JEAN
12273 -0634 00 4 12220  ENDRED SXD PORK,4                SAVE IR4 FOR EXIT (ENDREAD ENTRANCE)
12274 -0634 00 0 12236         SXD CHPOS,0               SET CHARACTER POSITION AND WORD
12275 -0634 00 0 12237         SXD WDNUM,0               NUMBER AT END OF RECORD
12276 -0520 00 0 12517  STEW   NZT ERSIG                 TEST IF ERROR PRINTOUT NEEDED
12277  0020 00 0 12313         TRA SUZIE
12300  0074 00 4 05214         TSX TERPRI,4              PRINT BLANK LINE
12301  0074 00 4 01222         TSX OUTPUT,4              PRINT UPPER ERROR  BUFFER
12302  0 00000 0 00364             BCDOUT
12303  0 00015 0 12520             ERBFU-13,,13
12304  0074 00 4 01222         TSX OUTPUT,4              PRINT BAD LINE
12305  0 00000 0 00364             BCDOUT
12306  0 00015 0 12535             BUFF-13,,13
12307  0074 00 4 01222         TSX OUTPUT,4              PRINT LOWER ERROR BUFFER
12310  0 00000 0 00364             BCDOUT
12311  0 00015 0 12555             ERBFL-13,,13
12312  0074 00 4 05214         TSX TERPRI,4              PRINT BLANK LINE
12313  0534 00 4 00523   SUZIE LXA EOR,4                 LOAD END OF RECORD CHARACTER
12314  0600 00 0 12604  JEAN   STZ EORTS
12315  0020 00 0 12261         TRA BACON
12316 -0634 00 4 01562   RIBS  SXD $ERROR,4
12317  0074 00 4 01563         TSX $ERROR+1,4
12320  542330600354            BCI 1,*CH 3*
                       *       TAPE READING ERROR -ADVANCE, STARTREAD-
                00471   SEVNS SYN     SEVENS
```

```
                                SPACE   5
                                    ALPHABETIC FUNCTIONS

                                    LITER(CHAR)
12321 -0634 00 4 12336  LITER   SXD AL1,4
12322 -0737 00 4 00000          PDC 0,4
12323  0500 00 0 12440          CLA A2
12324  0402 00 4 04270  AL3     SUB CHTYP-$H00,4          COMPARE WITH TABLE ENTRY
12325 -0534 00 4 12336          LXD AL1,4
12326 -0100 00 0 12331          TNZ AL6
12327  0500 00 0 00442          CLA $QD1                  EXIT WITH T
12330  0020 00 4 00001          TRA 1,4
12331 -0754 00 0 00000  AL6     PXD ,0                    EXIT WITH F
12332  0020 00 4 00001          TRA 1,4
                                    OPCHAR(CHAR)
12333 -0634 00 4 12336  OPCHAR  SXD AL1,4
12334 -0737 00 4 00000          PDC 0,4
12335  0500 00 0 12437          CLA A3
12336  1 00000 0 12324   AL1    TXI AL3,,0
                                    DIGIT(CHAR)
12337  0340 00 0 00524  DIGIT   CAS HOL9
12340  0020 00 0 12344          TRA AL5
12341  0761 00 0 00000          NOP
12342  0500 00 0 00442          CLA $QD1
12343  0020 00 4 00001          TRA 1,4
12344 -0754 00 0 00000  AL5     PXD ,0
12345  0020 00 4 00001          TRA 1,4




                                SPACE   5
                        *       ERROR1
                        *
                        *       ER1 CREATES A VISUAL POINTER IN ERBFU AND ERBFL
                        *       TO A READING ERROR
                        *
12346 -0625 00 0 12517   EROR1 STL     ERSIG              TURN ON ERROR SIGNAL
12347  0634 00 4 12363         SXA     ERIR,4             SAVE IR4
12350  0500 00 0 00375         CLA     $Q5                V FOR UPPER BUFFER
12351  0560 00 0 00424         LDQ     OCT41              A FOR LOWER BUFFER
12352 -0535 00 4 12236         LDC     CHPOS,4            SHIFT BOTH LETTERS INTO POSITION
12353 -0763 00 4 77772         LGL     -6,4
12354 -0534 00 4 12237         LXD     WDNUM,4
12355 -3 00000 4 12362         TXL     ERX,4,0            DO NOTHING IF END OF RECORD
12356 -0602 00 4 12535         ORS     ERBFU,4            INSERT V INTO UPPER BUFFER
12357 -0130 00 0 00000         XCL
12360  0322 00 4 12572         ERA     ERBFL,4            INSERT A INTO LOWER BUFFER
12361  0602 00 4 12572         SLW     ERBFL,4
12362 -0754 00 0 00000   ERX   PXD     ,0
12363  0774 00 4 00000   ERIR  AXT     **,4               RESTORE IR4
12364  0020 00 4 00001         TRA     1,4                EXIT
```

```
                                SPACE   5
                        *       UNPACK(NAME)
                        *
                        *       UNPACK(NAME) GIVES A LIST OF THE CHARACTER OBJECTS
                        *       IN THE CELL -NAME-, UP TO THE FIRST 77.
                        *
12365  0634 00 4 12414  UNPACK SXA     UPI4,4              SAVE IR2 AND IR4
12366  0634 00 2 12415         SXA     UPI2,2
12367 -0734 00 4 00000         PDX     ,4                  PUT ARGUMENT CELL IN MQ
12370  0560 00 4 00000         LDQ     0,4
12371  0774 00 2 00006         AXT     6,2
12372 -0754 00 0 00000   UP2   PXD     ,0                  LOOK AT A CHARACTER
12373 -0763 00 0 00006         LGL     6
12374  0340 00 0 00413         CAS     $Q63
12375  1 00001 2 12401         TXI     UP1,2,1             ADJUST IR2 FOR CHARACTER
12376  1 00001 2 12401         TXI     UP1,2,1               COUNT
12377  0601 00 2 12602         STO     T1+6,2              STORE THE CHARACTER
12400  2 00001 2 12372         TIX     UP2,2,1

12401  0600 00 0 03654   UP1   STZ     UPLST               SET END OF LIST TO NIL
12402  3 00006 2 12412   UP4   TXH     UP3,2,6             EXIT IF ALL CHARACTERS LISTED
12403  0500 00 2 12602         CLA     T1+6,2              PICK UP NEXT CHARACTER
12404  0400 00 0 00521         ADD     HORG                  AND FORN OBJECT
12405  0767 00 0 00022         ALS     18
12406  0560 00 0 03654         LDQ     UPLST
12407  0074 00 4 03730         TSX     $CONS,4             PUT CHAR AT HEAD OF LIST
12410  0601 00 0 03654         STO     UPLST
12411  1 00001 2 12402         TXI     UP4,2,1
12412  0500 00 0 03654   UP3   CLA     UPLST               RETURN WITH LOCATION OF LIST
12413  0600 00 0 03654         STZ     UPLST               AVOID UNNECESSARY GARBAGE COLL.
12414  0774 00 4 00000   UPI4  AXT     **,4
12415  0774 00 2 00000   UPI2  AXT     **,2
12416  0020 00 4 00001         TRA     1,4                 EXIT
                        *
                        *       THIS ROUTINE USES $CONS




                                SPACE   5
                                    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                        STORAGE

                     00521   HORG  SYN     $H00A
                     00522   EOF   SYN     $H12A
                     00523   EOR   SYN     $H72A
                     00524   HOL9  SYN     $H11D
                     00525   HOL14 SYN     $H14D
                     00530   HOL40 SYN     $H40D
                                TITLE
12417 +000000000001     CHTYP  DEC 1,1,1,1,1,1,1,1        0 = ILLEGAL CHARACTER
12427 +000000000001            DEC 1,1,4,3,3,0,0,0        1 = DIGIT
12437 +000000000003            DEC 3,2,2,2,2,2,2,2        2 = LETTER
12447 +000000000002            DEC 2,2,4,4,4,0,0,0        3 = OPERATION CHARACTER
```

```
12457 +000000000003            DEC 3,2,2,2,2,2,2,2        4 = OTHER
12467 +000000000002            DEC 2,2,4,4,3,0,0,0
12477 +000000000004            DEC 4,3,2,2,2,2,2,2
12507 +000000000002            DEC 2,2,4,4,4,0,0,0
                               DETAIL
                 00370   ZERO  SYN $ZERO
                 12417   A1    SYN CHTYP
                 12440   A2    SYN CHTYP+17
                 12437   A3    SYN CHTYP+16
                 00424   OCT41 SYN $QO41
                 00412   A36   SYN $Q36
12517                    ERSIG BSS 1                      ERROR INDICATOR
12520  006060606060            BCI     1,0               DOUBLE SPACE UNDER PROGRAMM CONTROL
12535                    ERBFU BES     12                UPPER ERROR BUFFER
12535  606060606060            BCI     1,                SINGLE SPACE UNDER PROGRAM CONTROL
12552                    BUFF  BES     12                BUFFER FOR INPUT RECORD
12555                          BES     3                 ROOM FOR EXTRA WORDS IN READ-IN
12555  606060606060            BCI     1,                SINGLE SPACE UNDER PROGRAM CONTROL
12572                    ERBFL BES     12                LOWER ERROR BUFFER
12572                   PWORD  BSS 1
12573  0 00001 0 12605   PARAM PZE     BOFFO-20,,1
                 00476   FLOS  SYN     FLOATD
12574                    T1    BSS     7
                 00475   FIXS  SYN     $FIXD
12603                    CHARS BSS     1
12604                    EORTS BSS 1                      NONZERO INDICATES EOR OUTPUT CHAR
12631                    BOFFO BES     20
12631                          BSS     1                 JUNK WORD FOR BOFFO REMNANTS
                 03654   UPLST SYN     BBPNT             CUMULATIVE LIST OF CHARACTERS
12632                          BSS     1
12633  0 00000 0 00000  CURC1  PZE                       POINTER APPEARS IN ADDRESS
12634  0 00000 0 00000  CURC   PZE                       POINTER APPEARS IN DECREMENT
12635  0 00000 0 00000   CHACT PZE                       CHARACTER COUNT
                        *
                        *   MKNO   A FUNCTION OF TWO ARGUMENTS, THE FIRST IS A NUMBER, THE SECO
                        *          ND IS A TYPE (FLO OR FIX), MKNO FORMS A NON UNIQUE NUMBER
12636  0634 00 4 12660   MKNO  SXA     MKIR,4            SAVE LINK IR
12637 -0600 00 0 03656         STQ     MKT1              TYPE OF NUMBER TO MQ
12640  0074 00 4 03710         TSX     $CONSW,4
12641  0131 00 0 00000         XCA
12642  0500 00 0 00460         CLA     $DMASK
12643  0074 00 4 03730         TSX     $CONS,4
12644 -0534 00 4 03656         LXD     MKT1,4            TYPE TO IR 4
12645  0622 00 0 03656         STD     MKT1
12646  0500 00 0 00441         CLA     $QT5              ASSUME IT IS OCTAL
12647 -3 10134 4 12652         TXL     *+3,4,$FIX-1
12650  3 10135 4 12652         TXH     *+2,4,$FIX
12651  0500 00 0 00436         CLA     $QT1
12652 -3 10117 4 12655         TXL     *+3,4,$FLOAT-1
12653  3 10120 4 12655         TXH     *+2,4,$FLOAT
12654  0500 00 0 00437         CLA     $QT2
12655 -0534 00 4 03656         LXD     MKT1,4            LOCATION OF NUMBER
12656 -0602 00 4 00000         ORS     0,4               PUT IN NUMBER FLAG
12657 -0754 00 4 00000         PXD     0,4               ANSWER TO AC
12660  0774 00 4 00000   MKIR  AXT     **,4              RESTORE LINK IR
12661  0020 00 4 00001         TRA     1,4
```

```
                        *
                        *
                        H       HED
                        *       LOGOR, LOGAND, AND LOGXOR
                        *
                        *       THESE FUNCTIONS TAKE THE LOGICAL AND, LOGICAL OR, AND LOGICAL
                        *       EXCLUSIVE OR RESPECTIVELY OF THEIR ARGUMENTS, WHICH ARE NUMBER
                        *       OBJECTS.  THE RESULT IS AN OCTAL NUMBER OBJECT.
                        *
12662  0100 00 4 00001   LOGOR TZE     1,4                RETURN 0 IF 0 INPUT
12663 -0634 00 4 12756         SXD     T1,4               SAVE IR4
12664  0774 00 4 07706         AXT     -$)PJ37,4          LOGOR ATOM
12665  0634 00 4 12756         SXA     T1,4               SET FUNCTION ON PDL
12666  0074 00 4 02312         TSX     $SAVE,4
12667 -3 12760 0 02401         TXL     $END1,,T1+2        SAVE 1 ITEM
12670  0074 00 4 15774         TSX     $EVLIS,4           EVALUATE LIST OF ARGUMENTS
12671  0074 00 4 02326         TSX     UNSAVE,4
12672  0560 00 0 00370         LDQ     $ZERO              OR OF NO ARGUMENTS
12673 -0600 00 0 12757         STQ     T1+1
12674  0560 00 0 12747         LDQ     ORS                INSTRUCTION FOR INNER LOOP
12675  0020 00 0 12725         TRA     LOG2
                        *
12676  0100 00 4 00001  LOGAND TZE     1,4                EXIT WITH 0 IF 0 INPUT
12677 -0634 00 4 12756         SXD     T1,4               SAVE IR4
12700  0774 00 4 07676         AXT     -$)PJ36,4          LOGAND ATOM
12701  0634 00 4 12756         SXA     T1,4               SET FUNCTION ON PDL
12702  0074 00 4 02312         TSX     $SAVE,4
12703 -3 12760 0 02401         TXL     $END1,,T1+2        SAVE 1 ITEM
12704  0074 00 4 15774         TSX     $EVLIS,4           EVALUATE LIST OF ARGUMENTS
12705  0074 00 4 02326         TSX     UNSAVE,4
12706  0560 00 0 00471         LDQ     SEVENS             AND OF NO ARGUMENT
12707 -0600 00 0 12757         STQ     T1+1
12710  0560 00 0 12750         LDQ     ANS                INSTRUCTION FOR INNER LOOP
12711  0020 00 0 12725         TRA     LOG2
                        *
12712  0100 00 4 00001  LOGXOR TZE     1,4                EXIT WITH 0 IF 0 INPUT
12713 -0634 00 4 12756         SXD     T1,4               SAVE IR4
12714  0774 00 4 07666         AXT     -$)PJ38,4          LOGXOR ATOM
12715  0634 00 4 12756         SXA     T1,4               SET FUNCTION ON PDL
12716  0074 00 4 02312         TSX     $SAVE,4
12717 -3 12760 0 02401         TXL     $END1,,T1+2        SAVE 1 ITEM
12720  0074 00 4 15774         TSX     $EVLIS,4           EVALUATE LIST OF ARGUMENTS
12721  0074 00 4 02326         TSX     UNSAVE,4
12722  0560 00 0 00370         LDQ     $ZERO              RIGNSUM OF NO ARGUMENTS
12723 -0600 00 0 12757         STQ     T1+1
12724  0560 00 0 12751         LDQ     ERS                TRA TO INSTRUCTIONS FOR INNER LOOP
                        *       COMMON PART OF LOGAND, LOGOR AND LOGXOR
12725 -0600 00 0 12737   LOG2  STQ     LOG5
12726  0634 00 2 12745         SXA     LOG4,2             SAVE IR2
12727 -0734 00 2 00000         PDX     ,2                 POINTER TO ARGUMENT LIST
                        *       FORM THE PROPER LOGICAL COMBINATION OF THE ARGUMENTS
12730  0500 00 2 00000   LOG1  CLA     0,2                1
12731 -0734 00 2 00000         PDX     0,2                CDR(L)
12732  0734 00 4 00000         PAX     0,4
12733 -0754 00 4 00000         PXD     0,4                CAR(L)
12734  0074 00 4 14342         TSX     NUMVAL,4           GET NUMBER FOR THIS ELEMENT
```

```
12735 -0734 00 4 00000          PDX     0,4
12736 -0500 00 4 00000          CAL     0,4
12737  0 00000 0 00000   LOG5           **                  INSTRUCTION SET EARLIER
12740  3 00000 2 12730          TXH     LOG1,2,0            LOOP AGAIN IF CDR(L) NOT NULL
                         *      RETURN A POINTER TO THE RESULT
12741 -0500 00 0 12757   LOG6  CAL     T1+1                PICK UP RESULT
12742  0560 00 0 00503          LDQ     $OCTD               MAKE AN OBJECT OF IT
12743  0074 00 4 12636          TSX     $MKNO,4
12744 -0534 00 4 12756          LXD     T1,4                RESTORE IR4 AND IR2
12745  0774 00 2 00000   LOG4   AXT     **,2
12746  0020 00 4 00001          TRA     1,4
                         *      INSTRUCTIONS TO BE INSERTED IN INNER LOOP
12747 -0602 00 0 12757   ORS    ORS     T1+1
12750  0320 00 0 12757   ANS    ANS     T1+1
12751  0020 00 0 12752   ERS    TRA     *+1                 TRA SINCE ERS TAKES 2 INSTRUCTIONS
12752  0322 00 0 12757          ERA     T1+1
12753  0602 00 0 12757          SLW     T1+1
12754  3 00000 2 12730          TXH     LOG1,2,0
12755  0020 00 0 12741          TRA     LOG6
                         *
12756 -000000000000       T1    OCT     -0,-0               STORAGE FOR LOGAND, ETC.
12757 -000000000000
                         *      THIS ROUTINE USES NUMVAL,$MKNO,$ZERO,AND SEVENS




                                SPACE   5
                         *      LEFTSHIFT(X,N)
                         *
                         *      IF N IS +, X IS SHIFTED LEFT N PLACES.
                         *      IF N IS -, X IS SHIFTED RIGHT -N PLACES.
                         *      BOTH INPUTS MUST BE NUMERICAL OBJECTS.
                         *
12760  0634 00 4 13003  LSHIFT SXA     LSH1,4              SAVE IR4
12761  0634 00 2 13002          SXA     LSH4,2              SAVE IR2
12762  0601 00 0 12756          STO     T2                  SAVE X
12763  0131 00 0 00000          XCA
12764 -0734 00 2 00000          PDX     0,2                 FIND VALUE OF N
12765  0074 00 4 13075          TSX     FIXVAL,4
12766  0774 00 4 77100          AXT     7*4096+7*512+1*64,4  SET UP ARS
12767 -0120 00 0 12771          TMI     LSH2                IF NEGATIVE, SET UP ARS
12770  0774 00 4 76700          AXT     7*4096+6*512+7*64,4  SET UP ALS
12771 -0634 00 4 12777   LSH2   SXD     LSH3,4              PUT OP CODE INTO INSTRUCTION
12772  0621 00 0 12777          STA     LSH3
12773  0500 00 0 12756          CLA     T2                  FIND VLAUE OF X
12774  0074 00 4 14342          TSX     NUMVAL,4
12775 -0734 00 4 00000          PDX     0,4
12776 -0500 00 4 00000          CAL     0,4
12777  0767 00 0 00000   LSH3   ALS     **                  THIS INSTRUCTION WAS SET UP EARLIER
13000  0560 00 0 00503          LDQ     $OCTD               FORM OCTAL NUMBER
13001  0074 00 4 12636          TSX     $MKNO,4
13002  0774 00 2 00000   LSH4   AXT     **,2                RESTORE IR2
13003  0774 00 4 00000   LSH1   AXT     **,4
13004  0020 00 4 00001          TRA     1,4
```

```
                    12756   T2      SYN     T1
                            *
                            *       THIS ROUTINE USES $MKNO,$OCTD,AND NUMVAL
                            Q       HED
                            *
                            *
                            * ARYGET       THE FUNCTION THAT GETS AND SETS THE VALUES OF ARRAYS
                            *               USED IN LISP AS FOLLOWS ...
                            *               TO GET A VALUE  (NAME,D1,D2,D3)
                            *               TO SET A VLUAE   (NAME,SET,VALUE,D1,D2,D3)
                            *
                            *               THE CALLING SEQUENCE IS AS FOLLOWS
                            *       SXA     ARYGTX,4
                            *       TSX     ARYGET,4
                            *       PZE     LOCATION OF TABLE 1,,NUMBER OF DIMENSIONS
                            *
  13005  0634 00 2 13044   ARYGET SXA     ARYY,2              SAVE INDEX REGISTER
  13006  0634 00 1 13045         SXA     ARYZ,1
  13007  0601 00 0 13072         STO     AGAO                SAVE ARGUMENT 1
  13010  0500 00 4 00003         CLA     3,4                 TABLE ZERO PARAMETER WORD
  13011  0621 00 0 13042         STA     AGXEX               ADDRESS OF END OF TABLE 1
  13012 -0734 00 2 00000         PDX     0,2                 NUMBER OF DIMENSIONS
  13013 -0600 00 0 13073         STQ     AGAT                ARG 2
  13014  0500 00 0 03321         CLA     $ARG3
  13015  0601 00 0 13074         STO     AGATH               ARGUMENT 3
  13016  0500 00 0 13070         CLA     AX                  XEC INSTRUCTION
  13017 -0534 00 4 13072         LXD     AGAO,4              GET ARG 1
  13020 -3 07031 4 13032         TXL     AGN,4,$SET-1        TEST FOR SET OPERATION
  13021  3 07032 4 13032         TXH     AGN,4,$SET          GO ON IF NOT $SET
  13022 -0600 00 0 13071         STQ     AGV                 IS SET SAVE VALUE
  13023  0500 00 0 03321         CLA     $ARG3
  13024  0601 00 0 13072         STO     AGAO                DIMENSION 1
  13025  0500 00 0 03322         CLA     $ARG4
  13026  0601 00 0 13073         STO     AGAT                DIMENSION 2
  13027  0500 00 0 03323         CLA     $ARG5
  13030  0601 00 0 13074         STO     AGATH               DIMENSION 3
  13031  0500 00 0 13067         CLA     AXS                 XEC* INSTRUCTION
  13032  0622 00 0 13042   AGN   STD     AGXEX               SET UP FETCH OR STORE INSTUCTION
  13033  3 00002 2 13047         TXH     AGDTH,2,2           GO IF 3 D ARRAY
  13034  3 00001 2 13056         TXH     AGDT,2,1            GO IF 2 D ARRAY
  13035 -0534 00 2 13072         LXD     AGAO,2              DIMENSION 1
  13036  0074 00 4 13075         TSX     FIXVAL,4            EVALUATE THE FIXED POINT NUMBER
  13037  0734 00 1 00000         PAX     0,1                 INTO PROPER INDEX
  13040  0774 00 6 00000         AXT     0,6                 ZERO INDEX REGISTERS
  13041  0500 00 0 13071   AGXE  CLA     AGV                 GET THE VALUE
  13042  0522 00 4 00000   AGXEX XEC     **,4                FETCH BY XEC OR STORE BY XEC*
  13043  0774 00 4 00000  ARYGTX AXT     **,4                RESTORE INDEX REGISTERS
  13044  0774 00 2 00000   ARYY  AXT     **,2
  13045  0774 00 1 00000   ARYZ  AXT     **,1
  13046  0020 00 4 00001         TRA     1,4
                            *
  13047 -0534 00 2 13074   AGDTH LXD     AGATH,2             DIMENSION 3
  13050  0074 00 4 13075         TSX     FIXVAL,4            EVALUATE AS A FIXED POINT NUMBER
  13051  0734 00 1 00000         PAX     0,1                 INTO INDEX
  13052 -0534 00 2 13072         LXD     AGAO,2              DIMENSION 1
  13053  0074 00 4 13075         TSX     FIXVAL,4            EVALUATE IT
```

```
      13054  0621 00 0 13065          STA     AGR                SET UP AXT INSTRUCTION
      13055  0020 00 0 13062          TRA     AGD                GO EVALUATE DIMENSUON 2
                                *
      13056  0634 00 0 13065   AGDT   SXA     AGR,0              PRESET AXT INSTRUCTION
      13057 -0534 00 2 13072          LXD     AGAO,2             DIMENSION 1
      13060  0074 00 4 13075          TSX     FIXVAL,4           FIXED POINT NUMBER EVALUATION
      13061  0734 00 1 00000          PAX     0,1                INTO INDEX 1
      13062 -0534 00 2 13073   AGD    LXD     AGAT,2             DIMENSION 2
      13063  0074 00 4 13075          TSX     FIXVAL,4           FIXED POINT NUMBER EVALUATION
      13064  0734 00 2 00000          PAX     0,2                INTO INDEX 2
      13065  0774 00 4 00000   AGR    AXT     **,4               ZERO OR DIMENSION 1
      13066  0020 00 0 13041          TRA     AGXE               GO BACK TO MAIN PROGRAM
                                *
A     13067  0522 60 0 00000   AXS    XEC*                       THE STORE INSTRUCTION
A     13070  0522 00 0 00000   AX     XEC                        THE FETCH INSTRUCTION
      13071  0 00000 0 00000   AGV                               VALUE TO BE STORED PUT HERE
      13072  0 00000 0 00000   AGAO                              DIMENSION 1
      13073  0 00000 0 00000   AGAT                              DIMENSION 2
      13074  0 00000 0 00000   AGATH                             DIMENSION 3
                                *
                                *       FIXVAL
                                *
                                *       FIXVAL HAS AS INPUT A POINTER TO A FIXED POINT NUMBER OBJECT IN
                                *       IR2, AND HANDS BACK THE NUMERICAL VALUE OF THAT OBJECT.
                                *
      13075  0634 00 2 13106  FIXVAL SXA     FXVE,2             SAVE IR2 IN CASE OF ERROR
      13076  0500 00 2 00000          CLA     0,2
      13077  0734 00 2 00000          PAX     0,2
      13100 -3 77776 2 13106          TXL     FXVE,2,-2          ERROR IF NOT ATOMIC
      13101 -0734 00 2 00000          PDX     0,2
      13102 -0320 00 0 00436          ANA     $QT1
      13103  0100 00 0 13106          TZE     FXVE
      13104  0500 00 2 00000          CLA     0,2                PICK UP VALUE
      13105  0020 00 4 00001          TRA     1,4                NORMAL EXIT
      13106  0774 00 2 00000   FXVE   AXT     **,2               IR2 SHOULD LAND IN DECR. OF AC
      13107 -0634 00 4 01562          SXD     $ERROR,4
      13110 -0754 00 2 00000          PXD     0,2                IT DOES INDEED LAND THERE
      13111  0074 00 4 01563          TSX     $ERROR+1,4
      13112  543160600454             BCI     1,*I  4*           BAD ARGUMENT -- FIXVAL
                                *
                                *
                                * ARYMAK       THE FUNCTION THAT MAKES ARRAYS
                                *              THE ARGUMENT IS A SINGLE LIST WHOSE SUB-LISTS HAVE THE
                                *              FORM  (NAME,(DIMENSION1,DIMENSION2,DIMENSION3),TYPE)
                                *       ARRAYS MAY BE 1, 2, OR 3 DIMENSIONAL AND MAY BE OF LIST OR
                                *              NON-LIST TYPE.
                                *
                                *              ARRAY IS STORED AS FOLLOWS ...
                                *       SXA    ARTGTX,4           ADDRESS OF SUBR TXL INSTRUCTION
                                *       TSX    ARYGET,4
                                *       PZE    END + 1,, N OF DIMENSIONS  (ARRAY PROPERTY POINTS HERE)
                                *       PZE    TOTAL LENGTH,,LIST OF LENGTH
                                *       PZE    TABLE ZERO,, NUMBER OF DIMENSIONS (ARYGET PARAMETER WORD)
                                *       CLA*   **,2               TABLE 1
                                *       **********************
                                *       STO    **,1               TABLE 2
```

```
                        *      ****************************
                        *                                  ARRAY PROPER GOES HERE
                        *
13113  0560 00 0 13115  ARYMAK LDQ     AMFAG               PICK UP FUNCTIONAL ARGUMENT
13114  0020 00 0 04214         TRA     MAPLIS              LET MALPIST HANDLE ITERATION ALONG LIS
                        *
13115 -3 00001 0 13116   AMFAG TXL     *+1,,1              FUNCTIONAL ARGUMENT
13116  0634 00 4 13320         SXA     AFRX,4              SAVE INDEX REGISTERS
13117  0634 00 2 13321         SXA     AFRY,2
13120 -0734 00 4 00000         PDX     0,4                 POINTER TO LIST
13121  0500 00 4 00000         CLA     0,4
13122  0734 00 4 00000         PAX     0,4                 POINTER TO SUBLIST
13123 -0500 00 4 00000         CAL     0,4
13124  0734 00 4 00000         PAX     0,4                 NAME
13125 -0634 00 4 03504         SXD     AFAT,4              SAVE IT
13126 -0734 00 4 00000         PDX     0,4
13127  0500 00 4 00000         CLA     0,4
13130  0734 00 2 00000         PAX     0,2                 POINTER TO DIMENSION LIST
13131 -0734 00 4 00000         PDX     0,4
13132  0500 00 4 00000         CLA     0,4
13133  0734 00 4 00000         PAX     0,4                 TYPE
13134  0600 00 0 13336         STZ     ATYP
13135 -3 07735 4 13140         TXL     ADA,4,$LIST-1       GO IF NOT $ LIST
13136  3 07736 4 13140         TXH     ADA,4,$LIST
13137 -0634 00 4 13336         SXD     ATYP,4              MAKES ATYPE NON-ZERO FOR LIST ARRAYS
13140  0500 00 2 00000   ADA   CLA     0,2                 FIRST WORD ON DIMENSION LIST
13141  0734 00 2 00000         PAX     0,2                 DIMENSION 1
13142  0622 00 0 03505         STD     ATMP                POINTER TO REST
13143  0074 00 4 13075         TSX     FIXVAL,4            EVALUATE THE FIXED POINT NUMBER
13144  0601 00 0 13340         STO     ADO                 DIMENSION 1
13145 -0534 00 4 03505         LXD     ATMP,4              PICK UP POINTER TO REST OF LIST
13146 -3 00000 4 13164         TXL     AOD,4,0             GO IF 1 D
13147  0500 00 4 00000         CLA     0,4                 NEXT WORD
13150  0622 00 0 03505         STD     ATMP                SAVE POINTER
13151  0734 00 2 00000         PAX     0,2                 DIMENSION 2
13152  0074 00 4 13075         TSX     FIXVAL,4            GET NUMBER VALUE
13153  0601 00 0 13341         STO     ADT                 DIMENSION 2
13154 -0534 00 4 03505         LXD     ATMP,4              POINTER TO REST OF LIST
13155 -3 00000 4 13173         TXL     ATD,4,0             GO IF 2 D ARRAY
13156  0500 00 4 00000         CLA     0,4
13157  0734 00 2 00000         PAX     0,2                 DIMENSION 3
13160  0074 00 4 13075         TSX     FIXVAL,4            NUMBER VALUE
13161  0601 00 0 13342         STO     ADTH                DIMENSION 3
13162  0774 00 2 00003         AXT     3,2                 NUMBER OF DIMENSIONS
13163  0020 00 0 13177         TRA     AGA                 GO TO NEXT PART OF PROGRAM
13164  0500 00 0 13340   AOD   CLA     ADO                 1D, TREAT AS A 1 X 1 X D1 ARRAY
13165  0601 00 0 13342         STO     ADTH
13166  0500 00 0 00371         CLA     $Q1
13167  0601 00 0 13341         STO     ADT                 DIMENSION 2
13170  0601 00 0 13340         STO     ADO                 DIMENSION 1
13171  0774 00 2 00001         AXT     1,2                 1 D ARRAY
13172  0020 00 0 13177         TRA     AGA                 GO NEXT PART
13173  0500 00 0 13340   ATD   CLA     ADO                 2 D, TREAT AS A 1 X D2 X D1 ARRAY
13174  0500 00 0 00371         CLA     $Q1
13175  0601 00 0 13340         STO     ADO                 DIMENSION 1
13176  0774 00 2 00002         AXT     2,2                 2 D ARRAY
```

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13177  0560 00 0 13340   AGA   LDQ     ADO               DIMENSION 1
13200 -0754 00 0 00000         PXD     0,0               ZERO AC
13201  0200 00 0 13341         MPY     ADT               DIMENSION 2
13202 -0600 00 0 13335         STQ     ADOT              D1 X D2
13203  0200 00 0 13342         MPY     ADTH              DIMENSION 3
13204  0520 00 0 13336         ZET     ATYP              SKIP NEXT IF NON-LIST ARRAY
13205 -0600 00 0 13336         STQ     ATYP              LIST LENGTH
13206  0131 00 0 00000         XCA                       D1 X D2 X D3 TO AC
13207  0400 00 0 13335         ADD     ADOT              ADD INDEX TABLE LENGTHS
13210  0400 00 0 13340         ADD     ADO
13211  0400 00 0 00375         ADD     $Q5               CONSTANT LENGTH
13212  0621 00 0 13333         STA     APWT              PARAMETER WORD TWO
13213  0621 00 0 13337         STA     ATMQ              SAVE LENGTH
13214  0534 00 4 13336         LXA     ATYP,4            ZERO OR LIST LENGTH
13215  0634 00 4 13333         SXA     APWT,4            PARAMETER WORD 2
13216  0074 00 4 04004         TSX     BLOCKR,4          RESERVE A BLOCK OF THIS LENGTH
13217  0100 00 0 13323         TZE     ARYTL             GO IF ARRAY WILL NOT FIT
13220  0621 00 0 03505         STA     ATMP              END OF BLOCK ADDRESS
13221  0400 00 0 00371         ADD     $Q1               ADD 1
13222  0621 00 0 13332         STA     APWO              PARAMETER WORD 1
13223 -0634 00 2 13334         SXD     ATBZ,2            NUMBER OF DIMENSIONS
13224 -0634 00 2 13332         SXD     APWO,2
13225 -0634 00 2 13343         SXD     ASBR,2
13226  0402 00 0 13337         SUB     ATMQ              LENGTH OF BLOCK
13227  0621 00 0 13343         STA     ASBR              ADDRESS OF BEGINNING OG BLOCK
13230  0737 00 4 00000         PAC     0,4               POINTER IN IR 4
13231  1 77776 4 13232         TXI     *+1,4,-2          POINTER TO ARRAY PROPERTY
13232 -0634 00 4 13344         SXD     AARY,4            SAVE POINTER
13233  0737 00 4 00000         PAC     0,4               POINTER TO BEGINNING OF ARRAY
13234  0400 00 0 00374         ADD     $Q4               LENGTH OF PREFIX - 1
13235  0400 00 0 13340         ADD     ADO
13236  0621 00 0 13334         STA     ATBZ              LAST LOC. IN TAQBLE ONE
13237  0774 00 2 00005         AXT     5,2               LENGTH OF PREFIX TO ARRAY
13240  0500 00 2 13335   ACLA  CLA     ADOT,2            PICK UP PREFIX
13241  0601 00 4 00000         STO     0,4               AND STORE IN CORE
13242  1 77777 4 13243         TXI     *+1,4,-1          UPDTAEC CORE LOCATION
13243  2 00001 2 13240         TIX     ACLA,2,1       GET REST OF PREFIX
13244 -0320 00 0 00457         ANA     $AMASK            TABLE ZERO IN AC
13245 -0501 00 0 13345         ORA     ACLAS             OR IN CLA* INSTRUCTION
13246  0534 00 2 13340         LXA     ADO,2             LENGTH OF TABLE
13247  0400 00 0 13341   AADD  ADD     ADT               INCREMENT BY DIMENSION 2
13250  0601 00 4 00000         STO     0,4               PUT IN CODE
13251  1 77777 4 13252         TXI     *+1,4,-1          UP DATE CORE COUNTER
13252  2 00001 2 13247         TIX     AADD,2,1          FINISH OFFF
13253  0534 00 2 13335         LXA     ADOT,2            LENGTH OF TABLE 2
13254 -0320 00 0 00457         ANA     $AMASK            CLEAR OUT ALL BUT ADDRESS
13255 -0501 00 0 13346         ORA     ARSTO             PUT INSTRUCTION
13256  0400 00 0 13342   AAA   ADD     ADTH              ADD DIMENSION 3
13257  0601 00 4 00000         STO     0,4               PUT IN CORE
13260  1 77777 4 13261         TXI     *+1,4,-1          UPDATE CORE COUNTER
13261  2 00001 2 13256         TIX     AAA,2,1           CONTINUE TO CONSTRUCT TABLE
                       *               TABLE CONSTRUCTION ALL DONE.
                       *               THE FOLLOWING ADDS PROPERTYS TO THE ARYATOM
13262  0500 00 0 13344         CLA     AARY              PICK UP POINTER TO TO ARRAY PROPERTY
13263  0560 00 0 00370         LDQ     $ZERO
13264  0074 00 4 03730         TSX     $CONS,4
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      13265  0560 00 0 00370         LDQ     $ZERO
      13266  0074 00 4 03730         TSX     $CONS,4
      13267  0131 00 0 00000         XCA
      13270  0500 00 0 13347         CLA     ARY                 POINTER TO ATOMIC SYMBOL ARRAY
      13271  0074 00 4 03730         TSX     $CONS,4             (ARRAY,(POINTER TO ARRAY PROPERTY))
      13272  0601 00 0 03505         STO     ATMP                SAVE IN TEMP STORAGE
      13273  0500 00 0 13343         CLA     ASBR                TXL INSTRUCTIONM
      13274  0074 00 4 03710         TSX     $CONSW,4            PUT IN FULL WORD SPACE
      13275  0560 00 0 03505         LDQ     ATMP                REST OF PROPERTIES
      13276  0074 00 4 03730         TSX     $CONS,4
      13277  0131 00 0 00000         XCA
      13300  0500 00 0 00506         CLA     ASB                 POINTER TO $SUBR ATOMIC SYMBOL
      13301  0074 00 4 03730         TSX     $CONS,4
      13302  0131 00 0 00000         XCA                         SAVE IN MQ
      13303 -0534 00 4 03504         LXD     AFAT,4              POINTER TO NAME
      13304  0500 00 4 00000         CLA     0,4                 FIRST WORD
      13305 -0734 00 4 00000         PDX     0,4                 SAVE POINTER TO REST
      13306 -0754 00 4 00000         PXD     0,4                 PUT IN AC
      13307  0131 00 0 00000         XCA                         INTER CHANGE AC AND MQ
      13310  0074 00 4 07675         TSX     $NCONC,4            SPLICE  2 LISTS TOGETHER
      13311 -0534 00 4 03504         LXD     AFAT,4              POINTER TO FIRST WORD ON PROPERTY LIST
      13312  0622 00 4 00000         STD     0,4                 REPLACE DECREMENT OPERATION
      13313 -0754 00 4 00000         PXD     0,4                 POINTER TO ARRY ATOM
      13314  0560 00 0 03305         LDQ     ARYLIS              PICK UP ARRAY LIST
      13315  0074 00 4 03730         TSX     $CONS,4             PUT ON AS ACTIVE ARRAY
      13316  0622 00 0 03305         STD     ARYLIS              UPDATE ARRAY LIST
      13317  0500 00 0 03504         CLA     AFAT                FINAL ANSWER
      13320  0774 00 4 00000   AFRX  AXT     **,4                RESTORE INDEX REGISTERS
      13321  0774 00 2 00000   AFRY  AXT     **,2
      13322  0020 00 4 00001         TRA     1,4                 EXIT
                                *
      13323 -0634 00 4 01562   ARYTL SXD     $ERROR,4            SAVE INDEX 4
      13324  0534 00 2 13321         LXA     AFRY,2              RESTORE INDEX 2
      13325  0500 00 0 03504         CLA     AFAT                ARRAY NAME
      13326  0074 00 4 01563         TSX     $ERROR+1,4          GO TO ERROR
      13327  543160600154            BCI     1,*I  1*            NOT ENOUGH ROOM FOR ARRAY
                                *               CONSTANTS AND STORAGE
      13330  0634 00 4 13043         SXA     ARYGTX,4            5 WORD PREFIX TO ARRAYS
      13331  0074 00 4 13005         TSX     ARYGET,4
      13332  0 00000 0 00000   APWO                              END+1,,N OF D
      13333  0 00000 0 00000   APWT                              LENGTH,,LIST LENGTH
      13334  0 00000 0 00000   ATBZ                              TABLE ZERO,, N OF D
      13335  0 00000 0 00000   ADOT                              D1 X D2
      13336  0 00000 0 00000   ATYP                              ZERO OR LIST LENGTH
      13337  0 00000 0 00000   ATMQ                              TEMPORARY STORAGE
      13340  0 00000 0 00000   ADO                               D1
      13341  0 00000 0 00000   ADT                               D2
      13342  0 00000 0 00000   ADTH                              D3
D     13343 -3 00000 0 00000   ASBR  TXL     **,**
      13344  0 00000 0 00000   AARY                              POINTER TO ARRAY PROPERTY
      13345  0500 60 2 00000   ACLAS CLA*    **,2                FETCH INSTRUCTION
      13346  0601 00 1 00000   ARSTO STO     **,1                PUT INSTRUCTION
      13347  0 10735 0 00000   ARY           ,,$ARRAY
                      00506    ASB   SYN     $SUBRD
                                *
                                *
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```
                        * UNUMIX       EVALUATES ITS 2 NUMERICAL ARGUMENTS AND FLOATS THE FIXED
                        *              POINT ARGUMENT IF A MIXED EXPRESSION.  THE NUMERICAL
                        *              VALUES ARE LEFT IN AC AND MQ WITH TYPE OF NUMBER IN $ARG3
                        *
13350  0634 00 4 13371  UNUMIX SXA     UNUX,4              SAVE LINK IR
13351 -0600 00 0 13416         STQ     UNUT                SAVE SECOND ARGUMENT
13352  0074 00 4 14342         TSX     NUMVAL,4            NUMERICALLY EVALUATE THE FIRST ARG
13353 -0734 00 4 00000         PDX     0,4                 POINTER TO FULL WORD
13354  0500 00 4 00000         CLA     0,4                 NUMERICAL VALUE
13355  0601 00 0 13415         STO     UNUS                SAVE IT
13356 -0600 00 0 13417         STQ     UNUR                SAVE TYPE OF NUMBER
13357  0500 00 0 13416         CLA     UNUT                PICK UP SECOND ARG
13360  0074 00 4 14342         TSX     NUMVAL,4            NUMERICALLY EVALUATE IT
13361 -0734 00 4 00000         PDX     0,4                 POINTER TO FULL WORD
13362  0500 00 4 00000         CLA     0,4                 NUMERICAL VALUE
13363  0131 00 0 00000         XCA                         VLUE TO MQ, TYPE TO AC
13364  0402 00 0 13417         SUB     UNUR                COMPARE WITH TYPE OF FIRST
13365 -0100 00 0 13373         TNZ     UNMXA               TRA IF NOT SAME
13366  0500 00 0 13417   UNUE  CLA     UNUR                PICK UP NUMBER TYPE
13367  0601 00 0 03321         STO     $ARG3
13370  0500 00 0 13415         CLA     UNUS                PICK UP FIRST NUMERICAL VALUE
13371  0774 00 4 00000   UNUX  AXT     **,4                RESTORE LINK IR
13372  0020 00 4 00001         TRA     1,4                 EXIT
                        *
13373 -0600 00 0 13416   UNMXA STQ     UNUT                MIXED TYPES, SAVE SECOND VALUE
13374  0634 00 2 13406         SXA     UNUX2,2             SAVE IR 2
13375 -0534 00 2 13417         LXD     UNUR,2              PICK UP TYPE OF FIRST NUMBER
13376  0074 00 4 14550         TSX     FIXFLO,4            DISPATCH
13377  0761 00 0 00000         NOP                         IMPOSSIBLE RETURN
13400  0020 00 0 13410         TRA     UNMXB               FLOAT SECOND NUMBER
13401  0500 00 0 13415         CLA     UNUS                FIRST NUMBER
13402  0074 00 4 14565         TSX     $UNFIX,4            FLOAT IT
13403  0560 00 0 00476         LDQ     UNFLT               $FLOAT FOR TYPE
13404 -0600 00 0 03321         STQ     $ARG3
13405  0560 00 0 13416         LDQ     UNUT                SECOND NUMBER
13406  0774 00 2 00000   UNUX2 AXT     **,2                RESTORE IR 2
13407  0020 00 0 13371         TRA     UNUX                RESTRE LINK AND EXIT
                        *
13410  0131 00 0 00000   UNMXB XCA                         FLOAT SECOND NUMBER
13411  0074 00 4 14565         TSX     $UNFIX,4            FLOAT FUNCTION
13412  0131 00 0 00000         XCA                         BACK TO MQ
13413  0534 00 2 13406         LXA     UNUX2,2             RESTORE IR 2
13414  0020 00 0 13366         TRA     UNUE                GET FIRST NUMBER, RESTORE LINK + EXIT
13415  0 00000 0 00000   UNUS                              FIRST NUMERICAL VALUE
13416  0 00000 0 00000   UNUT                              SECOND ARG AND VALUE
13417  0 00000 0 00000   UNUR                              TYPE OF FIRST ARG
                 00476  UNFLT SYN     FLOATD              FLOAT INDICATOR
                        *
                        * THIS ROUTINE USES NUMVAL,$UNFIX,FIXFLO, AND $ARG3  + $FLOAT
                        *
                        *
                        * DIVIDE       DIVIDES THE FIRST NUMERICAL ARGUMENT BY THE SECOND. THE
                        *              ANSWER IS A LIST OF THE QUOTIENT AND THE REMAINDER.
                        *
                        * QUOTEN       GIVES THE QUOTIENT WHEN THE FIRST NUMERICAL ARGUMENT IS
                        *              DIVIDED BY THE SECOND.
```

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                        *
                        * REMAIN       GIVES THE REMAINDER WHEN THE FIRST NUMERICAL ARGUMENT IS
                        *              DIVIDED BY THE SECOND.
13420  0604 00 0 13510  DIVIDE STI     DIVND              SAVE INDICATORS
13421  0057 00  000003         RIR     3                   DIIDE INDICATE
13422  0020 00 0 13432          TRA     DIVOP              DO OPERATION
                        *
13423  0604 00 0 13510  REMAIN STI     DIVND              SAVE INDICATORS
13424  0057 00  000003         RIR     3                  DIVIDE INDICATE
13425  0055 00  000002         SIR     2                  SET REMAINDER INDICATOR
13426  0020 00 0 13432          TRA     DIVOP              DO OPERATION
                        *
13427  0604 00 0 13510  QUOTEN STI     DIVND              SAVE INDICATORS
13430  0057 00  000003         RIR     3                  DIVIDE INDICATE
13431  0055 00  000001         SIR     1                  QUOTIENT INDICATOR
13432  0634 00 4 13501   DIVOP SXA     DIVX,4             SAVE LINK IR
13433  0634 00 2 13500         SXA     DIVX2,2            SAVE IR 2
13434  0074 00 4 13350         TSX     UNUMIX,4           NUMERICALLY EVALUATE THE ARGUMENTS
13435 -0534 00 2 03321         LXD     $ARG3,2            PICK UP TYPE
13436 -0600 00 0 13511         STQ     DIVT               SECOND ARGUMENT
13437  0074 00 4 14550         TSX     FIXFLO,4           DISPATCH ON TYPE
13440  0761 00 0 00000         NOP                        IMPOSSIBLE RETURN
13441  0241 00 0 13511         FDP     DIVT               FLOATING DIVIDE
13442  0020 00 0 13471         TRA     DIVFX              DO FIXED POINT DIVIDE
13443  0760 00 0 00012   DIVDC DCT                        CHECK  FOR ILLEGAL DIVISION
13444  0074 00 4 01676         TSX     $DCT,4             DIVIDE CHECK ERROR
13445  0054 00  000001         RFT     1                  SEE IF REMAINDER IS TO BE SAVED
13446  0020 00 0 13476         TRA     DIVA               NO, SET UP QUOTIENT
13447 -0600 00 0 13511         STQ     DIVT               YES, SAVE QUOTEINT
13450  0560 00 0 03321         LDQ     $ARG3              PICK UP TYPE
13451  0074 00 4 12636         TSX     $MKNO,4            MAKE REMAINDER A NUMBER
13452  0054 00  000002         RFT     2                  SEST TO SEE IF QUOTIENT IS WANTED
13453  0020 00 0 13504         TRA     DIVEX              NO, RESTORE AND EXIT
13454  0560 00 0 00370         LDQ     $ZERO              NIL IN MQ
13455  0074 00 4 03730         TSX     $CONS,4            LIST OF REMAINDER
13456  0131 00 0 00000         XCA                        SHUTTLE INTO MQ
13457  0500 00 0 13511         CLA     DIVT               PICK UP QUOTIENT
13460 -0600 00 0 13511         STQ     DIVT               SAVE LIST OF REMAINDER
13461  0560 00 0 03321         LDQ     $ARG3              PICK UP TYPE
13462  0074 00 4 12636         TSX     $MKNO,4            MAKE QUOTIENT A NUMBER
13463  0560 00 0 13511         LDQ     DIVT               LIST(REMAINDER)
13464  0074 00 4 03730         TSX     $CONS,4            LIST(QUOTIENT,REMAINDER)
13465  0534 00 4 13501         LXA     DIVX,4             RESTORE LINK IR
13466  0534 00 2 13500         LXA     DIVX2,2            RESTORE IR 2
13467  0441 00 0 13510         LDI     DIVND              RESTORE INDICATORS
13470  0020 00 4 00001         TRA     1,4                EXIT
                        *
13471  0131 00 0 00000   DIVFX XCA                        FIXED POINT DIVISION. PUT ARG 1 IN MQ
13472 -0754 00 0 00000         PXD     0,0                CLEAR AC
13473  0763 00 0 00000         LLS     0                  MQ SIGN TO AC
13474  0221 00 0 13511         DVP     DIVT               DIVIDE BY ARG 2
13475  0020 00 0 13443         TRA     DIVDC              PREFORM DIVIDE CHECK AND CARRY ON
13476  0131 00 0 00000   DIVA  XCA                        QUOTIENT TO AC
13477  0560 00 0 03321         LDQ     $ARG3              TYPE TO MQ
13500  0774 00 2 00000   DIVX2 AXT     **,2               RESTORE IR 2
13501  0774 00 4 00000   DIVX  AXT     **,4               RESTORE LINK IR
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13502  0441 00 0 13510         LDI     DIVND              RESTORE INDICATORS
13503  0020 00 0 12636         TRA     $MKNO
                       *
13504  0534 00 2 13500   DIVEX LXA     DIVX2,2            EXIT ROUTINE, RESTORE IR 2
13505  0534 00 4 13501         LXA     DIVX,4             RESTORE LINK IR
13506  0441 00 0 13510         LDI     DIVND              RESTORE INDICATORS
13507  0020 00 4 00001         TRA     1,4
                       *
13510  0 00000 0 00000   DIVND                            INDICATORS STORAGE
13511  0 00000 0 00000   DIVT                             LIST AND NON-LIST TEMPORARY STORAGE
                       *
                       * THIS ROUTINE USES $MKNO,$DCT,$CONS,$ARG3 AND UNUMIX
                       *
                       *
                       * DIFFER       COMPUTES THE DIFFERENCE BETWEEN ITS 2 NUMERICAL ARGUMENTS
                       *
13512  0634 00 4 13525  DIFFER SXA     DIFX,4             SAVE LINK IR
13513  0634 00 2 13524         SXA     DIFX2,2            SAVE IR 2
13514  0074 00 4 13350         TSX     UNUMIX,4           NUMERICALLY EVALUATE THE ARGUMENTS
13515 -0534 00 2 03321         LXD     $ARG3,2            PICK UP TYPE OF NUMBERS
13516 -0600 00 0 13527         STQ     DIFT               STORE SECOND NUMBER
13517  0074 00 4 14550         TSX     FIXFLO,4           DISPATCH ON TYPE
13520  0761 00 0 00000         NOP                        IMPOSSIBLE RETURN
13521  0302 00 0 13527         FSB     DIFT               FLOATING POINT
13522  0402 00 0 13527         SUB     DIFT               FIXED POINT
13523  0560 00 0 03321         LDQ     $ARG3              TYPE OF NUMBER
13524  0774 00 2 00000   DIFX2 AXT     **,2               RESTORE IR 2
13525  0774 00 4 00000   DIFX  AXT     **,4               RESTORE LINK IR
13526  0020 00 0 12636         TRA     $MKNO              MAKE RESULT A NUMBER
                       *
13527  0 00000 0 00000   DIFT                             TEMPORARY STORAGE
                       *
                       * THIS ROUTINE USES UNUMIX,FIXFLO,$ARG3 AND $MKNO
                       *
                       *
                       * EXPT TAKES 2 FIXED OR FLOATING POINT NUMBERS AS ARGUMENTS AND RAISES
                       *              THE FIRST TO THE POWER INDICATED BY THE SECOND.
                       *
13530  0634 00 4 13567   EXPT  SXA     EXPX,4             SAVE LINK IR
13531  0634 00 2 13570         SXA     EXPY,2             SAVE IR 2
13532  0074 00 4 13350         TSX     UNUMIX,4           EVALUATE THE 2 ARGUMENTS AS NUMBERS
13533 -0534 00 2 03321         LXD     $ARG3,2            PICK UP TYPE OF NUMBERS
13534  0074 00 4 14550         TSX     FIXFLO,4           DISPATCH ON FIX OR FLOAT
13535  0761 00 0 00000         NOP                        IMPOSSIBLE RETURN
13536  0020 00 0 13564         TRA     EXPA               IS FLOATING POINT
13537  0120 00 0 13546         TPL     EXPB
13540  0534 00 2 13570   EXPC  LXA     EXPY,2             RESTORE IR 2
13541  0534 00 4 13567         LXA     EXPX,4             RESTORE IR 4
13542 -0634 00 4 01562         SXD     $ERROR,4           SAVE IN $ERROR
13543 -0754 00 0 00000         PXD     0,0                CLEAR AC
13544  0074 00 4 01563         TSX     $ERROR+1,4         GO TO ERROR
13545  543160600254            BCI     1,*I  2*           FIRST ARGUMENT IS NEGATIVE -EXPT-
13546  0131 00 0 00000   EXPB  XCA                        INTERCHANGED FIXED POINT ARGUMENTS.
13547 -0600 00 0 77662         STQ     COMMON             TEMPORARY STORAGE
13550  0734 00 4 00000         PAX     0,4                EXPONENT
13551 -3 00000 4 13561         TXL     OUT,4,0            GO IF ZERO POWER
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13552 -2 00001 4 13556          TNX     OUT1,4,1          GO IF TO FIRST POWER
13553 -0754 00 0 00000          PXD     0,0               CLEAR AC
13554  0200 00 0 77662          MPY     COMMON            RAISE TO GIVEN POWER
13555  2 00001 4 13554          TIX     *-1,4,1           IN LOOP
13556  0131 00 0 00000   OUT1   XCA                       ANSWER TO AC
13557  0560 00 0 00475          LDQ     $FIXD             $FIX TO DECREMENT
13560  0020 00 0 13567          TRA     EXPX              RESTORE INDEX REGISYERS AND MAKE NUMBR
13561  0500 00 0 00371   OUT    CLA     $Q1               ANSWER IS 1
13562  0560 00 0 00475          LDQ     $FIXD             $FIX TO MQ
13563  0020 00 0 13567          TRA     EXPX              EXIT
13564 -0120 00 0 13540   EXPA   TMI     EXPC
13565  0074 00 4 13572          TSX     $POWR,4           POWER ROUTINE
13566  0560 00 0 00476          LDQ     FLOATD            $FLOAT TO MQ
13567  0774 00 4 00000   EXPX   AXT     **,4              RESTORE INDEX REGISTERS
13570  0774 00 2 00000   EXPY   AXT     **,2
13571  0020 00 0 12636          TRA     $MKNO             MAKE ANSWER AN NUMBER
                                 POWER
                        G        HED
13572 -0600 00 0 13714   POWR   STQ N
13573 -0634 00 1 77662          SXD COMMON,1
13574 -0634 00 2 77663          SXD COMMON+1,2
13575  0534 00 1 00370   P19    LXA ZERO,1
13576  0534 00 2 00370          LXA ZERO,2
13577  0765 00 0 00033          LRS 27
13600  0402 00 0 00415          SUB L200
13601 -0600 00 0 13715          STQ FN
13602  0560 00 0 00370          LDQ ZERO
13603 -0100 00 0 13606          TNZ P01
13604  0601 00 0 13716          STO E
13605  0020 00 0 13620          TRA P02
13606  0765 00 0 00001   P01    LRS 1
13607  1 00001 1 13610          TXI P03,1,1
13610 -0100 00 0 13606   P03    TNZ P01
13611 -0754 00 1 00000          PXD 0,1
13612  0771 00 0 00022          ARS 18
13613  0760 00 0 00003          SSP
13614  0400 00 0 00415          ADD L200
13615  0763 00 0 00033          LLS 27
13616  0601 00 0 13716          STO E
13617  0760 00 0 00000          CLM
13620  0560 00 0 13715   P02    LDQ FN
13621  0763 00 0 00033          LLS 27
13622  0400 00 0 00435          ADD LL200
13623  0300 00 0 13717          FAD RSQ
13624  0601 00 0 13720          STO P04
13625  0302 00 0 13726          FSB SQ
13626  0240 00 0 13720          FDH P04
13627 -0600 00 0 13721          STQ P05
13630  0260 00 0 13721          FMP P05
13631  0601 00 0 13722          STO P06
13632  0560 00 0 13722   P08    LDQ P06
13633  0260 00 2 13733          FMP C7,2
13634  0300 00 2 13732          FAD C5,2
13635  0601 00 2 13732          STO C5,2
13636  1 00001 2 13637          TXI P07,2,1
13637 -3 00002 2 13632   P07    TXL P08,2,2
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13640  0560 00 0 13730         LDQ C1
13641  0260 00 0 13721         FMP P05
13642  0302 00 0 13727         FSB R2
13643  0300 00 0 13716         FAD E
13644  0601 00 0 13716   P18   STO E
13645  0560 00 0 13714         LDQ N
13646  0260 00 0 13716         FMP E
13647  0601 00 0 13714         STO N
13650  0020 00 0 14023         TRA P09
13651  0 00000 0 00000   M1
13652  0 00000 0 00000   M2
13653  0 00000 0 00001   M3        1
13654  0 00400 0 00000   M4        0,0,256
13655  0534 00 1 00370   P41   LXA ZERO,1
13656  0560 00 0 13725   P11   LDQ W
13657  0260 00 1 13746         FMP A6,1
13660  0300 00 1 13745         FAD A5,1
13661  0601 00 1 13745         STO A5,1
13662  1 00001 1 13663         TXI P10,1,1
13663 -3 00005 1 13656   P10   TXL P11,1,5
13664  0601 00 0 13725         STO W
13665  0534 00 2 00370         LXA ZERO,2
13666  0500 00 2 13755   P13   CLA AP6,2
13667  0601 00 2 13746         STO A6,2
13670  1 00001 2 13671         TXI P12,2,1
13671 -3 00006 2 13666   P12   TXL P13,2,6
13672  0534 00 1 00370         LXA ZERO,1
13673  0500 00 1 13737   P15   CLA CP7,1
13674  0601 00 1 13733         STO C7,1
13675  1 00001 1 13676         TXI P14,1,1
13676 -3 00003 1 13673   P14   TXL P15,1,3
13677  0560 00 0 13725         LDQ W
13700  0260 00 0 13725         FMP W
13701  0601 00 0 13725         STO W
13702  0560 00 0 13725         LDQ W
13703  0260 00 0 13725         FMP W
13704  0601 00 0 13725         STO W
13705  0020 00 0 13756         TRA P16
13706  0 00000 0 00000   EA
13707  0020 00 0 13763   P171  TRA P17
13710  0 00000 0 00000   P24
13711  0601 00 0 13716   P21   STO E
13712  0 00000 0 00000   S1
13713  0 00000 0 00000   S2
13714  0 00000 0 00000   N
                 00370   ZERO  SYN $ZERO
                 00415   L200  SYN $QO200
13715  0 00000 0 00000   FN
13716  0 00000 0 00000   E
                 00435   LL200 SYN QO2Q11
13717 +200552023632      RSQ   OCT +200552023632
13720  0 00000 0 00000   P04
13721  0 00000 0 00000   P05
13722  0 00000 0 00000   P06
13723 +200542710300      LOG   OCT +200542710300
13724  0 00000 0 00000   S3
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13725  0 00000 0 00000   W
13726 +201552023632      SQ    OCT +201552023632
13727 +200400000000      R2    OCT +200400000000
13730 +202561250731      C1    OCT +202561250731
13731 +200754342231            OCT +200754342231
13732 +200447154100      C5    OCT +200447154100
13733 +177674535132      C7    OCT +177674535132
13734 +202561250731            OCT +202561250731
13735 +200754342231            OCT +200754342231
13736 +200447154100            OCT +200447154100
13737 +177674535132      CP7   OCT +177674535132
13740 +201400000000            OCT +201400000000
13741 +176777776476            OCT +176777776476
13742 +174400037635            OCT +174400037635
13743 +170523517764            OCT +170523517764
13744 +164547625227            OCT +164547625227
13745 +157554324201      A5    OCT +157554324201
13746 +154562606535      A6    OCT +154562606535
13747 +201400000000      L1    OCT +201400000000
13750 +176777776476            OCT +176777776476
13751 +174400037635            OCT +174400037635
13752 +170523517764            OCT +170523517764
13753 +164547625227            OCT +164547625227
13754 +157554324201            OCT +157554324201
13755 +154562606535      AP6   OCT +154562606535
13756  0601 00 0 14022   P16   STO EW
13757  0500 00 0 13707         CLA P171
13760  0601 00 0 13644         STO P18
13761  0500 00 0 14022         CLA EW
13762  0020 00 0 13575         TRA P19
13763  0020 00 0 14123   P17   TRA P20
13764  0500 00 0 13711   P42   CLA P21
13765  0601 00 0 13644         STO P18
13766  0534 00 1 00370         LXA ZERO,1
13767  0500 00 1 13737   P23   CLA CP7,1
13770  0601 00 1 13733         STO C7,1
13771  1 00001 1 13772         TXI P22,1,1
13772 -3 00003 1 13767   P22   TXL P23,1,3
13773  0560 00 0 13710         LDQ P24
13774  0260 00 0 13723         FMP LOG
13775  0302 00 0 13724         FSB S3
13776  0140 00 0 14013         TOV P25
13777  0601 00 0 13712         STO S1
14000  0560 00 0 13712         LDQ S1
14001  0260 00 0 13727         FMP R2
14002  0302 00 0 13747         FSB L1
14003  0601 00 0 13713         STO S2
14004  0560 00 0 13712         LDQ S1
14005  0260 00 0 13713         FMP S2
14006  0300 00 0 13747         FAD L1
14007  0601 00 0 13712         STO S1
14010  0560 00 0 14022         LDQ EW
14011  0260 00 0 13712         FMP S1
14012  0601 00 0 14022         STO EW
14013  0560 00 0 13651   P25   LDQ M1
14014  0260 00 0 14022         FMP EW
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14015  0601 00 0 14022         STO EW
14016  0500 00 0 13714         CLA N
14017  0120 00 0 14113         TPL P26
14020  0500 00 0 13747         CLA L1
14021  0020 00 0 14111         TRA P27
14022  0 00000 0 00000   EW
14023  0560 00 0 00370   P09   LDQ ZERO
14024  0760 00 0 00003         SSP
14025  0765 00 0 00033         LRS 27
14026  0402 00 0 00415         SUB L200
14027  0020 00 0 14106         TRA P28
14030  0500 00 0 00370   P40   CLA ZERO
14031  0763 00 0 00000  P39    LLS     **
14032  0400 00 0 00415         ADD L200
14033  0400 00 0 13653         ADD M3
14034  0767 00 0 00033         ALS 27
14035  0400 00 0 13654         ADD M4
14036  0601 00 0 13651         STO M1
14037 -0600 00 0 13652         STQ M2
14040  0500 00 0 13652         CLA M2
14041 -0100 00 0 14060         TNZ P29
14042  0500 00 0 13714         CLA N
14043  0120 00 0 14047         TPL P30
14044  0500 00 0 13747         CLA L1
14045  0240 00 0 13651         FDH M1
14046 -0600 00 0 13651         STQ M1
14047  0534 00 1 00370   P30   LXA ZERO,1
14050  0500 00 1 13737   P32   CLA CP7,1
14051  0601 00 1 13733         STO C7,1
14052  1 00001 1 14053         TXI P31,1,1
14053 -3 00003 1 14050   P31   TXL P32,1,3
14054  0500 00 0 13651         CLA M1
14055 -0534 00 1 77662         LXD COMMON,1
14056 -0534 00 2 77663         LXD COMMON+1,2
14057  0020 00 4 00001         TRA 1,4
14060  0760 00 0 00000   P29   CLM
14061  0534 00 2 00370         LXA ZERO,2
14062  0763 00 0 00001   P34   LLS 1
14063  1 00001 2 14064         TXI P33,2,1
14064  0100 00 0 14062   P33   TZE P34
14065  0765 00 0 00001         LRS 1
14066 -0754 00 2 00000         PXD 0,2
14067  0771 00 0 00022         ARS 18
14070 -0760 00 0 00003         SSM
14071  0400 00 0 00415         ADD L200
14072  0400 00 0 13653         ADD M3
14073  0763 00 0 00033         LLS 27
14074  0601 00 0 13652   P36   STO M2
14075  0560 00 0 13723         LDQ LOG
14076  0260 00 0 13652         FMP M2
14077  0601 00 0 13725         STO W
14100  0020 00 0 14121         TRA P35
14101  0500 00 0 13747   P37   CLA L1
14102  0601 00 0 13651         STO M1
14103  0500 00 0 13714         CLA N
14104  0760 00 0 00003         SSP
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14105  0020 00 0 14074         TRA P36
14106  0100 00 0 14101   P28   TZE P37
14107 -0120 00 0 14101         TMI P37
14110  0020 00 0 14117         TRA P38
14111  0240 00 0 14022   P27   FDH EW
14112 -0600 00 0 14022         STQ EW
14113  0500 00 0 14022   P26   CLA EW
14114 -0534 00 1 77662         LXD COMMON,1
14115 -0534 00 2 77663         LXD COMMON+1,2
14116  0020 00 4 00001         TRA 1,4
14117  0621 00 0 14031   P38   STA P39
14120  0020 00 0 14030         TRA P40
14121  0601 00 0 13724   P35   STO S3
14122  0020 00 0 13655         TRA P41
14123  0760 00 0 00003   P20   SSP
14124  0601 00 0 13710         STO P24
14125  0020 00 0 13764         TRA P42
                               HEAD    Q
                        * ADD  ADDS A STRING OF FIXED POINT OR FLOATING POINT NUMBERS
14126 -0634 00 4 03500   ADDP  SXD     AMIR,4              SAVE LINK IR
14127  0774 00 4 07355         AXT     $PLUS,4
14130  0604 00 0 03501         STI     AMIND               SAVE INDICATORS
14131  0057 00  000177         RIR     177                 RESET FIRST 7 INDICATORS
14132  0055 00  000001         SIR     1                   SET ADD INDICATOR (1)
14133  0020 00 0 14155         TRA     AMMMF               GO TO MAIN FUNCTION
                        *
14134 -0634 00 4 03500   MULT  SXD     AMIR,4              SAVE LINK IR
14135  0774 00 4 06657         AXT     $TIMES,4
14136  0604 00 0 03501         STI     AMIND               SAVE INDICATORS
14137  0057 00  000177         RIR     177                 RESET FIRST 7 INDICATORS
14140  0055 00  000002         SIR     2                   SET MULTIPLY INDICATOR (2)
14141  0020 00 0 14155         TRA     AMMMF               GO TO MAIN FUNCTION
                        *
14142 -0634 00 4 03500   MIN   SXD     AMIR,4              SAVE LINK IR
14143  0774 00 4 07604         AXT     $MINP,4
14144  0604 00 0 03501         STI     AMIND               SAVE INDICATORS
14145  0057 00  000177         RIR     177                 RESET FIRST 7 INDICATORS
14146  0055 00  000010         SIR     10                  SET MINIMUM INDICATOR (10)
14147  0020 00 0 14155         TRA     AMMMF               GO TO MAIN FUNCTION
                        *
14150 -0634 00 4 03500   MAX   SXD     AMIR,4              SAVE LINK IR
14151  0774 00 4 07614         AXT     $MAXP,4
14152  0604 00 0 03501         STI     AMIND               SAVE INDICATORS
14153  0057 00  000177         RIR     177                 RESET FIRST 7 INDICATORS
14154  0055 00  000004         SIR     4                   SET MAXIMUM INDICATOR (4)
14155  0634 00 4 03500   AMMMF SXA     AMIR,4              PUT PROGRAM NAME WITH LINK IR
14156  0074 00 4 02312         TSX     $SAVE,4             OTHER 3 FUNCTIONS ENTER AT *-1
14157 -3 03503 0 02377         TXL     $END2,,AMIND+2      SAVE 2 ITEMS
14160  0074 00 4 15774         TSX     $EVLIS,4            EVALUATE THE LIST OF ARGUMENTS
14161  0074 00 4 02326         TSX     UNSAVE,4            RESTORE IR 4 AND INDICATORS
14162  0634 00 2 14336         SXA     AMIR2,2             SAVE IR 2
14163  0600 00 0 14341         STZ     AMSUM               ZERO FINAL ANSWER REGISTER
14164 -0734 00 4 00000   AMLP  PDX     0,4                 PUT POINTER TO ARG LIST IN IR 4
14165 -3 00000 4 14330         TXL     AMEND,4,0           GO TO EXIT IF NULL
14166  0500 00 4 00000         CLA     0,4                 GET FIRST WORD
14167  0601 00 0 03502         STO     AMLIS               SAVE THE WORD
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14170  0734 00 4 00000         PAX     0,4             CAR OF LIST
14171 -0754 00 4 00000         PXD     0,4             TO DECREMENT
14172  0074 00 4 14342         TSX     NUMVAL,4        EVALUATE THE ITEM
14173 -0600 00 0 03503         STQ     AMQ             SAVE CHARACTERISTIC ($FIX OR $FLOAT)
14174  0056 00  000100         RNT     100             TEST FOR FIRST TIME THROUGH
14175  0020 00 0 14220         TRA     AMFRS           IS FIRST TIME GO TO INITIALIZE AMSUM
14176  0054 00  000002         RFT     2               TEST FOR MULT FUNCTION
14177  0020 00 0 14240         TRA     AMLT            EXECUTE MULT FUNCTION
14200 -0734 00 4 00000         PDX     0,4             POINTER TO FULL WORD
14201  0500 00 4 00000         CLA     0,4             GET NUMERICAL VALUE
14202  0056 00  000001         RNT     1               SKIP NEXT INSTRUCTION IF ADD FUNCTION
14203  0020 00 0 14300         TRA     AMM             EXECUTE MAX OR MIN FUNCTION
14204 -0534 00 2 03503         LXD     AMQ,2           ADD FUNCTION. PICK UP TYPE OF NUMBER
14205  0074 00 4 14550         TSX     FIXFLO,4        TEST FOR FIX OR FLOAT
14206  0761 00 0 00000         NOP                     IMPOSSIBLE RETURN
14207  0020 00 0 14233         TRA     AFLL            EXECUTE FAD
14210  0055 00  000020         SIR     20              IS FIXED POINT. SET FIXED POINT IND.
14211 -0774 00 4 14235         AXC     AFLR,4          PRESET IR 4
14212  0054 00  000040         RFT     40              SKIP NEXT INSTRUCTION IF NOT MIXED EXP
14213  0020 00 0 14266         TRA     UNFX            IS MIXED, FLOAT THIS NUMBER
14214  0400 00 0 14341         ADD     AMSUM           FIXED ADD OF SUM
14215  0601 00 0 14341  AMRT   STO     AMSUM           STORE NEW SUM
14216  0500 00 0 03502         CLA     AMLIS           PICK UP ARG LIST
14217  0020 00 0 14164         TRA     AMLP            DO NEXT ITEM
14220 -0734 00 4 00000  AMFRS  PDX     0,4             POINTER TO FULL WORD
14221  0500 00 4 00000         CLA     0,4             GET NUMERICAL VALUE
14222  0601 00 0 14341         STO     AMSUM           STORE NUMERICAL VALUE IN AMSUM
14223 -0534 00 2 03503         LXD     AMQ,2           PICK UP TYPE OF NUMBER
14224  0074 00 4 14550         TSX     FIXFLO,4        TEST FOR FIX OR FLOAT
14225  0761 00 0 00000         NOP                     IMPOSSIBLE EXIT
14226  0055 00  000040         SIR     40              SET FLOAT INDICATOR
14227  0055 00  000020         SIR     20              SET FIX INDICATOR
14230  0055 00  000100         SIR     100             SET INDICATOR SO IT WILL NOT GET BACK
14231  0500 00 0 03502         CLA     AMLIS           PICK UP REST OF ARG LIST
14232  0020 00 0 14164         TRA     AMLP            DO NEXT ITEM
14233  0055 00  000040  AFLL   SIR     40              IS FLOATING POINT, SET PROPER INDICATO
14234  0054 00  000020         RFT     20              SKIP NEXT INSTRUCTION IF NOT MIXED EXP
14235  0074 00 4 14270  AFLR   TSX     MIXFL,4         UNMIX THE EXPRESSION
14236  0300 00 0 14341         FAD     AMSUM           FLOATING ADD THE CURRENT SUM
14237  0020 00 0 14215         TRA     AMRT            STORE AND DO NEXT ITEM ON LIST
14240 -0734 00 4 00000  AMLT   PDX     0,4             POINTER TO FULL WORD
14241  0500 00 4 00000         CLA     0,4             GET NUMERICAL VALUE
14242 -0534 00 2 03503         LXD     AMQ,2           PICK UP TYPE
14243  0074 00 4 14550         TSX     FIXFLO,4        TEST FOR FIX OR FLOAT
14244  0761 00 0 00000         NOP                     IMPOSSIBLE RETURN
14245  0020 00 0 14260         TRA     AFMP            DO FMP
14246  0055 00  000020         SIR     20              SET FIXED POINT INDICATOR
14247 -0774 00 4 14262         AXC     AFLT,4          PRESET IR 4
14250  0054 00  000040         RFT     40              SKIP NEXT INSTRUCTION IF NOT MIXED EXP
14251  0020 00 0 14266         TRA     UNFX            IS MIXED, FLOAT THIS NUMBER
14252  0131 00 0 00000         XCA                     NUMBER TO MQ
14253  0200 00 0 14341         MPY     AMSUM           MPY BY CURRENT ANSWER
14254  0131 00 0 00000         XCA                     PUT LEAST SIGNIFICANT DIGITS IN AC
14255  0601 00 0 14341  AMRU   STO     AMSUM           STORE NEW ANSWER
14256  0500 00 0 03502         CLA     AMLIS           PICK UP ARG LIST
14257  0020 00 0 14164         TRA     AMLP            DO NEXT ITEM
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14260  0055 00  000040   AFMP  SIR     40                SET FLOATING POINT INDICATOR
14261  0054 00  000020         RFT     20                TEST FOR MIXED EXP
14262  0074 00 4 14270   AFLT  TSX     MIXFL,4           UNMIX THE EXPRESSION
14263  0131 00 0 00000         XCA                       NUMBER TO MQ
14264  0260 00 0 14341         FMP     AMSUM             FMP BY CURRENT ANSWER
14265  0020 00 0 14255         TRA     AMRU              STORE NEW ANSER AND DO NEXT ITEM
14266  0057 00  000020   UNFX  RIR     20                RESET FIXED POINT INDICATOR
14267  0020 00 0 14565         TRA     $UNFIX            FLOAT THE NUMBER IN THE AC
14270  0634 00 4 14276   MIXFL SXA     MXIR,4            FIX MIXED EXPRESSION
14271  0601 00 0 14340         STO     AMR               SAVE AC
14272  0500 00 0 14341         CLA     AMSUM             PICK UP CURRENT ANSWER
14273  0074 00 4 14266         TSX     UNFX,4            FLOAT IT
14274  0601 00 0 14341         STO     AMSUM             PUT IT AWAY
14275  0500 00 0 14340         CLA     AMR               RESTORE AC
14276  0774 00 4 00000   MXIR  AXT     **,4              RESTORE IR 4
14277  0020 00 4 00001         TRA     1,4               RETURN
14300 -0534 00 2 03503   AMM   LXD     AMQ,2             MAX OR MIN FUNCTION. GET TYPE
14301  0074 00 4 14550         TSX     FIXFLO,4          TEST FOR FIX OR FLOAT
14302  0761 00 0 00000         NOP                       IMPOSSIBLE RETURN
14303  0020 00 0 14316         TRA     AFL               EXECUTE FLOATING SECTION
14304  0055 00  000020         SIR     20                SET FIXED PONT INDICATOR
14305  0054 00  000040         RFT     40                TEST FOR MIXED EXP
14306  0074 00 4 14266         TSX     UNFX,4            FLOAT THE ARGUMENT IF MIXED
14307  0056 00  000004   AMRNT RNT     4                 TEST FORMAX FUNCTION
14310  0020 00 0 14322         TRA     AMIN              EXECUTE MIN FUNCTION
14311  0340 00 0 14341         CAS     AMSUM             COMPARE WITH CURRENT ANSWER
14312  0601 00 0 14341         STO     AMSUM             IS GREATER, STORE AS NEW ANSWER
14313  0761 00 0 00000         NOP                       THEY ARE EQUAL
14314  0500 00 0 03502         CLA     AMLIS             IS LESS, PICK UP ARGUMENT LIST
14315  0020 00 0 14164         TRA     AMLP              DO NEXT ITEM
14316  0055 00  000040   AFL   SIR     40                SET FLOATING POINT INDICATOR
14317  0054 00  000020         RFT     20                TEST FOR MIXED EXPRESSION
14320  0074 00 4 14270         TSX     MIXFL,4           UNMIX THE EXPRESSION
14321  0020 00 0 14307         TRA     AMRNT             COMPARE AND DO NEXT ITEM
14322  0340 00 0 14341   AMIN  CAS     AMSUM             MIN FUNCTION, COMPARE WITH CURRENT VAL
14323  0020 00 0 14326         TRA     *+3               IS GREATER
14324  0020 00 0 14326         TRA     *+2               IS EQUAL
14325  0601 00 0 14341         STO     AMSUM             IS LESS, STORE AS NEW ANSWER
14326  0500 00 0 03502         CLA     AMLIS             PICK UP NEXT ITEM
14327  0020 00 0 14164         TRA     AMLP              EXECUTE IT
14330  0500 00 0 14341   AMEND CLA     AMSUM             ALL DONE. PICKUP CURRENT ANSWER
14331  0560 00 0 00475         LDQ     AMFXC             PRESET MQ
14332  0054 00  000040         RFT     40                SKIP NEXT IF FIXED POINT
14333  0560 00 0 00476         LDQ     AMFLC             PICK UPI FIX IN MQ
14334  0441 00 0 03501         LDI     AMIND             RESTORE INDICATORS
14335 -0534 00 4 03500         LXD     AMIR,4            RESTORE IR 4
14336  0774 00 2 00000   AMIR2 AXT     **,2              RESTORE IR 2
14337  0020 00 0 12636         TRA     $MKNO             MAKE THE ANSWER A NUMBER
                 00476   AMFLC SYN     FLOATD            FLOAT CONSTANT
                 00475   AMFXC SYN     $FIXD             FIX CONSTANT
14340  0 00000 0 00000   AMR                             TEMP STORAGE
14341  0 00000 0 00000   AMSUM                           CURRENT ANSWER STORAGE
                        * NUMVAL       NUMERICAL VALUE TAKES ANY LIST AND DECIDES IF IT
                        *      REPRESENTS A FIXED POINT OR FLOATING POINT NUMBER. IF IT DOES NOT
                        *      THE ROUTINE CLEARS THE AC AND MQ DOES AN XEC 1,4 AND THEN GOES
                        *      TO ERROR WITH A BAD ARGUMENT COMPLAINT. IF THE LIST DOES
```

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                        *       REPRESENT A NUMBER, UPON EXIT THE FOLLOWING THINGS ARE LEFT
                        *       AS INDICATED                POINTER TO FULL WORD IN AC
                        *                                   $FIX OR $FLOAT IN MQ
14342  0634 00 4 14372  NUMVAL SXA     NVIR4,4            SAVE LINK IR
14343  0601 00 0 03321         STO     $ARG3              SAVE ORIGINAL ARGUMENT
14344 -0734 00 4 00000         PDX     0,4                POINTER TO NUMBER IN IR 4
14345 -3 00000 4 14351   NVLP  TXL     NVNO,4,0           NULL  LIST IS NOT A NUMBER
14346  0500 00 4 00000         CLA     0,4                FIRST ELEMENT
14347  0734 00 4 00000         PAX     0,4                CAR LIST
14350  3 77776 4 14362         TXH     NVATM,4,-2         GO IF AN ATOM
                        *
14351 -0754 00 0 00000   NVNO  PXD     0,0                IS NOT NUMBER, CLEAR AC
14352  0131 00 0 00000         XCA                        PUT IN MQ
14353 -0754 00 0 00000         PXD     0,0                CLEAR AC AGAIN
14354  0534 00 4 14372         LXA     NVIR4,4            RESTORE LINK IR
14355  0522 00 4 00001         XEC     1,4                EXECUTE POSSIBLE EXIT INSTRUCTION
14356  0500 00 0 03321         CLA     $ARG3              MUST BE AN ERROR, PICK UP ORIGINAL ARGPAGE 142
14357 -0634 00 4 01562         SXD     $ERROR,4
14360  0074 00 4 01563         TSX     $ERROR+1,4         GO TO ERROR
14361  543160600354            BCI     1,*I  3*           BAD ARGUMENT NUMVAL
                        *
14362 -0734 00 4 00000  NVATM  PXD     0,4
14363 -0320 00 0 00470         ANA     TAGMSK
14364  0100 00 0 14351         TZE     NVNO
14365  0771 00 0 00017         ARS     15
14366  0621 00 0 14370         STA     *+2
14367 -0754 00 4 00000         PXD     0,4
14370 -0774 00 4 00000         AXC     **,4
14371  0560 00 4 14373         LDQ     NVTBL,4
14372  0774 00 4 00000   NVIR4 AXT     **,4               RESTORE IR 4
14373  0020 00 4 00001  NVTBL  TRA     1,4
14374  0 10135 0 00000                 0,,$FIX
14375  0 10120 0 00000                 0,,$FLOAT
14376  0 00000 0 00000                 0,,0
14377  0 00000 0 00000                 0,,0
14400  0 10135 0 00000                 0,,$FIX
                        *
                        *
                        * ADD1          ADD 1 ADDS ONE TO ANY FIXED POINT OR FLOATING POINT
                        *       NUMBER AND EXITS WITH THE NUMBER NUMBER
14401  0634 00 1 14417   ADD1  SXA     A1IR1,1            SAVE IR 1
14402  0774 00 1 00000         AXT     0,1                ZERO IR 1(INDICATES ADD OP)
14403  0634 00 2 14420   AD1   SXA     A1IR2,2            SAVE IR 2
14404  0634 00 4 14421         SXA     A1IR4,4            SAVE LINK IR
14405  0074 00 4 14342         TSX     NUMVAL,4           EVALUTE NUMERICAL ARGUMENT
14406 -0600 00 0 14423         STQ     A1T                SAVE $FIX OR $FLOAT
14407 -0734 00 4 00000         PDX     0,4                POINTER TO FULL WORD
14410  0500 00 4 00000         CLA     0,4                GET NUMERICAL VALUE
14411 -0534 00 2 14423         LXD     A1T,2              PICK UP $FIX OR $FLOAT
14412  0074 00 4 14550         TSX     FIXFLO,4
14413  0761 00 0 00000         NOP                        IMPOSSIBLE RETURN
14414  0522 00 1 14424         XEC     FAD,1              IS FLOAT, DO FLOATING POINT OP
14415  0522 00 1 14426         XEC     ADDF,1             DO FIXED POINT OP
14416  0560 00 0 14423         LDQ     A1T                RESTORE $FLOAT AFTER FAD
14417  0774 00 1 00000   A1IR1 AXT     **,1               RESTORE IR 1
14420  0774 00 2 00000   A1IR2 AXT     **,2               RESTORE IR 2
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14421  0774 00 4 00000   A1IR4 AXT     **,4              RESTORE LINK IR
14422  0020 00 0 12636         TRA     $MKNO             MAKE RESULT A NUMBER
                        *
14423  0 00000 0 00000   A1T                             TEMPORARY STORAGE
14424  0300 00 0 00454   FAD   FAD     $QF1              FLOATING ADD FOR ADD1
14425  0302 00 0 00454         FSB     $QF1              FOR SUB1
14426  0400 00 0 00371   ADDF  ADD     $Q1               FOR ADD1
14427  0402 00 0 00371         SUB     $Q1               FOR SUB1
                        *
                        * SUB1          SUBTRACT 1 SUBTRACTS ONE FROM A FIXED POINT OR FLOATING
                        *       POINT NUMBER. USES CODING OF ADD1 WITH AN INITIALIZATION.
14430  0634 00 1 14417   SUB1  SXA     A1IR1,1           SAVE IR1
14431  0774 00 1 77777         AXT     -1,1              SET FOR SUBTRACT OPERATIONS
14432  0020 00 0 14403         TRA     AD1               PERFORM ADD1 CODING
                        * SUB1 USES THE CODING OF ADD1
                        *
                        *
14433  0634 00 4 14437  GRTRTP SXA     GRTIR,4           SAVE LINK IR
14434  0074 00 4 13350         TSX     UNUMIX,4          EVALUATE NUMERICAL ARGUMENTS
14435  0040 00 0 14441         TLQ     GRTT              PREDICATE TRUE
14436 -0754 00 0 00000         PXD     0,0               FALSE, CLEAR AC
14437  0774 00 4 00000   GRTIR AXT     **,4
14440  0020 00 4 00001         TRA     1,4               EXIT
                        *
14441  0500 00 0 00442   GRTT  CLA     $QD1              GET TRUE VALUE
14442  0020 00 0 14437         TRA     GRTIR             RESTORE LINK IR AND EXIT
                        *
                        *
                        * LESSTP       LESS THAN PREDICATE.  SIMPLE DOES GREATER THAN  PREDICATE
                        *       WITH THA ARGUMENT REVERSED.
                        *
14443  0131 00 0 00000  LESSTP XCA                       INTERCHANGE ARGUMENTS
14444  0020 00 0 14433         TRA     GRTRTP            DO GREATER THAN PREDICATE
                        *
                        * THE FOLLOWING IS A NUMBER PREDICATE PACKAGE WHICH INCLUDES NUMBER
                        *       PREDICATE, ZERO PREDICATE, MINUS PREDICATE, ONE PREDICATE, FIX
                        *       PREDICATE AND FLOAT PREDICATE. ALL THESE PREDICATES SHARE CERTAIN
                        *       BLOCKS OF CODING AND TEMPORARY STORAGE.
                        * NUMBRP       NUMBER PREDICATE TEST ITS ARGUMENT FOR A NUMBER
14445  0634 00 4 14451  NUMBRP SXA     NPIR,4            SAVE LINK IR
14446  0074 00 4 14342         TSX     NUMVAL,4          EVALUATE ARGUMENT
14447  0100 00 0 14451         TZE     NPIR              IF ZERO NOT A NUMBER
14450  0500 00 0 00442   NPT   CLA     $QD1              IS A NUMBER, PICK UP TRUTH
14451  0774 00 4 00000   NPIR  AXT     **,4              RESTORE LINK IR
14452  0020 00 4 00001         TRA     1,4               EXIT
                        *
                        * FLOATP       FLOATING POINT NUMBER PREDICATE TESTS TO SEE IF ITS
                        *       ARGUMENT IS A FLOATING POINT NUMBER
14453  0634 00 4 14451  FLOATP SXA     NPIR,4            SAVE LINK IR
14454  0634 00 2 14525         SXA     ZPIR,2            SAVE IR 2
14455  0074 00 4 14342         TSX     NUMVAL,4          EVALUATE ARGUMENT
14456  0131 00 0 00000         XCA                       GET TYPE IN AC
14457 -0734 00 2 00000         PDX     0,2               TYPE IN IR 2
14460  0074 00 4 14550         TSX     FIXFLO,4          TEST FOR $FIX OR $FLOAT
14461  0761 00 0 00000         NOP                       IMPOSSIBLE RETURN
14462  0020 00 0 14464         TRA     FLT               IS FLOATING POINT
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14463  0020 00 0 14524         TRA     ZPF             IS NOT FLOATING POINT, EXIT FALSE
14464  0500 00 0 00442   FLT   CLA     $QD1            GET TRUTH VALUE
14465  0020 00 0 14525         TRA     ZPIR            RESTORE IR S AND EXIT
                        *
                        * FIXP         FIXED POINT PREDICATE TESTS FOR FIXED POINT NUMBERS.
14466  0634 00 4 14451   FIXP  SXA     NPIR,4          SAVE LINK IR
14467  0634 00 2 14525         SXA     ZPIR,2          SAVE IR 2
14470  0074 00 4 14342         TSX     NUMVAL,4        EVALUATE ARGUMENT
14471  0131 00 0 00000         XCA                     GET TYPE IN AC
14472 -0734 00 2 00000         PDX     0,2             TYPE IN IR 2
14473  0074 00 4 14550         TSX     FIXFLO,4        TEST FOR $FIX OR $FLOAT
14474  0761 00 0 00000         NOP                     IMPOSSIBLE EXIT
14475  0020 00 0 14524         TRA     ZPF             IS FLOAT, EXIT FALSE
14476  0500 00 0 00442         CLA     $QD1            IS FIX, GET TRUTH VALUE
14477  0020 00 0 14525         TRA     ZPIR            RESTORE IR S AND RETURN
                        *
                        * MINUSP       MINUS PREDICATE TESTS TO SEE IF ITS ARGUMENT IS A
                        *       NEGATIVE NUMBER.
14500  0634 00 4 14451  MINUSP SXA     NPIR,4          SAVE LINK IR
14501  0074 00 4 14342         TSX     NUMVAL,4        EVALUATE ARGUMENT
14502 -0734 00 4 00000         PDX     0,4
14503  0500 00 4 00000         CLA     0,4             PICK UP NUMBER
14504 -0120 00 0 14450         TMI     NPT             EXIT TRUE IF MINUS
14505 -0754 00 0 00000         PXD     0,0             IS NOT, EXIT FALSE
14506  0020 00 0 14451         TRA     NPIR            RESTORE LINK IR AND EXIT
                        *
                        * ZEROP        ZERO PREDICATE TESTS ITS ARGUMENT FOR A FIXED POINT
                        *       ZERO    OR
                        *       ZERO OR A FLOATING POINT ZERO + OR - A TOLERANCE (FLOTOL).
14507  0634 00 4 14451   ZEROP SXA     NPIR,4          SAVE LINK IR
14510  0634 00 2 14525         SXA     ZPIR,2          SAVE IR 2
14511  0074 00 4 14342         TSX     NUMVAL,4        EVALUATE ARGUMENT
14512 -0734 00 4 00000         PDX     0,4             GET POINTER TO IR 4
14513  0500 00 4 00000         CLA     0,4             FULL WORD
14514  0760 00 0 00003  ZPG    SSP                     GET MAGNITUDE OF N
14515  0100 00 0 14527         TZE     ZPT             EXIT TRUE IF ZERO
14516  0131 00 0 00000         XCA                     PUT NUMBER IN MQ
14517 -0734 00 2 00000         PDX     0,2             PUT TYPE IN IR 2
14520  0500 00 0 14623         CLA     FLOTOL          PICK UP FLOATING POINT TOLERENCE
14521  0074 00 4 14550         TSX     FIXFLO,4        TEST FOR FIX OR FLOAT
14522  0020 00 0 14531         TRA     ZPTS            NOT FIX OR FLO MEANS FLO FROM ONEP
14523  0020 00 0 14531         TRA     ZPTS            IS FLOATING POINT, COMPARE WITH FLOTOL
14524 -0754 00 0 00000   ZPF   PXD     0,0             IS FIXED POINT, EXIT FALSE
14525  0774 00 2 00000   ZPIR  AXT     **,2            RESTORE IR 2
14526  0020 00 0 14451         TRA     NPIR            RESTORE IR 4 AND EXIT
14527  0500 00 0 00442   ZPT   CLA     $QD1            GET TRUTH VALUE
14530  0020 00 0 14525         TRA     ZPIR            RESTORE IR S AND EXIT
14531  0040 00 0 14527   ZPTS  TLQ     ZPT             IS FLOATING POINT, EXIT TRUE IF LESS
14532  0020 00 0 14524         TRA     ZPF             OTHERWISE EXIT FALSE
                        * ONEP         ONE PREDICAT TESTS TO SEE IF ITS ARGUMENT IS ONE
                        *       BY SUBTRACTIGN ONE AND TESTING THE RESULT WITH ZEROP.
14533  0634 00 4 14451   ONEP  SXA     NPIR,4          SAVE LINK IR
14534  0634 00 2 14525         SXA     ZPIR,2          SAVE IR 2
14535  0074 00 4 14342         TSX     NUMVAL,4        EVALUATE ARGUMENT
14536 -0734 00 4 00000         PDX     0,4             POINTER TO AC
14537  0500 00 4 00000         CLA     0,4             FULL WORD TO AC
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14540  0131 00 0 00000         XCA                     TYPE TO AC
14541 -0734 00 2 00000         PDX     0,2             TYPE TO IR 2
14542  0131 00 0 00000         XCA
14543  0074 00 4 14550         TSX     FIXFLO,4        DISPATCH ON FIX OR FLOAT
14544  0761 00 0 00000         NOP                     IMPOSSIBLE RETURN
14545  0302 00 0 00454         FSB     $QF1
14546  0402 00 0 00371         SUB     $Q1             SUBTRACT 1
14547  0020 00 0 14514         TRA     ZPG             APPLY ZERO PREDICATE
                       *
                       *       FIXFLO                  SUBROUTINE TO DISPATCH ON FIX OR FLO,
                       *                               ARGUMENT IN IR 2.
                       *
14550 -3 10134 2 14552  FIXFLO  TXL     *+2,2,$FIX-1    TXL - TXL FILTER FOR $FIX
14551 -3 10135 2 14564          TXL     FX,2,$FIX       GO IF $FIX
14552 -3 10117 2 14554          TXL     *+2,2,$FLOAT-1  TXL - TXL FILTER FOR FLOAT
14553 -3 10120 2 14560          TXL     FL,2,$FLOAT     GO IF $FLOAT
14554  0522 00 4 00001          XEC     1,4             EXECUTE IF NEITHER FIX OR FLOAT
14555  0020 00 4 00004          TRA     4,4             RETURN
14556  0020 00 4 00005          TRA     5,4             SKIP EXIT
14557  0020 00 4 00006          TRA     6,4             SKIP 2 EXIT
14560  0522 00 4 00002   FL     XEC     2,4             EXECUTE IF $FLOAT
14561  0020 00 4 00004          TRA     4,4             RETURN
14562  0020 00 4 00005          TRA     5,4             SKIP EXIT
14563  0020 00 4 00006          TRA     6,4             SKIP 2 EXIT
14564  0020 00 4 00003   FX     TRA     3,4
                       *       FIXFLO USES $FIX AND $FLAOT
                       * UNFIX         UNFIX MAKES A FIXED POINT ARGUMENT IN THE AC A FLOATING
                       *       POINT NUMBER LEFT IN AC. MQ IS PRESERVED.
14565  0601 00 0 14621   UNFIX STO     UFC             SAVE ARGUMENT
14566 -0320 00 0 00434          ANA     UFMSK           MASK OUT ALL BUT CHARACTERISTIC
14567 -0100 00 0 14576          TNZ     UFE             IF ANY THING LEFT IT MUST BE NORMALIZD
14570  0500 00 0 14621          CLA     UFC             NOTHING LEFT, RESTORE ARGUMENT
14571 -0501 00 0 00433          ORA     UFMC            OR IN CHARACTERISTIC
14572 -0600 00 0 14620          STQ     UFQ             SAVE MQ
14573  0300 00 0 00433          FAD     UFMC            ESSENTIALLY FAD OR ZERO TO NORMALIZE
14574  0560 00 0 14620          LDQ     UFQ             RESTORE MQ
14575  0020 00 4 00001          TRA     1,4             EXIT
                       *
14576  0634 00 4 14616   UFE    SXA     UFXR,4          NUMBER GREATER THAN 2 TO 27. SAVE IR 4
14577  0774 00 4 00234          AXT     2*64+3*8+4,4     CHARACTERISTIC SO FAR
14600  0600 00 0 14622          STZ     UFS             INITIALIZE SIGN PORTION
14601  0120 00 0 14604          TPL     UFF             SKIP IF +
14602  0760 00 0 00003          SSP                     MAKE IT +
14603 -0625 00 0 14622          STL     UFS             RECORD FACT BY MAKING UFS NON-ZERO
14604  0771 00 0 00001   UFF    ARS     1               DIVIDE NUMBER BY 2
14605  0340 00 0 00432          CAS     UFNC            SEE IF NORMALIZED YET
14606  1 00001 4 14604          TXI     UFF,4,1         ADD 1 TO CHARACTERISTIC AND TRY AGAIN
14607  1 00001 4 14604          TXI     UFF,4,1         DITTO
14610  0601 00 0 14621          STO     UFC             IS NORMALIZED
14611 -0754 00 4 00000          PXD     0,4             CHARACTERISTIC TO AC
14612  0767 00 0 00011          ALS     9               POSITION CHARACTERISTIC
14613 -0501 00 0 14621          ORA     UFC             OR IN NORMALIZED NUMBER
14614  0520 00 0 14622          ZET     UFS             TEST FOR SIGN, 0 MEANS +
14615 -0760 00 0 00003          SSM                     NOT ZERO SO MAKE MINUS
14616  0774 00 4 00000   UFXR   AXT     **,4            RESTORE IR 4
14617  0020 00 4 00001          TRA     1,4             EXIT
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                00434   UFMSK SYN Q777Q9                CHARACTERISTIC MASK
                00433   UFMC  SYN Q233Q9                GENERAL CHARACTERISTIC
                00432   UFNC  SYN $QO1Q9
14620  0 00000 0 00000   UFQ                             MQ
14621  0 00000 0 00000   UFC                             AC TEMPORARY STORAGE
14622  0 00000 0 00000   UFS                             SIGN STORAGE
                       * UNFIX USES NO EXTERNAL CONSTANTS.
                       * FLOTOL       FLOATING POINT TOLERENCE USED IN DESIDING IF FLOATING
                       *      POINT NUMBERS ARE INTEGERS.
14623 +156622516334    FLOTOL DEC     3E-6             FLOATING POINT TOLERENCE VALUE
                       * MNSPRG       MINUS PROGRAM MAKES A LIST OF MINUS AND ITS ARGUMENT
                       *
                       * MNSPRG       CREATES A NUMBER OF OPPOSITE SIGN OF NUMERAL ARGUMENT
                       *
14624  0634 00 4 14631  MNSPRG SXA     MRXR,4           SAVE LINK IR
14625  0074 00 4 14342         TSX     NUMVAL,4         EVALUATE THE NUMERICAL ARGUMENT
14626 -0734 00 4 00000         PDX     0,4              POINTER TO FULL WORD
14627  0500 00 4 00000         CLA     0,4              NUMERICAL VALUE
14630  0760 00 0 00002         CHS                      MAKE OPPOSITE SIGN
14631  0774 00 4 00000   MRXR  AXT     **,4             RESTORE LINK IR
14632  0020 00 0 12636         TRA     $MKNO            MAKE IT A NUMBER
                       *
                       * RCPPRG       CALCULATES THE RECIPORICAL OF A NUMBER.
14633  0634 00 4 14654  RCPPRG SXA     RRXR,4           SAVE LINK IR
14634  0634 00 2 14655         SXA     RRXR2,2          SAVE IR 2
14635  0074 00 4 14342         TSX     NUMVAL,4         EVALUTE THE NUMERICAL ARGUMENT
14636 -0734 00 4 00000         PDX     0,4              POINTER TO FULL WORD
14637  0500 00 4 00000         CLA     0,4              NUMERICAL VALUE
14640  0601 00 0 14662         STO     RCPT             SAVE VALUE
14641  0131 00 0 00000         XCA                      TYPE TO AC
14642 -0734 00 2 00000         PDX     0,2              TYPE TO IR 2
14643  0074 00 4 14550         TSX     FIXFLO,4         DISPATCH ON FIX OR FLOAT
14644  0761 00 0 00000         NOP                      IMPOSSIBLE RETURN
14645  0500 00 0 00454         CLA     $QF1             IS FLOAT, PICK UP FLOATING POINT 1
14646  0020 00 0 14657         TRA     RCPFX            IS FIXED POINT
14647  0241 00 0 14662         FDP     RCPT             DIVIDE BY ARGUMENT
14650  0760 00 0 00012         DCT                      CHECK FOR ILLEGAL DIVISION
14651  0074 00 4 01676         TSX     $DCT,4           DIVIDE CHECK ERROR
14652  0131 00 0 00000         XCA                      QUOTENT TO AC
14653  0560 00 0 00476         LDQ     RCPS             $FLOAT TO MQ
14654  0774 00 4 00000   RRXR  AXT     **,4             RESTORE LINK IR
14655  0774 00 2 00000   RRXR2 AXT     **,2             RESTORE IR 2
14656  0020 00 0 12636         TRA     $MKNO            MAKE ANSWER A NUMBER
                       *
14657  0131 00 0 00000   RCPFX XCA                      FIXED POINT RECIP, ANSWER IS ZERO
14660 -0754 00 0 00000         PXD     0,0              CLEAR AC
14661  0020 00 0 14654         TRA     RRXR             RESTORE IR S AND MAKE A NUMBER
                       *
14662  0 00000 0 00000   RCPT                           TEMPORARY STORAGE
                00476   RCPS  SYN     FLOATD           FLOAT INDICATOR
                       *
```

```
                                EJECT
                                    APPLY

                                    APPLY(F,L,A) =
                                       SELECT(CAR(L).,
                                              -1,APP2(F,L,A).,
                                              LAMBDA,EVAL(F,APPEND(PAIR(CADR(F),L),A)).,
                                              LABEL,APPLY(CADDR(F),L,APPEND(
                                                   PAIR1(CADR(F),CADDR(F))),A).,
                                              APPLY(EVAL(F,A),L,A))

                              A       HED
14663 -0634 00 4 03350   APPLY SXD ASS1,4
14664  0100 00 4 00001         TZE 1,4
14665  0601 00 0 03353         STO AST1                  F
14666 -0734 00 4 00000         PDX 0,4
14667  0634 00 4 03350         SXA     ASS1,4            SAVE FUNCTION ALONG WITH INDEX REGISTE
14670  0500 00 4 00000         CLA 0,4                   CWR(F)
14671  0734 00 4 00000         PAX 0,4                   CAR(F)
14672  3 77776 4 14722         TXH ASP1,4,-2             =-1
14673 -0754 00 4 00000         PXD 0,4
14674  0340 00 0 00502         CAS ASLMD                 = LAMBDA
14675  0020 00 0 14677         TRA *+2
14676  0020 00 0 14725         TRA ASP2
14677  0340 00 0 00500         CAS ASFUN
14700  0020 00 0 14702         TRA *+2
14701  0020 00 0 15000         TRA ASP4
14702  0340 00 0 00501         CAS ASLBL                 = LABEL
14703  0020 00 0 14705         TRA *+2
14704  0020 00 0 14750         TRA ASP3
14705  0074 00 4 02312         TSX $SAVE,4
14706 -3 03354 0 02375         TXL     $END3,,ASSA+2     SAVE 3 ITEMS
14707 -0600 00 0 03351         STQ ASSL
14710  0560 00 0 03321         LDQ $ARG3
14711 -0600 00 0 03352         STQ ASSA
14712  0500 00 0 03353         CLA AST1                  F
14713  0074 00 4 15454         TSX $EVAL,4               EVAL(F,A)
14714  0560 00 0 03352         LDQ ASSA
14715 -0600 00 0 03321         STQ $ARG3
14716  0560 00 0 03351         LDQ ASSL
14717  0074 00 4 02326         TSX UNSAVE,4
14720 -0534 00 4 03350         LXD ASS1,4
14721  0020 00 0 14663         TRA APPLY                 APPLY(EVAL(F,A),L,A)

14722  0500 00 0 03353   ASP1  CLA AST1                  F
14723 -0534 00 4 03350         LXD ASS1,4
14724  0020 00 0 15016         TRA $APP2                 P APP29F,L,A)
                              *            LAMBDA BRANCH
14725 -0534 00 4 03353   ASP2  LXD AST1,4                F
14726  0500 00 0 03321         CLA $ARG3
14727  0601 00 0 03355         STO AST3
14730  0500 00 4 00000         CLA 0,4                   CWR(F)
14731 -0734 00 4 00000         PDX 0,4                   CDR(F)
14732  0500 00 4 00000         CLA 0,4                  CWDR(F)
14733  0601 00 0 03356         STO AST4
14734  0734 00 4 00000         PAX 0,4                   CADR(F)
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14735 -0754 00 4 00000         PXD 0,4
14736  0074 00 4 07562         TSX $PAIR,4                PAIR(CADR(F),L)
14737  0560 00 0 03355         LDQ AST3                   A
14740  0074 00 4 07675         TSX     $NCONC,4
14741  0131 00 0 00000         XCA
14742 -0534 00 4 03356         LXD AST4,4                 CDDR(F)
14743  0500 00 4 00000         CLA 0,4
14744  0734 00 4 00000         PAX 0,4
14745 -0754 00 4 00000         PXD 0,4
14746 -0534 00 4 03350         LXD ASS1,4
14747  0020 00 0 15454         TRA $EVAL      EVAL(CADDR(F),APPEND(PAIR(CADR(F),L),A))

                        *              LABEL BRANCH
14750 -0534 00 4 03353   ASP3  LXD AST1,4                 F
14751 -0600 00 0 03354         STQ AST2                   L
14752  0560 00 0 03321         LDQ $ARG3                  A
14753 -0600 00 0 03355         STQ AST3
14754  0500 00 4 00000         CLA 0,4                    CWR(F)
14755 -0734 00 4 00000         PDX 0,4                    CDR(F)
14756  0500 00 4 00000         CLA 0,4
14757  0601 00 0 03356         STO AST4                   CWDR(F)
14760 -0734 00 4 00000         PDX 0,4                    CDDR(F)
14761  0500 00 4 00000         CLA 0,4
14762  0734 00 4 00000         PAX 0,4                    CADDR(F)
14763 -0754 00 4 00000         PXD 0,4
14764  0601 00 0 03353         STO AST1
14765  0131 00 0 00000         XCA
14766  0534 00 4 03356         LXA AST4,4
14767 -0754 00 4 00000         PXD 0,4                    CADR(F)
14770  0074 00 4 03730         TSX $CONS,4                CONS(CADR(F),CONS(CADDR(F),0))
14771  0560 00 0 03355         LDQ AST3                   A
14772  0074 00 4 03730         TSX $CONS,4                APPEND( ABOVE,A)
14773  0601 00 0 03321         STO $ARG3
14774  0560 00 0 03354         LDQ AST2
14775  0500 00 0 03353         CLA AST1                   CADDR(F)
14776 -0534 00 4 03350         LXD ASS1,4
14777  0020 00 0 14663         TRA APPLY   APPLY(CADDR(F),L,APPEND(PAIR(CADR(F),CADDR(F)),A))

                        *              FUNARG BRANCH
15000 -0534 00 4 03353   ASP4  LXD AST1,4                 F
15001  0500 00 4 00000         CLA ,4
15002 -0734 00 4 00000         PDX ,4                     CDR(F)
15003  0500 00 4 00000         CLA ,4
15004  0601 00 0 03353         STO AST1                   CWDR(F)
15005 -0734 00 4 00000         PDX ,4                     CDDR(F)
15006  0500 00 4 00000         CLA ,4
15007  0734 00 4 00000         PAX ,4                     CADDR(F)
15010 -0754 00 4 00000         PXD ,4
15011  0601 00 0 03321         STO $ARG3                  A
15012  0534 00 4 03353         LXA AST1,4                 CADR(F)
15013 -0754 00 4 00000         PXD ,4                     F
15014 -0534 00 4 03350         LXD ASS1,4
15015  0020 00 0 14663         TRA $APPLY
```

```
                    00501   ASLBL SYN LABELD
                    00502   ASLMD SYN LAMDAD
                    00500   ASFUN SYN     FNARGD
                    00370   ASZRO SYN     $ZERO

                                  APP2(F,L,A)=SELECT(F.,CAR,CAAR(L).,CDR,
                                  CDAR(L).,CONS,CONS(CAR(L),CADR(L)).,LIST,COPY(L).,SEARCH(F,
                                  LAMBDA(J,CAR(J)=SUBR OR CAR(J)=EXP),
                                  LAMBDA(J,CAR(J)=SUBR YIELDS APP3(CWADR
                                  (J),DISTRIB(L)),1 YIELDS APPLY(CADR(J),L,A)))
                                  ERROR)

                              A       HED
15016 -0634 00 4 15147   APP2  SXD     ATS1,4              SAVE LINK IR
15017 -0534 00 4 03321         LXD     $ARG3,4             GET ALIST
15020 -0634 00 4 15153         SXD     A,4                 SAVE IT
15021 -0600 00 0 15152         STQ     AL                  ARGUMENT LIST
15022  0601 00 0 15151         STO     F                   FUNCTION (IS ATOMIC SYMBOL)
15023  0600 00 0 15145         STZ     APTRT               INITIALIZE TRACE TEST CELL
15024 -0734 00 4 00000   APSES PDX     0,4                 ARG TO IR
15025 -3 00000 4 15071         TXL     APSAL,4,0           GO IF NO MORE PROPERTY LIST
15026  0500 00 4 00000         CLA     0,4                 FIRST WORD
15027  0734 00 4 00000         PAX     0,4                 CAR
15030 -3 06646 4 15032         TXL     *+2,4,$TRACE-1
15031 -3 06647 4 15121         TXL     APTRK,4,$TRACE      LOOK FOR TRACE
15032 -3 06732 4 15034         TXL     *+2,4,$SUBR-1       LOOK FOR
15033 -3 06733 4 15046         TXL     R2,4,$SUBR          $SUBR OR
15034 -3 10156 4 15024         TXL     APSES,4,$EXPR-1     $EXPR
15035  3 10157 4 15024         TXH     APSES,4,$EXPR
                              *        EXPR BRANCH IN APPLY
15036 -0734 00 4 00000   R21   PDX     0,4                 POINTER TO NEXT WORD AFTER $EXPR
15037  0500 00 4 00000         CLA     0,4                 NEXT WORD
15040  0734 00 4 00000         PAX     0,4                 CAR
15041 -0754 00 4 00000         PXD     0,4                 IS FUNCTION
15042  0520 00 0 15145         ZET     APTRT               TEST FOR TRACE MODE
15043  0020 00 0 15111         TRA     APTXP               TRACE THIS EXPRESSION
15044 -0534 00 4 15147         LXD     ATS1,4              RESTORE LINK IR
15045  0020 00 0 14663         TRA     $APPLY              GO TO APPLY
                              *        RZ THE SUBR BRANCH OF APPLY
15046 -0734 00 4 00000   R2    PDX     0,4                 GET THE TXL INSTRUCTION BT  TAKING
15047  0500 00 4 00000         CLA     0,4                 CWR (CADR L))
15050  0734 00 4 00000         PAX     0,4
15051  0500 00 4 00000         CLA     0,4
15052  0601 00 0 15146         STO     CWADR               TXL INSTRUCTION
15053  0500 00 0 03350         CLA     ASS1
15054  0601 00 0 03315         STO     CSV
15055  0500 00 0 15152         CLA     AL                  GET THE ARGUMENT LIST
15056  0074 00 4 10072         TSX     SPREAD,4            SPREAD IT INTO AC, MQ, ARG3, ETC.
15057  0520 00 0 15145         ZET     APTRT               TEST FOR TRACE MODE
15060  0020 00 0 15131         TRA     APTSB               TRACE THIS SUBROUTINE
15061  0074 00 4 02312         TSX     $SAVE,4
15062 -3 03320 0 02377         TXL     $END2,,$ALIST+2
15063 -0534 00 4 15153         LXD     A,4
15064 -0634 00 4 03316         SXD     $ALIST,4
15065  0074 00 4 15146         TSX     CWADR,4
15066  0074 00 4 02326         TSX     UNSAVE,4
```

```
15067 -0534 00 4 03315         LXD     CSV,4
15070  0020 00 4 00001         TRA     1,4
                       *
15071  0500 00 0 15150  APSAL   CLA     FAS                WHERE TO GO IF NOT FOUND ON PAIR LIST
15072  0601 00 0 03321         STO     $ARG3
15073  0500 00 0 15151         CLA     F                  ATOMIC FUNCTION
15074  0560 00 0 15153         LDQ     A
15075  0074 00 4 10042         TSX     SASSOC,4           SEARCH PAIR LIST FOR LABEL DEFINITION
15076 -0734 00 4 00000         PDX     0,4                POINTER TO ASSOCIATED ITEM
15077  0500 00 4 00000         CLA     0,4
15100 -0734 00 4 00000         PDX     0,4                POINTER TO ITEM
15101 -0754 00 4 00000         PXD     0,4
15102  0560 00 0 15153         LDQ     A                  RESTORE PAIR LIST
15103 -0600 00 0 03321         STQ     $ARG3
15104  0560 00 0 15152         LDQ     AL                 RESTORE ARGUMENT LIST
15105  0520 00 0 15145         ZET     APTRT              TEST FOR TRACE MODE
15106  0020 00 0 15111         TRA     APTXP              TRACE THIS EXPRESSION
15107 -0534 00 4 15147         LXD     ATS1,4             RESTORE LINK IR
15110  0020 00 0 14663         TRA     $APPLY             GO TO APPLY WITH ITEM ASSOCIATED WITH
                       *                                  THE ATOMIC FUNCTION
15111  0074 00 4 02312  APTXP  TSX     $SAVE,4            TRACE EXPR
15112 -3 03317 0 02401         TXL     $END1,,CSV+2
15113  0074 00 4 14663         TSX     $APPLY,4
15114  0020 00 0 15136         TRA     APEXC              FINISH UP
                       *
15115 -0634 00 4 01562   R33   SXD     $ERROR,4
15116  0500 00 0 15151         CLA     F                  PICK UP FUNCTION
15117  0074 00 4 01563         TSX     $ERROR+1,4         GO TO ERROR
15120  542160600254            BCI     1,*A  2*           FUNCTION OBJECT HAS NO DEFINITION
                       *
15121 -0625 00 0 15145   APTRK STL     APTRT
15122  0601 00 0 15144         STO     APA                SAVE THE AC
15123  0534 00 4 03350         LXA     ASS1,4             ATOM NAME
15124 -0754 00 4 00000         PXD     0,4
15125  0074 00 4 16050         TSX     ARGOF,4            PRINT ARGUMETNS OF
15126  0560 00 0 15152         LDQ     AL                 RESTORE MQ AFTER PRINTING
15127  0500 00 0 15144         CLA     APA                RESTORE AC
15130  0020 00 0 15024         TRA     APSES              CONTINUE PROPERTY LIST SEARCH
                       *
15131  0074 00 4 02312  APTSB  TSX     $SAVE,4            TRACE SUBR
15132 -3 03320 0 02377         TXL     $END2,,$ALIST+2
15133 -0534 00 4 15153         LXD     A,4
15134 -0634 00 4 03316         SXD     $ALIST,4
15135  0074 00 4 15146         TSX     CWADR,4
15136  0074 00 4 02326  APEXC  TSX     UNSAVE,4
15137  0131 00 0 00000         XCA                        VALUE TO MQ
15140  0534 00 4 03315         LXA     CSV,4
15141 -0754 00 4 00000         PXD     0,4                TO AC
15142 -0534 00 4 03315         LXD     CSV,4
15143  0020 00 0 16104         TRA     VALOF              PRINT VALUE OF
                       *
15144  0 00000 0 00000   APA                              AC STORAGE
15145  0 00000 0 00000   APTRT                            TRACE MODE TEST SWITCH
15146  0 00000 0 00000   CWADR                            TXL INSTRUCTION FOR SUBR
15147  0 00000 0 00000   ATS1                             LINK INDEX REGISTER
15150 -3 00000 0 15115   FAS   TXL     R33,,0             NOT FOUND ON PAIR LIST SO CALL ERROR
```

```
15151  0 00000 0 00000   F                                ATOMIC FUNCTION GOES HERE
15152  0 00000 0 00000   AL                               ARGUMENT LIST
15153  0 00000 0 00000   A                                A OR PAIR LIST
                         *


                         A       HED
15154  0100 00 0 15205    EVCON TZE E3
15155 -0634 00 4 03364          SXD ECS1,4
15156  0074 00 4 02312          TSX $SAVE,4
15157 -3 03371 0 02373          TXL     $END4,,ECS4+2      SAVE 4 ITEMS
15160 -0600 00 0 03365          STQ ECS2
15161 -0734 00 4 00000          PDX 0,4
15162  0500 00 4 00000    E1    CLA 0,4
15163  0601 00 0 03366          STO ECS3
15164  0734 00 4 00000          PAX 0,4
15165  0500 00 4 00000          CLA 0,4
15166  0601 00 0 03367          STO ECS4
15167  0734 00 4 00000          PAX 0,4
15170 -0754 00 4 00000          PXD 0,4
15171  0074 00 4 15454          TSX $EVAL,4
15172  0560 00 0 03365          LDQ ECS2
15173  0100 00 0 15203          TZE E2
15174 -0534 00 4 03367          LXD ECS4,4
15175  0500 00 4 00000          CLA 0,4
15176  0734 00 4 00000          PAX 0,4
15177 -0754 00 4 00000          PXD 0,4
15200  0074 00 4 02326          TSX UNSAVE,4
15201 -0534 00 4 03364          LXD ECS1,4
15202  0020 00 0 15454          TRA $EVAL
15203 -0534 00 4 03366    E2    LXD ECS3,4
15204  3 00000 4 15162          TXH E1,4,0
15205 -0634 00 4 01562    E3    SXD $ERROR,4
15206  0534 00 4 03366          LXA     ECS3,4
15207 -0754 00 4 00000          PXD     0,4                PRINT LAST CONDITION
15210  0074 00 4 01563          TSX $ERROR+1,4
15211  542160600354             BCI     1,*A  3*           CONDITIONAL UNSATISFIED
                                BASIC LISP FUNCTIONS FOR APPLY


                         R       HED
                                 CAR

15212  0634 00 4 15217  CARP    SXA     CARX,4
15213 -0734 00 4 00000          PDX ,4
15214  0500 00 4 00000          CLA ,4
15215  0734 00 4 00000          PAX ,4
15216 -0754 00 4 00000          PXD ,4
15217  0774 00 4 00000  CARX    AXT     **,4
15220  0020 00 4 00001          TRA 1,4
15221  0 00000 0 00000    BFS1

15222  0634 00 4 15226  CDRP    SXA     CDRX,4
15223 -0734 00 4 00000          PDX ,4
15224  0500 00 4 00000          CLA ,4
15225 -0320 00 0 00460          ANA BFDM
```

```
15226  0774 00 4 00000  CDRX   AXT     **,4
15227  0020 00 4 00001         TRA 1,4
                00460   BFDM   SYN     $DMASK


15230  0634 00 4 15241  ATOMP  SXA     ATMX,4
15231  0100 00 0 15236         TZE ATP1
15232 -0734 00 4 00000         PDX ,4
15233  0500 00 4 00000         CLA ,4
15234  0734 00 4 00000         PAX ,4
15235 -3 77776 4 15240         TXL *+3,4,-2
15236  0500 00 0 00442   ATP1  CLA BFQ1
15237  0020 00 0 15241         TRA *+2
15240 -0754 00 0 00000         PXD ,0
15241  0774 00 4 00000  ATMX   AXT     **,4
15242  0020 00 4 00001         TRA 1,4
                00442   BFQ1   SYN     $QD1

15243  0100 00 0 15246   NULLP TZE *+3
15244 -0754 00 0 00000         PXD ,0
15245  0020 00 4 00001         TRA 1,4
15246  0500 00 0 00442         CLA BFQ1
15247  0020 00 4 00001         TRA 1,4



                                    LAMBDA FOR FUNCTIONAL ARGUMENTS

15250 -0634 00 4 15221   LAMP  SXD BFS1,4
15251  0601 00 0 03415         STO BFS2                    L
15252  0131 00 0 00000         XCA
15253  0560 00 0 00370         LDQ BFZRO
15254  0074 00 4 03730         TSX $CONS,4                 CONS(A,0)
15255  0131 00 0 00000         XCA
15256  0500 00 0 03415         CLA BFS2
15257  0074 00 4 07541         TSX APPEND,4
15260  0131 00 0 00000         XCA
15261  0500 00 0 00500         CLA BFFAG
15262 -0534 00 4 15221         LXD BFS1,4
15263  0020 00 0 03730         TRA $CONS                   LIST(FUNARG,L,A)
                00500   BFFAG SYN     FNARGD
                00370   BFZRO SYN     $ZERO

                                    LABEL FSUBR

15264 -0634 00 4 15221   LABP  SXD BFS1,4
15265 -0600 00 0 03416         STQ BFS3                    A
15266 -0734 00 4 00000         PDX ,4                      L
15267  0500 00 4 00000         CLA ,4
15270  0601 00 0 03415         STO BFS2                    CWR(L)
15271 -0734 00 4 00000         PDX ,4                      CDR(L)
15272  0500 00 4 00000         CLA ,4
15273  0734 00 4 00000         PAX ,4                      CADR(L)
15274 -0754 00 4 00000         PXD ,4
15275  0601 00 0 03414         STO BFS4
15276  0131 00 0 00000         XCA
```

```
15277  0534 00 4 03415         LXA BFS2,4                CAR(L)
15300  0131 00 0 00000         XCA
15301 -0754 00 4 00000         PXD ,4
15302  0074 00 4 03730         TSX $CONS,4               LIST(CAR(L),CADR(L))
15303  0560 00 0 03416         LDQ BFS3
15304  0074 00 4 03730         TSX $CONS,4               CONS(LIST,A)
15305  0131 00 0 00000         XCA
15306  0500 00 0 03414         CLA BFS4                  CADR(L)
15307 -0534 00 4 15221         LXD BFS1,4
15310  0020 00 0 15454         TRA $EVAL



                                   SETQ

15311 -0634 00 4 03461   SETQP SXD REPS1,4
15312  0074 00 4 02312         TSX $SAVE,4
15313 -3 03464 0 02377         TXL     $END2,,REPV+2
15314 -0734 00 4 00000         PDX ,4                    L
15315  0500 00 4 00000         CLA ,4
15316  0734 00 4 00000         PAX ,4                    CAR(L)
15317 -0634 00 4 03462         SXD REPV,4
15320 -0734 00 4 00000         PDX ,4                    CDR(L)
15321  0500 00 4 00000         CLA ,4
15322  0734 00 4 00000         PAX ,4                    CADR(L)
15323 -0754 00 4 00000         PXD ,4
15324  0074 00 4 15454         TSX $EVAL,4               EVAL(CADR(L),A)
15325  0601 00 0 03463         STO REPT1
15326  0500 00 0 15341         CLA REPP1
15327  0601 00 0 03321         STO $ARG3
15330  0560 00 0 03447         LDQ PRGVAR
15331  0500 00 0 03462         CLA REPV
15332  0074 00 4 10042         TSX SASSOC,4              SASSOC(CAR(L),PV,ERROR)
15333 -0734 00 4 00000         PDX ,4
15334  0500 00 0 03463         CLA REPT1
15335  0622 00 4 00000         STD     0,4               REPLACE DECREMENT
15336  0074 00 4 02326         TSX UNSAVE,4
15337 -0534 00 4 03461         LXD REPS1,4
15340  0020 00 4 00001         TRA 1,4

15341 -3 00000 0 15342   REPP1 TXL *+1,,0
15342 -0634 00 4 01562         SXD $ERROR,4
15343  0500 00 0 03462         CLA REPV
15344  0074 00 4 01563         TSX $ERROR+1,4
15345  542160600454            BCI     1,*A  4*          SETQ GIVEN ON NON-EXISTENT VARIABLE

                                   SET

15346 -0634 00 4 15221   SETP  SXD BFS1,4
15347  0601 00 0 15367         STO BFS5
15350 -0600 00 0 03415         STQ BFS2
15351  0560 00 0 15362         LDQ SETP1
15352 -0600 00 0 03321         STQ $ARG3
15353  0560 00 0 03447         LDQ PRGVAR
15354  0074 00 4 10042         TSX SASSOC,4
```

```
15355 -0734 00 4 00000         PDX ,4
15356  0500 00 0 03415         CLA BFS2
15357  0622 00 4 00000         STD 0,4
15360 -0534 00 4 15221         LXD BFS1,4
15361  0020 00 4 00001         TRA 1,4

15362 -3 00000 0 15363   SETP1 TXL *+1,,0
15363 -0634 00 4 01562         SXD $ERROR,4
15364  0500 00 0 15367         CLA BFS5
15365  0074 00 4 01563         TSX $ERROR+1,4
15366  542160600554            BCI     1,*A  5*          SET  GIVEN ON NON EXISTENT VARIABLE
15367  0 00000 0 00000  BFS5

                        *              AND SPECIAL FORM
15370 -0100 00 0 15373   EVA8  TNZ EVA6
15371  0500 00 0 00442         CLA EVCT
15372  0020 00 4 00001         TRA 1,4
15373 -0634 00 4 03343   EVA6  SXD EVA1,4
15374  0074 00 4 02312         TSX $SAVE,4
15375 -3 03347 0 02375         TXL     $END3,,EVA9+2      SAVE 3 ITEMS
15376 -0734 00 4 00000         PDX ,4
15377  0500 00 4 00000   EVA4  CLA ,4
15400  0601 00 0 03344         STO EVA2
15401  0734 00 4 00000         PAX ,4
15402 -0754 00 4 00000         PXD ,4
15403 -0600 00 0 03345         STQ EVA9
15404  0074 00 4 15454         TSX $EVAL,4
15405  0560 00 0 03345         LDQ EVA9
15406 -0100 00 0 15412         TNZ EVA3
15407  0074 00 4 02326   EVA5  TSX UNSAVE,4
15410 -0534 00 4 03343         LXD EVA1,4
15411  0020 00 4 00001         TRA 1,4
15412 -0534 00 4 03344   EVA3  LXD EVA2,4
15413  3 00000 4 15377         TXH EVA4,4,0
15414  0500 00 0 00442         CLA EVCT
15415  0020 00 0 15407         TRA EVA5
                        *              OR SPECIAL FORM
15416 -0100 00 0 15421   EVR8  TNZ EVR6
15417  0500 00 0 00370         CLA EVCF
15420  0020 00 4 00001         TRA 1,4
15421 -0634 00 4 03435   EVR6  SXD EVR1,4
15422  0074 00 4 02312         TSX $SAVE,4
15423 -3 03441 0 02375         TXL     $END3,,EVR9+2      SAVE 3 ITEMS
15424 -0734 00 4 00000         PDX ,4
15425  0500 00 4 00000   EVR4  CLA ,4
15426  0601 00 0 03436         STO EVR2
15427  0734 00 4 00000         PAX ,4
15430 -0754 00 4 00000         PXD ,4
15431 -0600 00 0 03437         STQ EVR9
15432  0074 00 4 15454         TSX $EVAL,4
15433  0560 00 0 03437         LDQ EVR9
15434  0100 00 0 15441         TZE EVR3
15435  0500 00 0 00442         CLA EVCT
15436  0074 00 4 02326   EVR5  TSX UNSAVE,4
15437 -0534 00 4 03435         LXD EVR1,4
15440  0020 00 4 00001         TRA 1,4
```

```
15441 -0534 00 4 03436   EVR3  LXD EVR2,4
15442  3 00000 4 15425         TXH EVR4,4,0
15443  0500 00 0 00370         CLA EVCF
15444  0020 00 0 15436         TRA EVR5
                 00442   EVCT  SYN     $QD1
                 00370   EVCF  SYN     $ZERO

15445 -0600 00 0 15221   EQP   STQ BFS1
15446  0402 00 0 15221         SUB BFS1
15447 -0100 00 0 15452         TNZ *+3
15450  0500 00 0 00442         CLA BFQ1
15451  0020 00 4 00001         TRA 1,4
15452 -0754 00 0 00000         PXD ,0
15453  0020 00 4 00001         TRA 1,4

                               EVAL(E,A)  5/6/59

                       A       HED
15454 -0634 00 4 03372   EVAL  SXD EVS1,4
15455  0100 00 4 00001         TZE 1,4
15456  0601 00 0 16121         STO EVTE                  E
15457 -0734 00 4 00000         PDX ,4
15460  0500 00 4 00000         CLA ,4
15461  0625 00 0 16126         STT     EVLNS             SEE IF A NUMBER
15462  0520 00 0 16126         ZET     EVLNS             SKIP IF NOT A NUMBER
15463  0020 00 0 15542         TRA     EV1N              IS A NUMBER(CONSTANT)
15464  0734 00 4 00000         PAX ,4                    CAR(E)
15465  3 77776 4 15545         TXH EVP1,4,-2             = - 1
15466 -0634 00 4 16122         SXD EVTAE,4               CAR(E)
15467  0634 00 4 03372         SXA     EVS1,4            SAVE FUNCTION WITH INDEX REGISTER
15470  0622 00 0 03411         STD EVTDE                 CDR(E)
15471  0500 00 4 00000         CLA ,4
15472  0625 00 0 16126         STT     EVLNS             SEE IF A NUMBER
15473  0520 00 0 16126         ZET     EVLNS             TEST FOR A NUMBER
15474  0020 00 0 16007         TRA     EVP26             UNDEFINED FUNCTION IF A NUMBER
15475  0734 00 4 00000         PAX ,4                    CAAR(E)
15476 -3 77776 4 15756         TXL     EVP27,4,-2        GO IF CAR(E) NOT AN ATOM
                       *
                       *             CAAR(E) = -1
                       *
15477  0634 00 0 03375         SXA     EVTRK,0           ZERO THE ADDRESS
15500 -0634 00 0 03375         SXD     EVTRK,0           ZERO DECREMENT
15501 -0734 00 4 00000   EVP2  PDX ,4                    CDAR(E)
15502 -3 00000 4 15642         TXL EVP25,4,0             NULL(J)
15503  0500 00 4 00000         CLA ,4
15504  0734 00 4 00000         PAX ,4                    CAR(J)
15505  3 06647 4 15507         TXH     *+2,4,$TRACE
15506  3 06646 4 15540         TXH     EVTRT,4,$TRACE-1  =TRACE
15507  3 06733 4 15511         TXH *+2,4,$SUBR
15510  3 06732 4 15756         TXH     EVP27,4,$SUBR-1   OF IF A SUBR
15511  3 10103 4 15513         TXH *+2,4,$FSUBR
15512  3 10102 4 15613         TXH EVP22,4,$FSUBR-1      =FSUBR
15513  3 10157 4 15515         TXH *+2,4,$EXPR
15514  3 10156 4 15634         TXH EVP23,4,$EXPR-1       =EXPR
15515  3 10142 4 15501         TXH EVP2,4,$FEXPR
15516 -3 10141 4 15501         TXL EVP2,4,$FEXPR-1       /= FEXPR
```

```
15517  0622 00 0 03412         STD EVD2                CDR(J)
15520 -0600 00 0 03321         STQ $ARG3               A
15521  0500 00 0 03321         CLA $ARG3
15522  0560 00 0 00370         LDQ EVZRO               0
15523  0074 00 4 03730         TSX $CONS,4             CONS(A,0)
15524  0131 00 0 00000         XCA
15525  0500 00 0 03411         CLA EVTDE
15526  0074 00 4 03730         TSX $CONS,4             LIST(CDR(E),A)
15527  0131 00 0 00000         XCA
15530 -0534 00 4 03412         LXD EVD2,4              CDR(J)
15531  0500 00 4 00000         CLA ,4
15532  0734 00 4 00000         PAX ,4                  CADR(J)
15533 -0754 00 4 00000         PXD ,4
15534  0520 00 0 03375         ZET     EVTRK           TEST FOR TRACE MODE
15535  0020 00 0 16031         TRA     EVTXP
15536 -0534 00 4 03372         LXD EVS1,4
15537  0020 00 0 14663         TRA $APPLY              APPLY(CADR(J),LIST(CDR(E),A),A)
                       *
15540 -0625 00 0 03375  EVTRT  STL     EVTRK           SET THE TRACE SWITCH
15541  0020 00 0 15501         TRA     EVP2            GO SEARCH MORE
                       *
                       *
                       *              CAR(E) = -1
                       *
15542  0500 00 0 16121  EV1N   CLA     EVTE            GET THE NUMBER
15543 -0534 00 4 03372         LXD     EVS1,4          RESTORE LINK INDEX
15544  0020 00 4 00001         TRA     1,4
                       *
15545 -0734 00 4 00000  EVP1   PDX ,4                  J
15546 -3 00000 4 15563         TXL EVP11,4,0           = 0
15547  0500 00 4 00000         CLA ,4
15550  0734 00 4 00000         PAX ,4                  CAR(J)
15551  3 10742 4 15545         TXH EVP1,4,$APVAL       = APVAL
15552 -3 10741 4 15545         TXL EVP1,4,$APVAL-1
15553 -0734 00 4 00000  EVP13  PDX ,4                  CDR(J)
15554  0500 00 4 00000         CLA ,4
15555  0734 00 4 00000         PAX ,4                  CADR(J)
15556  0500 00 4 00000         CLA ,4
15557  0734 00 4 00000         PAX ,4                  CAADR(J)
15560 -0754 00 4 00000         PXD ,4
15561 -0534 00 4 03372         LXD EVS1,4
15562  0020 00 4 00001         TRA 1,4
                       *
15563 -0600 00 0 16123  EVP11  STQ EVTA                A
15564  0500 00 0 16121         CLA EVTE                E
15565  0622 00 0 15600         STD EVI1
15566  0402 00 0 00442         SUB EVQD1
15567  0622 00 0 15601         STD EVI2
15570 -0634 00 2 16125         SXD EVD1,2
15571 -0534 00 4 16123         LXD EVTA,4
15572 -3 00000 4 15607  EVL1   TXL EVP12,4,0           NULL(J)
15573  0500 00 4 00000         CLA ,4
15574  0734 00 2 00000         PAX ,2                  CAR(J)
15575 -0734 00 4 00000         PDX ,4                  CDR(J)
15576  0500 00 2 00000         CLA ,2
15577  0734 00 2 00000         PAX ,2                  CAAR(J)
```

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15600  3 00000 2 15572   EVI1  TXH EVL1,2,**              CAAR(J) = E
15601 -3 00000 2 15572   EVI2  TXL EVL1,2,**
15602 -0734 00 4 00000         PDX ,4                     CDAR(J)
15603 -0754 00 4 00000         PXD ,4
15604 -0534 00 2 16125         LXD EVD1,2
15605 -0534 00 4 03372         LXD EVS1,4
15606  0020 00 4 00001         TRA 1,4
                        *
15607 -0634 00 4 01562   EVP12 SXD $ERROR,4
15610  0500 00 0 16121         CLA EVTE
15611  0074 00 4 01563         TSX $ERROR+1,4
15612  542160601054            BCI     1,*A  8*           UNBOUND VARIBLE MENTIONED -EVAL-
                        *
15613 -0734 00 4 00000   EVP22 PDX ,4                     CDR(J)     FSUBR
15614  0500 00 4 00000         CLA ,4
15615  0734 00 4 00000         PAX ,4                     CADR(J)
15616  0500 00 4 00000         CLA ,4                     CWADR(J)
15617  0601 00 0 16124         STO EVT1
15620  0500 00 0 03372         CLA     EVS1               ATOM AN DIR4 FOR SAVING $ALIST
15621  0601 00 0 03315         STO     CSV
15622  0074 00 4 02312         TSX     $SAVE,4
15623 -3 03320 0 02377         TXL     $END2,,$ALIST+2
15624 -0600 00 0 03316         STQ     $ALIST
15625  0520 00 0 03375         ZET     EVTRK              TEST WHETERT TO TRACT
15626  0020 00 0 16014         TRA     EVTFS              YES,TRACE FSUBR
15627  0500 00 0 03411         CLA     EVTDE              GET BACK ARGUMENTS
15630  0074 00 4 16124         TSX     EVT1,4
15631  0074 00 4 02326         TSX     UNSAVE,4
15632 -0534 00 4 03315         LXD     CSV,4
15633  0020 00 4 00001         TRA     1,4
                        *
                        *               EVP23 THE EXPR BRANCH FOR EVAL
                        *
15634 -0734 00 4 00000   EVP23 PDX     0,4                REST OF PROPERTY LIST
15635  0500 00 4 00000         CLA     0,4                GET THE EXPR
15636  0734 00 4 00000         PAX     0,4
15637 -0634 00 4 16122         SXD     EVTAE,4            SAVE IN TEMPORARY STORAGE
15640 -0534 00 4 02317         LXD     $CPPI,4            PUSH DOWN COUNTER
15641  1 77773 4 15665         TXI     EVP28,4,-5         SAVE 5 ITEMS
                        *
15642  0500 00 0 16122   EVP25 CLA EVTAE                  CAR(E)
15643  0622 00 0 15657         STD EVI3                   TXH
15644  0402 00 0 00442         SUB EVQD1
15645  0622 00 0 15660         STD EVI4                   TXL
15646 -0634 00 2 16124         SXD EVT1,2
15647 -0600 00 0 16125         STQ EVD1
15650 -0534 00 4 16125         LXD EVD1,4                 A
15651 -3 00000 4 16007   EVL2  TXL EVP26,4,0              NULL(J)
15652  0500 00 4 00000         CLA ,4
15653 -0734 00 4 00000         PDX ,4                     CDR(J)
15654  0734 00 2 00000         PAX ,2                     CAR(J)
15655  0500 00 2 00000         CLA ,2
15656  0734 00 2 00000         PAX ,2                     CAAR(J)
15657  3 00000 2 15651   EVI3  TXH EVL2,2,**              /= CAR(E)
15660 -3 00000 2 15651   EVI4  TXL EVL2,2,**
15661 -0534 00 2 16124         LXD     EVT1,2
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15662  0622 00 0 16122         STD     EVTAE              SAVE FUNCTION
15663 -0534 00 4 02317  EV27   LXD     $CPPI,4
15664  1 77773 4 15665         TXI     *+1,4,-5           SAVE TOTAL OF 4 ITEMS
15665  0522 00 0 02414   EVP28 XEC     ENDPDL             TEST FOR OUT OF PUSH DOWN LIST
15666 -0634 00 4 02317         SXD     $CPPI,4
15667  0500 00 0 03372         CLA     EVS1
15670  0601 00 4 77773         STO     -5,4
15671  0500 00 0 03373         CLA     EVSE
15672  0601 00 4 77774         STO     -4,4
15673  0500 00 0 03374         CLA     EVSA
15674  0601 00 4 77775         STO     -3,4
15675  0500 00 0 03375         CLA     EVTRK
15676  0601 00 4 77776         STO     -2,4
15677  0500 00 0 16127         CLA     EVCM
15700  0601 00 4 77777         STO     -1,4
15701  0500 00 0 16122         CLA     EVTAE              GET THE FUNCTION
15702  0622 00 0 03373         STD     EVSE
15703 -0600 00 0 03374         STQ EVSA                   A
15704  0500 00 0 03411         CLA EVTDE                  CDR(E)
15705  0560 00 0 15763         LDQ     ELP1          FUNCTIONAL ARGUMENT
15706  0074 00 4 04214         TSX     MAPLIS,4      MAPLIST(L,EVAL(CAR(L),A))
15707  0601 00 0 16124         STO EVT1
15710  0500 00 0 03374         CLA     EVSA
15711  0601 00 0 03321         STO     $ARG3
15712  0500 00 0 03373         CLA     EVSE
15713 -0534 00 4 02317         LXD     $CPPI,4       START OPEN UNSAVE
15714  0560 00 4 77773         LDQ     -5,4
15715 -0600 00 0 03372         STQ     EVS1
15716  0560 00 4 77774         LDQ     -4,4
15717 -0600 00 0 03373         STQ     EVSE
15720  0560 00 4 77775         LDQ     -3,4
15721 -0600 00 0 03374         STQ     EVSA
15722  0560 00 4 77776         LDQ     -2,4
15723 -0600 00 0 03375         STQ     EVTRK
15724  1 00005 4 15725         TXI     *+1,4,5
15725 -0634 00 4 02317         SXD     $CPPI,4
15726  0560 00 0 16124         LDQ     EVT1
15727  0520 00 0 03375         ZET     EVTRK              TEST RACE SWITCH
15730  0020 00 0 15733         TRA     EVDCO              DECODE EVTRAK
15731 -0534 00 4 03372  EVAPG  LXD     EVS1,4
15732  0020 00 0 14663         TRA $APPLY                 APPLY(CADAR(J),EVLIS(CDR(E),A),A)
                       *
                       *              IF CAR E IS A SUBR, THE POINTRE TO THE TXL INSTRUCTION
                       *              IS SAVED IN THE DECREMENT OF VETRK.  THE ADDRESS OF
                       *              EVTRK IS THE TRACE SWITCH.
                       *
15733 -0534 00 4 03375  EVDCO  LXD     EVTRK,4            LOOK FOR SUBR POINTER
15734 -3 00000 4 16031         TXL     EVTXP,4,0          THERE ISNT ANY. SO GO AND TRACE EXPR
15735  0534 00 4 03375         LXA     EVTRK,4            SEE IF THE SUBR IS TRACED
15736  3 00000 4 15731         TXH     EVAPG,4,0          YES IT IS. LET APPLY HANDLE IT
15737 -0534 00 4 03375         LXD     EVTRK,4            GET THE TXL SUBR WORD
15740  0500 00 4 00000         CLA     0,4
15741  0601 00 0 16124         STO     EVT1               READY TO EXECUTE
15742  0500 00 0 03372         CLA     EVS1               GET RETURN INDEX AND ATOM NAME
15743  0601 00 0 03315         STO     CSV                AND SAVE THEM ALONG WITH $ALIST
15744  0074 00 4 02312         TSX     $SAVE,4
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15745 -3 03320 0 02377          TXL     $END2,,$ALIST+2
15746  0500 00 0 03321          CLA     $ARG3
15747  0601 00 0 03316          STO     $ALIST              POST CURRENT ALIST
15750  0131 00 0 00000          XCA                         ARGUMENT LIST TO AC
15751  0074 00 4 10072          TSX     $SPREAD,4           SMEAR IT OUT
15752  0074 00 4 16124          TSX     EVT1,4              EXECUTE SUBR
15753  0074 00 4 02326          TSX     UNSAVE,4            RESTORE ALIST AND IX
15754 -0534 00 4 03315          LXD     CSV,4
15755  0020 00 4 00001          TRA     1,4                 AND RETURN
                        *
15756 -0734 00 4 00000  EVP27    PDX     0,4                 SUBR BRANCH
15757  0500 00 4 00000          CLA     0,4
15760  0734 00 4 00000          PAX     0,4                 POINTER TO TXL WORD
15761 -0634 00 4 03375          SXD     EVTRK,4             TO SAVE POSITION
15762  0020 00 0 15663          TRA     EV27                EVALUATE ARGUMENTS
                        *
15763 -3 00000 0 15764   ELP1   TXL *+1,,0
15764  0634 00 4 15772          SXA     ELT1,4              SAVE LINK IR
15765 -0734 00 4 00000          PDX ,4                      J
15766  0500 00 4 00000          CLA ,4
15767  0734 00 4 00000          PAX ,4
15770 -0754 00 4 00000          PXD ,4                      CAR(J)
15771  0560 00 0 03374          LDQ     EVSA                GET CURRENT A LIST
15772  0774 00 4 00000   ELT1   AXT     **,4                RESTORE LINK IR
15773  0020 00 0 15454          TRA $EVAL
                        *
                        *       EVLIS
                        *
15774 -0634 00 4 03372   EVLIS  SXD     EVS1,4              SAVE LINK IR
15775  0774 00 4 10167          AXT     EVLISL,4            ATOM EVLIS
15776  0634 00 4 03372          SXA     EVS1,4              FOR BACKTRACE
15777  0074 00 4 02312          TSX     $SAVE,4             SAVE EVAL STORAGE
16000 -3 03376 0 02375          TXL     $END3,,EVSA+2
16001 -0600 00 0 03374          STQ     EVSA
16002  0560 00 0 15763          LDQ     ELP1
16003  0074 00 4 04214          TSX     MAPLIS,4
16004  0074 00 4 02326          TSX     UNSAVE,4
16005 -0534 00 4 03372          LXD     EVS1,4
16006  0020 00 4 00001          TRA     1,4
                        *
16007 -0634 00 4 01562   EVP26  SXD $ERROR,4
16010 -0534 00 2 16124          LXD     EVT1,2
16011  0500 00 0 16121          CLA EVTE
16012  0074 00 4 01563          TSX $ERROR+1,4
16013  542160601154             BCI     1,*A  9*            FUNCTION OBJECT HAS NO DEFINITION EVAL
                        *
16014  0734 00 4 00000  EVTFS   PAX     0,4                 ATOM NAME
16015 -0754 00 4 00000          PXD     0,4                 TO PRINT POSITION
16016  0560 00 0 03411          LDQ     EVTDE
16017  0074 00 4 16050          TSX     ARGOF,4             PRINT ARGUMENT MESSAGE
16020  0560 00 0 03316          LDQ     $ALIST              RESTORE ALIST AFTER ARGOF
16021  0500 00 0 03411          CLA     EVTDE               AND ARGUMENT LIST
16022  0074 00 4 16124          TSX     EVT1,4              DO THE FSUBR
16023  0074 00 4 02326          TSX     UNSAVE,4            RESTORE THE IR
16024  0131 00 0 00000          XCA                         VALUE TO MQ
16025  0534 00 4 03315          LXA     CSV,4               GET ATOM NAME FOR VALUE MESSAGE
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16026 -0754 00 4 00000         PXD     0,4               TO AC
16027 -0534 00 4 03315         LXD     CSV,4             AND RETURN IR4
16030  0020 00 0 16104         TRA     VALOF             PRINT VALUE MESSAGE
                       *
16031  0622 00 0 03411  EVTXP   STD     EVTDE             SAVE LAMBDA EXPRESSION
16032  0534 00 4 03372         LXA     EVS1,4            GET ATOMIC FUNCTION
16033 -0754 00 4 00000         PXD     0,4               TO PRINT POSITION
16034  0074 00 4 16050         TSX     ARGOF,4           PRINT ARGUMENT MESSAGE
16035  0074 00 4 02312         TSX     $SAVE,4           SAVE THE RETURN IX
16036 -3 03374 0 02401         TXL     $END1,,EVS1+2
16037  0560 00 0 16124         LDQ     EVT1              RESTORE THE LIST OF ARGUMENTS
16040  0500 00 0 03411         CLA     EVTDE             AND THE LAMBDA EXPRESSION
16041  0074 00 4 14663         TSX     $APPLY,4          APPLY THE FUNCTION TO ITS ARGS
16042  0074 00 4 02326         TSX     UNSAVE,4
16043  0131 00 0 00000         XCA                       PUT VALUE IN AC
16044  0534 00 4 03372         LXA     EVS1,4            NAME OF ROUTINE TRACED
16045 -0754 00 4 00000         PXD     0,4               PUT IN AC
16046 -0534 00 4 03372         LXD     EVS1,4            LINK IR
16047  0020 00 0 16104         TRA     VALOF             PRINT VALUE OF STATEMETN
                       *
                       *       ARGOF   PRINTS ARGUMENTS OF  NAME FOLLOWED BY THE LIST OF ARGUMEN
                       *
16050  0634 00 4 16074  ARGOF  SXA     PRX,4             SAVE INDEX REGISTERS
16051  0634 00 2 16073         SXA     PRY,2
16052  0601 00 0 16076         STO     AGA               SAVE ATOM NAME
16053 -0600 00 0 16077         STQ     AGQ               SAVE LIST OF ARGUMENTS
16054  0074 00 4 05214         TSX     TERPRI,4          PRINT A BLANK LINE
16055  0774 00 2 00003         AXT     3,2               PRINT2 OUT 3 WORDS
16056  0500 00 2 16103         CLA     AGM+3,2
16057  0074 00 4 05110         TSX     $PRIN2,4
16060  2 00001 2 16056         TIX     *-2,2,1           LOOP
16061  0500 00 0 16076         CLA     AGA
16062  0074 00 4 04604         TSX     $PRINT,4          PRINT OUT THE LINE
16063 -0534 00 2 16077         LXD     AGQ,2             START THE PRINLIS
16064 -3 00000 2 16073  PLL    TXL     PRY,2,0           EXIT IF END OF LIST
16065  0500 00 2 00000         CLA     0,2               NEXT ITEM
16066 -0734 00 2 00000         PDX     0,2               CDR OF LIST
16067  0734 00 4 00000         PAX     0,4               CAR
16070 -0754 00 4 00000         PXD     0,4
16071  0074 00 4 04604         TSX     $PRINT,4
16072  0020 00 0 16064         TRA     PLL               GET NEXT ITEM
16073  0774 00 2 00000  PRY    AXT     **,2              RESTORE INDEX REGISTERS
16074  0774 00 4 00000  PRX    AXT     **,4
16075  0020 00 4 00001         TRA     1,4               EXIT
                       *
16076  0 00000 0 00000  AGA                              TEMPORARY STORAGE
16077  0 00000 0 00000  AGQ
16100  215127644425     AGM    BCI     1,ARGUME
16101 -056362607777             OCT     456362607777      ARGUMENTS
16102 -062660777777     AGO    OCT     462660777777      OF
16103  652143642560     VALV   BCI     1,VALUE
                       *
                       *       VALOF   PRINTS VALUE OF NAME FOLLOWED BY ONE LIST
                       *               SHARES STORAGE WITH ARGOF ROUTINE
                       *
16104  0634 00 4 16117  VALOF  SXA     VAX,4             SAVE LINK IR
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16105  0601 00 0 16076          STO     AGA                ATOM NAME
16106 -0600 00 0 16077          STQ     AGQ                VALUE OF EXPRESSION
16107  0074 00 4 05214          TSX     TERPRI,4           PRINT A BLANK LINE
16110  0500 00 0 16103          CLA     VALV               WORD VALUE
16111  0074 00 4 05110          TSX     $PRIN2,4           PUT IN OUTPUT LINE
16112  0500 00 0 16102          CLA     AGO                WORD OF
16113  0074 00 4 05110          TSX     $PRIN2,4
16114  0500 00 0 16076          CLA     AGA                ATOM
16115  0074 00 4 04604          TSX     $PRINT,4           PRINT OUT THE LINE
16116  0500 00 0 16077          CLA     AGQ                VALUE
16117  0774 00 4 00000    VAX   AXT     **,4               RESTORE LINK IR
16120  0020 00 0 04604          TRA     $PRINT             PRINT OUT VALUE AND RETURN
16121  0 00000 0 00000    EVTE                             E
16122  0 00000 0 00000    EVTAE                            CAR(E)
16123  0 00000 0 00000    EVTA                             A
16124  0 00000 0 00000    EVT1
16125  0 00000 0 00000    EVD1
16126  0 00000 0 00000    EVLNS                            TST CELL FOR NUMBERS
16127 -3 03377 0 02373    EVCM  TXL     $END4,,EVTRK+2
                 00370    EVZRO SYN     $ZERO
                 00442    EVQD1 SYN     $QD1
                        * INTER         MULTIPLE LISP STATEMENT PROGRAM FEATURE INTERPRETER
                        *               RECODED TO MAKE THE INTERPRETER AND COMPILER PROGRAM
                        *               FEATURE UNDERSTAND THE SAME LANGUAGE
                        *
                        R       HED
16130 -0634 00 4 03444    INTER SXD     INTRX,4            SAVE LINK IR
16131  0074 00 4 02312          TSX     $SAVE,4            SAVE PROTECTED TEMPORARY STORAGE
16132 -3 03452 0 02371          TXL     $END5,,INTGS+2     SAVE 5 ITEMS
16133  0634 00 2 03446          SXA     INTGL,2              SAVE INDEX REGISTER 2
16134 -0600 00 0 03447          STQ     INTPL              SAVE PAIR LIST
16135  0600 00 0 03450          STZ     INTGS              ZERO THE GO SWITCH
16136 -0734 00 4 00000          PDX     0,4                POINTER TO PROGRAM
16137  0500 00 4 00000          CLA     0,4                FIRST WORD
16140  0622 00 0 03445          STD     INTB               POINTER TO BEGINNING OF PROGRAM
16141  0622 00 0 16271          STD     INTE               DITTO
16142  0734 00 4 00000          PAX     0,4                POINTER TO LIST OF PROGRAM VARIABLES
16143 -0754 00 4 00000          PXD     0,4                TO DECREMENT
16144  0560 00 0 16242          LDQ     INTFB              FUNCTIONAL ARGUMENT
16145  0074 00 4 04214          TSX     MAPLIS,4           (MAPLIST PV (LAMBDA (L) (CONS (CAR L)
16146  0560 00 0 03447          LDQ     INTPL              NIL)))   PICK UP PAIR LIST
16147  0074 00 4 07675          TSX     $NCONC,4           ATTACH PROGARM VARIBLES TO PAIR LIST
16150  0601 00 0 03447          STO     INTPL              PUT IN PAIR LISDT REGISTER
16151  0560 00 0 00370          LDQ     $ZERO              ZERO THE MQ
16152 -0534 00 4 16271    INTGM LXD     INTE,4             SEARCH PROGRAM FOR GO TO POINTS
16153 -3 00000 4 16166          TXL     INTAA,4,0          GO IF END OF PROGRAM
16154  0500 00 4 00000          CLA     0,4                NEXT WORD
16155  0622 00 0 16271          STD     INTE               SAVE CDR
16156  0734 00 2 00000          PAX     0,2                CAR
16157  0500 00 2 00000          CLA     0,2                MAKE ATOM TEST
16160  0734 00 2 00000          PAX     0,2
16161 -3 77776 2 16152          TXL     INTGM,2,-2         GO IF NOT AN ATOM
16162 -0754 00 4 00000          PXD     0,4                IS AN ATOM, PUT POINTER TO CURRENT LOC
16163  0074 00 4 03730          TSX     $CONS,4            PUT ON GO LOST
16164  0131 00 0 00000          XCA                        ANSWER TO MQ
16165  0020 00 0 16152          TRA     INTGM              NEXT ITEM
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16166 -0620 00 0 03446   INTAA SLQ     INTGL              ALL DONE, STORE GO LIST
16167 -0534 00 4 03445   INTGA LXD     INTB,4,0           NEXT PROGRAM LOCATION
16170 -3 00000 4 16262         TXL     INTRN,4,0          RETURN WITH NIL IF RAN OUT OF STATEMEN
16171  0500 00 4 00000         CLA     0,4                NEXT WORD
16172  0622 00 0 03445         STD     INTB               SAVE CDR
16173  0734 00 4 00000         PAX     0,4                CAR
16174  0500 00 4 00000         CLA     0,4                FIRST WORD
16175  0734 00 2 00000         PAX     0,2                CHECK FOR ATOM OR $COND
16176  3 77776 2 16167         TXH     INTGA,2,-2         GO TO NEXT STEP IF ATOM
16177 -3 10457 2 16221         TXL     INTEV,2,$COND-1    GO TO EVAL IF NOT $COND
16200  3 10460 2 16221         TXH     INTEV,2,$COND
16201 -0734 00 2 00000         PDX     0,2                IS $COND DO AN EVCOND
16202 -3 00000 2 16167   INTEB TXL     INTGA,2,0          GO TO NEXT STEP IF COND UNSATISFIED
16203  0500 00 2 00000         CLA     0,2                FIRST COND STATEMENT
16204 -0734 00 2 00000         PDX     0,2                CDR
16205  0734 00 4 00000         PAX     0,4                FIRST SUB COND
16206  0500 00 4 00000         CLA     0,4
16207 -0734 00 4 00000         PDX     0,4                POINTER TO THEN PART
16210  0634 00 4 03445         SXA     INTB,4             SAVE IN PROTECTED STORAGE
16211  0734 00 4 00000         PAX     0,4                POINTRE TO IF PART
16212 -0754 00 4 00000         PXD     0,4                PUT IN DECREMENT
16213  0560 00 0 03447         LDQ     INTPL              PAIR LIST
16214  0074 00 4 15454         TSX     $EVAL,4            EVALUATE IT
16215  0100 00 0 16202         TZE     INTEB              GO IF IF PART IS FALSE
16216  0534 00 4 03445         LXA     INTB,4             GET THEN PART
16217  0500 00 4 00000         CLA     0,4
16220  0734 00 4 00000         PAX     0,4                PPRINTER TPO THEN PART
16221 -0754 00 4 00000   INTEV PXD     0,4                LIST TO BE EVALUATED
16222  0560 00 0 03447         LDQ     INTPL              GET PAIR LIST
16223  0074 00 4 15454         TSX     $EVAL,4            EVALUATE IT
16224 -0520 00 0 03450         NZT     INTGS              SEE IF GO SWITCH SET
16225  0020 00 0 16167         TRA     INTGA              GO TO NEXT STATEMENT
16226  0534 00 4 03450         LXA     INTGS,4            WAS SET, SEE IF GO OR RETURN
16227  3 77776 4 16262         TXH     INTRN,4,-2         TRA IF RETURN
16230 -0754 00 4 00000         PXD     0,4                POINTER TO ITEM
16231  0560 00 0 16253         LDQ     INTFC              GET SASSOC FUNCTIONAL ARGUMENT
16232 -0600 00 0 03321         STQ     $ARG3              PUT IN $ARG3
16233  0560 00 0 03446         LDQ     INTGL              GET GO LIST
16234  0074 00 4 10042         TSX     SASSOC,4           SEARCH FOR ATOM
16235 -0734 00 4 00000         PDX     0,4                POINTRE TP  PROGRAM POINT
16236  0500 00 4 00000         CLA     0,4                TAKE CDR
16237  0622 00 0 03445         STD     INTB               SET PROGRAM POINT
16240  0600 00 0 03450         STZ     INTGS              ZERO THE GO SWITCH
16241  0020 00 0 16167         TRA     INTGA              GO TO THAT STATEMENT
                         *
16242 -3 00001 0 16243   INTFB TXL     *+1,,1             MAPLIST FUNCTIONAL ARGUMENT
16243  0634 00 4 16251         SXA     INTFX,4            (LAMBDA (L) (CONS (CAR L) NIL))
16244 -0734 00 4 00000         PDX     0,4
16245  0500 00 4 00000         CLA     0,4
16246  0734 00 4 00000         PAX     0,4
16247 -0754 00 4 00000         PXD     0,4
16250  0560 00 0 00370         LDQ     $ZERO
16251  0774 00 4 00000   INTFX AXT     **,4
16252  0020 00 0 03730         TRA     $CONS
                         *
16253 -3 00001 0 16254   INTFC TXL     *+1,,1             UNLABELED GO TO POINT ERROR
```

```
16254 -0634 00 4 01562          SXD     $ERROR,4          SAVE LINK IR
16255  0534 00 4 03450          LXA     INTGS,4           POINTER TO GO POINT LABEL
16256 -0754 00 4 00000          PXD     0,4               PUT IN DECREMENT
16257  0534 00 2 03446          LXA     INTGL,2           RESTORE INDEX REGISTER 2
16260  0074 00 4 01563          TSX     $ERROR+1,4        GO TO ERROR
16261  542160600654             BCI     1,*A  6*               GO TO POINT NOT LABELED
                        *
16262 -0534 00 4 03450   INTRN  LXD     INTGS,4           RETURN VALUE
16263 -0754 00 4 00000          PXD     0,4               PUT IN DECREMENT
16264  0600 00 0 03450          STZ     INTGS             ZERO THE GO SWITCH
16265  0534 00 2 03446          LXA     INTGL,2           RESTORE INDEX REGISTER 2
16266  0074 00 4 02326          TSX     UNSAVE,4          RESTORE PROTECTED STORAGE
16267 -0534 00 4 03444          LXD     INTRX,4           RESTORE LINK IR
16270  0020 00 4 00001          TRA     1,4
                        *               TEMPORARY STORAGE FOR INTERPRETERS
16271  0 00000 0 00000   INTE                            TEMPORARY STORAGE
                  03447  PRGVAR SYN     INTPL
                        *
                        *
                        * RETURN                        SPECIAL PROGRAM SETS RETURN SWITCH
                        *                               IN PROGRAM INTERPRETER
                        *
16272 -0501 00 0 00457  RETURN ORA      $AMASK            SIGNAL THAT IT IS A RETURN
16273  0601 00 0 03450          STO     INTGS             SET UP GO SWITCH
16274  0500 00 0 00442          CLA     $QD1              PICK UP TRUTH VALUE
16275  0020 00 4 00001          TRA     1,4               EXIT
                        *
                        * GO            SPECIAL FORM FOR PROGRAM INTERPRETER, GIVES GO TO POINT
                        *
16276 -0634 00 4 03413  GOGOGO SXD      GOX,4             SAVE LINK IR
16277 -0734 00 4 00000          PDX     0,4               POINTER TO ARGUMENT LIST
16300  0500 00 4 00000          CLA     0,4
16301  0621 00 0 03450          STA     INTGS             PUT GAR IN GO SWITCH
16302  0734 00 4 00000          PAX     0,4               CAR TO IR
16303  0500 00 4 00000          CLA     0,4               GET FIRST WORD
16304  0734 00 4 00000          PAX     0,4               SEE IF ATOMIC
16305  3 77776 4 16316          TXH     GOT,4,-2          EXIT TRUE IF ATIMIC
16306  0534 00 4 03450          LXA     INTGS,4           OTHERWISE GET ARGUMENT
16307 -0754 00 4 00000          PXD     0,4               PUT INDECREMENT
16310  0074 00 4 02312          TSX     $SAVE,4           SAVE LINK IR
16311 -3 03415 0 02401          TXL     $END1,,GOX+2      SAVE 1 ITEM
16312  0074 00 4 15454          TSX     $EVAL,4           EVALUATE THE ARGUMENT
16313  0074 00 4 02326          TSX     UNSAVE,4          RSTORE LINK IR
16314 -0734 00 4 00000          PDX     0,4               VALUE
16315  0634 00 4 03450          SXA     INTGS,4           PU IN GO SWITCH
16316  0500 00 0 00442   GOT    CLA     $QD1              TRUTH VALUE
16317 -0534 00 4 03413          LXD     GOX,4             RESTORE LINK IR
16320  0020 00 4 00001          TRA     1,4               EXIT
                        *
                        *       DECK                      LAP PART ONE
                                HEAD    C                 THIS IS THE COMPILER AND ASMBLR
                        *
                        * LAP IS THE ASSEMBLER. ONE ARG IS LISTING.  IT IS LIST OF INSTRUC-
                        * TIONS, NON-ATOMIC OR NIL. THE ATOMIC SYMBOLS ARE LOCATION SYMBOLS
                        * SECOND ARG IS START OF SYMBIL TABLE WHICH IS AN A-LIST.
                        * THE FIRST ITEM IS ORG AS FOLLOWS-
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```
                        *      NIL= IN BPS
                        *      ATOM= AT SYMBOLIC LOCATION
                        *      NUM= ATHIS NUMBER
                        *      (NAME TYPE NUM) = IN BPS, AND PUT TXL ON PROP LIST OF NAME
                        *      WITH FLAG TYPE AND NUM (B DEC. OF TXL.
                        * INSTRUCTION FORMAT IS (OP ADDR TAG DEC)
                        * FIELD FORMAT IS AS FOLLOWS-
                        *      TEMP SYMBOL
                        *      NUMBER
                        *      SYM SUBR OR FSUBR
                        *      (E NAME) FOR IMMEDIATE AS IN TXL FILTER
                        *      (QUOTE NAME) FOR IMTE IN DEC OF WORD ON QTLST
                        *      POINTER TO COMMON WORD.MAKES ONE IF NONE ALREADY
                        *      SUM OF ANY OF ABOVE
                        * LAP IS IDENTITY FUNCTION
                        *      LAP DOES NOT USE IX1. IX2,4 ARE SCARTCH
                        * ERRORS IN LAP AS FOLLOWS-
                        *      *L  1*  UNABLE TO EVALUATE ORIGIN
                        *      *L  2*  OUT OF BPS DISCOVERED AFTER PASS 1
                        *      *L  3* UNDEFINED SYMBOL
                        *      *L  4*  FIELD WAS RECURSIVE
                        *
16321  0634 00 4 16470  LAP    SXA     LAX,4
16322  0634 00 2 16471         SXA     LAX+1,2
16323  0601 00 0 16477         STO     LIST            THIS IS THE INPUT
16324 -0600 00 0 16501         STQ     TAB             START OF SYMBOL TABLE
16325 -0734 00 4 00000         PDX     0,4
16326  0500 00 4 00000         CLA     0,4
16327  0622 00 0 16505         STD     REST            SAVE REST OF LISTING
16330  0734 00 2 00000         PAX     0,2             ORIGIN IN IX2
16331 -3 00000 2 16356         TXL     INBP,2,0        NIL MEANS  BPS ASSEMBLY
16332  0500 00 2 00000         CLA     0,2
16333  0734 00 4 00000         PAX     0,4             CAR OF ORIGIN
16334 -3 77776 4 16356         TXL     INBP,4,-2       NOT ATOM MEANS BPS MODE SO GO
16335 -0625 00 0 16511         STL     MODE            NOISE = NOT BPS
16336 -0754 00 2 00000         PXD     0,2             MAKE NUMBER TEST
16337  0074 00 4 14445         TSX     NUMBRP,4
16340 -0100 00 0 16351         TNZ     LSQ             IF A NUMBER
16341 -0754 00 2 00000         PXD     0,2             ORIGIN TO AC
16342  0560 00 4 00510         LDQ     $QSYMD,4        (QUOTE SYM)
16343  0074 00 4 11771         TSX     GET,4
16344 -0100 00 0 16350         TNZ     *+4             ORIGINA WAS FIOUND
16345 -0634 00 4 01562         SXD     $ERROR,4
16346 -0754 00 2 00000         PXD     0,2             SHOW IT
16347  0074 00 4 01563         TSX     $ERROR+1,4      UNDEFINED ORIGIN
16350  544360600154            BCI     1,*L  1*
16351 -0754 00 2 00000  LSQ    PXD     0,2
16352  0074 00 4 14342         TSX     NUMVAL,4        GET NUMERICAL VALUE
16353 -0734 00 4 00000  LSO    PDX     0,4
16354  0500 00 4 00000         CLA     0,4             PUTS SYM IN AC FOR NOT BPS MODE
16355  0020 00 0 16361         TRA     *+4
16356  0500 00 0 02304  INBP   CLA     $ORG            PUTS ORG IN AC FOR BPS MODE
16357  0600 00 0 16511         STZ     MODE            INDICATES BPS MODE
16360  0074 00 4 16535         TSX     JUST,4          JUSTIFY AC
16361  0601 00 0 16506         STO     STAR            UPDATE MARKER
16362  0601 00 0 16507         STO     START           RESET MARKER
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16363  0600 00 0 16510         STZ     PASWD              INDICATE PASS 1
16364  0074 00 4 16543         TSX     PASS,4
16365  0500 00 0 16501         CLA     TAB
16366  0074 00 4 04604         TSX     $PRINT,4           PRINT SYMBOL TABLE
16367  0520 00 0 16511         ZET     MODE
16370  0020 00 0 16373         TRA     *+3                IF NOT IN BPS MODE
16371  0534 00 4 16506         LXA     STAR,4
16372  0522 00 0 16526         XEC     LBPTP              TEST FOR OUT OF BPS
16373  0534 00 4 16507         LXA     START,4            RESET STAR FOR SECOND PASS
16374  0634 00 4 16506         SXA     STAR,4
16375 -0534 00 4 16477         LXD     LIST,4
16376  0500 00 4 00000         CLA     0,4
16377  0622 00 0 16505         STD     REST               USED BY PASS AGAIN
16400 -0625 00 0 16510         STL     PASWD              NOISE MEANS PASS 2
16401  0074 00 4 16543         TSX     PASS,4             FOR PASS 2
16402  0520 00 0 16511         ZET     MODE
16403  0020 00 0 16464         TRA     LEND               IF NOT IN BPS MODE
16404  0534 00 4 16506         LXA     STAR,4             RSET ORG FOR NEXT ASSEMBLY
16405  0634 00 4 02304         SXA     $ORG,4
16406 -0534 00 4 16477         LXD     LIST,4
16407  0500 00 4 00000         CLA     0,4                CWR OF LISTING
16410  0734 00 4 00000         PAX     0,4
16411  0500 00 4 00000         CLA     0,4                GET CWR OF ORIGIN
16412  0734 00 2 00000         PAX     0,2                CAR OF ORIGIN
16413 -0734 00 4 00000         PDX     0,4                CDR OF ORIGIN
16414   3 77776 2 16464         TXH     LEND,2,-2          IF ATOM THEN NO TXL NEEDED
16415 -0634 00 2 16473         SXD     NAME,2             CAR OF ORG IS NAME
16416  0500 00 4 00000         CLA     0,4
16417  0734 00 2 00000         PAX     0,2                CADR OF ORIGIN IS TYPE
16420 -0634 00 2 16474         SXD     TYPE,2             STORE TYPE
16421 -0320 00 0 00460         ANA     $DMASK             CDDR IS NOE IN AC
16422  0074 00 4 11712         TSX     CADARX,4           CADAR PUTS PART OF NUM IN DECR OF AC
16423  0622 00 0 16475         STD     INDC               FOR TXL WORD
16424  0534 00 4 16507         LXA     START,4
16425  0634 00 4 16475         SXA     INDC,4             COMPLETES TXL WORD
16426  0500 00 0 16473         CLA     NAME
16427  0074 00 4 17034         TSX     PRO,4
16430  0560 00 0 16474         LDQ     TYPE
16431  0074 00 4 11771         TSX     GET,4
16432  0100 00 0 16444         TZE     MKIND              IF THERE WAS NO OLD TXL
16433 -0734 00 2 00000         PDX     0,2                SAVE POINTER TO TXL
16434  0500 00 2 00000         CLA     0,2                CWR OF OLD TXL
16435  0737 00 4 00000         PAC     0,4                POINTER TO OLD BIN PTROG.
16436  0500 00 0 16507         CLA     START              START OF NEW PROGRAM
16437 -0501 00 0 16476         ORA     PATCH              MAKE TRA INSTRUCTION
16440  0601 00 4 00000         STO     0,4                CLOBBER OLD PROG.
16441  0500 00 0 16475         CLA     INDC
16442  0601 00 2 00000         STO     0,2                ON TOP OF OLD TXL
16443  0020 00 0 16464         TRA     LEND
16444  0500 00 0 16475  MKIND  CLA     INDC
16445 -0534 00 4 16474         LXD     TYPE,4             SYM SHOULD HAVE TO TXL ON POINTER
16446 -3 06705 4 16451         TXL     IND2,4,$SYM-1
16447   3 06706 4 16451         TXH     IND2,4,$SYM
16450 -0320 00 0 00457         ANA     $AMASK
16451  0074 00 4 03710   IND2  TSX     $CONSW,4
16452  0131 00 0 00000         XCA                        SAVE AC
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16453 -0534 00 2 16473          LXD     NAME,2              NAME OF SUBR OR TYOE
16454  0500 00 2 00000          CLA     0,2
16455 -0320 00 0 00460          ANA     $DMASK              CDR OF NAME NOW IN AC
16456  0131 00 0 00000          XCA
16457  0074 00 4 03730          TSX     $CONS,4             CONS (TXL,RESTOF PROPERTY LIST)
16460  0131 00 0 00000          XCA
16461  0500 00 0 16474          CLA     TYPE
16462  0074 00 4 03730          TSX     $CONS,4             CONS,TYPE,RST OF ATM)
16463  0622 00 2 00000          STD     0,2                 RPLACD OF PROPERTY 9IST
16464  0500 00 0 16477  LEND    CLA     LIST
16465  0600 00 0 16477          STZ     LIST
16466  0600 00 0 16501          STZ     TAB
16467  0600 00 0 16504          STZ     INST
                        *       DONT STORE ZERO IN QTLST
16470  0774 00 4 00000  LAX     AXT     **,4
16471  0774 00 2 00000          AXT     **,2
16472  0020 00 4 00001          TRA     1,4
                        * ALL LAP REGISTERS FOLLOW,INCL. THOSE USED BY SUBROUTINES
16473  0 00000 0 00000  NAME                                NAME OF FUNCTION
16474  0 00000 0 00000  TYPE                                SUBR FSUBR ETC
16475 -3 00000 0 00000  INDC    TXL     **,,**              FOR TSL WORD
16476  0020 00 0 00000  PATCH   TRA     **                  FOR CLOBBER INSTRUCTION
                        *       DECK                        PERM PROTECTED LAP STORAGE
                 16477  PROBE   SYN     *                   BEGINNING OF PROTECTED AREA
16477  0 00000 0 00000  LIST                                MAIN LISTING GOES HERE
16500  0 00000 0 00000  QTLST                               THE LIST OF QUOTES.NEVER ERASE
16501  0 00000 0 00000  TAB                                 TEMPORARY SYM TABLE
16502  0 00000 0 00000  LCOM                                STORAGE FOR COMMON ONLY.PROTECTED
16503  0 00000 0 00000  PROS                                PROTECTED FUNCTION NAMES AND SPECIALS
                 16503  PROEN   SYN     *-1                 END OF PROTECTED AREA
                        *       DECK                        LAP PART TWO
16504  0 00000 0 00000  INST                                HOLDS CURRENT INSTRUCTION OR FRACTION
16505  0 00000 0 00000  REST                                REMAINDER OF LISTING. PASS ALTERS THIS
16506  0 00000 0 00000  STAR                                * DIRECT ADDRESS POINTER TO CURRENT LO
16507  0 00000 0 00000  START                               RESET CELL FOR *
16510  0 00000 0 00000  PASWD                               ZERO MEANS PASS 1. NOISE = PASS 2
16511  0 00000 0 00000  MODE                                ZERO MEANS BPS ASSEMBLY
16512  0 00000 0 00000  HOLD                                SCRATCH CELL FOR AFELD ONLY.WATCH OUT
16513  0 00000 0 00000  SUM                                 FOR USE BY AFELD LIST ONLY
16514  0 00000 0 00000  NOCUR                               FOR AFELD LIST ONLY.PREVENTS RECURSION
16515  0 00000 0 00000  REM                                 FOR AFELD LIST ONLY.
16516  0 00000 0 03316  ALST            $ALIST
16517  0 00000 0 00000  ERCC
16520 -3 00000 0 16521  LSAC    TXL     *+1,,0
16521 -0754 00 0 00000          PXD     0,0
16522  0020 00 4 00001          TRA     1,4
                        *       DECK                        ATOM PIECES
16523  0 00000 0 17357  MOV             MOVE                THE WORD POINTED TO BY SYM ON *MOVE
16524  0 00000 0 17255  LSTR            LST                 POINTED TO BY SYM ON ATOM *LIST
16525  0 00000 0 17454  RTRN            RESTOR
                        *       DECK                        LAP PART THREE
                        *       ADDR(REM)=IX4 SAVED.DECR=REST OF LIST FIELD
                        *
                        * LBPTP CHECKS FOR OUT OF BPS AND MAKES ERROR IF D SO.
16526  3 00000 4 16527  LBPTP   TXH     *+1,4,**            SETUP FILLS THIS CELL
16527 -0634 00 4 01562          SXD     $ERROR,4
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16530 -0754 00 4 00000          PXD     0,4
16531  0560 00 0 00503          LDQ     $OCTD
16532  0074 00 4 12636          TSX     $MKNO,4
16533  0074 00 4 01563          TSX     $ERROR+1,4
16534  544360600254             BCI     1,*L  2*
                        *
                        *  JUST REDUCES THE AC MOD 2**15.THE RESULT IS 15 BITS IN ADDR OF AC
                        *   IT IS ALWAYS POSITIVE
16535  0120 00 0 16540  JUST    TPL     *+3
16536  0760 00 0 00006          COM
16537  0402 00 0 00371          SUB     $Q1
16540 -0320 00 0 00457          ANA     $AMASK
16541 -0140 00 4 00001          TNO     1,4
16542  0020 00 4 00001          TRA     1,4
                        *
                        *  PASS DOES BOTH PASSES FOR LAP
                        *       FIRST PASS MAKES SYMBOL TABLE AND UPDATES ON INSTRUCTIONS
                        *       SECOND PASS IGNORES SYMBOLS ASSEMBLES AND UPDTS INSTRUCTIONS
16543  0634 00 4 16600  PASS    SXA     PAUX,4
16544 -0534 00 4 16505  LOP1    LXD     REST,4
16545 -3 00000 4 16600          TXL     PAUX,4,0            IF NO MORE LISTING
16546  0500 00 4 00000          CLA     0,4
16547  0622 00 0 16505          STD     REST                RESET REST OF LISTING
16550  0734 00 4 00000          PAX     0,4
16551 -0634 00 4 16504          SXD     INST,4
16552 -3 00000 4 16572          TXL     AMBL,4,0            IF NIL
16553  0500 00 4 00000          CLA     0,4
16554  0734 00 4 00000          PAX     0,4
16555 -3 77776 4 16572          TXL     AMBL,4,-2           IF NOT ATOMO
16556  0520 00 0 16510          ZET     PASWD
16557  0020 00 0 16544          TRA     LOP1                IF PASS 2
16560  0500 00 0 16506          CLA     STAR                OTHERWISE ADD    TO TABLE
16561  0560 00 0 00503          LDQ     $OCTD
16562  0074 00 4 12636          TSX     $MKNO,4             MAKE A NUMBER
16563  0131 00 0 00000          XCA
16564  0500 00 0 16504          CLA     INST
16565  0074 00 4 03730          TSX     $CONS,4             (NAME.VALUE)
16566  0560 00 0 16501          LDQ     TAB
16567  0074 00 4 03730          TSX     $CONS,4
16570  0601 00 0 16501          STO     TAB
16571  0020 00 0 16544          TRA     LOP1
16572  0520 00 0 16510  AMBL    ZET     PASWD               LAND HERE IF INSTRUCTION NOT SYMBOL
16573  0074 00 4 16602          TSX     AINS,4              ON PASS 2 ONLY
16574  0534 00 4 16506          LXA     STAR,4
16575  1 00001 4 16576          TXI     *+1,4,1             UPDATE * AFTER INSTRUCTION IS ASSEMBLE
16576  0634 00 4 16506          SXA     STAR,4
16577  0020 00 0 16544          TRA     LOP1
16600  0774 00 4 00000  PAUX    AXT     **,4
16601  0020 00 4 00001          TRA     1,4
                        *
                        * AINS IS THE INSTRUCTION ASSEMBLER. ARG IS IN INST. VAL IS IN AC
16602  0634 00 4 16620  AINS    SXA     AINX,4
16603  0074 00 4 16622          TSX     AFELD,4
16604  0601 60 0 16506          STO*    STAR
16605  0074 00 4 16622          TSX     AFELD,4
16606  0074 00 4 16535          TSX     JUST,4
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16607 -0602 60 0 16506         ORS*    STAR              THIS IS ADDRESS FIELD
16610  0074 00 4 16622         TSX     AFELD,4
16611  0767 00 0 00017         ALS     15
16612  0140 00 0 16613         TOV     *+1
16613 -0602 60 0 16506         ORS*    STAR              TAG FIELD
16614  0074 00 4 16622         TSX     AFELD,4
16615  0074 00 4 16535         TSX     JUST,4
16616  0767 00 0 00022         ALS     18                NO OVERFLOW AFTER JUST
16617 -0602 60 0 16506         ORS*    STAR
16620  0774 00 4 00000  AINX   AXT     **,4
16621  0020 00 4 00001         TRA     1,4
                       *
                       * AFELD IS THE FIELD EVALUATOR. A LIST OF FIELDS IS EXPECTED IN INST.
                       * IT EVALUATES THE FIRST AND SETS INST TO THE REST. IF NO MORE FIELDS LE
                       * ARE LEFT, IT GOES TOAINX, THE EXIT POINT OF AINS
                       * AFELD HAS CERTAIN PRIVATE CELLS,SEE AFTER LAP.) THE LIST AFELD IS A
                       * SLIGHTLY RECURSIVE DEVISE WHICH HAS SPECIAL CELLS AND CANNOT REENTER I
                       * ITSELF WITHOUT ERROR.
16622  0634 00 4 17032  AFELD  SXA     FELX,4
16623  0600 00 0 16514         STZ     NOCUR
16624 -0534 00 4 16504         LXD     INST,4
16625 -3 00000 4 16620         TXL     AINX,4,0          IF NO MORE FIELDS
16626  0500 00 4 00000         CLA     0,4
16627  0622 00 0 16504         STD     INST              REST OF FIELDS
16630  0734 00 2 00000         PAX     0,2
16631  0500 00 2 00000  LEM    CLA     0,2
16632  0734 00 4 00000         PAX     0,4
16633 -3 77776 4 16707         TXL     NATM,4,-2         IF NOT ATOMIC FIELD
16634  3 00000 2 16637         TXH     *+3,2,0
16635  0500 00 0 02304         CLA     $ORG              NIL SYMBOL MEANS ORIGIN
16636  0020 00 0 17032         TRA     FELX
16637 -0754 00 2 00000         PXD     0,2
16640  0560 00 0 16520         LDQ     LSAC              FN ARG FOR SASSOC
16641 -0600 00 0 03321         STQ     $ARG3
16642  0560 00 0 16501         LDQ     TAB
16643  0074 00 4 10042         TSX     SASSOC,4          LOOK UP IN SYM TABLE
16644  0100 00 0 16652         TZE     NTAB              NOT IN TAB
16645  0074 00 4 15222         TSX     $CDRP,4
16646  0074 00 4 14342  NEVAL  TSX     NUMVAL,4
16647 -0734 00 4 00000         PDX     0,4
16650  0500 00 4 00000         CLA     0,4
16651  0020 00 0 17032         TRA     FELX
16652 -0754 00 2 00000  NTAB   PXD     0,2
16653  0074 00 4 14445         TSX     NUMBRP,4
16654  0100 00 0 16657         TZE     *+3               IF NOT A NUMBER
16655 -0754 00 2 00000         PXD     0,2               LISP NUMBER IN AC
16656  0020 00 0 16646         TRA     NEVAL
16657 -0634 00 2 16517         SXD     ERCC,2            SAVE ATOM
16660  0500 00 2 00000  LOP2   CLA     0,2     LOOP FOR SYM,SUBR,FSUBR
16661 -0734 00 2 00000         PDX     0,2
16662  0734 00 4 00000         PAX     0,4
16663  3 00000 2 16670         TXH     PA,2,0            IF NOT NIL
16664 -0634 00 4 01562         SXD     $ERROR,4
16665  0500 00 0 16517         CLA     ERCC
16666  0074 00 4 01563         TSX     $ERROR+1,4
16667  544360600354            BCI     1,*L  3*          UNDEFINED SYMBOL
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16670 -3 06705 4 16672  PA     TXL     *+2,4,$SYM-1
16671 -3 06706 4 16703         TXL     FINX,4,$SYM
16672 -3 06732 4 16674         TXL     *+2,4,$SUBR-1
16673 -3 06733 4 16676         TXL     FIND,4,$SUBR
16674 -3 10102 4 16660         TXL     LOP2,4,$FSUBR-1
16675  3 10103 4 16660         TXH     LOP2,4,$FSUBR
16676  0500 00 2 00000  FIND   CLA     0,2
16677  0734 00 4 00000         PAX     0,4
16700  0500 00 4 00000         CLA     0,4
16701 -0320 00 0 00457         ANA     $AMASK
16702  0020 00 0 17032         TRA     FELX
                        *
16703  0500 00 2 00000  FINX   CLA     0,2
16704  0734 00 4 00000         PAX     0,4
16705  0500 00 4 00000         CLA     0,4
16706  0020 00 0 17032         TRA     FELX
                        *
16707 -3 06153 4 16715  NATM   TXL     NTE,4,$H25-1
16710  3 06154 4 16715         TXH     NTE,4,$H25          FOR (E EXP)
16711 -0754 00 2 00000         PXD     0,2                 ENTIRE FIELD
16712  0074 00 4 11730         TSX     CADRXX,4
16713  0771 00 0 00022         ARS     18
16714  0020 00 0 17032         TRA     FELX
16715 -3 07247 4 16754  NTE    TXL     NQT,4,$QUOTE-1      LAND HERE FOR NOT (...
16716  3 07250 4 16754         TXH     NQT,4,$QUOTE        ABOVE AND THIS FOR (QUOTE...
16717 -0734 00 2 00000         PDX     0,2                 AC HAS CWR OF FIELD
16720  0500 00 2 00000         CLA     0,2
16721  0734 00 2 00000         PAX     0,2                 POINTER TO EQ QUANTITY
16722 -0534 00 4 16500         LXD     QTLST,4
16723 -3 00000 4 16737         TXL     NON,4,0             TEST FOR NO LIST
16724  0500 00 4 00000  FLOOP  CLA     0,4                 AN EQUAL TYPE SEARCH
16725  0601 00 0 16512         STO     HOLD                TEMPORARY SAVING OF REST
16726  0734 00 4 00000         PAX     0,4
16727  0500 00 4 00000         CLA     0,4
16730 -0320 00 0 00460         ANA     $DMASK              LITREAL QUANTITY FOR EQUAL COMPARISON
16731  0131 00 0 00000         XCA
16732 -0754 00 2 00000         PXD     0,2                 THE NEW ITEM
16733  0074 00 4 04461         TSX     $EQUAL,4            TEST FOR EUQALITY
16734 -0100 00 0 16752         TNZ     ONQT                IF ALREADY ON LIST
16735 -0534 00 4 16512         LXD     HOLD,4
16736  3 00000 4 16724         TXH     FLOOP,4,0           IF NOT HEAD OF QTLIST
16737 -0754 00 2 00000  NON    PXD     0,2                 NEED TO MAKE ENTRY
16740  0131 00 0 00000         XCA
16741  0754 00 0 00000         PXA     0,0
16742  0074 00 4 03730         TSX     $CONS,4             CONS(NIL EXP)
16743  0601 00 0 16512         STO     HOLD                NEEDS NO PROTECTION AS SEEN BY WHAT FO
                        *               FOLLOWS
16744  0560 00 0 16500         LDQ     QTLST
16745  0074 00 4 03730         TSX     $CONS,4             CONS((NIL.EXP, ...
16746  0601 00 0 16500         STO     QTLST
16747 -0535 00 4 16512         LDC     HOLD,4              WANT TRUE POINTER
16750  0754 00 4 00000  TRP    PXA     0,4
16751  0020 00 0 17032         TRA     FELX
                        *      THIS    IS POINTER TO A NIL.EXP WORD IN FREE STORAGE
16752  0535 00 4 16512  ONQT   LAC     HOLD,4
16753  0020 00 0 16750         TRA     TRP
```

```
16754 -3 07107 4 17004  NQT     TXL     FDLST,4,SPECAL-1
16755  3 07110 4 17004          TXH     FDLST,4,SPECAL      (SPECIAL NAME)
16756  0560 00 0 00507          LDQ     QSPECD              SPECIAL IN MQ
16757 -0320 00 0 00460          ANA     $DMASK              (NAME) IN AC
16760  0074 00 4 15212          TSX     $CARP,4
16761  0074 00 4 11771          TSX     GET,4
16762 -0100 00 0 17001          TNZ     SPP                 JUST NEED TO ASSURE PROTECTION
16763  0560 00 0 00370          LDQ     $ZERO
16764  0074 00 4 03730          TSX     $CONS,4             AC HAS ZERO IF YOU ARE HERE
16765  0601 00 0 16502          STO     LCOM                PROTECTED TEMP CELL
16766 -0754 00 2 00000          PXD     0,2                 (SPECIAL NAME)
16767  0074 00 4 11705          TSX     CAADRX,4            CDR(NAME)
16770 -0734 00 2 00000          PDX     0,2                 SAVE ABOVE
16771  0131 00 0 00000          XCA
16772  0500 00 0 16502          CLA     LCOM
16773  0074 00 4 03730          TSX     $CONS,4
16774  0131 00 0 00000          XCA
16775  0500 00 0 00507          CLA     QSPECD
16776  0074 00 4 03730          TSX     $CONS,4
16777  0622 00 2 00000          STD     0,2                 RPLACD OF NAME
17000  0074 00 4 11730          TSX     CADRXX,4            POINTER TO (NIL)
17001  0074 00 4 17034  SPP     TSX     PRO,4
17002 -0737 00 4 00000          PDC     0,4
17003  0020 00 0 16750          TRA     TRP
17004 -0520 00 0 16514  FDLST   NZT     NOCUR               NO RE-ENTRY TO AFELD LIST IS ALLOWED
17005  0020 00 0 17011          TRA     *+4
17006 -0634 00 4 01562          SXD     $ERROR,4
17007  0074 00 4 01563          TSX     $ERROR+1,4
17010  544360600454             BCI     1,*L  4*            NO RECURSIVE FIELDS ALLOWED
17011 -0625 00 0 16514          STL     NOCUR               PREVENT RECURSION
17012  0600 00 0 16513          STZ     SUM                 RESET SUM WORD
17013  0534 00 4 17032          LXA     FELX,4
17014  0634 00 4 16515          SXA     REM,4               SAVES THE RETURN FOR AFELD
17015  0500 00 2 00000  LOPL    CLA     0,2
17016  0622 00 0 16515          STD     REM
17017  0734 00 2 00000          PAX     0,2
17020 -0774 00 4 17022          AXC     *+2,4
17021  0634 00 4 17032          SXA     FELX,4              REENTER THE EVALUATOR
17022  0020 00 0 16631          TRA     LEM
17023  0400 00 0 16513          ADD     SUM
17024  0601 00 0 16513          STO     SUM
17025 -0534 00 2 16515          LXD     REM,2               REST OF FIELDS
17026  3 00000 2 17015          TXH     LOPL,2,0            IF THERE ARE MORE FIELDS (SUBFLDS)
17027  0600 00 0 16514          STZ     NOCUR               ALLOWS ENTRY TO LIST AFELD AGAIN
17030  0534 00 4 16515          LXA     REM,4
17031  0020 00 4 00001          TRA     1,4
17032  0774 00 4 00000  FELX    AXT     **,4
17033  0020 00 4 00001          TRA     1,4
                        *
17034  0634 00 4 17050  PRO     SXA     PX,4
17035  0601 00 0 17060          STO     PTR                 SAVE ARGUMENT
17036  0622 00 0 17047          STD     PH                  SET UP TXH
17037  0402 00 0 00442          SUB     $QD1                AND
17040  0622 00 0 17046          STD     PL                  TXL SIEVE
17041  0500 00 0 16503          CLA     PROS                GET PROTECTED LIST
17042 -0734 00 4 00000  PNL     PDX     0,4
```

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17043 -3 00000 4 17053          TXL     PMK,4,0           END OF LIST, SO MAKE NEW ENTRY
17044  0500 00 4 00000          CLA     0,4
17045  0734 00 4 00000          PAX     0,4
17046 -3 00000 4 17042  PL      TXL     PNL,4,**
17047  3 00000 4 17042  PH      TXH     PNL,4,**          FALL THROUGH IF FOUND
17050  0774 00 4 00000  PX      AXT     **,4
17051  0500 00 0 17060          CLA     PTR               RESTORE AC
17052  0020 00 4 00001          TRA     1,4
                        *
17053  0560 00 0 16503  PMK     LDQ     PROS              MAKE A NEW ITEM
17054  0500 00 0 17060          CLA     PTR
17055  0074 00 4 03730          TSX     $CONS,4
17056  0601 00 0 16503          STO     PROS              STORE NEW LIST
17057  0020 00 0 17050          TRA     PX                AND RETURN
                        *
17060  0 00000 0 00000  PTR
                        *
                        *
                        *       DECK                      PERMANENT COMPILER SUBROUTINES
                        *             LINK HANDLES ALL SUBROUTINE CALLS FROM COMPILED FUNCTION
                        *             IT REPLACES STR WITH TSX IF SUBROUTINE BEING CALLED
                        *             IS A SUBR OR FSUBR
                        *             IT GOES TO APPLY IF THE CALL IS TO EXPR OR FEXPR WITH
                        *             $ALIST AS THIRD ARGUMENT
                        *             LINK EXPECTS A TAG OF 7 IN THE STR INST, NAME OF FUNCTION
                        *             IN THE ADDRESS, AND THE NUMBER OF ARGUMENTS IN THE DECREM
                        *             ENT               LINK WILL GO TO THE ROUTINE WHICH
                        *             HANDLES ERROR TRAPS IF THE CALLING INST DOESNT HAVE A 7
                        *             TAG
                        *
17061  0601 00 0 03417  LINK    STO     LNKA
17062 -0600 00 0 03420          STQ     LNKB              SAVE AC AND MQ
17063  0634 00 4 17243          SXA     LER,4             SAVE IR4
17064  0535 00 4 00000          LAC     0,4               COMP POINTER TO STR+1
17065  1 00001 4 17066          TXI     *+1,4,1           MAKE ORDINARY TSX POINTER
17066  0500 00 4 00000          CLA     0,4               GET STR INST  7
17067  0601 00 0 17253          STO     LNKD              SAVE IT
17070 -0320 00 0 00470          ANA     TAGMSK            CHECK FOR 7 TAG
17071  0322 00 0 00470          ERA     TAGMSK
17072 -0100 00 0 17243          TNZ     LER               IF NOT 7 TAG
17073 -0634 00 4 17252          SXD     LNKC,4            SAVE POINTER
17074  0500 00 0 00177          CLA     B$ZERO            RESTORE NIL
17075  0601 00 0 00000          STO     0
17076  0600 00 0 17246          STZ     LNTRS             RESET TRACE SWITCH
17077  0534 00 4 17253          LXA     LNKD,4            FUNCTION ATIM
17100  0500 00 4 00000          CLA     0,4               START PROPERTY LIST SEARCH
17101 -0734 00 4 00000  LNLP    PDX     0,4
17102 -3 00000 4 17134          TXL     LNNF,4,0          NO DEFINITION SO FN VARIABLE
17103  0500 00 4 00000          CLA     0,4
17104  0734 00 4 00000          PAX     0,4
17105 -3 06732 4 17107          TXL     *+2,4,$SUBR-1
17106 -3 06733 4 17171          TXL     LNSBR,4,$SUBR
17107 -3 10102 4 17111          TXL     *+2,4,$FSUBR-1
17110 -3 10103 4 17171          TXL     LNSBR,4,$FSUBR
17111 -3 06646 4 17113          TXL     *+2,4,$TRACE-1
17112 -3 06647 4 17136          TXL     LNTR,4,$TRACE
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17113 -3 10156 4 17115         TXL     *+2,4,$EXPR-1
17114 -3 10157 4 17117         TXL     LNEXP,4,$EXPR
17115 -3 10141 4 17101         TXL     LNLP,4,$FEXPR-1
17116  3 10142 4 17101         TXH     LNLP,4,$FEXPR
17117 -0734 00 4 00000  LNEXP  PDX     0,4                EXPR-FEXPR BRANCH
17120  0500 00 4 00000         CLA     0,4
17121  0734 00 4 00000         PAX     0,4                LAMBDA EXPRESSION
17122 -0634 00 4 17247  LNGN   SXD     LNFN,4             SAVE IT
17123  0500 00 0 03316         CLA     $ALIST
17124  0601 00 0 03321         STO     $ARG3              PROPER ALIST
17125  0520 00 0 17246         ZET     LNTRS              TRACE TEST
17126  0020 00 0 17153         TRA     LNTEX              TRACE EXPR OF FEXPR
17127  0074 00 4 17206         TSX     LNARS,4            LIST ARGUMENTS
17130  0131 00 0 00000         XCA
17131  0500 00 0 17247         CLA     LNFN               LAMBDA EXPRESSION
17132 -0534 00 4 17252         LXD     LNKC,4             RETURN IR
17133  0020 00 0 14663         TRA     $APPLY             DO
                       *
17134  0534 00 4 17253  LNNF   LXA     LNKD,4             FUNCTION DEFN IS ON ALIST
17135  0020 00 0 17122         TRA     LNGN               APPLY WILL TAKE CARE OF THIS
                       *
17136 -0625 00 0 17246  LNTR   STL     LNTRS              SET TRACE SWITCH
17137  0601 00 0 17250         STO     LNAC               SAVE AC
17140  0074 00 4 17206         TSX     LNARS,4            LIST ARGUMENTS
17141  0601 00 0 17251         STO     LNRGL              AND SAVE THEM
17142  0131 00 0 00000         XCA                        TO PRINT POSITION
17143  0534 00 4 17253         LXA     LNKD,4             ATOM NAME
17144  0634 00 4 17252         SXA     LNKC,4             SAVE WITH INDEX REGISTER
17145 -0754 00 4 00000         PXD     0,4                ALSO FOR TRACE MESSAGE
17146  0074 00 4 02312         TSX     $SAVE,4            SAVE NAME AND RETRN
17147 -3 17254 0 02401         TXL     $END1,,LNKC+2
17150  0074 00 4 16050         TSX     A$ARGOF,4          PRINT ARGUMENTS
17151  0500 00 0 17250         CLA     LNAC               RESTORE AC
17152  0020 00 0 17101         TRA     LNLP               AND CONTINUE PROPERTY LIST SEARCH
                       *
17153  0500 00 0 17247  LNTEX  CLA     LNFN               TRACE EXPR OR FEXPR
17154  0560 00 0 17251         LDQ     LNRGL              SET UP ARGUMENTS OF APPLY
17155  0074 00 4 14663         TSX     $APPLY,4           AND DO THE FUNCTION
17156  0074 00 4 02326  LNTEN  TSX     UNSAVE,4           GET BACK IR4 AND FN NAME
17157  0131 00 0 00000         XCA
17160  0534 00 4 17252         LXA     LNKC,4             ATOM NAME TO AC
17161 -0754 00 4 00000         PXD     0,4
17162 -0534 00 4 17252         LXD     LNKC,4             RESTORE INDEX
17163  0020 00 0 16104         TRA     A$VALOF            PRINT VALUE MESSAGE
                       *
17164  0621 00 0 17167  LNTSB  STA     LNDIS              TRACE SUBR OF FSUBR
17165  0500 00 0 03417         CLA     LNKA               RESTORE AC
17166  0560 00 0 03420         LDQ     LNKB               AND MQ
17167  0074 00 4 00000  LNDIS  TSX     **,4               EXECUTER SUBROUTINE
17170  0020 00 0 17156         TRA     LNTEN              AND REPORT VALUE
                       *
17171 -0734 00 4 00000  LNSBR  PDX     0,4                SUBR OR FSUBR BRANCH
17172  0500 00 4 00000         CLA     0,4
17173  0734 00 4 00000         PAX     0,4
17174  0500 00 4 00000         CLA     0,4                TXL SUBR,,N WORD
17175  0520 00 0 17246         ZET     LNTRS              TEST FOR TRACING
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17176  0020 00 0 17164         TRA     LNTSB
17177  0621 00 0 17254         STA     LNTSX              MAKE A TSX
17200  0500 00 0 17254         CLA     LNTSX              GET IT
17201 -0534 00 4 17252         LXD     LNKC,4             RETURN IR
17202  0601 00 4 00000         STO     0,4                CHANGE THE STR TO TSX
17203  0500 00 0 03417         CLA     LNKA               RESTORE AC
17204  0560 00 0 03420         LDQ     LNKB
17205  0020 00 4 00000         TRA     0,4                GO TO NEW TSX
                       *
17206  0634 00 4 17237  LNARS  SXA     LNLX,4             SUBROUTINE WHICH LISTS ARGS
17207 -0534 00 4 17253         LXD     LNKD,4             NUMBER OF ARGS
17210 -3 00000 4 17241         TXL     LNN,4,0            LST WONT WORK ON ZERO THINGS
17211 -0634 00 4 17213         SXD     LNKP,4             PUT IN LST ARG POSITION
17212  0074 00 4 17255         TSX     LST,4              LIST THEM
17213  3 00000 0 03417  LNKP   TXH     LNKA,0,**
17214  0734 00 0 03420         PAX     LNKB,0
17215  0734 00 0 03321         PAX     $ARG3,0
17216  0734 00 0 03322         PAX     $ARG4,0
17217  0734 00 0 03323         PAX     $ARG5,0
17220  0734 00 0 03324         PAX     $ARG6,0
17221  0734 00 0 03325         PAX     $ARG7,0
17222  0734 00 0 03326         PAX     $ARG8,0
17223  0734 00 0 03327         PAX     $ARG9,0
17224  0734 00 0 03330         PAX     $ARG10,0
17225  0734 00 0 03331         PAX     $ARG11,0
17226  0734 00 0 03332         PAX     $ARG12,0
17227  0734 00 0 03333         PAX     $ARG13,0
17230  0734 00 0 03334         PAX     $ARG14,0
17231  0734 00 0 03335         PAX     $ARG15,0
17232  0734 00 0 03336         PAX     $ARG16,0
17233  0734 00 0 03337         PAX     $ARG17,0
17234  0734 00 0 03340         PAX     $ARG18,0
17235  0734 00 0 03341         PAX     $ARG19,0
17236  0734 00 0 03342         PAX     $ARG20,0
17237  0774 00 4 00000  LNLX   AXT     **,4               RESTORE INTEX
17240  0020 00 4 00001         TRA     1,4
17241 -0754 00 0 00000  LNN    PXD     0,0                NIL
17242  0020 00 0 17237         TRA     LNLX
                       *
17243  0774 00 4 00000  LER    AXT     **,4               RESTORE IR4
17244  0500 00 0 03417         CLA     LNKA
17245  0020 00 0 01766         TRA     STRPNT             GO TO ERROR HANDLING ROUTINEPP
                       *               LINK STORAGE
                       *               IS HERE, EXCEPT FOR LINKA NAD LINKB WHICH ARE IN GARBAG
17246  0 00000 0 00000  LNTRS                            TRACE SWITCH
17247  0 00000 0 00000  LNFN                             FUNCTION DEFINITION
17250  0 00000 0 00000  LNAC                             TEMPORARY AC STORAGE
17251  0 00000 0 00000  LNRGL                            ARGS LISTED DURNING TRANCE INTERLUDE
17252  0 00000 0 00000  LNKC                             IR4 POINTRE TO STR WORD
17253  0 00000 0 00000  LNKD                             CONTAINS STR NAME,7,NUM
17254  0074 00 4 00000  LNTSX  TSX     **,4               INSTRUCTION TO BE PLANTED
                       *               LST IS THE SUBROUTINE WHICH DOES LISTING IN COMPILED
                       *               FUNCTION           N ELEMENTS HWERE N IS IN AC, ARE
                       *               LISTED             ARGUMENTS ARE GOTTEN BY CLA*
                       *               FROM THE N REGISTERS SUCEDING THE CALL
                       *
```

```
17255  0634 00 2 17316  LST    SXA     LX2,2              SAVE IR2
17256  0500 00 4 00001         CLA     1,4                TO GET N FROM FIRSTDECREMENT
17257  0622 00 0 17261         STD     LSN                TO DECREMENT IR4 FOR POINT EXIT
17260  0622 00 0 17275         STD     LSC                TO DECREMENT THE CONS COUNTER
17261 -2 00000 4 17262  LSN    TNX     *+1,4,**
17262 -0734 00 2 00000         PDX     0,2                N TO IR2
17263 -0754 00 4 00000         PXD     0,4                START TO COMPLEMENT IR4
17264 -0737 00 4 00000         PDC     0,4                OH FOR A 7094
17265  1 00001 4 17266         TXI     *+1,4,1            ONE MORE FOR EXIT
17266  0634 00 4 17302         SXA     LSP,4              SET UP GET INST
17267  0634 00 4 17320         SXA     LSE,4              AND RETURN
17270 -0534 00 4 03751         LXD     $FREE,4            FIRST FREE WORD
17271  3 00000 4 17273         TXH     *+2,4,0            TEST FOR OUT OF FREE
17272  0074 00 4 04037         TSX     $FROUT,4           WILL RETURN -2,4
17273 -0634 00 4 17327         SXD     LAN,4              THE ANSWER TO THIS SAUSAGE CONS
17274  0534 00 4 03742         LXA     $CNTR1,4           GET CONS COUNTER
17275  2 00000 4 17300  LSC    TIX     *+3,4,**           REDUCE IT BY N
17276  0074 00 4 03752         TSX     ARREST,4           OUT OF CONSES
17277  0774 00 4 77777         AXT     -1,4               RESET COUNTRE (UP TO N CONSES MAY BE
17300  0634 00 4 03742         SXA     $CNTR1,4           LOST EVERY 7777 OCTAL CONSES)
17301 -0534 00 4 17327         LXD     LAN,4              RESTORE IR4 TO FREE WORD POINTER
17302  0500 60 2 00000  LSP    CLA*    **,2               GET ARGUMENT
17303  0771 00 0 00022         ARS     18                 TO ADDRESS
17304  0621 00 4 00000         STA     0,4                PUT IT IN THE FREE WORD ADDR
17305  0500 00 4 00000         CLA     0,4                NEXT FREE WORD
17306  0634 00 4 17314         SXA     LFX,4              SAVE PRECEDING WORD TO CUT OFF
17307 -0734 00 4 00000  LSR    PDX     0,4                NEXT FREE WORD TO IR
17310 -3 00000 4 17321         TXL     LFIX,4,0           OUT OF FREE STORAGE7
17311  2 00001 2 17302         TIX     LSP,2,1            COUNT DOWN
17312  0622 00 0 03751         STD     $FREE              RESTORE FREE
17313 -0754 00 0 00000         PXD     0,0                CLEAR
17314  0774 00 4 00000  LFX    AXT     **,4               LAST WORD IN LIST
17315  0622 00 4 00000         STD     0,4                GETS NIL IN ITS DECREMENT
17316  0774 00 2 00000  LX2    AXT     **,2               RESTORE IR2
17317  0500 00 0 17327         CLA     LAN                GET THE ANSWER
17320  0020 00 0 00000  LSE    TRA     **                 RETURN
17321  0500 00 0 17327  LFIX   CLA     LAN                TO GET IT PROTECTED DURING MOP UP
17322  0074 00 4 02522         TSX     RECLAM,4
17323  0500 00 0 03751         CLA     $FREE              FIX UP THE SAUSAGE
17324  0522 00 0 17314         XEC     LFX                GET LAST WORD TO IR
17325  0622 00 4 00000         STD     0,4                FIX ITS DECREMENT
17326  0020 00 0 17307         TRA     LSR
17327  0 00000 0 00000  LAN    PZE
                        *      UNWND IS UNSAVE FOR COMPILED FUNCTIONS, USED BY ERRORSET
                        *      TO RESTORE THE PDL TO PRISTINE STATE
17330  0634 00 4 17354  UNWND SXA     UNR,4              SAVE RETURN
17331  0634 00 2 17355         SXA     UNR+1,2            SAVE IR2
17332 -0534 00 4 02317         LXD     $CPPI,4            $CPPI IS COMPLEMENT OF PDL POSITOIN
17333  0500 00 4 77777         CLA     -1,4               SO THIS GETS  STR 0,,N
17334  0622 00 0 17352         STD     UNJ                SAVE N TO RESTORE PDL
17335  0402 00 0 00442         SUB     $QD1               AND SET UP TEST WHICH SAYS THAT
17336  0622 00 0 17343         STD     UNH                WE HABE CRAWLED UP THE PDL ALL WAY
17337 -0535 00 4 02317         LDC     $CPPI,4            NEED TRUE POINTER FOR CALLING WORDS
17340  0634 00 4 17344         SXA     UNG,4              IN VERSE ORDER FROM PDL
17341  0774 00 4 00001         AXT     1,4                INITIALIZE THE RECALL LOOP
17342  1 00001 4 17343  UNF    TXI     *+1,4,1            INCREMENT THE GET IR
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17343  3 00000 4 17351  UNH    TXH    UND,4,**          TEST FOR LAST WORD RESTORED
17344  0500 00 4 00000  UNG    CLA    **,4              GET SAVED ITEM (GOING FROM BOT TO TOP)
17345  0734 00 2 00000         PAX    0,2               ZERO ADDRESS INTICATES NOT NECESS RES
17346 -2 00000 2 17342         TNX    UNF,2,0           FALL THROUGH IS TO RESTORE WORD
17347  0737 00 2 00000         PAC    0,2               ADDR IS TRUE POINTER TO LOCATION
17350  1 00001 4 17343         TXI    UNH,4,1           WOK ON NEXT ONE
17351 -0534 00 4 02317  UND    LXD    $CPPI,4           PUSH UP $CPPI
17352  1 00000 4 17353  UNJ    TXI    *+1,4,**          BY N
17353 -0634 00 4 02317         SXD    $CPPI,4
17354  0774 00 4 00000  UNR    AXT    **,4              RESTORE LINK
17355  0774 00 2 00000         AXT    **,2              AND IR2
17356  0020 00 4 00001         TRA    1,4
                       *   MOVE IS A SPECIAL COMPILER SERVICE SUBROTUINE WITH BAD CALLING.
                       *      TSX    *MOVE,1
                       *      TNX    NAME,1,*MN
17357  0634 00 1 17364  MOVE   SXA    MOVY,1
17360 -0534 00 1 02317         LXD    $CPPI,1           PICK UP PDL PPINTER
17361  0601 00 1 00001         STO    1,1               SAVE AC
17362 -0600 00 1 00002         STQ    2,1
17363 -0634 00 4 17453         SXD    TXLW,4            SAVE RETURN INDEX
17364  0774 00 4 00000  MOVY   AXT    **,4              PICK UP REFERECE TO CALLING HEAD
17365  0500 00 4 00001         CLA    1,4               TNX WORD HAS NAME IN ADDR.
17366  0621 00 0 17453         STA    TXLW              COMPLETES THE TXL WORD
17367  0622 00 0 17452         STD    STRW              PUT N IN STRW DECREMENT
17370  0500 00 0 17453         CLA    TXLW
17371  0601 00 1 00000         STO    0,1               PUT IT AT HEAD OF PDL BLOCK
17372  0500 00 4 00000         CLA    0,4               TSX HAS COUNT FIELD
17373 -0320 00 0 00467         ANA    CNTMSK            COUNT FIELD MASK
17374  0100 00 0 17444         TZE    MOVD              IF LESS THAN 3 ARGS
17375 -0734 00 4 00000         PDX    0,4               COUNT FIELD TO IX
17376  0020 00 4 17443         TRA    MOVD-1,4          ENTER PART OF MOVE ROUTINE
17377  0500 00 0 03342         CLA    $ARG20
17400  0601 00 1 00024         STO    20,1
17401  0500 00 0 03341         CLA    $ARG19
17402  0601 00 1 00023         STO    19,1
17403  0500 00 0 03340         CLA    $ARG18
17404  0601 00 1 00022         STO    18,1
17405  0500 00 0 03337         CLA    $ARG17
17406  0601 00 1 00021         STO    17,1
17407  0500 00 0 03336         CLA    $ARG16
17410  0601 00 1 00020         STO    16,1
17411  0500 00 0 03335         CLA    $ARG15
17412  0601 00 1 00017         STO    15,1
17413  0500 00 0 03334         CLA    $ARG14
17414  0601 00 1 00016         STO    14,1
17415  0500 00 0 03333         CLA    $ARG13
17416  0601 00 1 00015         STO    13,1
17417  0500 00 0 03332         CLA    $ARG12
17420  0601 00 1 00014         STO    12,1
17421  0500 00 0 03331         CLA    $ARG11
17422  0601 00 1 00013         STO    11,1
17423  0500 00 0 03330         CLA    $ARG10
17424  0601 00 1 00012         STO    10,1
17425  0500 00 0 03327         CLA    $ARG9
17426  0601 00 1 00011         STO    9,1
17427  0500 00 0 03326         CLA    $ARG8
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17430  0601 00 1 00010         STO     8,1
17431  0500 00 0 03325         CLA     $ARG7
17432  0601 00 1 00007         STO     7,1
17433  0500 00 0 03324         CLA     $ARG6
17434  0601 00 1 00006         STO     6,1
17435  0500 00 0 03323         CLA     $ARG5
17436  0601 00 1 00005         STO     5,1
17437  0500 00 0 03322         CLA     $ARG4
17440  0601 00 1 00004         STO     4,1
17441  0500 00 0 03321         CLA     $ARG3
17442  0601 00 1 00003         STO     3,1
17443  0534 00 4 17364         LXA     MOVY,4              RESTORE IR4
17444  0522 00 4 00001  MOVD   XEC     1,4          XECED TNX DECREMENTS TXI BUT NO TRANSFER
17445 -0634 00 1 02317         SXD     $CPPI,1             KEEP CPPI UP TO DATE ALSO
17446  0522 00 0 02414         XEC     ENDPDL              TEST FOR OUT OF BPS
17447  0500 00 0 17452         CLA     STRW                CREATES SECOND PARAMETER WORD
17450  0601 00 1 77777         STO     -1,1                PUT AT VERY END OF BLOCK
17451  0020 00 4 00002         TRA     2,4                 RETURN FROM LINK
17452 -1 00000 0 00000  STRW   STR     **
17453 -3 00000 0 00000  TXLW   TXL     **,,**
                       *
                       * RESTOR PICKS UP IX4 FROM PDL,SETS BACK CPPI ,AND EXITS.
17454 -0634 00 1 02317  RESTOR SXD     $CPPI,1
17455  0131 00 0 00000         XCA                         SAVE VALUE OF FUNCTION
17456  0500 00 1 00000         CLA     0,1                 PICK UP RETURN WORD
17457 -0734 00 4 00000         PDX     0,4                 RESTORE IX4
17460  0131 00 0 00000         XCA                         RESTORE AC
17461  0020 00 4 00001         TRA     1,4                 EXIT
                       *
                       *       DECK                        PERMANENT ATOMS
17462                  TOPROG  BSS     0
```

```
                                EJECT
                    66230       ORG     27800           PERMANENT OBJECTS START HERE
66230                       LOWERP BSS  1               LWER LIMIT OF PERMENANT LIST STRUCTURE
                                    **********HEAD OR HED**********
                                0       HED             XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

                                    LOWER LIMIT OF PERM. LIST STRUCTURE

66231  0 00000 0 00000                                  LAST BUCKET
                    66232       DUP     1,125           MAKE BUCKETS
66232  0 11547 0 00000                  ,,-*+1
66233  0 11546 0 00000
66234  0 11545 0 00000
66235  0 11544 0 00000
66236  0 11543 0 00000
66237  0 11542 0 00000
66240  0 11541 0 00000
66241  0 11540 0 00000
66242  0 11537 0 00000
66243  0 11536 0 00000
66244  0 11535 0 00000
66245  0 11534 0 00000
66246  0 11533 0 00000
66247  0 11532 0 00000
66250  0 11531 0 00000
66251  0 11530 0 00000
66252  0 11527 0 00000
66253  0 11526 0 00000
66254  0 11525 0 00000
66255  0 11524 0 00000
66256  0 11523 0 00000
66257  0 11522 0 00000
66260  0 11521 0 00000
66261  0 11520 0 00000
66262  0 11517 0 00000
66263  0 11516 0 00000
66264  0 11515 0 00000
66265  0 11514 0 00000
66266  0 11513 0 00000
66267  0 11512 0 00000
66270  0 11511 0 00000
66271  0 11510 0 00000
66272  0 11507 0 00000
66273  0 11506 0 00000
66274  0 11505 0 00000
66275  0 11504 0 00000
66276  0 11503 0 00000
66277  0 11502 0 00000
66300  0 11501 0 00000
66301  0 11500 0 00000
66302  0 11477 0 00000
66303  0 11476 0 00000
66304  0 11475 0 00000
66305  0 11474 0 00000
66306  0 11473 0 00000
66307  0 11472 0 00000
```

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66310  0 11471 0 00000
66311  0 11470 0 00000
66312  0 11467 0 00000
66313  0 11466 0 00000
66314  0 11465 0 00000
66315  0 11464 0 00000
66316  0 11463 0 00000
66317  0 11462 0 00000
66320  0 11461 0 00000
66321  0 11460 0 00000
66322  0 11457 0 00000
66323  0 11456 0 00000
66324  0 11455 0 00000
66325  0 11454 0 00000
66326  0 11453 0 00000
66327  0 11452 0 00000
66330  0 11451 0 00000
66331  0 11450 0 00000
66332  0 11447 0 00000
66333  0 11446 0 00000
66334  0 11445 0 00000
66335  0 11444 0 00000
66336  0 11443 0 00000
66337  0 11442 0 00000
66340  0 11441 0 00000
66341  0 11440 0 00000
66342  0 11437 0 00000
66343  0 11436 0 00000
66344  0 11435 0 00000
66345  0 11434 0 00000
66346  0 11433 0 00000
66347  0 11432 0 00000
66350  0 11431 0 00000
66351  0 11430 0 00000
66352  0 11427 0 00000
66353  0 11426 0 00000
66354  0 11425 0 00000
66355  0 11424 0 00000
66356  0 11423 0 00000
66357  0 11422 0 00000
66360  0 11421 0 00000
66361  0 11420 0 00000
66362  0 11417 0 00000
66363  0 11416 0 00000
66364  0 11415 0 00000
66365  0 11414 0 00000
66366  0 11413 0 00000
66367  0 11412 0 00000
66370  0 11411 0 00000
66371  0 11410 0 00000
66372  0 11407 0 00000
66373  0 11406 0 00000
66374  0 11405 0 00000
66375  0 11404 0 00000
66376  0 11403 0 00000
66377  0 11402 0 00000
```

```
66400  0 11401 0 00000
66401  0 11400 0 00000
66402  0 11377 0 00000
66403  0 11376 0 00000
66404  0 11375 0 00000
66405  0 11374 0 00000
66406  0 11373 0 00000
66407  0 11372 0 00000
66410  0 11371 0 00000
66411  0 11370 0 00000
66412  0 11367 0 00000
66413  0 11366 0 00000
66414  0 11365 0 00000
66415  0 11364 0 00000
66416  0 11363 0 00000
66417  0 11362 0 00000
66420  0 11361 0 00000
66421  0 11360 0 00000
66422  0 11357 0 00000
66423  0 11356 0 00000
66424  0 11355 0 00000
66425  0 11354 0 00000
66426  0 11353 0 00000
66427  0 11352 0 00000  BUCKET         ,,-*+1             POINTER TO BUCKETS
                 66427  OBLIST SYN     BUCKET
```

```
                                EJECT
                                HEAD    0
                                    OBJECT LIST

66430  0 11347 0 77777  OBLB       -1,,-*-1
66431  0 11346 0 11023                -II14,,-*-1        ADD 1                          GENER000
66432  0 11345 0 11001                -)ALST,,-*-1
66433  0 11344 0 10772            AND,,-*-1                                          GENER002
66434  0 11343 0 10762            F1,,-*-1                                           GENER003
66435  0 11342 0 10752            F18,,-*-1                                          GENER004
66436  0 11341 0 10742            APVAL,,-*-1                                        GENER005
66437  0 11340 0 10735                -II1,,-*-1         ARRAY                          GENER006
66440  0 11337 0 10725            ATOM,,-*-1                                         GENER007
66441  0 11336 0 10715            F29,,-*-1                                          GENER008
66442  0 11335 0 10675            CAR,,-*-1                                          GENER009
66443  0 11334 0 10665            CDR,,-*-1                                          GENER010
66444  0 11333 0 10655            CAAR,,-*-1                                         GENER011
66445  0 11332 0 10645            CDAR,,-*-1                                         GENER012
66446  0 11331 0 10635            CADR,,-*-1                                         GENER013
66447  0 11330 0 10625            CDDR,,-*-1                                         GENER014
66450  0 11327 0 10615            CAAAR,,-*-1                                        GENER015
66451  0 11326 0 10605            CAADR,,-*-1                                        GENER016
66452  0 11325 0 10575            CADAR,,-*-1                                        GENER017
66453  0 11324 0 10565            CADDR,,-*-1                                        GENER018
66454  0 11323 0 10555            CDAAR,,-*-1                                        GENER019
66455  0 11322 0 10545            CDADR,,-*-1                                        GENER020
66456  0 11321 0 10535            CDDAR,,-*-1                                        GENER021
66457  0 11320 0 10525            CDDDR,,-*-1                                        GENER022
66460  0 11317 0 10460            COND,,-*-1                                         GENER023
66461  0 11316 0 10450            CONSN,,-*-1                                        GENER024
66462  0 11315 0 10430            COPYN,,-*-1                                        GENER025
66463  0 11314 0 10323                DUMP,,-*-1                                     GENER026
66464  0 11313 0 10440            F12,,-*-1                                          GENER027
66465  0 11312 0 10420            F35,,-*-1                                          GENER028
66466  0 11311 0 10365                -IJ01,,-*-1        DIFFER                         GENER029
66467  0 11310 0 10343                -IJ02,,-*-1        DIVIDE                         GENER030
66470  0 11307 0 10261            EQ,,-*-1                                           GENER031
66471  0 11306 0 10241            F8,,-*-1                                           GENER032
66472  0 11305 0 10231            F21,,-*-1                                          GENER033
66473  0 11304 0 10177            F19,,-*-1                                          GENER034
66474  0 11303 0 10167            EVLISL,,-*-1                                       GENER035
66475  0 11302 0 10157            EXPR,,-*-1                                         GENER036
66476  0 11301 0 10152            F32,,-*-1                                          GENER037
66477  0 11300 0 10142            FEXPR,,-*-1                                        GENER038
66500  0 11277 0 10135            FIX,,-*-1                                          GENER039
66501  0 11276 0 10130                -II11,,-*-1        FIX P                          GENER040
66502  0 11275 0 10120            FLOAT,,-*-1                                        GENER041
66503  0 11274 0 10113                -II12,,-*-1        FLOAT P                        GENER042
66504  0 11273 0 10103            FSUBR,,-*-1                                        GENER043
66505  0 11272 0 10076            FUNARG,,-*-1                                       GENER044
66506  0 11271 0 10071            FUNCT,,-*-1                                        GENER045
66507  0 11270 0 10057            SYMGEN,,-*-1                                       GENER046
66510  0 11267 0 10037            GO,,-*-1                                           GENER047
66511  0 11266 0 10027                -II3,,-*-1         GREATER THAN P                 GENER048
66512  0 11265 0 10015            F16,,-*-1                                          GENER049
66513  0 11264 0 10005            LABEL,,-*-1                                        GENER050
```

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66514  0 11263 0 07775          LAMBDA,,-*-1                                    GENER051
66515  0 11262 0 07770              LAP,,-*-1                                   GENER052
66516  0 11261 0 07746              -II4,,-*-1        LESS THAN P               GENER053
66517  0 11260 0 07736          LIST,,-*-1                                      GENER054
66520  0 11257 0 07716              LOADA,,-*-1       LOADER OBJECT             GENER055
66521  0 11256 0 07646          PMAPCA,,-*-1                                    GENER056
66522  0 11255 0 07636           -)069B,,-*-1
66523  0 11254 0 07626           -)069A,,-*-1
66524  0 11253 0 07614              -II7,,-*-1        MAXIMUM                   GENER059
66525  0 11252 0 07604              -II8,,-*-1        MINIMUM                   GENER060
66526  0 11251 0 07574          MINUS,,-*-1                                     GENER061
66527  0 11250 0 07564              -II16,,-*-1       MINUS P                   GENER062
66530  0 11247 0 07544          F3,,-*-1                                        GENER063
66531  0 11246 0 00000          NIL,,-*-1                                       GENER064
66532  0 11245 0 07534          NOT,,-*-1                                       GENER065
66533  0 11244 0 07524          NULL,,-*-1                                      GENER066
66534  0 11243 0 07514              -II13,,-*-1       NUMBER P                  GENER067
66535  0 11242 0 07472              OBLBA,,-*-1       OBLIST OBJECT             GENER068
66536  0 11241 0 07455              -II9,,-*-1        ONE P                     GENER069
66537  0 11240 0 07435          OR,,-*-1                                        GENER070
66540  0 11237 0 07415          F2,,-*-1                                        GENER071
66541  0 11236 0 07405          PAUSE,,-*-1                                     GENER072
66542  0 11235 0 07365          PLB,,-*-1                                       GENER073
66543  0 11234 0 07355          PLUS,,-*-1                                      GENER074
66544  0 11233 0 07335          PNAME,,-*-1                                     GENER075
66545  0 11232 0 07320          F4,,-*-1                                        GENER076
66546  0 11231 0 07300          PROG,,-*-1                                      GENER077
66547  0 11230 0 07260          PROPO,,-*-1                                     GENER078
66550  0 11227 0 07270              -IJ05,,-*-1       PUNCH                     GENER079
66551  0 11226 0 07250          QUOTE,,-*-1                                     GENER080
66552  0 11225 0 07240              -IJ03,,-*-1       QUOTIENT                  GENER081
66553  0 11224 0 07226          F13,,-*-1                                       GENER082
66554  0 11223 0 07216              -II18,,-*-1       RECIP                     GENER083
66555  0 11222 0 07206          RCLAM,,-*-1                                     GENER084
66556  0 11221 0 07140          PRPLCA,,-*-1                                    GENER085
66557  0 11220 0 07130          PRPLCD,,-*-1                                    GENER086
66560  0 11217 0 07174              -IJ04,,-*-1       REMAINDER                 GENER087
66561  0 11216 0 07150              RETATM,,-*-1      RETURN                    GENER088
66562  0 11215 0 07052          SASCO,,-*-1                                     GENER089
66563  0 11214 0 07042          SRCH,,-*-1                                      GENER090
66564  0 11213 0 07032          SET,,-*-1                                       GENER091
66565  0 11212 0 07022          SETQ,,-*-1                                      GENER092
66566  0 11211 0 07002          F34,,-*-1                                       GENER093
66567  0 11210 0 06772          STOP,,-*-1                                      GENER094
66570  0 11207 0 06733          SUBR,,-*-1                                      GENER095
66571  0 11206 0 06647              TRACE,,-*-1                                 GENER096
66572  0 11205 0 07101              SMOVE,,-*-1                                 GENER097
66573  0 11204 0 07072              SRETUR,,-*-1                                GENER098
66574  0 11203 0 07061              SLIST,,-*-1                                 GENER099
66575  0 11202 0 07110              SPECAL,,-*-1                                GENER100
66576  0 11201 0 06743              -II15,,-*-1       SUBTRACT 1                GENER101
66577  0 11200 0 06726          F17,,-*-1                                       GENER102
66600  0 11177 0 06716          F30,,-*-1                                       GENER103
66601  0 11176 0 00001              1,,-*-1           *T* BINARY TRUE ATOM      GENER104
66602  0 11175 0 06671          F27,,-*-1                                       GENER105
66603  0 11174 0 06706              SYM,,-*-1                                   GENER106
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66604  0 11173 0 06657          TIMES,,-*-1                                    GENER107
66605  0 11172 0 06642          F36,,-*-1                                      GENER108
66606  0 11171 0 06620              -II10,,-*-1        ZERO P                 GENER109
66607  0 11170 0 10047          CGET,,-*-1                                     GENER110
66610  0 11167 0 07162              REMPP,,-*-1                                GENER111
66611  0 11166 0 06127          H00,,-*-1                                      GENER112
66612  0 11165 0 06130          H01,,-*-1                                      GENER113
66613  0 11164 0 06131          H02,,-*-1                                      GENER114
66614  0 11163 0 06132          H03,,-*-1                                      GENER115
66615  0 11162 0 06133          H04,,-*-1                                      GENER116
66616  0 11161 0 06134          H05,,-*-1                                      GENER117
66617  0 11160 0 06135          H06,,-*-1                                      GENER118
66620  0 11157 0 06136          H07,,-*-1                                      GENER119
66621  0 11156 0 06137          H10,,-*-1                                      GENER120
66622  0 11155 0 06140          H11,,-*-1                                      GENER121
66623  0 11154 0 06141          H12,,-*-1                                      GENER122
66624  0 11153 0 06142          H13,,-*-1                                      GENER123
66625  0 11152 0 06144          H15,,-*-1                                      GENER124
66626  0 11151 0 06143          H14,,-*-1                                      GENER125
66627  0 11150 0 06145          H16,,-*-1                                      GENER126
66630  0 11147 0 06146          H17,,-*-1                                      GENER127
66631  0 11146 0 06147          H20,,-*-1                                      GENER128
66632  0 11145 0 06150          H21,,-*-1                                      GENER129
66633  0 11144 0 06151          H22,,-*-1                                      GENER130
66634  0 11143 0 06152          H23,,-*-1                                      GENER131
66635  0 11142 0 06153          H24,,-*-1                                      GENER132
66636  0 11141 0 06154          H25,,-*-1                                      GENER133
66637  0 11140 0 06155          H26,,-*-1                                      GENER134
66640  0 11137 0 06156          H27,,-*-1                                      GENER135
66641  0 11136 0 06157          H30,,-*-1                                      GENER136
66642  0 11135 0 06160          H31,,-*-1                                      GENER137
66643  0 11134 0 06161          H32,,-*-1                                      GENER138
66644  0 11133 0 06162          H33,,-*-1                                      GENER139
66645  0 11132 0 06163          H34,,-*-1                                      GENER140
66646  0 11131 0 06164          H35,,-*-1                                      GENER141
66647  0 11130 0 06165          H36,,-*-1                                      GENER142
66650  0 11127 0 06166          H37,,-*-1                                      GENER143
66651  0 11126 0 06167          H40,,-*-1                                      GENER144
66652  0 11125 0 06170          H41,,-*-1                                      GENER145
66653  0 11124 0 06171          H42,,-*-1                                      GENER146
66654  0 11123 0 06172          H43,,-*-1                                      GENER147
66655  0 11122 0 06173          H44,,-*-1                                      GENER148
66656  0 11121 0 06174          H45,,-*-1                                      GENER149
66657  0 11120 0 06175          H46,,-*-1                                      GENER150
66660  0 11117 0 06176          H47,,-*-1                                      GENER151
66661  0 11116 0 06177          H50,,-*-1                                      GENER152
66662  0 11115 0 06200          H51,,-*-1                                      GENER153
66663  0 11114 0 06201          H52,,-*-1                                      GENER154
66664  0 11113 0 06202          H53,,-*-1                                      GENER155
66665  0 11112 0 06203          H54,,-*-1                                      GENER156
66666  0 11111 0 06204          H55,,-*-1                                      GENER157
66667  0 11110 0 06205          H56,,-*-1                                      GENER158
66670  0 11107 0 06206          H57,,-*-1                                      GENER159
66671  0 11106 0 06207          H60,,-*-1                                      GENER160
66672  0 11105 0 06210          H61,,-*-1                                      GENER161
66673  0 11104 0 06211          H62,,-*-1                                      GENER162
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66674  0 11103 0 06212            H63,,-*-1                                          GENER163
66675  0 11102 0 06213            H64,,-*-1                                          GENER164
66676  0 11101 0 06214            H65,,-*-1                                          GENER165
66677  0 11100 0 06215            H66,,-*-1                                          GENER166
66700  0 11077 0 06216            H67,,-*-1                                          GENER167
66701  0 11076 0 06217            H70,,-*-1                                          GENER168
66702  0 11075 0 06220            H71,,-*-1                                          GENER169
66703  0 11074 0 06221            H72,,-*-1                                          GENER170
66704  0 11073 0 06222            H73,,-*-1                                          GENER171
66705  0 11072 0 06223            H74,,-*-1                                          GENER172
66706  0 11071 0 06224            H75,,-*-1                                          GENER173
66707  0 11070 0 06225            H76,,-*-1                                          GENER174
66710  0 11067 0 06226            H77,,-*-1                                          GENER175
66711  0 11066 0 10410            PJ1,,-*-1                                          GENER176
66712  0 11065 0 11013            PJ2,,-*-1                                          GENER177
66713  0 11064 0 10221            PJ4,,-*-1                                          GENER179
66714  0 11063 0 10251            PJ5,,-*-1                                          GENER180
66715  0 11062 0 10470            PJ6,,-*-1                                          GENER181
66716  0 11061 0 07656            PJ7,,-*-1                                          GENER182
66717  0 11060 0 07120            PJ8,,-*-1                                          GENER183
66720  0 11057 0 07375            PJ9,,-*-1                                          GENER184
66721  0 11056 0 10333            PJ10,,-*-1                                         GENER185
66722  0 11055 0 07345            PJ11,,-*-1                                         GENER186
66723  0 11054 0 10705            PJ12,,-*-1                                         GENER187
66724  0 11053 0 07012            PJ14,,-*-1                                         GENER189
66725  0 11052 0 06765            PJ15,,-*-1                                         GENER190
66726  0 11051 0 10375            PJ16,,-*-1                                         GENER191
66727  0 11050 0 07726            PJ17,,-*-1                                         GENER192
66730  0 11047 0 07445            PJ18,,-*-1                                         GENER193
66731  0 11046 0 10353            PJ19,,-*-1                                         GENER194
66732  0 11045 0 06755            PJ21,,-*-1                                         GENER195
66733  0 11044 0 06701            PJ23,,-*-1                                         GENER196
66734  0 11043 0 07425                PJ24,,-*-1                                     GENER197
66735  0 11042 0 07502                PJ25,,-*-1                                     GENER198
66736  0 11041 0 07554                PJ26,,-*-1                                     GENER199
66737  0 11040 0 10502                PJ27,,-*-1                                     GENER200
66740  0 11037 0 07462                PJ28,,-*-1                                     GENER201
66741  0 11036 0 10313                PJ30,,-*-1                                     GENER202
66742  0 11035 0 06630                PJ31,,-*-1                                     GENER203
66743  0 11034 0 10515                PJ32,,-*-1                                     GENER204
66744  0 11033 0 07330                PJ33,,-*-1                                     GENER205
66745  0 11032 0 10301                PJ34,,-*-1                                     GENER206
66746  0 11031 0 10271                PJ35,,-*-1                                     GENER207
66747  0 11030 0 07676                PJ36,,-*-1                                     GENER208
66750  0 11027 0 07706                PJ37,,-*-1                                     GENER209
66751  0 11026 0 07666                PJ38,,-*-1                                     GENER210
66752  0 11025 0 07310                PJ39,,-*-1                                     GENER211
66753  0 11024 0 10211                ERSETO,,-*-1       ERRORSET                    GENER212
66754  0 00000 0 07760                PVW1               LAST OBJECT   - LEFTSHIFT   GENER213
```

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                                EJECT
                                    PROPERTY LISTS

66755  0 11022 0 77777  II14          -1,,-*-1                                    GPLI0000
66756  0 11021 0 06733                $SUBR,,-*-1                                 GPLI0001
66757  0 11017 0 11020                -*-1,,-*-2                                  GPLI0002
66760 -3 00001 0 14401         TXL     ADD1,,1                                    GPLI0003
66761  0 11016 0 07335                 $PNAME,,-*-1                                GPLI0004
66762  0 00000 0 11015                 -*-1              ADD1                      GPLI0005
66763  0 00000 0 11014                 -*-1                                        GPLI0006
66764 +212424017777            OCT     212424017777                               GPLI0007
                               *                                                   GPLI0008
66765  0 11012 0 77777  )PJ2       -1,,-*-1    ADVANCE                            GPLI0009
66766  0 11011 0 06733             SUBR,,-*-1                                     GPLI0010
66767  0 11007 0 11010         PZE -*-1,,-*-2                                     GPLI0011
66770 -3 00000 0 12211         TXL ADVANC,,0                                      GPLI0012
66771  0 11006 0 07335             PNAME,,-*-1                                    GPLI0013
66772  0 00000 0 11005             -*-1                                           GPLI0014
66773  0 11003 0 11004             -*-1,,-*-2                                     GPLI0015
66774  212465214523            BCD 1ADVANC                                        GPLI0016
66775  0 00000 0 11002             -*-1                                           GPLI0017
66776 +257777777777            OCT 257777777777                                   GPLI0018
                               *                                                   GPLI0019
66777  0 11000 0 77777  )ALST       -1,,-*-1                                      GPLI0020
67000  0 10777 0 07335             PNAME,,-*-1                                    GPLI0021
67001  0 10774 0 10776                 -*-1,,-*-3        $ALIST                   GPLI0022
67002  0 00000 0 10775             -*-1                                           GPLI0023
67003 -132143316263            OCT     532143316263                               GPLI0024
67004  0 10773 0 06706                 SYM,,-*-1                                  GPLI0025
67005  0 00000 0 61262                 -C$ALST                                    GPLI0026
                               *                                                   GPLI0027
67006  0 10771 0 77777  )002       -1,,-*-1                                      GPLI0028
67007  0 10770 0 10103             FSUBR,,-*-1                                    GPLI0029
67010  0 10766 0 10767             -*-1,,-*-2                                     GPLI0030
67011 -3 00000 0 15370         TXL $EVAND,,0                                      GPLI0031
67012  0 10765 0 07335             $PNAME,,-*-1                                   GPLI0032
67013  0 00000 0 10764             -*-1              AND                          GPLI0033
67014  0 00000 0 10763             -*-1                                           GPLI0034
67015 +214524777777            OCT 214524777777                                   GPLI0035
                               *                                                   GPLI0036
67016  0 10761 0 77777  )003       -1,,-*-1                                      GPLI0037
67017  0 10760 0 06733             SUBR,,-*-1                                     GPLI0038
67020  0 10756 0 10757             -*-1,,-*-2                                     GPLI0039
67021 -3 00002 0 07541         TXL APPEND,,2                                      GPLI0040
67022  0 10755 0 07335             PNAME,,-*-1                                    GPLI0041
67023  0 00000 0 10754             -*-1                  APPEND                   GPLI0042
67024  0 00000 0 10753             -*-1                                           GPLI0043
67025  214747254524            BCD 1APPEND                                        GPLI0044
                               *                                                   GPLI0045
67026  0 10751 0 77777  )004       -1,,-*-1                                      GPLI0046
67027  0 10750 0 06733             SUBR,,-*-1                                     GPLI0047
67030  0 10746 0 10747             -*-1,,-*-2                                     GPLI0048
67031 -3 00003 0 14663         TXL APPLY,,3                                       GPLI0049
67032  0 10745 0 07335             PNAME,,-*-1                                    GPLI0050
67033  0 00000 0 10744             -*-1              APPLY                        GPLI0051
67034  0 00000 0 10743             -*-1                                           GPLI0052
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67035 +214747437077           OCT 214747437077                                GPLI0053
                              *                                               GPLI0054
67036  0 10741 0 77777  )005          -1,,-*-1                                GPLI0055
67037  0 10740 0 07335                PNAME,,-*-1                             GPLI0056
67040  0 00000 0 10737                -*-1               APVAL                GPLI0057
67041  0 00000 0 10736                -*-1                                    GPLI0058
67042  214765214377           VFD     H30/APVAL,O6/77                         GPLI0059
                              *                                               GPLI0060
67043  0 10734 0 77777  II1          -1,,-*-1                                GPLI0061
67044  0 10733 0 06733                SUBR,,-*-1                              GPLI0062
67045  0 10731 0 10732                -*-1,,-*-2                              GPLI0063
67046 -3 00001 0 13113        TXL     ARYMAK,,1                               GPLI0064
67047  0 10730 0 07335                PNAME,,-*-1                             GPLI0065
67050  0 00000 0 10727                -*-1               ARRAY                GPLI0066
67051  0 00000 0 10726                -*-1                                    GPLI0067
67052 +215151217077           OCT     215151217077                            GPLI0068
                              *                                               GPLI0069
67053  0 10724 0 77777  )007          -1,,-*-1                                GPLI0070
67054  0 10723 0 06733                SUBR,,-*-1                              GPLI0071
67055  0 10721 0 10722                -*-1,,-*-2                              GPLI0072
67056 -3 00001 0 15230        TXL     ATOMP,,1                                GPLI0073
67057  0 10720 0 07335                PNAME,,-*-1                             GPLI0074
67060  0 00000 0 10717                -*-1               ATOM                 GPLI0075
67061  0 00000 0 10716                -*-1                                    GPLI0076
67062 +216346447777           OCT     216346447777                            GPLI0077
                              *                                               GPLI0078
67063  0 10714 0 77777  )008       -1,,-*-1                                   GPLI0079
67064  0 10713 0 06733             SUBR,,-*-1                                 GPLI0080
67065  0 10711 0 10712             -*-1,,-*-2                                 GPLI0081
67066 -3 00002 0 10134        TXL ATTRIB,,2                                  GPLI0082
67067  0 10710 0 07335             PNAME,,-*-1                                GPLI0083
67070  0 00000 0 10707             -*-1              ATTRIB                   GPLI0084
67071  0 00000 0 10706             -*-1                                       GPLI0085
67072  216363513122           BCD 1ATTRIB                                     GPLI0086
                              *                                               GPLI0087
67073  0 10704 0 77777  )PJ12  PZE -1,,-*-1                                   GPLI0088
67074  0 10703 0 07335        PZE PNAME,,-*-1                                 GPLI0089
67075  0 10700 0 10702             -*-1,,-*-3            BLANK                GPLI0090
67076  0 00000 0 10701             -*-1                                       GPLI0091
67077 +224321454277           OCT 224321454277                                GPLI0092
67100  0 10677 0 10742             APVAL1,,-*-1                               GPLI0093
67101  0 00000 0 10676             -*-1                                       GPLI0094
67102  0 00000 0 06207             H60                                        GPLI0095
                              *                                               GPLI0096
67103  0 10674 0 77777  )011          -1,,-*-1                                GPLI0097
67104  0 10673 0 06733                SUBR,,-*-1                              GPLI0098
67105  0 10671 0 10672                -*-1,,-*-2                              GPLI0099
67106 -3 00001 0 15212        TXL     CARP,,1                                 GPLI0100
67107  0 10670 0 07335                PNAME,,-*-1                             GPLI0101
67110  0 00000 0 10667                -*-1               CAR                  GPLI0102
67111  0 00000 0 10666                -*-1                                    GPLI0103
67112 +232151777777           OCT     232151777777                            GPLI0104
                              *                                               GPLI0105
67113  0 10664 0 77777  )012          -1,,-*-1                                GPLI0106
67114  0 10663 0 06733                SUBR,,-*-1                              GPLI0107
67115  0 10661 0 10662                -*-1,,-*-2                              GPLI0108
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67116 -3 00001 0 15222         TXL     CDRP,,1                                  GPLI0109
67117  0 10660 0 07335                 PNAME,,-*-1                              GPLI0110
67120  0 00000 0 10657                 -*-1              CDR                    GPLI0111
67121  0 00000 0 10656                 -*-1                                     GPLI0112
67122 +232451777777            OCT     232451777777                             GPLI0113
                          *                                                     GPLI0114
67123  0 10654 0 77777  )201           -1,,-*-1                                 GPLI0115
67124  0 10653 0 06733                 SUBR,,-*-1                               GPLI0116
67125  0 10651 0 10652                 -*-1,,-*-2                               GPLI0117
67126 -3 00001 0 11726         TXL     CAARXX,,1                                GPLI0118
67127  0 10650 0 07335                 PNAME,,-*-1                              GPLI0119
67130  0 00000 0 10647                 -*-1              CAAR                   GPLI0120
67131  0 00000 0 10646                 -*-1                                     GPLI0121
67132 +232121517777            OCT     232121517777                             GPLI0122
                          *                                                     GPLI0123
67133  0 10644 0 77777  )202           -1,,-*-1                                 GPLI0124
67134  0 10643 0 06733                 SUBR,,-*-1                               GPLI0125
67135  0 10641 0 10642                 -*-1,,-*-2                               GPLI0126
67136 -3 00001 0 11765         TXL     CDARXX,,1                                GPLI0127
67137  0 10640 0 07335                 PNAME,,-*-1                              GPLI0128
67140  0 00000 0 10637                 -*-1              CDAR                   GPLI0129
67141  0 00000 0 10636                 -*-1                                     GPLI0130
67142 +232421517777            OCT     232421517777                             GPLI0131
                          *                                                     GPLI0132
67143  0 10634 0 77777  )203           -1,,-*-1                                 GPLI0133
67144  0 10633 0 06733                 SUBR,,-*-1                               GPLI0134
67145  0 10631 0 10632                 -*-1,,-*-2                               GPLI0135
67146 -3 00001 0 11730         TXL     CADRXX,,1                                GPLI0136
67147  0 10630 0 07335                 PNAME,,-*-1                              GPLI0137
67150  0 00000 0 10627                 -*-1              CADR                   GPLI0138
67151  0 00000 0 10626                 -*-1                                     GPLI0139
67152 +232124517777            OCT     232124517777                             GPLI0140
                          *                                                     GPLI0141
67153  0 10624 0 77777  )204           -1,,-*-1                                 GPLI0142
67154  0 10623 0 06733                 SUBR,,-*-1                               GPLI0143
67155  0 10621 0 10622                 -*-1,,-*-2                               GPLI0144
67156 -3 00001 0 11767         TXL     CDDRXX,,1                                GPLI0145
67157  0 10620 0 07335                 PNAME,,-*-1                              GPLI0146
67160  0 00000 0 10617                 -*-1              CDDR                   GPLI0147
67161  0 00000 0 10616                 -*-1                                     GPLI0148
67162 +232424517777            OCT     232424517777                             GPLI0149
                          *                                                     GPLI0150
67163  0 10614 0 77777  )205           -1,,-*-1                                 GPLI0151
67164  0 10613 0 06733                 SUBR,,-*-1                               GPLI0152
67165  0 10611 0 10612                 -*-1,,-*-2                               GPLI0153
67166 -3 00001 0 11672         TXL     CAAARX,,1                                GPLI0154
67167  0 10610 0 07335                 PNAME,,-*-1                              GPLI0155
67170  0 00000 0 10607                 -*-1              CAAAR                  GPLI0156
67171  0 00000 0 10606                 -*-1                                     GPLI0157
67172 +232121215177            OCT     232121215177                             GPLI0158
                          *                                                     GPLI0159
67173  0 10604 0 77777  )206           -1,,-*-1                                 GPLI0160
67174  0 10603 0 06733                 SUBR,,-*-1                               GPLI0161
67175  0 10601 0 10602                 -*-1,,-*-2                               GPLI0162
67176 -3 00001 0 11705         TXL     CAADRX,,1                                GPLI0163
67177  0 10600 0 07335                 PNAME,,-*-1                              GPLI0164
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67200  0 00000 0 10577                -*-1              CAADR                GPLI0165
67201  0 00000 0 10576                -*-1                                   GPLI0166
67202 +232121245177           OCT     232121245177                           GPLI0167
                         *                                                   GPLI0168
67203  0 10574 0 77777  )207          -1,,-*-1                               GPLI0169
67204  0 10573 0 06733                SUBR,,-*-1                             GPLI0170
67205  0 10571 0 10572                -*-1,,-*-2                             GPLI0171
67206 -3 00001 0 11712           TXL  CADARX,,1                              GPLI0172
67207  0 10570 0 07335                PNAME,,-*-1                            GPLI0173
67210  0 00000 0 10567                -*-1              CADAR                GPLI0174
67211  0 00000 0 10566                -*-1                                   GPLI0175
67212 +232124215177           OCT     232124215177                           GPLI0176
                         *                                                   GPLI0177
67213  0 10564 0 77777  )208          -1,,-*-1                               GPLI0178
67214  0 10563 0 06733                SUBR,,-*-1                             GPLI0179
67215  0 10561 0 10562                -*-1,,-*-2                             GPLI0180
67216 -3 00001 0 11721           TXL  CADDRX,,1                              GPLI0181
67217  0 10560 0 07335                PNAME,,-*-1                            GPLI0182
67220  0 00000 0 10557                -*-1              CADDR                GPLI0183
67221  0 00000 0 10556                -*-1                                   GPLI0184
67222 +232124245177           OCT     232124245177                           GPLI0185
                         *                                                   GPLI0186
67223  0 10554 0 77777  )209          -1,,-*-1                               GPLI0187
67224  0 10553 0 06733                SUBR,,-*-1                             GPLI0188
67225  0 10551 0 10552                -*-1,,-*-2                             GPLI0189
67226 -3 00001 0 11732           TXL  CDAARX,,1                              GPLI0190
67227  0 10550 0 07335                PNAME,,-*-1                            GPLI0191
67230  0 00000 0 10547                -*-1              CDAAR                GPLI0192
67231  0 00000 0 10546                -*-1                                   GPLI0193
67232 +232421215177           OCT     232421215177                           GPLI0194
                         *                                                   GPLI0195
67233  0 10544 0 77777  )210          -1,,-*-1                               GPLI0196
67234  0 10543 0 06733                SUBR,,-*-1                             GPLI0197
67235  0 10541 0 10542                -*-1,,-*-2                             GPLI0198
67236 -3 00001 0 11744           TXL  CDADRX,,1                              GPLI0199
67237  0 10540 0 07335                PNAME,,-*-1                            GPLI0200
67240  0 00000 0 10537                -*-1              CDADR                GPLI0201
67241  0 00000 0 10536                -*-1                                   GPLI0202
67242 +232421245177           OCT     232421245177                           GPLI0203
                         *                                                   GPLI0204
67243  0 10534 0 77777  )211          -1,,-*-1                               GPLI0205
67244  0 10533 0 06733                SUBR,,-*-1                             GPLI0206
67245  0 10531 0 10532                -*-1,,-*-2                             GPLI0207
67246 -3 00001 0 11751           TXL  CDDARX,,1                              GPLI0208
67247  0 10530 0 07335                PNAME,,-*-1                            GPLI0209
67250  0 00000 0 10527                -*-1              CDDAR                GPLI0210
67251  0 00000 0 10526                -*-1                                   GPLI0211
67252 +232424215177           OCT     232424215177                           GPLI0212
                         *                                                   GPLI0213
67253  0 10524 0 77777  )212          -1,,-*-1                               GPLI0214
67254  0 10523 0 06733                SUBR,,-*-1                             GPLI0215
67255  0 10521 0 10522                -*-1,,-*-2                             GPLI0216
67256 -3 00001 0 11760           TXL  CDDDRX,,1                              GPLI0217
67257  0 10520 0 07335                PNAME,,-*-1                            GPLI0218
67260  0 00000 0 10517                -*-1              CDDDR                GPLI0219
67261  0 00000 0 10516                -*-1                                   GPLI0220
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67262 +232424245177           OCT     232424245177                                GPLI0221
                      *                                                           GPLI0222
67263  0 10514 0 77777  )PJ32         -1,,-*-1      CHARCOUNT                     GPLI0223
67264  0 10513 0 07335                PNAME,,-*-1                                 GPLI0224
67265  0 10506 0 10512                -*-1,,-*-5                                  GPLI0225
67266  0 10511 0 10510                -*-2,,-*-1                                  GPLI0226
67267  0 00000 0 10507                -*-2                                        GPLI0227
67270  233021512346           BCI     1,CHARCO       BCI CHARCOUNT                GPLI0228
67271 -244563777777           OCT     644563777777                                GPLI0229
67272  0 10505 0 10742                APVAL1,,-*-1                                GPLI0230
67273  0 00000 0 10504                -*-1                                        GPLI0231
67274  0 00000 0 10503                -*-1                                        GPLI0232
67275 -0 65143 1 77777        MZE     -1,1,-CHACT                                 GPLI0233
                      *                                                           GPLI0234
67276  0 10501 0 77777  )PJ27         -1,,-*-1                                    GPLI0235
67277  0 10500 0 06733                SUBR,,-*-1                                  GPLI0236
67300  0 10476 0 10477                -*-1,,-*-2                                  GPLI0237
67301 -3 00000 0 12201        TXL     CLEAR,,0                                    GPLI0238
67302  0 10475 0 07335                PNAME,,-*-1                                 GPLI0239
67303  0 00000 0 10474                -*-1               CLEARBUFF                GPLI0240
67304  0 10472 0 10473                -*-1,,-*-2                                  GPLI0241
67305  234325215122           BCI     1,CLEARB                                    GPLI0242
67306  0 00000 0 10471                -*-1                                        GPLI0243
67307 -242626777777           OCT     642626777777                                GPLI0244
                      *                                                           GPLI0245
67310  0 10467 0 77777  )PJ6          -1,,-*-1                                    GPLI0246
67311  0 10466 0 07335                PNAME,,-*-1                                 GPLI0247
67312  0 10463 0 10465                -*-1,,-*-3         COMMA                    GPLI0248
67313  0 00000 0 10464                -*-1                                        GPLI0249
67314 +234644442177           OCT     234644442177                                GPLI0250
67315  0 10462 0 10742                APVAL1,,-*-1                                GPLI0251
67316  0 00000 0 10461                -*-1                                        GPLI0252
67317  0 00000 0 06222                H73                                         GPLI0253
                      *                                                           GPLI0254
67320  0 10457 0 77777  )016          -1,,-*-1                                    GPLI0255
67321  0 10456 0 10103                FSUBR,,-*-1                                 GPLI0256
67322  0 10454 0 10455                -*-1,,-*-2                                  GPLI0257
67323 -3 00000 0 15154        TXL     $EVCON,,0                                   GPLI0258
67324  0 10453 0 07335                PNAME,,-*-1                                 GPLI0259
67325  0 00000 0 10452                -*-1               COND                     GPLI0260
67326  0 00000 0 10451                -*-1                                        GPLI0261
67327 +234645247777           OCT     234645247777                                GPLI0262
                      *                                                           GPLI0263
67330  0 10447 0 77777  )017          -1,,-*-1                                    GPLI0264
67331  0 10446 0 06733                SUBR,,-*-1                                  GPLI0265
67332  0 10444 0 10445                -*-1,,-*-2                                  GPLI0266
67333 -3 00002 0 03730        TXL     CONS,,2                                     GPLI0267
67334  0 10443 0 07335                PNAME,,-*-1                                 GPLI0268
67335  0 00000 0 10442                -*-1               CONS                     GPLI0269
67336  0 00000 0 10441                -*-1                                        GPLI0270
67337 +234645627777           OCT     234645627777                                GPLI0271
                      *                                                           GPLI0272
67340  0 10437 0 77777  )019          -1,,-*-1                                    GPLI0273
67341  0 10436 0 06733                SUBR,,-*-1                                  GPLI0274
67342  0 10434 0 10435                -*-1,,-*-2                                  GPLI0275
67343 -3 00001 0 07343        TXL     CP1,,1                                      GPLI0276
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67344  0 10433 0 07335                PNAME,,-*-1                                GPLI0277
67345  0 00000 0 10432                -*-1              CP1                      GPLI0278
67346  0 00000 0 10431                -*-1                                       GPLI0279
67347 +234701777777           OCT     234701777777                               GPLI0280
                         *                                                       GPLI0281
67350  0 10427 0 77777  )020          -1,,-*-1                                   GPLI0282
67351  0 10426 0 06733                SUBR,,-*-1                                 GPLI0283
67352  0 10424 0 10425                -*-1,,-*-2                                 GPLI0284
67353 -3 00001 0 04345           TXL  $COPY,,1                                   GPLI0285
67354  0 10423 0 07335                PNAME,,-*-1                                GPLI0286
67355  0 00000 0 10422                -*-1              COPY                     GPLI0287
67356  0 00000 0 10421                -*-1                                       GPLI0288
67357 +234647707777           OCT     234647707777                               GPLI0289
                         *                                                       GPLI0290
67360  0 10417 0 77777  )021          -1,,-*-1                                   GPLI0291
67361  0 10416 0 06733                SUBR,,-*-1                                 GPLI0292
67362  0 10414 0 10415                -*-1,,-*-2                                 GPLI0293
67363 -3 00000 0 04057           TXL  COUNT,,0                                   GPLI0294
67364  0 10413 0 07335                PNAME,,-*-1                                GPLI0295
67365  0 00000 0 10412                -*-1              COUNT                    GPLI0296
67366  0 00000 0 10411                -*-1                                       GPLI0297
67367 +234664456377           OCT     234664456377                               GPLI0298
                         *                                                       GPLI0299
67370  0 10407 0 77777  )PJ1       -1,,-*-1                                     GPLI0300
67371  0 10406 0 10742             APVAL1,,-*-1                                 GPLI0301
67372  0 10405 0 65145             -CURC1,,-*-1                                 GPLI0302
67373  0 10404 0 07335             PNAME,,-*-1                                  GPLI0303
67374  0 10377 0 10403             -*-1,,-*-5        CURCHAR                    GPLI0304
67375  0 10401 0 10402             -*-1,,-*-2                                   GPLI0305
67376  236451233021           BCD 1CURCHA                                       GPLI0306
67377  0 00000 0 10400             -*-1                                         GPLI0307
67400 -117777777777           OCT 517777777777                                  GPLI0308
67401  0 10376 0 07110                SPECAL,,-*-1                               GPLI0309
67402  0 00000 0 65144                -CURC                                      GPLI0310
                         *                                                       GPLI0311
67403  0 10374 0 77777  )PJ16         -1,,-*-1                                   GPLI0312
67404  0 10373 0 10742                APVAL1,,-*-1                               GPLI0313
67405  0 10371 0 10372                -*-1,,-*-2                                 GPLI0314
67406  0 00000 0 06167                H40                                        GPLI0315
67407  0 10370 0 07335                PNAME,,-*-1                                GPLI0316
67410  0 00000 0 10367                -*-1              DASH                     GPLI0317
67411  0 00000 0 10366                -*-1                                       GPLI0318
67412 +242162307777           OCT     242162307777                               GPLI0319
                         *                                                       GPLI0320
67413  0 10364 0 77777  IJ01          -1,,-*-1                                   GPLI0321
67414  0 10363 0 06733                $SUBR,,-*-1                                GPLI0322
67415  0 10361 0 10362                -*-1,,-*-2                                 GPLI0323
67416 -3 00002 0 13512           TXL  DIFFER,,2                                  GPLI0324
67417  0 10360 0 07335                $PNAME,,-*-1                               GPLI0325
67420  0 00000 0 10357                -*-1              DIFFERENCE               GPLI0326
67421  0 10356 0 10355                -*-2,,-*-1                                 GPLI0327
67422  0 00000 0 10354                -*-2                                       GPLI0328
67423  243126262551           BCI     1,DIFFER                                   GPLI0329
67424 +254523257777           OCT     254523257777                               GPLI0330
                         *                                                       GPLI0331
67425  0 10352 0 77777  )PJ19         -1,,-*-1                                   GPLI0332
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67426  0 10351 0 06733                SUBR,,-*-1                                GPLI0333
67427  0 10347 0 10350                -*-1,,-*-2                                GPLI0334
67430 -3 00001 0 12337        TXL     DIGIT,,1                                  GPLI0335
67431  0 10346 0 07335                PNAME,,-*-1                               GPLI0336
67432  0 00000 0 10345                -*-1               DIGIT                  GPLI0337
67433  0 00000 0 10344                -*-1                                      GPLI0338
67434 +243127316377           OCT     243127316377                              GPLI0339
                      *                                                        GPLI0340
67435  0 10342 0 77777  IJ02          -1,,-*-1                                  GPLI0341
67436  0 10341 0 06733                $SUBR,,-*-1                               GPLI0342
67437  0 10337 0 10340                -*-1,,-*-2                                GPLI0343
67440 -3 00002 0 13420        TXL     DIVIDE,,2                                 GPLI0344
67441  0 10336 0 07335                $PNAME,,-*-1                              GPLI0345
67442  0 00000 0 10335                -*-1               DIVIDE                 GPLI0346
67443  0 00000 0 10334                -*-1                                      GPLI0347
67444  243165312425           BCI     1,DIVIDE                                  GPLI0348
                      *                                                        GPLI0349
67445  0 10332 0 77777  )PJ10      -1,,-*-1                                    GPLI0350
67446  0 10331 0 07335             PNAME,,-*-1                                 GPLI0351
67447  0 10326 0 10330             -*-1,,-*-3         DOLLAR                   GPLI0352
67450  0 00000 0 10327             -*-1                                        GPLI0353
67451  244643432151           BCD 1DOLLAR                                       GPLI0354
67452  0 10325 0 10742             APVAL1,,-*-1                                GPLI0355
67453  0 00000 0 10324             -*-1                                        GPLI0356
67454  0 00000 0 06202             H53                                         GPLI0357
                      *                                                        GPLI0358
67455  0 10322 0 77777  DMP0B          -1,,-*-1                                GPLI0359
67456  0 10321 0 06733                SUBR,,-*-1                              GPLI0360
67457  0 10317 0 10320                -*-1,,-*-2                              GPLI0361
67460 -3 00004 0 10736        TXL     DUMPXX,,4                               GPLI0362
67461  0 10316 0 07335                PNAME,,-*-1                             GPLI0363
67462  0 00000 0 10315                -*-1               DUMP                 GPLI0364
67463  0 00000 0 10314                -*-1                                    GPLI0365
67464 +246444477777           OCT     246444477777                            GPLI0366
                      *                                                        GPLI0367
67465  0 10312 0 77777  )PJ30          -1,,-*-1                                GPLI0368
67466  0 10311 0 06733                SUBR,,-*-1                              GPLI0369
67467  0 10307 0 10310                -*-1,,-*-2                              GPLI0370
67470 -3 00000 0 12273        TXL     ENDRED,,0                               GPLI0371
67471  0 10306 0 07335                PNAME,,-*-1                             GPLI0372
67472  0 00000 0 10305                -*-1               ENDREAD              GPLI0373
67473  0 10304 0 10303                -*-2,,-*-1                              GPLI0374
67474  0 00000 0 10302                -*-2                                    GPLI0375
67475  254524512521           BCI     1,ENDREA                                GPLI0376
67476 +247777777777           OCT     247777777777                            GPLI0377
                      *                                                        GPLI0378
67477  0 10300 0 77777  )PJ34          -1,,-*-1                                GPLI0379
67500  0 10277 0 10742                APVAL1,,-*-1                            GPLI0380
67501  0 10275 0 10276                -*-1,,-*-2                              GPLI0381
67502  0 00000 0 06141                H12                                     GPLI0382
67503  0 10274 0 07335                PNAME,,-*-1                             GPLI0383
67504  0 00000 0 10273                -*-1               EOF                  GPLI0384
67505  0 00000 0 10272                -*-1                                    GPLI0385
67506 +254626777777           OCT     254626777777                            GPLI0386
                      *                                                        GPLI0387
67507  0 10270 0 77777  )PJ35          -1,,-*-1                                GPLI0388
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67510  0 10267 0 10742                APVAL1,,-*-1                                GPLI0389
67511  0 10265 0 10266                -*-1,,-*-2                                  GPLI0390
67512  0 00000 0 06221                H72                                         GPLI0391
67513  0 10264 0 07335                PNAME,,-*-1                                 GPLI0392
67514  0 00000 0 10263                -*-1                EOR                     GPLI0393
67515  0 00000 0 10262                -*-1                                        GPLI0394
67516 +254651777777          OCT     254651777777                                GPLI0395
                        *                                                        GPLI0396
67517  0 10260 0 77777  )030          -1,,-*-1                                    GPLI0397
67520  0 10257 0 06733                SUBR,,-*-1                                  GPLI0398
67521  0 10255 0 10256                -*-1,,-*-2                                  GPLI0399
67522 -3 00002 0 15445          TXL    EQP,,2                                      GPLI0400
67523  0 10254 0 07335                PNAME,,-*-1                                 GPLI0401
67524  0 00000 0 10253                -*-1                EQ                      GPLI0402
67525  0 00000 0 10252                -*-1                                        GPLI0403
67526 +255077777777          OCT     255077777777                                GPLI0404
                        *                                                        GPLI0405
67527  0 10250 0 77777  )PJ5          -1,,-*-1                                    GPLI0406
67530  0 10247 0 07335                PNAME,,-*-1                                 GPLI0407
67531  0 10244 0 10246                -*-1,,-*-3          EQSIGN                  GPLI0408
67532  0 00000 0 10245                -*-1                                        GPLI0409
67533  255062312745            BCI    1,EQSIGN                                    GPLI0410
67534  0 10243 0 10742                APVAL1,,-*-1                                GPLI0411
67535  0 00000 0 10242                -*-1                                        GPLI0412
67536  0 00000 0 06142                H13                                         GPLI0413
                        *                                                        GPLI0414
67537  0 10240 0 77777  )032          -1,,-*-1                                    GPLI0415
67540  0 10237 0 06733                SUBR,,-*-1                                  GPLI0416
67541  0 10235 0 10236                -*-1,,-*-2                                  GPLI0417
67542 -3 00002 0 04461          TXL    EQUAL,,2                                    GPLI0418
67543  0 10234 0 07335                PNAME,,-*-1                                 GPLI0419
67544  0 00000 0 10233                -*-1                EQUAL                   GPLI0420
67545  0 00000 0 10232                -*-1                                        GPLI0421
67546 +255064214377          OCT     255064214377                                GPLI0422
                        *                                                        GPLI0423
67547  0 10230 0 77777  )034          -1,,-*-1                                    GPLI0424
67550  0 10227 0 06733                SUBR,,-*-1                                  GPLI0425
67551  0 10225 0 10226                -*-1,,-*-2                                  GPLI0426
67552 -3 00001 0 02071          TXL    ERROR1,,1                                   GPLI0427
67553  0 10224 0 07335                PNAME,,-*-1                                 GPLI0428
67554  0 00000 0 10223                -*-1                ERROR                   GPLI0429
67555  0 00000 0 10222                -*-1                                        GPLI0430
67556 +255151465177          OCT     255151465177                                GPLI0431
                        *                                                        GPLI0432
67557  0 10220 0 77777  )PJ4       -1,,-*-1                                      GPLI0433
67560  0 10217 0 06733              SUBR,,-*-1                                    GPLI0434
67561  0 10215 0 10216              -*-1,,-*-2                                    GPLI0435
67562 -3 00000 0 12346          TXL  EROR1,,0                                     GPLI0436
67563  0 10214 0 07335              PNAME,,-*-1                                   GPLI0437
67564  0 00000 0 10213              -*-1              ERROR1                      GPLI0438
67565  0 00000 0 10212              -*-1                                          GPLI0439
67566  255151465101            BCD  1ERROR1                                      GPLI0440
                        *                                                        GPLI0441
67567  0 10210 0 77777  )PJ41         -1,,-*-1                                    GPLI0442
67570  0 10207 0 06733                SUBR,,-*-1                                  GPLI0443
67571  0 10205 0 10206                -*-1,,-*-2                                  GPLI0444
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67572 -3 00003 0 11560        TXL     ERRSET,,3                                GPLI0445
67573  0 10204 0 07335                PNAME,,-*-1                              GPLI0446
67574  0 00000 0 10203                -*-1              ERRORSET               GPLI0447
67575  0 10202 0 10201                -*-2,,-*-1                               GPLI0448
67576  0 00000 0 10200                -*-2                                     GPLI0449
67577  255151465162           BCI     1,ERRORS                                 GPLI0450
67600 +256377777777           OCT     256377777777                             GPLI0451
                      *                                                       GPLI0452
67601  0 10176 0 77777  )035          -1,,-*-1                                 GPLI0453
67602  0 10175 0 06733                SUBR,,-*-1                               GPLI0454
67603  0 10173 0 10174                -*-1,,-*-2                               GPLI0455
67604 -3 00002 0 15454        TXL     EVAL,,2                                  GPLI0456
67605  0 10172 0 07335                PNAME,,-*-1                              GPLI0457
67606  0 00000 0 10171                -*-1              EVAL                   GPLI0458
67607  0 00000 0 10170                -*-1                                     GPLI0459
67610 +256521437777           OCT     256521437777                             GPLI0460
                      *                                                       GPLI0461
67611  0 10166 0 77777  )036          -1,,-*-1                                 GPLI0462
67612  0 10165 0 06733                $SUBR,,-*-1                              GPLI0463
67613  0 10163 0 10164                -*-1,,-*-2                               GPLI0464
67614 -3 00002 0 15774        TXL     EVLIS,,2                                 GPLI0465
67615  0 10162 0 07335                $PNAME,,-*-1                             GPLI0466
67616  0 00000 0 10161                -*-1              EVLIS                  GPLI0467
67617  0 00000 0 10160                -*-1                                     GPLI0468
67620 +256543316277           OCT     256543316277                             GPLI0469
                      *                                                       GPLI0470
67621  0 10156 0 77777  )037          -1,,-*-1                                 GPLI0471
67622  0 10155 0 07335                PNAME,,-*-1                              GPLI0472
67623  0 00000 0 10154                -*-1              EXPR                   GPLI0473
67624  0 00000 0 10153                -*-1                                     GPLI0474
67625 +256747517777           OCT     256747517777                             GPLI0475
                      *                                                       GPLI0476
67626  0 10151 0 77777  )038          -1,,-*-1                                 GPLI0477
67627  0 10150 0 06733                SUBR,,-*-1                               GPLI0478
67630  0 10146 0 10147                -*-1,,-*-2                               GPLI0479
67631 -3 00002 0 13530        TXL     EXPT,,2                                  GPLI0480
67632  0 10145 0 07335                PNAME,,-*-1                              GPLI0481
67633  0 00000 0 10144                -*-1              EXPT                   GPLI0482
67634  0 00000 0 10143                -*-1                                     GPLI0483
67635 +256747637777           OCT     256747637777                             GPLI0484
                      *                                                       GPLI0485
67636  0 10141 0 77777  )040          -1,,-*-1                                 GPLI0486
67637  0 10140 0 07335                PNAME,,-*-1                              GPLI0487
67640  0 00000 0 10137                -*-1              FEXPR                  GPLI0488
67641  0 00000 0 10136                -*-1                                     GPLI0489
67642 +262567475177           OCT     262567475177                             GPLI0490
                      *                                                       GPLI0491
67643  0 10134 0 77777  )041          -1,,-*-1                                 GPLI0492
67644  0 10133 0 07335                PNAME,,-*-1                              GPLI0493
67645  0 00000 0 10132                -*-1              FIX                    GPLI0494
67646  0 00000 0 10131                -*-1                                     GPLI0495
67647 +263167777777           OCT     263167777777                             GPLI0496
                      *                                                       GPLI0497
67650  0 10127 0 77777  II11          -1,,-*-1                                 GPLI0498
67651  0 10126 0 06733                $SUBR,,-*-1                              GPLI0499
67652  0 10124 0 10125                -*-1,,-*-2                               GPLI0500
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67653 -3 00001 0 14466        TXL     FIXP,,1                                 GPLI0501
67654  0 10123 0 07335                $PNAME,,-*-1                            GPLI0502
67655  0 00000 0 10122                -*-1              FIXP                  GPLI0503
67656  0 00000 0 10121                -*-1                                    GPLI0504
67657 +263167477777           OCT     263167477777                            GPLI0505
                      *                                                       GPLI0506
67660  0 10117 0 77777  )042          -1,,-*-1                                GPLI0507
67661  0 10116 0 07335                PNAME,,-*-1                             GPLI0508
67662  0 00000 0 10115                -*-1              FLOAT                 GPLI0509
67663  0 00000 0 10114                -*-1                                    GPLI0510
67664 +264346216377           OCT     264346216377                            GPLI0511
                      *                                                       GPLI0512
67665  0 10112 0 77777  II12          -1,,-*-1                                GPLI0513
67666  0 10111 0 06733                $SUBR,,-*-1                             GPLI0514
67667  0 10107 0 10110                -*-1,,-*-2                              GPLI0515
67670 -3 00001 0 14453        TXL     FLOATP,,1                               GPLI0516
67671  0 10106 0 07335                $PNAME,,-*-1                            GPLI0517
67672  0 00000 0 10105                -*-1              FLOATP                GPLI0518
67673  0 00000 0 10104                -*-1                                    GPLI0519
67674  264346216347           BCI     1,FLOATP                                GPLI0520
                      *                                                       GPLI0521
67675  0 10102 0 77777  )043          -1,,-*-1                                GPLI0522
67676  0 10101 0 07335                PNAME,,-*-1                             GPLI0523
67677  0 00000 0 10100                -*-1              FSUBR                 GPLI0524
67700  0 00000 0 10077                -*-1                                    GPLI0525
67701 +266264225177           OCT     266264225177                            GPLI0526
                      *                                                       GPLI0527
67702  0 10075 0 77777  )044       -1,,-*-1                                   GPLI0528
67703  0 10074 0 07335             PNAME,,-*-1                                GPLI0529
67704  0 00000 0 10073             -*-1              FUNARG                   GPLI0530
67705  0 00000 0 10072             -*-1                                       GPLI0531
67706  266445215127           BCD 1FUNARG                                     GPLI0532
                      *                                                       GPLI0533
67707  0 10070 0 77777  )045          -1,,-*-1                                GPLI0534
67710  0 10067 0 10103                FSUBR,,-*-1                             GPLI0535
67711  0 10065 0 10066                -*-1,,-*-2                              GPLI0536
67712 -3 00000 0 15250        TXL     $LAMP,,0                                GPLI0537
67713  0 10064 0 07335                PNAME,,-*-1                             GPLI0538
67714  0 00000 0 10063                -*-1              FUNCTION              GPLI0539
67715  0 10061 0 10062                -*-1,,-*-2                              GPLI0540
67716  266445236331           BCD 1FUNCTI                                     GPLI0541
67717  0 00000 0 10060                -*-1                                    GPLI0542
67720 -064577777777           OCT     464577777777                            GPLI0543
                      *                                                       GPLI0544
67721  0 10056 0 77777  )046          -1,,-*-1                                GPLI0545
67722  0 10055 0 06733                $SUBR,,-*-1                             GPLI0546
67723  0 10053 0 10054                -*-1,,-*-2                              GPLI0547
67724 -3 00000 0 10174        TXL     GENSYM,,0                               GPLI0548
67725  0 10052 0 07335                $PNAME,,-*-1                            GPLI0549
67726  0 00000 0 10051                -*-1              GENSYM                GPLI0550
67727  0 00000 0 10050                -*-1                                    GPLI0551
67730  272545627044           BCD 1GENSYM                                     GPLI0552
                      *                                                       GPLI0553
67731  0 10046 0 77777  )231          -1,,-*-1                                GPLI0554
67732  0 10045 0 06733                SUBR,,-*-1                              GPLI0555
67733  0 10043 0 10044                -*-1,,-*-2                              GPLI0556
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67734 -3 00002 0 11771        TXL     C$GET,,2                                GPLI0557
67735  0 10042 0 07335                PNAME,,-*-1                             GPLI0558
67736  0 00000 0 10041                -*-1              GET                   GPLI0559
67737  0 00000 0 10040                -*-1                                    GPLI0560
67740 +272563777777           OCT     272563777777                            GPLI0561
                      *                                                       GPLI0562
67741  0 10036 0 77777  )047          -1,,-*-1                                GPLI0563
67742  0 10035 0 10103                $FSUBR,,-*-1                            GPLI0564
67743  0 10033 0 10034                -*-1,,-*-2                              GPLI0565
67744 -3 00001 0 16276        TXL     GOGOGO,,1                               GPLI0566
67745  0 10032 0 07335                PNAME,,-*-1                             GPLI0567
67746  0 00000 0 10031                -*-1              GO                    GPLI0568
67747  0 00000 0 10030                -*-1                                    GPLI0569
67750 +274677777777           OCT     274677777777                            GPLI0570
                      *                                                       GPLI0571
67751  0 10026 0 77777  II3          -1,,-*-1                                GPLI0572
67752  0 10025 0 06733                $SUBR,,-*-1                             GPLI0573
67753  0 10023 0 10024                -*-1,,-*-2                              GPLI0574
67754 -3 00002 0 14433        TXL     GRTRTP,,2                               GPLI0575
67755  0 10022 0 07335                $PNAME,,-*-1                            GPLI0576
67756  0 00000 0 10021                -*-1              GREATERP              GPLI0577
67757  0 10020 0 10017                -*-2,,-*-1                              GPLI0578
67760  0 00000 0 10016                -*-2                                    GPLI0579
67761  275125216325           BCI     1,GREATE                                GPLI0580
67762 -114777777777           OCT     514777777777                            GPLI0581
                      *                                                       GPLI0582
67763  0 10014 0 77777  )052          -1,,-*-1                                GPLI0583
67764  0 10013 0 06733                SUBR,,-*-1                              GPLI0584
67765  0 10011 0 10012                -*-1,,-*-2                              GPLI0585
67766 -3 00001 0 06420        TXL     INTRN1,,1                               GPLI0586
67767  0 10010 0 07335                PNAME,,-*-1                             GPLI0587
67770  0 00000 0 10007                -*-1              INTERN                GPLI0588
67771  0 00000 0 10006                -*-1                                    GPLI0589
67772  314563255145           BCD 1INTERN                                     GPLI0590
                      *                                                       GPLI0591
67773  0 10004 0 77777  )054          -1,,-*-1                                GPLI0592
67774  0 10003 0 10103                FSUBR,,-*-1                             GPLI0593
67775  0 10001 0 10002                -*-1,,-*-2                              GPLI0594
67776 -3 00000 0 15264        TXL     LABP,,0                                 GPLI0595
67777  0 10000 0 07335                PNAME,,-*-1                             GPLI0596
70000  0 00000 0 07777                -*-1              LABEL                 GPLI0597
70001  0 00000 0 07776                -*-1                                    GPLI0598
70002 -032122254377           OCT     432122254377                            GPLI0599
                      *                                                       GPLI0600
70003  0 07774 0 77777  )055          -1,,-*-1                                GPLI0601
70004  0 07773 0 07335                PNAME,,-*-1                             GPLI0602
70005  0 00000 0 07772                -*-1              LAMBDA                GPLI0603
70006  0 00000 0 07771                -*-1                                    GPLI0604
70007  432144222421           BCD 1LAMBDA                                     GPLI0605
                      *                                                       GPLI0606
70010  0 07767 0 77777  )LAP          -1,,-*-1                                GPLI0607
70011  0 07766 0 06733                SUBR,,-*-1                              GPLI0608
70012  0 07764 0 07765                -*-1,,-*-2                              GPLI0609
70013 -3 00002 0 16321        TXL     C$LAP,,2                                GPLI0610
70014  0 07763 0 07335                PNAME,,-*-1                             GPLI0611
70015  0 00000 0 07762                -*-1              LAP                   GPLI0612
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70016  0 00000 0 07761                -*-1                                    GPLI0613
70017 -032147777777           OCT     432147777777                            GPLI0614
                       *                                                      GPLI0615
70020  0 07757 0 77777  PVV1           -1,,-*-1                                GPLI0616
70021  0 07756 0 06733                SUBR,,-*-1                              GPLI0617
70022  0 07754 0 07755                -*-1,,-*-2                              GPLI0618
70023 -3 00002 0 12760         TXL     LSHIFT,,2                               GPLI0619
70024  0 07753 0 07335                PNAME,,-*-1                             GPLI0620
70025  0 00000 0 07752                -*-1              LEFTSHIFT             GPLI0621
70026  0 07751 0 07750                -*-2,,-*-1                              GPLI0622
70027  0 00000 0 07747                -*-2                                    GPLI0623
70030  432526636230           BCI     1,LEFTSH                                GPLI0624
70031 +312663777777           OCT     312663777777                            GPLI0625
                       *                                                      GPLI0626
70032  0 07745 0 77777  II4            -1,,-*-1                                GPLI0627
70033  0 07744 0 06733                $SUBR,,-*-1                             GPLI0628
70034  0 07742 0 07743                -*-1,,-*-2                              GPLI0629
70035 -3 00002 0 14443         TXL     LESSTP,,2                               GPLI0630
70036  0 07741 0 07335                $PNAME,,-*-1                            GPLI0631
70037  0 00000 0 07740                -*-1              LESSP                 GPLI0632
70040  0 00000 0 07737                -*-1                                    GPLI0633
70041 -032562624777           OCT     432562624777                            GPLI0634
                       *                                                      GPLI0635
70042  0 07735 0 77777  )057           -1,,-*-1                                GPLI0636
70043  0 07734 0 10103                FSUBR,,-*-1                             GPLI0637
70044  0 07732 0 07733                -*-1,,-*-2                              GPLI0638
70045 -3 00000 0 15774         TXL     EVLIS,,0                                GPLI0639
70046  0 07731 0 07335                PNAME,,-*-1                             GPLI0640
70047  0 00000 0 07730                -*-1              LIST                  GPLI0641
70050  0 00000 0 07727                -*-1                                    GPLI0642
70051 -033162637777           OCT     433162637777                            GPLI0643
                       *                                                      GPLI0644
70052  0 07725 0 77777  )PJ17          -1,,-*-1                                GPLI0645
70053  0 07724 0 06733                SUBR,,-*-1                              GPLI0646
70054  0 07722 0 07723                -*-1,,-*-2                              GPLI0647
70055 -3 00001 0 12321         TXL     LITER,,1                                GPLI0648
70056  0 07721 0 07335                PNAME,,-*-1                             GPLI0649
70057  0 00000 0 07720                -*-1              LITER                 GPLI0650
70060  0 00000 0 07717                -*-1                                    GPLI0651
70061 -033163255177           OCT     433163255177                            GPLI0652
                       *                                                      GPLI0653
70062  0 07715 0 77777  )234A          -1,,-*-1                                GPLI0654
70063  0 07714 0 06733                SUBR,,-*-1                              GPLI0655
70064  0 07712 0 07713                -*-1,,-*-2                              GPLI0656
70065 -3 00000 0 77724         TXL     LOADER,,0                               GPLI0657
70066  0 07711 0 07335                PNAME,,-*-1                             GPLI0658
70067  0 00000 0 07710                -*-1              LOAD                  GPLI0659
70070  0 00000 0 07707                -*-1                                    GPLI0660
70071 -034621247777           OCT     434621247777                            GPLI0661
                       *                                                      GPLI0662
70072  0 07705 0 77777  )PJ37          -1,,-*-1                                GPLI0663
70073  0 07704 0 10103                FSUBR,,-*-1                             GPLI0664
70074  0 07702 0 07703                -*-1,,-*-2                              GPLI0665
70075 -3 00000 0 12676         TXL     LOGAND,,0                               GPLI0666
70076  0 07701 0 07335                PNAME,,-*-1                             GPLI0667
70077  0 00000 0 07700                -*-1              LOGAND                GPLI0668
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70100  0 00000 0 07677                -*-1                                    GPLI0669
70101  434627214524           BCI     1,LOGAND                                GPLI0670
                      *                                                       GPLI0671
70102  0 07675 0 77777  )PJ36          -1,,-*-1                                GPLI0672
70103  0 07674 0 10103                FSUBR,,-*-1                             GPLI0673
70104  0 07672 0 07673                -*-1,,-*-2                              GPLI0674
70105 -3 00000 0 12662         TXL     LOGOR,,0                                GPLI0675
70106  0 07671 0 07335                PNAME,,-*-1                             GPLI0676
70107  0 00000 0 07670                -*-1              LOGOR                 GPLI0677
70110  0 00000 0 07667                -*-1                                    GPLI0678
70111 -034627465177            OCT     434627465177                            GPLI0679
                      *                                                       GPLI0680
70112  0 07665 0 77777  )PJ38          -1,,-*-1                                GPLI0681
70113  0 07664 0 10103                FSUBR,,-*-1                             GPLI0682
70114  0 07662 0 07663                -*-1,,-*-2                              GPLI0683
70115 -3 00000 0 12712         TXL     LOGXOR,,0                               GPLI0684
70116  0 07661 0 07335                PNAME,,-*-1                             GPLI0685
70117  0 00000 0 07660                -*-1              LOGXOR                GPLI0686
70120  0 00000 0 07657                -*-1                                    GPLI0687
70121  434627674651           BCI     1,LOGXOR                                GPLI0688
                      *                                                       GPLI0689
70122  0 07655 0 77777  )PJ7           -1,,-*-1                                GPLI0690
70123  0 07654 0 07335                PNAME,,-*-1                             GPLI0691
70124  0 07651 0 07653                -*-1,,-*-3        LPAR                  GPLI0692
70125  0 00000 0 07652                -*-1                                    GPLI0693
70126 -034721517777            OCT     434721517777                            GPLI0694
70127  0 07650 0 10742                APVAL1,,-*-1                            GPLI0695
70130  0 00000 0 07647                -*-1                                    GPLI0696
70131  0 00000 0 06223                H74                                     GPLI0697
                      *                                                       GPLI0698
70132  0 07645 0 77777  )065           -1,,-*-1                                GPLI0699
70133  0 07644 0 06733                SUBR,,-*-1                              GPLI0700
70134  0 07642 0 07643                -*-1,,-*-2                              GPLI0701
70135 -3 00002 0 07620         TXL     MAPCAR,,2                               GPLI0702
70136  0 07641 0 07335                PNAME,,-*-1                             GPLI0703
70137  0 00000 0 07640                -*-1              MAP                   GPLI0704
70140  0 00000 0 07637                -*-1                                    GPLI0705
70141 -042147777777            OCT     442147777777                            GPLI0706
                      *                                                       GPLI0707
70142  0 07635 0 77777  )069B          -1,,-*-1                                GPLI0708
70143  0 07634 0 06733                SUBR,,-*-1                              GPLI0709
70144  0 07632 0 07633                -*-1,,-*-2                              GPLI0710
70145 -3 00002 0 07645         TXL     MAPCON,,2                               GPLI0711
70146  0 07631 0 07335                PNAME,,-*-1                             GPLI0712
70147  0 00000 0 07630                -*-1              MAPCON                GPLI0713
70150  0 00000 0 07627                -*-1                                    GPLI0714
70151  442147234645            BCD 1MAPCON                                     GPLI0715
                      *                                                       GPLI0716
70152  0 07625 0 77777  )069A          -1,,-*-1                                GPLI0717
70153  0 07624 0 06733                SUBR,,-*-1                              GPLI0718
70154  0 07622 0 07623                -*-1,,-*-2                              GPLI0719
70155 -3 00002 0 04214         TXL     MAPLIS,,2                               GPLI0720
70156  0 07621 0 07335                PNAME,,-*-1                             GPLI0721
70157  0 00000 0 07620                -*-1              MAPLIST               GPLI0722
70160  0 07617 0 07616                -*-2,,-*-1                              GPLI0723
70161  0 00000 0 07615                -*-2                                    GPLI0724
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70162  442147433162           BCD 1MAPLIS                                  GPLI0725
70163 -237777777777           OCT     637777777777                         GPLI0726
                      *                                                    GPLI0727
70164  0 07613 0 77777  II7           -1,,-*-1                             GPLI0728
70165  0 07612 0 10103                $FSUBR,,-*-1                         GPLI0729
70166  0 07610 0 07611                -*-1,,-*-2                           GPLI0730
70167 -3 00002 0 14150         TXL     MAX,,2                               GPLI0731
70170  0 07607 0 07335                $PNAME,,-*-1                         GPLI0732
70171  0 00000 0 07606                -*-1              MAX                GPLI0733
70172  0 00000 0 07605                -*-1                                 GPLI0734
70173 -042167777777           OCT     442167777777                         GPLI0735
                      *                                                    GPLI0736
70174  0 07603 0 77777  II8           -1,,-*-1                             GPLI0737
70175  0 07602 0 10103                $FSUBR,,-*-1                         GPLI0738
70176  0 07600 0 07601                -*-1,,-*-2                           GPLI0739
70177 -3 00002 0 14142         TXL     MIN,,2                               GPLI0740
70200  0 07577 0 07335                $PNAME,,-*-1                         GPLI0741
70201  0 00000 0 07576                -*-1              MIN                GPLI0742
70202  0 00000 0 07575                -*-1                                 GPLI0743
70203 -043145777777           OCT     443145777777                         GPLI0744
                      *                                                    GPLI0745
70204  0 07573 0 77777  )070          -1,,-*-1                             GPLI0746
70205  0 07572 0 06733                $SUBR,,-*-1                          GPLI0747
70206  0 07570 0 07571                -*-1,,-*-2                           GPLI0748
70207 -3 00001 0 14624         TXL     MNSPRG,,1                            GPLI0749
70210  0 07567 0 07335                $PNAME,,-*-1                         GPLI0750
70211  0 00000 0 07566                -*-1              MINUS              GPLI0751
70212  0 00000 0 07565                -*-1                                 GPLI0752
70213 -043145646277           OCT     443145646277                         GPLI0753
                      *                                                    GPLI0754
70214  0 07563 0 77777  II16          -1,,-*-1                             GPLI0755
70215  0 07562 0 06733                $SUBR,,-*-1                          GPLI0756
70216  0 07560 0 07561                -*-1,,-*-2                           GPLI0757
70217 -3 00001 0 14500         TXL     MINUSP,,1                            GPLI0758
70220  0 07557 0 07335                $PNAME,,-*-1                         GPLI0759
70221  0 00000 0 07556                -*-1              MINUSP             GPLI0760
70222  0 00000 0 07555                -*-1                                 GPLI0761
70223  443145646247           BCI     1,MINUSP                             GPLI0762
                      *                                                    GPLI0763
70224  0 07553 0 77777  )PJ26         -1,,-*-1                             GPLI0764
70225  0 07552 0 06733                SUBR,,-*-1                           GPLI0765
70226  0 07550 0 07551                -*-1,,-*-2                           GPLI0766
70227 -3 00000 0 12147         TXL     MKNAM,,0                             GPLI0767
70230  0 07547 0 07335                PNAME,,-*-1                          GPLI0768
70231  0 00000 0 07546                -*-1              MKNAM              GPLI0769
70232  0 00000 0 07545                -*-1                                 GPLI0770
70233 -044245214477           OCT     444245214477                         GPLI0771
                      *                                                    GPLI0772
70234  0 07543 0 77777  )071          -1,,-*-1                             GPLI0773
70235  0 07542 0 06733                SUBR,,-*-1                           GPLI0774
70236  0 07540 0 07541                -*-1,,-*-2                           GPLI0775
70237 -3 00002 0 07675         TXL     NCONC,,2                             GPLI0776
70240  0 07537 0 07335                PNAME,,-*-1                          GPLI0777
70241  0 00000 0 07536                -*-1              NCONC              GPLI0778
70242  0 00000 0 07535                -*-1                                 GPLI0779
70243 -052346452377           OCT     452346452377                         GPLI0780
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                        *                                                       GPLI0781
70244  0 07533 0 77777  )074          -1,,-*-1                                 GPLI0782
70245  0 07532 0 06733                 $SUBR,,-*-1                              GPLI0783
70246  0 07530 0 07531                 -*-1,,-*-2                               GPLI0784
70247 -3 00001 0 10150         TXL      NOTS,,1                                  GPLI0785
70250  0 07527 0 07335                 $PNAME,,-*-1                             GPLI0786
70251  0 00000 0 07526                 -*-1               NOT                   GPLI0787
70252  0 00000 0 07525                 -*-1                                     GPLI0788
70253 -054663777777            OCT      454663777777                             GPLI0789
                        *                                                       GPLI0790
70254  0 07523 0 77777  )075          -1,,-*-1                                 GPLI0791
70255  0 07522 0 06733                 SUBR,,-*-1                               GPLI0792
70256  0 07520 0 07521                 -*-1,,-*-2                               GPLI0793
70257 -3 00001 0 15243         TXL      NULLP,,1                                 GPLI0794
70260  0 07517 0 07335                 PNAME,,-*-1                              GPLI0795
70261  0 00000 0 07516                 -*-1               NULL                  GPLI0796
70262  0 00000 0 07515                 -*-1                                     GPLI0797
70263 -056443437777            OCT      456443437777                             GPLI0798
                        *                                                       GPLI0799
70264  0 07513 0 77777  II13           -1,,-*-1                                 GPLI0800
70265  0 07512 0 06733                 $SUBR,,-*-1                              GPLI0801
70266  0 07510 0 07511                 -*-1,,-*-2                               GPLI0802
70267 -3 00001 0 14445         TXL      NUMBRP,,1                                GPLI0803
70270  0 07507 0 07335                 $PNAME,,-*-1                             GPLI0804
70271  0 00000 0 07506                 -*-1               NUMBERP               GPLI0805
70272  0 07505 0 07504                 -*-2,,-*-1                               GPLI0806
70273  0 00000 0 07503                 -*-2                                     GPLI0807
70274  456444222551            BCI      1,NUMBER                                 GPLI0808
70275 -077777777777            OCT      477777777777                             GPLI0809
                        *                                                       GPLI0810
70276  0 07501 0 77777  )PJ25          -1,,-*-1                                 GPLI0811
70277  0 07500 0 06733                 SUBR,,-*-1                               GPLI0812
70300  0 07476 0 07477                 -*-1,,-*-2                               GPLI0813
70301 -3 00000 0 12071         TXL      NUMOB,,0                                 GPLI0814
70302  0 07475 0 07335                 PNAME,,-*-1                              GPLI0815
70303  0 00000 0 07474                 -*-1               NUMOB                 GPLI0816
70304  0 00000 0 07473                 -*-1                                     GPLI0817
70305 -056444462277            OCT      456444462277                             GPLI0818
                        *                                                       GPLI0819
70306  0 07471 0 77777  )079A          -1,,-*-1                                 GPLI0820
70307  0 07470 0 10742                 APVAL1,,-*-1                             GPLI0821
70310  0 07466 0 07467                 -*-1,,-*-2                               GPLI0822
70311  0 00000 0 11351                 -OBLIST                                  GPLI0823
70312  0 07465 0 07335                 PNAME,,-*-1                              GPLI0824
70313  0 00000 0 07464                 -*-1               OBLIST                GPLI0825
70314  0 00000 0 07463                 -*-1                                     GPLI0826
70315  462243316263            BCD 1OBLIST                                      GPLI0827
                        *                                                       GPLI0828
70316  0 07461 0 77777  )PJ28          -1,,-*-1                                 GPLI0829
70317  0 07460 0 07335                 PNAME,,-*-1                              GPLI0830
70320  0 00000 0 07457                 -*-1               OCTAL                 GPLI0831
70321  0 00000 0 07456                 -*-1                                     GPLI0832
70322 -062363214377            OCT      462363214377                             GPLI0833
                        *                                                       GPLI0834
70323  0 07454 0 77777  II9            -1,,-*-1                                 GPLI0835
70324  0 07453 0 06733                 $SUBR,,-*-1                              GPLI0836
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70325  0 07451 0 07452                -*-1,,-*-2                                GPLI0837
70326 -3 00001 0 14533        TXL     ONEP,,1                                   GPLI0838
70327  0 07450 0 07335                $PNAME,,-*-1                              GPLI0839
70330  0 00000 0 07447                -*-1               ONEP                   GPLI0840
70331  0 00000 0 07446                -*-1                                      GPLI0841
70332 -064525477777           OCT     464525477777                              GPLI0842
                      *                                                        GPLI0843
70333  0 07444 0 77777  )PJ18          -1,,-*-1                                  GPLI0844
70334  0 07443 0 06733                SUBR,,-*-1                                GPLI0845
70335  0 07441 0 07442                -*-1,,-*-2                                GPLI0846
70336 -3 00001 0 12333        TXL     OPCHAR,,1                                 GPLI0847
70337  0 07440 0 07335                PNAME,,-*-1                               GPLI0848
70340  0 00000 0 07437                -*-1               OPCHAR                 GPLI0849
70341  0 00000 0 07436                -*-1                                      GPLI0850
70342  464723302151           BCD 1OPCHAR                                       GPLI0851
                      *                                                        GPLI0852
70343  0 07434 0 77777  )079           -1,,-*-1                                  GPLI0853
70344  0 07433 0 10103                FSUBR,,-*-1                               GPLI0854
70345  0 07431 0 07432                -*-1,,-*-2                                GPLI0855
70346 -3 00000 0 15416        TXL     $EVOR,,0                                  GPLI0856
70347  0 07430 0 07335                $PNAME,,-*-1                              GPLI0857
70350  0 00000 0 07427                -*-1               OR                     GPLI0858
70351  0 00000 0 07426                -*-1                                      GPLI0859
70352 -065177777777           OCT     465177777777                              GPLI0860
                      *                                                        GPLI0861
70353  0 07424 0 77777  )PJ24          -1,,-*-1                                  GPLI0862
70354  0 07423 0 06733                SUBR,,-*-1                                GPLI0863
70355  0 07421 0 07422                -*-1,,-*-2                                GPLI0864
70356 -3 00001 0 12032        TXL     PACK,,1                                   GPLI0865
70357  0 07420 0 07335                PNAME,,-*-1                               GPLI0866
70360  0 00000 0 07417                -*-1               PACK                   GPLI0867
70361  0 00000 0 07416                -*-1                                      GPLI0868
70362 -072123427777           OCT     472123427777                              GPLI0869
                      *                                                        GPLI0870
70363  0 07414 0 77777  )080           -1,,-*-1                                  GPLI0871
70364  0 07413 0 06733                SUBR,,-*-1                                GPLI0872
70365  0 07411 0 07412                -*-1,,-*-2                                GPLI0873
70366 -3 00002 0 07562        TXL     PAIR,,2                                   GPLI0874
70367  0 07410 0 07335                PNAME,,-*-1                               GPLI0875
70370  0 00000 0 07407                -*-1               PAIR                   GPLI0876
70371  0 00000 0 07406                -*-1                                      GPLI0877
70372 -072131517777           OCT     472131517777                              GPLI0878
                      *                                                        GPLI0879
70373  0 07404 0 77777  )234C          -1,,-*-1                                  GPLI0880
70374  0 07403 0 06733                SUBR,,-*-1                                GPLI0881
70375  0 07401 0 07402                -*-1,,-*-2                                GPLI0882
70376 -3 00000 0 01554        TXL     PAUSEF,,0                                 GPLI0883
70377  0 07400 0 07335                PNAME,,-*-1                               GPLI0884
70400  0 00000 0 07377                -*-1               PAUSE                  GPLI0885
70401  0 00000 0 07376                -*-1                                      GPLI0886
70402 -072164622577           OCT     472164622577                              GPLI0887
                      *                                                        GPLI0888
70403  0 07374 0 77777  )PJ9           -1,,-*-1                                  GPLI0889
70404  0 07373 0 07335                PNAME,,-*-1                               GPLI0890
70405  0 07370 0 07372                -*-1,,-*-3         PERIOD                 GPLI0891
70406  0 00000 0 07371                -*-1                                      GPLI0892
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70407  472551314624           BCD 1PERIOD                                  GPLI0893
70410  0 07367 0 10742               APVAL1,,-*-1                         GPLI0894
70411  0 00000 0 07366               -*-1                                 GPLI0895
70412  0 00000 0 06162               H33                                  GPLI0896
                      *                                                   GPLI0897
70413  0 07364 0 77777  )234B        -1,,-*-1                             GPLI0898
70414  0 07363 0 06733               SUBR,,-*-1                           GPLI0899
70415  0 07361 0 07362               -*-1,,-*-2                           GPLI0900
70416 -3 00000 0 01371        TXL     PSHLDB,,0                            GPLI0901
70417  0 07360 0 07335               PNAME,,-*-1                          GPLI0902
70420  0 00000 0 07357               -*-1              PLB                GPLI0903
70421  0 00000 0 07356               -*-1                                 GPLI0904
70422 -074322777777           OCT     474322777777                         GPLI0905
                      *                                                   GPLI0906
70423  0 07354 0 77777  )081        -1,,-*-1                             GPLI0907
70424  0 07353 0 10103               $FSUBR,,-*-1                         GPLI0908
70425  0 07351 0 07352               -*-1,,-*-2                           GPLI0909
70426 -3 00002 0 14126        TXL     ADDP,,2                              GPLI0910
70427  0 07350 0 07335               $PNAME,,-*-1                         GPLI0911
70430  0 00000 0 07347               -*-1              PLUS               GPLI0912
70431  0 00000 0 07346               -*-1                                 GPLI0913
70432 -074364627777           OCT     474364627777                         GPLI0914
                      *                                                   GPLI0915
70433  0 07344 0 77777  )PJ11        -1,,-*-1                             GPLI0916
70434  0 07343 0 07335               PNAME,,-*-1                          GPLI0917
70435  0 07340 0 07342               -*-1,,-*-3        PLUSS              GPLI0918
70436  0 00000 0 07341               -*-1                                 GPLI0919
70437 -074364626277           OCT     474364626277                         GPLI0920
70440  0 07337 0 10742               APVAL1,,-*-1                         GPLI0921
70441  0 00000 0 07336               -*-1                                 GPLI0922
70442  0 00000 0 06147               H20                                  GPLI0923
                      *                                                   GPLI0924
70443  0 07334 0 77777  )083        -1,,-*-1                             GPLI0925
70444  0 07333 0 07335               PNAME,,-*-1                          GPLI0926
70445  0 00000 0 07332               -*-1              PNAME              GPLI0927
70446  0 00000 0 07331               -*-1                                 GPLI0928
70447 -074521442577           OCT     474521442577                         GPLI0929
                      *                                                   GPLI0930
70450  0 07327 0 77777  )PJ33        -1,,-*-1                             GPLI0931
70451  0 07326 0 06733               SUBR,,-*-1                           GPLI0932
70452  0 07324 0 07325               -*-1,,-*-2                           GPLI0933
70453 -3 00001 0 04703        TXL     $PRIN1,,1                            GPLI0934
70454  0 07323 0 07335               PNAME,,-*-1                          GPLI0935
70455  0 00000 0 07322               -*-1              PRIN1              GPLI0936
70456  0 00000 0 07321               -*-1                                 GPLI0937
70457 -075131450177           OCT     475131450177                         GPLI0938
                      *                                                   GPLI0939
70460  0 07317 0 77777  )087        -1,,-*-1                             GPLI0940
70461  0 07316 0 06733               SUBR,,-*-1                           GPLI0941
70462  0 07314 0 07315               -*-1,,-*-2                           GPLI0942
70463 -3 00001 0 04604        TXL     PRINT,,1                             GPLI0943
70464  0 07313 0 07335               PNAME,,-*-1                          GPLI0944
70465  0 00000 0 07312               -*-1              PRINT              GPLI0945
70466  0 00000 0 07311               -*-1                                 GPLI0946
70467 -075131456377           OCT     475131456377                         GPLI0947
                      *                                                   GPLI0948
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70470  0 07307 0 77777  )PJ39          -1,,-*-1                                  GPLI0949
70471  0 07306 0 06733                 SUBR,,-*-1                                GPLI0950
70472  0 07304 0 07305                 -*-1,,-*-2                                GPLI0951
70473 -3 00001 0 05104         TXL      PRINT2,,1                                 GPLI0952
70474  0 07303 0 07335                 PNAME,,-*-1                               GPLI0953
70475  0 00000 0 07302                 -*-1                PRINT2                GPLI0954
70476  0 00000 0 07301                 -*-1                                      GPLI0955
70477  475131456302            BCI     1,PRINT2                                  GPLI0956
                        *                                                        GPLI0957
70500  0 07277 0 77777  )089           -1,,-*-1                                  GPLI0958
70501  0 07276 0 10103                 FSUBR,,-*-1                               GPLI0959
70502  0 07274 0 07275                 -*-1,,-*-2                                GPLI0960
70503 -3 00000 0 16130         TXL      INTER,,0                                  GPLI0961
70504  0 07273 0 07335                 PNAME,,-*-1                               GPLI0962
70505  0 00000 0 07272                 -*-1                PROG                  GPLI0963
70506  0 00000 0 07271                 -*-1                                      GPLI0964
70507 -075146277777            OCT     475146277777                              GPLI0965
                        *                                                        GPLI0966
70510  0 07267 0 77777  IJ05           -1,,-*-1                                  GPLI0967
70511  0 07266 0 06733                 $SUBR,,-*-1                               GPLI0968
70512  0 07264 0 07265                 -*-1,,-*-2                                GPLI0969
70513 -3 00001 0 05325         TXL      $PUNCH,,1                                 GPLI0970
70514  0 07263 0 07335                 $PNAME,,-*-1                              GPLI0971
70515  0 00000 0 07262                 -*-1                PUNCH                 GPLI0972
70516  0 00000 0 07261                 -*-1                                      GPLI0973
70517 -076445233077            OCT     476445233077                              GPLI0974
                        *                                                        GPLI0975
70520  0 07257 0 77777  )090           -1,,-*-1                                  GPLI0976
70521  0 07256 0 06733                 SUBR,,-*-1                                GPLI0977
70522  0 07254 0 07255                 -*-1,,-*-2                                GPLI0978
70523 -3 00003 0 10011         TXL      APROP,,3                                  GPLI0979
70524  0 07253 0 07335                 PNAME,,-*-1                               GPLI0980
70525  0 00000 0 07252                 -*-1                PROP                  GPLI0981
70526  0 00000 0 07251                 -*-1                                      GPLI0982
70527 -075146477777            OCT     475146477777                              GPLI0983
                        *                                                        GPLI0984
70530  0 07247 0 77777  )094           -1,,-*-1                                  GPLI0985
70531  0 07246 0 10103                 FSUBR,,-*-1                               GPLI0986
70532  0 07244 0 07245                 -*-1,,-*-2                                GPLI0987
70533 -3 00000 0 15212         TXL      CARP,,0                                   GPLI0988
70534  0 07243 0 07335                 PNAME,,-*-1                               GPLI0989
70535  0 00000 0 07242                 -*-1                QUOTE                 GPLI0990
70536  0 00000 0 07241                 -*-1                                      GPLI0991
70537 -106446632577            OCT     506446632577                              GPLI0992
                        *                                                        GPLI0993
70540  0 07237 0 77777  IJ03           -1,,-*-1                                  GPLI0994
70541  0 07236 0 06733                 $SUBR,,-*-1                               GPLI0995
70542  0 07234 0 07235                 -*-1,,-*-2                                GPLI0996
70543 -3 00002 0 13427         TXL      QUOTEN,,2                                 GPLI0997
70544  0 07233 0 07335                 $PNAME,,-*-1                              GPLI0998
70545  0 00000 0 07232                 -*-1                QUOTIENT              GPLI0999
70546  0 07231 0 07230                 -*-2,,-*-1                                GPLI1000
70547  0 00000 0 07227                 -*-2                                      GPLI1001
70550  506446633125            BCI     1,QUOTIE                                  GPLI1002
70551 -056377777777            OCT     456377777777                              GPLI1003
                        *                                                        GPLI1004
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70552  0 07225 0 77777  )096          -1,,-*-1                                  GPLI1005
70553  0 07224 0 06733                SUBR,,-*-1                                GPLI1006
70554  0 07222 0 07223                -*-1,,-*-2                                GPLI1007
70555 -3 00000 0 05732        TXL     READ,,0                                   GPLI1008
70556  0 07221 0 07335                PNAME,,-*-1                               GPLI1009
70557  0 00000 0 07220                -*-1              READ                    GPLI1010
70560  0 00000 0 07217                -*-1                                      GPLI1011
70561 -112521247777           OCT     512521247777                              GPLI1012
                      *                                                        GPLI1013
70562  0 07215 0 77777  II18          -1,,-*-1                                  GPLI1014
70563  0 07214 0 06733                $SUBR,,-*-1                               GPLI1015
70564  0 07212 0 07213                -*-1,,-*-2                                GPLI1016
70565 -3 00001 0 14633        TXL     RCPPRG,,1                                 GPLI1017
70566  0 07211 0 07335                $PNAME,,-*-1                              GPLI1018
70567  0 00000 0 07210                -*-1              RECIP                   GPLI1019
70570  0 00000 0 07207                -*-1                                      GPLI1020
70571 -112523314777           OCT     512523314777                              GPLI1021
                      *                                                        GPLI1022
70572  0 07205 0 77777  )234D          -1,,-*-1                                  GPLI1023
70573  0 07204 0 06733                SUBR,,-*-1                                GPLI1024
70574  0 07202 0 07203                -*-1,,-*-2                                GPLI1025
70575 -3 00000 0 02522        TXL     RECLAM,,0                                 GPLI1026
70576  0 07201 0 07335                PNAME,,-*-1                               GPLI1027
70577  0 00000 0 07200                -*-1              RECLAIM                 GPLI1028
70600  0 07177 0 07176                -*-2,,-*-1                                GPLI1029
70601  0 00000 0 07175                -*-2                                      GPLI1030
70602  512523432131           BCI     1,RECLAI                                  GPLI1031
70603 -047777777777           OCT     447777777777                              GPLI1032
                      *                                                        GPLI1033
70604  0 07173 0 77777  IJ04          -1,,-*-1                                  GPLI1034
70605  0 07172 0 06733                $SUBR,,-*-1                               GPLI1035
70606  0 07170 0 07171                -*-1,,-*-2                                GPLI1036
70607 -3 00002 0 13423        TXL     REMAIN,,2                                 GPLI1037
70610  0 07167 0 07335                $PNAME,,-*-1                              GPLI1038
70611  0 00000 0 07166                -*-1              REMAINDER               GPLI1039
70612  0 07165 0 07164                -*-2,,-*-1                                GPLI1040
70613  0 00000 0 07163                -*-2                                      GPLI1041
70614  512544213145           BCI     1,REMAIN                                  GPLI1042
70615 +242551777777           OCT     242551777777                              GPLI1043
                      *                                                        GPLI1044
70616  0 07161 0 77777  )250          -1,,-*-1                                  GPLI1045
70617  0 07160 0 06733                SUBR,,-*-1                                GPLI1046
70620  0 07156 0 07157                -*-1,,-*-2                                GPLI1047
70621 -3 00002 0 07714        TXL     REMPRP,,2                                 GPLI1048
70622  0 07155 0 07335                PNAME,,-*-1                               GPLI1049
70623  0 00000 0 07154                -*-1              REMPROP                 GPLI1050
70624  0 07152 0 07153                -*-2,,-*-2                                GPLI1051
70625  512544475146           BCD 1REMPRO                                       GPLI1052
70626  0 00000 0 07151                -*-1                                      GPLI1053
70627 -077777777777           OCT     477777777777                              GPLI1054
                      *                                                        GPLI1055
70630  0 07147 0 77777  )102          -1,,-*-1                                  GPLI1056
70631  0 07146 0 06733                $SUBR,,-*-1                               GPLI1057
70632  0 07144 0 07145                -*-1,,-*-2                                GPLI1058
70633 -3 00001 0 16272        TXL     RETURN,,1                                 GPLI1059
70634  0 07143 0 07335                $PNAME,,-*-1                              GPLI1060
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70635  0 00000 0 07142                -*-1              RETURN                    GPLI1061
70636  0 00000 0 07141                -*-1                                        GPLI1062
70637  512563645145           BCD 1RETURN                                         GPLI1063
                         *                                                       GPLI1064
70640  0 07137 0 77777  )100          -1,,-*-1                                    GPLI1065
70641  0 07136 0 06733                SUBR,,-*-1                                  GPLI1066
70642  0 07134 0 07135                -*-1,,-*-2                                  GPLI1067
70643 -3 00000 0 10155         TXL     RPLACA,,0                                  GPLI1068
70644  0 07133 0 07335                PNAME,,-*-1                                 GPLI1069
70645  0 00000 0 07132                -*-1              RPLACA                    GPLI1070
70646  0 00000 0 07131                -*-1                                        GPLI1071
70647  514743212321           BCD 1RPLACA                                         GPLI1072
                         *                                                       GPLI1073
70650  0 07127 0 77777  )101          -1,,-*-1                                    GPLI1074
70651  0 07126 0 06733                SUBR,,-*-1                                  GPLI1075
70652  0 07124 0 07125                -*-1,,-*-2                                  GPLI1076
70653 -3 00000 0 10164         TXL     RPLACD,,0                                  GPLI1077
70654  0 07123 0 07335                PNAME,,-*-1                                 GPLI1078
70655  0 00000 0 07122                -*-1              RPLACD                    GPLI1079
70656  0 00000 0 07121                -*-1                                        GPLI1080
70657  514743212324           BCD 1RPLACD                                         GPLI1081
                         *                                                       GPLI1082
70660  0 07117 0 77777  )PJ8          -1,,-*-1                                    GPLI1083
70661  0 07116 0 07335                PNAME,,-*-1                                 GPLI1084
70662  0 07113 0 07115                -*-1,,-*-3        RPAR                      GPLI1085
70663  0 00000 0 07114                -*-1                                        GPLI1086
70664 -114721517777            OCT     514721517777                             GPLI1087
70665  0 07112 0 10742                APVAL1,,-*-1                                GPLI1088
70666  0 00000 0 07111                -*-1                                        GPLI1089
70667  0 00000 0 06163                H34                                         GPLI1090
                         *                                                       GPLI1091
70670  0 07107 0 77777  )SPCL         -1,,-*-1                                    GPLI1092
70671  0 07106 0 07335                PNAME,,-*-1                                 GPLI1093
70672  0 00000 0 07105                -*-1              SPECIAL                   GPLI1094
70673  0 07103 0 07104                -*-1,,-*-2                                  GPLI1095
70674  624725233121            BCI     1,SPECIA                                   GPLI1096
70675  0 00000 0 07102                -*-1                                        GPLI1097
70676  437777777777            VFD     H6/L,O30/7777777777                        GPLI1098
                         *                                                       GPLI1099
70677  0 07100 0 77777  )MOV          -1,,-*-1                                    GPLI1100
70700  0 07077 0 07335                PNAME,,-*-1                                 GPLI1101
70701  0 07074 0 07076                -*-1,,-*-3        *MOVE                     GPLI1102
70702  0 00000 0 07075                -*-1                                        GPLI1103
70703  544446652577            VFD     H30/*MOVE,O6/77                            GPLI1104
70704  0 07073 0 06706                SYM,,-*-1                                   GPLI1105
70705 -0 00000 0 61255         MZE     -C$MOV                                     GPLI1106
                         *                                                       GPLI1107
70706  0 07071 0 77777  )RTRN         -1,,-*-1                                    GPLI1108
70707  0 07070 0 07335                PNAME,,-*-1                                 GPLI1109
70710  0 07063 0 07067                -*-1,,-*-5        *RETURN                   GPLI1110
70711  0 07065 0 07066                -*-1,,-*-2                                  GPLI1111
70712  545125636451            BCI     1,*RETUR                                   GPLI1112
70713  0 00000 0 07064                -*-1                                        GPLI1113
70714  457777777777            VFD     H6/N,O30/7777777777                        GPLI1114
70715  0 07062 0 06706                SYM,,-*-1                                   GPLI1115
70716 -0 00000 0 61253         MZE     -C$RTRN                                    GPLI1116
```

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                        *                                                       GPLI1117
70717  0 07060 0 77777  )LST          -1,,-*-1                                 GPLI1118
70720  0 07057 0 07335                 PNAME,,-*-1                              GPLI1119
70721  0 07054 0 07056                 -*-1,,-*-3          *LIST                GPLI1120
70722  0 00000 0 07055                 -*-1                                     GPLI1121
70723  544331626377             VFD     H30/*LIST,O6/77                          GPLI1122
70724  0 07053 0 06706                 SYM,,-*-1                                GPLI1123
70725 -0 00000 0 61254          MZE     -C$LSTR                                  GPLI1124
                        *                                                       GPLI1125
70726  0 07051 0 77777  )106          -1,,-*-1                                 GPLI1126
70727  0 07050 0 06733                 SUBR,,-*-1                               GPLI1127
70730  0 07046 0 07047                 -*-1,,-*-2                               GPLI1128
70731 -3 00003 0 10042          TXL     APSSOC,,3                                GPLI1129
70732  0 07045 0 07335                 PNAME,,-*-1                              GPLI1130
70733  0 00000 0 07044                 -*-1                SASSOC               GPLI1131
70734  0 00000 0 07043                 -*-1                                     GPLI1132
70735  622162624623             BCD 1SASSOC                                    GPLI1133
                        *                                                       GPLI1134
70736  0 07041 0 77777  )236          -1,,-*-1                                 GPLI1135
70737  0 07040 0 06733                 SUBR,,-*-1                               GPLI1136
70740  0 07036 0 07037                 -*-1,,-*-2                               GPLI1137
70741 -3 00004 0 04400          TXL     SEARCH,,4                                GPLI1138
70742  0 07035 0 07335                 PNAME,,-*-1                              GPLI1139
70743  0 00000 0 07034                 -*-1                SEARCH               GPLI1140
70744  0 00000 0 07033                 -*-1                                     GPLI1141
70745  622521512330             BCD 1SEARCH                                    GPLI1142
                        *                                                       GPLI1143
70746  0 07031 0 77777  )107          -1,,-*-1                                 GPLI1144
70747  0 07030 0 06733                 $SUBR,,-*-1                              GPLI1145
70750  0 07026 0 07027                 -*-1,,-*-2                               GPLI1146
70751 -3 00002 0 15346          TXL     SETP,,2                                  GPLI1147
70752  0 07025 0 07335                 $PNAME,,-*-1                             GPLI1148
70753  0 00000 0 07024                 -*-1                SET                  GPLI1149
70754  0 00000 0 07023                 -*-1                                     GPLI1150
70755 -222563777777             OCT     622563777777                             GPLI1151
                        *                                                       GPLI1152
70756  0 07021 0 77777  )108          -1,,-*-1                                 GPLI1153
70757  0 07020 0 10103                 $FSUBR,,-*-1                             GPLI1154
70760  0 07016 0 07017                 -*-1,,-*-2                               GPLI1155
70761 -3 00000 0 15311          TXL     SETQP,,0                                 GPLI1156
70762  0 07015 0 07335                 PNAME,,-*-1                              GPLI1157
70763  0 00000 0 07014                 -*-1                SETQ                 GPLI1158
70764  0 00000 0 07013                 -*-1                                     GPLI1159
70765 -222563507777             OCT     622563507777                             GPLI1160
                        *                                                       GPLI1161
70766  0 07011 0 77777  )PJ14          -1,,-*-1                                 GPLI1162
70767  0 07010 0 07335                 PNAME,,-*-1                              GPLI1163
70770  0 07005 0 07007                 -*-1,,-*-3          SLASH                GPLI1164
70771  0 00000 0 07006                 -*-1                                     GPLI1165
70772 -224321623077             OCT     624321623077                             GPLI1166
70773  0 07004 0 10742                 APVAL1,,-*-1                             GPLI1167
70774  0 00000 0 07003                 -*-1                                     GPLI1168
70775  0 00000 0 06210                 H61                                      GPLI1169
                        *                                                       GPLI1170
70776  0 07001 0 77777  )109          -1,,-*-1                                 GPLI1171
70777  0 07000 0 06733                 SUBR,,-*-1                               GPLI1172
```

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71000  0 06776 0 06777                -*-1,,-*-2                                GPLI1173
71001 -3 00000 0 03774        TXL      SPEAK,,0                                  GPLI1174
71002  0 06775 0 07335                PNAME,,-*-1                               GPLI1175
71003  0 00000 0 06774                -*-1              SPEAK                   GPLI1176
71004  0 00000 0 06773                -*-1                                      GPLI1177
71005 -224725214277           OCT      624725214277                              GPLI1178
                      *                                                         GPLI1179
71006  0 06771 0 77777  )111          -1,,-*-1                                  GPLI1180
71007  0 06770 0 07335                PNAME,,-*-1                               GPLI1181
71010  0 00000 0 06767                -*-1              STOP                    GPLI1182
71011  0 00000 0 06766                -*-1                                      GPLI1183
71012 -226346477777           OCT      626346477777                              GPLI1184
                      *                                                         GPLI1185
71013  0 06764 0 77777  )PJ15         -1,,-*-1                                  GPLI1186
71014  0 06763 0 07335                PNAME,,-*-1                               GPLI1187
71015  0 06760 0 06762                -*-1,,-*-3        STAR                    GPLI1188
71016  0 00000 0 06761                -*-1                                      GPLI1189
71017 -226321517777           OCT      626321517777                              GPLI1190
71020  0 06757 0 10742                APVAL1,,-*-1                              GPLI1191
71021  0 00000 0 06756                -*-1                                      GPLI1192
71022  0 00000 0 06203                H54                                       GPLI1193
                      *                                                         GPLI1194
71023  0 06754 0 77777  )PJ21         -1,,-*-1                                  GPLI1195
71024  0 06753 0 06733                SUBR,,-*-1                                GPLI1196
71025  0 06751 0 06752                -*-1,,-*-2                                GPLI1197
71026 -3 00000 0 12221        TXL      STREAD,,0                                 GPLI1198
71027  0 06750 0 07335                PNAME,,-*-1                               GPLI1199
71030  0 00000 0 06747                -*-1              STARTREAD               GPLI1200
71031  0 06745 0 06746                -*-1,,-*-2                                GPLI1201
71032  626321516351           BCD 1STARTR                                       GPLI1202
71033  0 00000 0 06744                -*-1                                      GPLI1203
71034 +252124777777           OCT      252124777777                              GPLI1204
                      *                                                         GPLI1205
71035  0 06742 0 77777  II15          -1,,-*-1                                  GPLI1206
71036  0 06741 0 06733                $SUBR,,-*-1                               GPLI1207
71037  0 06737 0 06740                -*-1,,-*-2                                GPLI1208
71040 -3 00001 0 14430        TXL      SUB1,,1                                   GPLI1209
71041  0 06736 0 07335                $PNAME,,-*-1                              GPLI1210
71042  0 00000 0 06735                -*-1              SUB1                    GPLI1211
71043  0 00000 0 06734                -*-1                                      GPLI1212
71044 -226422017777           OCT      626422017777                              GPLI1213
                      *                                                         GPLI1214
71045  0 06732 0 77777  )113          -1,,-*-1                                  GPLI1215
71046  0 06731 0 07335                PNAME,,-*-1                               GPLI1216
71047  0 00000 0 06730                -*-1              SUBR                    GPLI1217
71050  0 00000 0 06727                -*-1                                      GPLI1218
71051 -226422517777           OCT      626422517777                              GPLI1219
                      *                                                         GPLI1220
71052  0 06725 0 77777  )114          -1,,-*-1                                  GPLI1221
71053  0 06724 0 06733                SUBR,,-*-1                                GPLI1222
71054  0 06722 0 06723                -*-1,,-*-2                                GPLI1223
71055 -3 00002 0 07445        TXL      SUBLIS,,2                                 GPLI1224
71056  0 06721 0 07335                PNAME,,-*-1                               GPLI1225
71057  0 00000 0 06720                -*-1              SUBLIS                  GPLI1226
71060  0 00000 0 06717                -*-1                                      GPLI1227
71061  626422433162           BCD 1SUBLIS                                       GPLI1228
```

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                        *                                                       GPLI1229
71062  0 06715 0 77777  )115          -1,,-*-1                                 GPLI1230
71063  0 06714 0 06733                 SUBR,,-*-1                               GPLI1231
71064  0 06712 0 06713                 -*-1,,-*-2                               GPLI1232
71065 -3 00003 0 07367          TXL     SUBST,,3                                GPLI1233
71066  0 06711 0 07335                 PNAME,,-*-1                              GPLI1234
71067  0 00000 0 06710                 -*-1              SUBST                  GPLI1235
71070  0 00000 0 06707                 -*-1                                     GPLI1236
71071 -226422626377             OCT     626422626377                            GPLI1237
                        *                                                       GPLI1238
71072  0 06705 0 77777  )SYM          -1,,-*-1                                 GPLI1239
71073  0 06704 0 07335                 PNAME,,-*-1                              GPLI1240
71074  0 00000 0 06703                 -*-1              SYM                    GPLI1241
71075  0 00000 0 06702                 -*-1                                     GPLI1242
71076 -227044777777             OCT     627044777777                            GPLI1243
                        *                                                       GPLI1244
71077  0 06700 0 77777  )PJ23         -1,,-*-1                                 GPLI1245
71100  0 06677 0 06733                 SUBR,,-*-1                               GPLI1246
71101  0 06675 0 06676                 -*-1,,-*-2                               GPLI1247
71102 -3 00000 0 05214          TXL     TERPRI,,0                               GPLI1248
71103  0 06674 0 07335                 PNAME,,-*-1                              GPLI1249
71104  0 00000 0 06673                 -*-1              TERPRI                 GPLI1250
71105  0 00000 0 06672                 -*-1                                     GPLI1251
71106  632551475131             BCD 1TERPRI                                     GPLI1252
                        *                                                       GPLI1253
71107  0 06670 0 77777  )122          -1,,-*-1                                 GPLI1254
71110  0 06667 0 06733                 SUBR,,-*-1                               GPLI1255
71111  0 06665 0 06666                 -*-1,,-*-2                               GPLI1256
71112 -3 00000 0 01521          TXL     $TIME,,0                                GPLI1257
71113  0 06664 0 07335                 PNAME,,-*-1                              GPLI1258
71114  0 00000 0 06663                 -*-1              TEMPUS-FUGIT           GPLI1259
71115  0 06662 0 06661                 -*-2,,-*-1                               GPLI1260
71116  0 00000 0 06660                 -*-2                                     GPLI1261
71117  632544476462             BCI     2,TEMPUS-FUGIT                          GPLI1262
71120  402664273163
                        *                                                       GPLI1263
71121  0 06656 0 77777  )124          -1,,-*-1                                 GPLI1264
71122  0 06655 0 10103                 $FSUBR,,-*-1                             GPLI1265
71123  0 06653 0 06654                 -*-1,,-*-2                               GPLI1266
71124 -3 00002 0 14134          TXL     MULT,,2                                 GPLI1267
71125  0 06652 0 07335                 $PNAME,,-*-1                             GPLI1268
71126  0 00000 0 06651                 -*-1              TIMES                  GPLI1270
71127  0 00000 0 06650                 -*-1                                     GPLI1271
71130 -233144256277             OCT     633144256277                            GPLI1272
                        *                                                       GPLI1273
71131  0 06646 0 77777  )213          -1,,-*-1                                 GPLI1274
71132  0 06645 0 07335                 $PNAME,,-*-1                             GPLI1275
71133  0 00000 0 06644                 -*-1              TRACE                  GPLI1276
71134  0 00000 0 06643                 -*-1                                     GPLI1277
71135  635121232577             VFD     H30/TRACE,O6/77                         GPLI1278
                        *                                                       GPLI1279
71136  0 06641 0 77777  )127          -1,,-*-1                                 GPLI1280
71137  0 06640 0 06733                 SUBR,,-*-1                               GPLI1281
71140  0 06636 0 06637                 -*-1,,-*-2                               GPLI1282
71141 -3 00000 0 04101          TXL     UNCONT,,0                               GPLI1283
71142  0 06635 0 07335                 PNAME,,-*-1                              GPLI1284
```

```
71143  0 00000 0 06634                -*-1              UNCOUNT                  GPLI1285
71144  0 06633 0 06632                -*-2,,-*-1                                 GPLI1286
71145  0 00000 0 06631                -*-2                                       GPLI1287
71146  644523466445           BCD 1UNCOUN                                        GPLI1288
71147 -237777777777           OCT     637777777777                               GPLI1289
                      *                                                         GPLI1290
71150  0 06627 0 77777  )PJ31          -1,,-*-1                                  GPLI1291
71151  0 06626 0 06733                SUBR,,-*-1                                 GPLI1292
71152  0 06624 0 06625                -*-1,,-*-2                                 GPLI1293
71153 -3 00001 0 12365         TXL     UNPACK,,1                                  GPLI1294
71154  0 06623 0 07335                PNAME,,-*-1                                GPLI1295
71155  0 00000 0 06622                -*-1              UNPACK                   GPLI1296
71156  0 00000 0 06621                -*-1                                       GPLI1297
71157  644547212342           BCI     1,UNPACK                                   GPLI1298
                      *                                                         GPLI1299
71160  0 06617 0 77777  II10          -1,,-*-1                                  GPLI1300
71161  0 06616 0 06733                $SUBR,,-*-1                                GPLI1301
71162  0 06614 0 06615                -*-1,,-*-2                                 GPLI1302
71163 -3 00001 0 14507         TXL     ZEROP,,1                                   GPLI1303
71164  0 06613 0 07335                $PNAME,,-*-1                               GPLI1304
71165  0 00000 0 06612                -*-1              ZEROP                    GPLI1305
71166  0 00000 0 06611                -*-1                                       GPLI1306
71167 -312551464777           OCT     712551464777                               GPLI1307
                      *                                                         GPLI1308
```

```
                EJECT
        *
        *
```

```
                        EJECT
                    *   PROPERTY LISTS FOR ALPHABETIC OBJECTS
                    *
71170  0 00000 0 00000  HH00          0                                                    GPLA0000
                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0001
71171  0 00000 0 00001  HH01          1                                                    GPLA0002
                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0003
71172  0 00000 0 00002  HH02          2                                                    GPLA0004
                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0005
71173  0 00000 0 00003  HH03          3                                                    GPLA0006
                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0007
71174  0 00000 0 00004  HH04          4                                                    GPLA0008
                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0009
71175  0 00000 0 00005  HH05          5                                                    GPLA0010
                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0011
71176  0 00000 0 00006  HH06          6                                                    GPLA0012
                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0013
71177  0 00000 0 00007  HH07          7                                                    GPLA0014
                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0015
71200 +000000000010     HH10   OCT    10                                                   GPLA0016
                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0017
71201 +000000000011     HH11   OCT    11                                                   GPLA0018
                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0019
                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0020
71202  0 06575 0 07335  HH12          PNAME,,-*-1        END OF FILE                       GPLA0021
71203  0 06572 0 06574                -*-1,,-*-3         $EOF$                             GPLA0022
71204  0 00000 0 06573                -*-1                                                 GPLA0023
71205 -132546265377            OCT    532546265377                                         GPLA0024
71206  0 06571 0 10742                APVAL1,,-*-1                                         GPLA0025
71207  0 00000 0 06570                -*-1                                                 GPLA0026
71210  0 00000 0 06141                H12                                                  GPLA0027
                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0028
71211  0 06566 0 07335  HH13          PNAME,,-*-1        =                                 GPLA0029
71212  0 00000 0 06565                -*-1               =                                 GPLA0030
71213  0 00000 0 06564                -*-1                                                 GPLA0031
71214 +137777777777            OCT    137777777777                                         GPLA0032
                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0033
71215  0 06562 0 07335  HH14          PNAME,,-*-1        8-4 MINUS                         GPLA0034
71216  0 00000 0 06561                -*-1                                                 GPLA0035
71217  0 00000 0 06560                -*-1                                                 GPLA0036
71220 +147777777777            OCT    147777777777                                         GPLA0037
                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0038
71221  0 06556 0 07335  HH15          PNAME,,-*-1        ILLEGAL                           GPLA0039
71222  0 00000 0 06555                -*-1               $IL15$                            GPLA0040
71223  0 00000 0 06554                -*-1                                                 GPLA0041
71224  533143010553            BCD    1$IL15$                                              GPLA0042
                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0043
71225  0 06552 0 07335  HH16          PNAME,,-*-1        ILLEGAL                           GPLA0044
71226  0 00000 0 06551                -*-1               $IL16$                            GPLA0045
71227  0 00000 0 06550                -*-1                                                 GPLA0046
71230  533143010653            BCD    1$IL16$                                              GPLA0047
                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0048
71231  0 06546 0 07335  HH17          PNAME,,-*-1        ILLEGAL                           GPLA0049
71232  0 00000 0 06545                -*-1               $IL17$                            GPLA0050
71233  0 00000 0 06544                -*-1                                                 GPLA0051
71234  533143010753            BCD    1$IL17$                                              GPLA0052
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                                    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0053
71235  0 06542 0 07335  HH20            PNAME,,-*-1        +                                          GPLA0054
71236  0 00000 0 06541                  -*-1               +                                          GPLA0055
71237  0 00000 0 06540                  -*-1                                                          GPLA0056
71240 +207777777777             OCT     207777777777                                                  GPLA0057
                                    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0058
71241  0 06536 0 07335  HH21            PNAME,,-*-1        A                                          GPLA0059
71242  0 00000 0 06535                  -*-1               A                                          GPLA0060
71243  0 00000 0 06534                  -*-1                                                          GPLA0061
71244 +217777777777             OCT     217777777777                                                  GPLA0062
                                    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0063
71245  0 06532 0 07335  HH22            PNAME,,-*-1        B                                          GPLA0064
71246  0 00000 0 06531                  -*-1               B                                          GPLA0065
71247  0 00000 0 06530                  -*-1                                                          GPLA0066
71250 +227777777777             OCT     227777777777                                                  GPLA0067
                                    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0068
71251  0 06526 0 07335  HH23            PNAME,,-*-1        C                                          GPLA0069
71252  0 00000 0 06525                  -*-1               C                                          GPLA0070
71253  0 00000 0 06524                  -*-1                                                          GPLA0071
71254 +237777777777             OCT     237777777777                                                  GPLA0072
                                    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0073
71255  0 06522 0 07335  HH24            PNAME,,-*-1        D                                          GPLA0074
71256  0 00000 0 06521                  -*-1               D                                          GPLA0075
71257  0 00000 0 06520                  -*-1                                                          GPLA0076
71260 +247777777777             OCT     247777777777                                                  GPLA0077
                                    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0078
71261  0 06516 0 07335  HH25            PNAME,,-*-1        E                                          GPLA0079
71262  0 00000 0 06515                  -*-1               E                                          GPLA0080
71263  0 00000 0 06514                  -*-1                                                          GPLA0081
71264 +257777777777             OCT     257777777777                                                  GPLA0082
                                    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0083
71265  0 06512 0 77777  HH26            -1,,-*-1           F                                          GPLA0084
71266  0 06511 0 10742                  APVAL,,-*-1                                                   GPLA0085
71267  0 06507 0 06510                  -*-1,,-*-2         F                                          GPLA0086
71270  0 00000 0 00000                  0                                                             GPLA0087
71271  0 06506 0 07335                  PNAME,,-*-1                                                   GPLA0088
71272  0 00000 0 06505          PZE     -*-1                                                          GPLA0089
71273  0 00000 0 06504          PZE     -*-1                                                          GPLA0090
71274 +267777777777             OCT     267777777777                                                  GPLA0091
                                    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0092
71275  0 06502 0 07335  HH27            PNAME,,-*-1        G                                          GPLA0093
71276  0 00000 0 06501                  -*-1               G                                          GPLA0094
71277  0 00000 0 06500                  -*-1                                                          GPLA0095
71300 +277777777777             OCT     277777777777                                                  GPLA0096
                                    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0097
71301  0 06476 0 07335  HH30            PNAME,,-*-1        H                                          GPLA0098
71302  0 00000 0 06475                  -*-1               H                                          GPLA0099
71303  0 00000 0 06474                  -*-1                                                          GPLA0100
71304 +307777777777             OCT     307777777777                                                  GPLA0101
                                    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0102
71305  0 06472 0 07335  HH31            PNAME,,-*-1        I                                          GPLA0103
71306  0 00000 0 06471                  -*-1               I                                          GPLA0104
71307  0 00000 0 06470                  -*-1                                                          GPLA0105
71310 +317777777777             OCT     317777777777                                                  GPLA0106
                                    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0107
71311  0 06466 0 07335  HH32            PNAME,,-*-1        +0                                         GPLA0108
```

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71312  0 00000 0 06465                -*-1              $IL32$                              GPLA0109
71313  0 00000 0 06464                -*-1                                                  GPLA0110
71314  533143030253            BCD 1$IL32$                                                 GPLA0111
                                   * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0112
71315  0 06462 0 07335  HH33          PNAME,,-*-1       .                                   GPLA0113
71316  0 00000 0 06461                -*-1              .                                   GPLA0114
71317  0 00000 0 06460                -*-1                                                  GPLA0115
71320 +337777777777            OCT     337777777777                                        GPLA0116
                                   * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0117
71321  0 06456 0 07335  HH34          PNAME,,-*-1       )                                   GPLA0118
71322  0 00000 0 06455                -*-1              )                                   GPLA0119
71323  0 00000 0 06454                -*-1                                                  GPLA0120
71324 +347777777777            OCT     347777777777                                        GPLA0121
                                   * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0122
71325  0 06452 0 07335  HH35          PNAME,,-*-1       ILLEGAL                             GPLA0123
71326  0 00000 0 06451                -*-1              $IL35$                              GPLA0124
71327  0 00000 0 06450                -*-1                                                  GPLA0125
71330  533143030553            BCD 1$IL35$                                                 GPLA0126
                                   * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0127
71331  0 06446 0 07335  HH36          PNAME,,-*-1       ILLEGAL                             GPLA0128
71332  0 00000 0 06445                -*-1              $IL36$                              GPLA0129
71333  0 00000 0 06444                -*-1                                                  GPLA0130
71334  533143030653            BCD 1$IL36$                                                 GPLA0131
                                   * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0132
71335  0 06442 0 07335  HH37          PNAME,,-*-1       ILLEGAL                             GPLA0133
71336  0 00000 0 06441                -*-1              $IL37$                              GPLA0134
71337  0 00000 0 06440                -*-1                                                  GPLA0135
71340  533143030753            BCD 1$IL37$                                                 GPLA0136
                                   * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0137
71341  0 06436 0 07335  HH40          PNAME,,-*-1       11 MINUS                            GPLA0138
71342  0 00000 0 06435                -*-1              -                                   GPLA0139
71343  0 00000 0 06434                -*-1                                                  GPLA0140
71344 -007777777777            OCT     407777777777                                        GPLA0141
                                   * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0142
71345  0 06432 0 07335  HH41          PNAME,,-*-1       J                                   GPLA0143
71346  0 00000 0 06431                -*-1              J                                   GPLA0144
71347  0 00000 0 06430                -*-1                                                  GPLA0145
71350 -017777777777            OCT     417777777777                                        GPLA0146
                                   * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0147
71351  0 06426 0 07335  HH42          PNAME,,-*-1       K                                   GPLA0148
71352  0 00000 0 06425                -*-1              K                                   GPLA0149
71353  0 00000 0 06424                -*-1                                                  GPLA0150
71354 -027777777777            OCT     427777777777                                        GPLA0151
                                   * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0152
71355  0 06422 0 07335  HH43          PNAME,,-*-1       L                                   GPLA0153
71356  0 00000 0 06421                -*-1              L                                   GPLA0154
71357  0 00000 0 06420                -*-1                                                  GPLA0155
71360 -037777777777            OCT     437777777777                                        GPLA0156
                                   * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0157
71361  0 06416 0 07335  HH44          PNAME,,-*-1       M                                   GPLA0158
71362  0 00000 0 06415                -*-1              M                                   GPLA0159
71363  0 00000 0 06414                -*-1                                                  GPLA0160
71364 -047777777777            OCT     447777777777                                        GPLA0161
                                   * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0162
71365  0 06412 0 07335  HH45          PNAME,,-*-1       N                                   GPLA0163
71366  0 00000 0 06411                -*-1              N                                   GPLA0164
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 71367  0 00000 0 06410                 -*-1                                                  GPLA0165
 71370 -057777777777              OCT     457777777777                                          GPLA0166
                                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0167
 71371  0 06406 0 07335  HH46             PNAME,,-*-1        O                                  GPLA0168
 71372  0 00000 0 06405                   -*-1               O                                  GPLA0169
 71373  0 00000 0 06404                   -*-1                                                  GPLA0170
 71374 -067777777777              OCT     467777777777                                          GPLA0171
                                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0172
 71375  0 06402 0 07335  HH47             PNAME,,-*-1        P                                  GPLA0173
 71376  0 00000 0 06401                   -*-1               P                                  GPLA0174
 71377  0 00000 0 06400                   -*-1                                                  GPLA0175
 71400 -077777777777              OCT     477777777777                                          GPLA0176
                                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0177
 71401  0 06376 0 07335  HH50             PNAME,,-*-1        Q                                  GPLA0178
 71402  0 00000 0 06375                   -*-1               Q                                  GPLA0179
 71403  0 00000 0 06374                   -*-1                                                  GPLA0180
 71404 -107777777777              OCT     507777777777                                          GPLA0181
                                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0182
 71405  0 06372 0 07335  HH51             PNAME,,-*-1        R                                  GPLA0183
 71406  0 00000 0 06371                   -*-1               R                                  GPLA0184
 71407  0 00000 0 06370                   -*-1                                                  GPLA0185
 71410 -117777777777              OCT     517777777777                                          GPLA0186
                                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0187
 71411  0 06366 0 07335  HH52             PNAME,,-*-1        -0                                 GPLA0188
 71412  0 00000 0 06365                   -*-1               $IL52$                             GPLA0189
 71413  0 00000 0 06364                   -*-1                                                  GPLA0190
 71414  533143050253              BCD 1$IL52$                                                   GPLA0191
                                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0192
 71415  0 06362 0 07335  HH53             PNAME,,-*-1        $                                  GPLA0193
 71416  0 00000 0 06361                   -*-1               $                                  GPLA0194
 71417  0 00000 0 06360                   -*-1                                                  GPLA0195
 71420 -137777777777              OCT     537777777777                                          GPLA0196
                                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0197
 71421  0 06356 0 07335  HH54             PNAME,,-*-1        *                                  GPLA0198
 71422  0 06353 0 06355                   -*-1,,-*-3         *                                  GPLA0199
 71423  0 00000 0 06354                   -*-1                                                  GPLA0200
 71424 -147777777777              OCT     547777777777                                          GPLA0201
 71425  0 06352 0 06706                   SYM,,-*-1                                             GPLA0202
 71426  0 00000 0 61272                   -C$STAR                                               GPLA0203
                                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0204
 71427  0 06350 0 07335  HH55             PNAME,,-*-1        ILLEGAL                            GPLA0205
 71430  0 00000 0 06347                   -*-1               $IL55$                             GPLA0206
 71431  0 00000 0 06346                   -*-1                                                  GPLA0207
 71432  533143050553              BCD 1$IL55$                                                   GPLA0208
                                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0209
 71433  0 06344 0 07335  HH56             PNAME,,-*-1        ILLEGAL                            GPLA0210
 71434  0 00000 0 06343                   -*-1               $IL56$                             GPLA0211
 71435  0 00000 0 06342                   -*-1                                                  GPLA0212
 71436  533143050653              BCD 1$IL56$                                                   GPLA0213
                                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0214
 71437  0 06340 0 07335  HH57             PNAME,,-*-1        ILLEGAL                            GPLA0215
 71440  0 00000 0 06337                   -*-1               $IL57$                             GPLA0216
 71441  0 00000 0 06336                   -*-1                                                  GPLA0217
 71442  533143050753              BCD 1$IL57$                                                   GPLA0218
                                      * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0219
 71443  0 06334 0 07335  HH60             PNAME,,-*-1        BLANK                              GPLA0220
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71444  0 00000 0 06333                -*-1                                                    GPLA0221
71445  0 00000 0 06332                -*-1                                                    GPLA0222
71446 -207777777777           OCT     607777777777                                            GPLA0223
                                  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0224
71447  0 06330 0 07335  HH61          PNAME,,-*-1        /                                    GPLA0225
71450  0 00000 0 06327                -*-1               /                                    GPLA0226
71451  0 00000 0 06326                -*-1                                                    GPLA0227
71452 -217777777777           OCT     617777777777                                            GPLA0228
                                  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0229
71453  0 06324 0 07335  HH62          PNAME,,-*-1        S                                    GPLA0230
71454  0 00000 0 06323                -*-1               S                                    GPLA0231
71455  0 00000 0 06322                -*-1                                                    GPLA0232
71456 -227777777777           OCT     627777777777                                            GPLA0233
                                  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0234
71457  0 06320 0 77777  HH63          -1,,-*-1           T                                    GPLA0235
71460  0 06317 0 10742                APVAL,,-*-1                                             GPLA0236
71461  0 06315 0 06316                -*-1,,-*-2                                              GPLA0237
71462  0 00000 0 00001                1                                                       GPLA0238
71463  0 06314 0 07335                PNAME,,-*-1                                             GPLA0239
71464  0 00000 0 06313         PZE    -*-1                                                    GPLA0240
71465  0 00000 0 06312         PZE    -*-1                                                    GPLA0241
71466 -237777777777           OCT     637777777777                                            GPLA0242
                                  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0243
71467  0 06310 0 07335  HH64          PNAME,,-*-1        U                                    GPLA0244
71470  0 00000 0 06307                -*-1               U                                    GPLA0245
71471  0 00000 0 06306                -*-1                                                    GPLA0246
71472 -247777777777           OCT     647777777777                                            GPLA0247
                                  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0248
71473  0 06304 0 07335  HH65          PNAME,,-*-1        V                                    GPLA0249
71474  0 00000 0 06303                -*-1               V                                    GPLA0250
71475  0 00000 0 06302                -*-1                                                    GPLA0251
71476 -257777777777           OCT     657777777777                                            GPLA0252
                                  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0253
71477  0 06300 0 07335  HH66          PNAME,,-*-1        W                                    GPLA0254
71500  0 00000 0 06277                -*-1               W                                    GPLA0255
71501  0 00000 0 06276                -*-1                                                    GPLA0256
71502 -267777777777           OCT     667777777777                                            GPLA0257
                                  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0258
71503  0 06274 0 07335  HH67          PNAME,,-*-1        X                                    GPLA0259
71504  0 00000 0 06273                -*-1               X                                    GPLA0260
71505  0 00000 0 06272                -*-1                                                    GPLA0261
71506 -277777777777           OCT     677777777777                                            GPLA0262
                                  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0263
71507  0 06270 0 07335  HH70          PNAME,,-*-1        Y                                    GPLA0264
71510  0 00000 0 06267                -*-1               Y                                    GPLA0265
71511  0 00000 0 06266                -*-1                                                    GPLA0266
71512 -307777777777           OCT     707777777777                                            GPLA0267
                                  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0268
71513  0 06264 0 07335  HH71          PNAME,,-*-1        Z                                    GPLA0269
71514  0 00000 0 06263                -*-1               Z                                    GPLA0270
71515  0 00000 0 06262                -*-1                                                    GPLA0271
71516 -317777777777           OCT     717777777777                                            GPLA0272
                                  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0273
71517  0 06260 0 07335  HH72          PNAME,,-*-1        END OF RECORD                        GPLA0274
71520  0 06255 0 06257                -*-1,,-*-3         $EOR$                                GPLA0275
71521  0 00000 0 06256                -*-1                                                    GPLA0276
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71522 -132546515377           OCT     532546515377                                    GPLA0277
71523  0 06254 0 10742                APVAL1,,-*-1                                    GPLA0278
71524  0 00000 0 06253                -*-1                                            GPLA0279
71525  0 00000 0 06221                H72                                             GPLA0280
                                  * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0281
71526  0 06251 0 07335  HH73          PNAME,,-*-1        ,                            GPLA0282
71527  0 00000 0 06250                -*-1               ,                            GPLA0283
71530  0 00000 0 06247                -*-1                                            GPLA0284
71531 -337777777777           OCT     737777777777                                    GPLA0285
                                  * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0286
71532  0 06245 0 07335  HH74          PNAME,,-*-1        (                            GPLA0287
71533  0 00000 0 06244                -*-1               (                            GPLA0288
71534  0 00000 0 06243                -*-1                                            GPLA0289
71535 -347777777777           OCT     747777777777                                    GPLA0290
                                  * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0291
71536  0 06241 0 07335  HH75          PNAME,,-*-1        ILLEGAL                      GPLA0292
71537  0 00000 0 06240                -*-1               $IL75$                       GPLA0293
71540  0 00000 0 06237                -*-1                                            GPLA0294
71541  533143070553           BCD 1$IL75$                                             GPLA0295
                                  * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0296
71542  0 06235 0 07335  HH76          PNAME,,-*-1        ILLEGAL                      GPLA0297
71543  0 00000 0 06234                -*-1               $IL76$                       GPLA0298
71544  0 00000 0 06233                -*-1                                            GPLA0299
71545  533143070653           BCD 1$IL76$                                             GPLA0300
                                  * * * * * * * * * * * * * * * * * * * * * * * * * *GPLA0301
71546  0 06231 0 07335  HH77          PNAME,,-*-1        ILLEGAL                      GPLA0302
71547  0 00000 0 06230                -*-1               $IL77$                       GPLA0303
71550  0 00000 0 06227                -*-1                                            GPLA0304
71551  533143070753           BCD 1$IL77$                                             GPLA0305
                         *                                                           GPLA0306
                         *                                                           GPLA0307
71552  0 06232 0 77777  )H77          -1,,-HH77                                       GPLA0308
71553  0 06236 0 77777  )H76          -1,,-HH76                                       GPLA0309
71554  0 06242 0 77777  )H75          -1,,-HH75                                       GPLA0310
71555  0 06246 0 77777  )H74          -1,,-HH74                                       GPLA0311
71556  0 06252 0 77777  )H73          -1,,-HH73                                       GPLA0312
71557  0 06261 0 77777  )H72          -1,,-HH72                                       GPLA0313
71560  0 06265 0 77777  )H71          -1,,-HH71                                       GPLA0314
71561  0 06271 0 77777  )H70          -1,,-HH70                                       GPLA0315
71562  0 06275 0 77777  )H67          -1,,-HH67                                       GPLA0316
71563  0 06301 0 77777  )H66          -1,,-HH66                                       GPLA0317
71564  0 06305 0 77777  )H65          -1,,-HH65                                       GPLA0318
71565  0 06311 0 77777  )H64          -1,,-HH64                                       GPLA0319
71566  0 06321 0 77777  )H63          -1,,-HH63                                       GPLA0320
71567  0 06325 0 77777  )H62          -1,,-HH62                                       GPLA0321
71570  0 06331 0 77777  )H61          -1,,-HH61                                       GPLA0322
71571  0 06335 0 77777  )H60          -1,,-HH60                                       GPLA0323
71572  0 06341 0 77777  )H57          -1,,-HH57                                       GPLA0324
71573  0 06345 0 77777  )H56          -1,,-HH56                                       GPLA0325
71574  0 06351 0 77777  )H55          -1,,-HH55                                       GPLA0326
71575  0 06357 0 77777  )H54          -1,,-HH54                                       GPLA0327
71576  0 06363 0 77777  )H53          -1,,-HH53                                       GPLA0328
71577  0 06367 0 77777  )H52          -1,,-HH52                                       GPLA0329
71600  0 06373 0 77777  )H51          -1,,-HH51                                       GPLA0330
71601  0 06377 0 77777  )H50          -1,,-HH50                                       GPLA0331
71602  0 06403 0 77777  )H47          -1,,-HH47                                       GPLA0332
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71603  0 06407 0 77777  )H46          -1,,-HH46                                GPLA0333
71604  0 06413 0 77777  )H45          -1,,-HH45                                GPLA0334
71605  0 06417 0 77777  )H44          -1,,-HH44                                GPLA0335
71606  0 06423 0 77777  )H43          -1,,-HH43                                GPLA0336
71607  0 06427 0 77777  )H42          -1,,-HH42                                GPLA0337
71610  0 06433 0 77777  )H41          -1,,-HH41                                GPLA0338
71611  0 06437 0 77777  )H40          -1,,-HH40                                GPLA0339
71612  0 06443 0 77777  )H37          -1,,-HH37                                GPLA0340
71613  0 06447 0 77777  )H36          -1,,-HH36                                GPLA0341
71614  0 06453 0 77777  )H35          -1,,-HH35                                GPLA0342
71615  0 06457 0 77777  )H34          -1,,-HH34                                GPLA0343
71616  0 06463 0 77777  )H33          -1,,-HH33                                GPLA0344
71617  0 06467 0 77777  )H32          -1,,-HH32                                GPLA0345
71620  0 06473 0 77777  )H31          -1,,-HH31                                GPLA0346
71621  0 06477 0 77777  )H30          -1,,-HH30                                GPLA0347
71622  0 06503 0 77777  )H27          -1,,-HH27                                GPLA0348
71623  0 06513 0 77777  )H26          -1,,-HH26                                GPLA0349
71624  0 06517 0 77777  )H25          -1,,-HH25                                GPLA0350
71625  0 06523 0 77777  )H24          -1,,-HH24                                GPLA0351
71626  0 06527 0 77777  )H23          -1,,-HH23                                GPLA0352
71627  0 06533 0 77777  )H22          -1,,-HH22                                GPLA0353
71630  0 06537 0 77777  )H21          -1,,-HH21                                GPLA0354
71631  0 06543 0 77777  )H20          -1,,-HH20                                GPLA0355
71632  0 06547 0 77777  )H17          -1,,-HH17                                GPLA0356
71633  0 06553 0 77777  )H16          -1,,-HH16                                GPLA0357
71634  0 06557 0 77777  )H15          -1,,-HH15                                GPLA0358
71635  0 06563 0 77777  )H14          -1,,-HH14                                GPLA0359
71636  0 06567 0 77777  )H13          -1,,-HH13                                GPLA0360
71637  0 06576 0 77777  )H12          -1,,-HH12                                GPLA0361
71640  0 06577 1 77777  )H11          -1,1,-HH11                               GPLA0362
71641  0 06600 1 77777  )H10          -1,1,-HH10                               GPLA0363
71642  0 06601 1 77777  )H07          -1,1,-HH07                               GPLA0364
71643  0 06602 1 77777  )H06          -1,1,-HH06                               GPLA0365
71644  0 06603 1 77777  )H05          -1,1,-HH05                               GPLA0366
71645  0 06604 1 77777  )H04          -1,1,-HH04                               GPLA0367
71646  0 06605 1 77777  )H03          -1,1,-HH03                               GPLA0368
71647  0 06606 1 77777  )H02          -1,1,-HH02                               GPLA0369
71650  0 06607 1 77777  )H01          -1,1,-HH01                               GPLA0370
71651  0 06610 1 77777  )H00          -1,1,-HH00                               GPLA0371
71652                   UPERML BSS     0
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EJECT

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                    EJECT
                    HEAD    0
                *   SYN CARDS CAUSE MANY SYMBOLS TO HAVE O-HEADED EQUIVALENTS
                *
06127  H00      SYN     -)H00                                          GPLA0372
06130  H01      SYN     -)H01                                          GPLA0373
06131  H02      SYN     -)H02                                          GPLA0374
06132  H03      SYN     -)H03                                          GPLA0375
06133  H04      SYN     -)H04                                          GPLA0376
06134  H05      SYN     -)H05                                          GPLA0377
06135  H06      SYN     -)H06                                          GPLA0378
06136  H07      SYN     -)H07                                          GPLA0379
06137  H10      SYN     -)H10                                          GPLA0380
06140  H11      SYN     -)H11                                          GPLA0381
06141  H12      SYN     -)H12                                          GPLA0382
06142  H13      SYN     -)H13                                          GPLA0383
06143  H14      SYN     -)H14                                          GPLA0384
06144  H15      SYN     -)H15                                          GPLA0385
06145  H16      SYN     -)H16                                          GPLA0386
06146  H17      SYN     -)H17                                          GPLA0387
06147  H20      SYN     -)H20                                          GPLA0388
06150  H21      SYN     -)H21                                          GPLA0389
06151  H22      SYN     -)H22                                          GPLA0390
06152  H23      SYN     -)H23                                          GPLA0391
06153  H24      SYN     -)H24                                          GPLA0392
06154  H25      SYN     -)H25                                          GPLA0393
06155  H26      SYN     -)H26                                          GPLA0394
06156  H27      SYN     -)H27                                          GPLA0395
06157  H30      SYN     -)H30                                          GPLA0396
06160  H31      SYN     -)H31                                          GPLA0397
06161  H32      SYN     -)H32                                          GPLA0398
06162  H33      SYN     -)H33                                          GPLA0399
06163  H34      SYN     -)H34                                          GPLA0400
06164  H35      SYN     -)H35                                          GPLA0401
06165  H36      SYN     -)H36                                          GPLA0402
06166  H37      SYN     -)H37                                          GPLA0403
06167  H40      SYN     -)H40                                          GPLA0404
06170  H41      SYN     -)H41                                          GPLA0405
06171  H42      SYN     -)H42                                          GPLA0406
06172  H43      SYN     -)H43                                          GPLA0407
06173  H44      SYN     -)H44                                          GPLA0408
06174  H45      SYN     -)H45                                          GPLA0409
06175  H46      SYN     -)H46                                          GPLA0410
06176  H47      SYN     -)H47                                          GPLA0411
06177  H50      SYN     -)H50                                          GPLA0412
06200  H51      SYN     -)H51                                          GPLA0413
06201  H52      SYN     -)H52                                          GPLA0414
06202  H53      SYN     -)H53                                          GPLA0415
06203  H54      SYN     -)H54                                          GPLA0416
06204  H55      SYN     -)H55                                          GPLA0417
06205  H56      SYN     -)H56                                          GPLA0418
06206  H57      SYN     -)H57                                          GPLA0419
06207  H60      SYN     -)H60                                          GPLA0420
06210  H61      SYN     -)H61                                          GPLA0421
06211  H62      SYN     -)H62                                          GPLA0422
06212  H63      SYN     -)H63                                          GPLA0423
```

```
06213  H64     SYN     -)H64                                   GPLA0424
06214  H65     SYN     -)H65                                   GPLA0425
06215  H66     SYN     -)H66                                   GPLA0426
06216  H67     SYN     -)H67                                   GPLA0427
06217  H70     SYN     -)H70                                   GPLA0428
06220  H71     SYN     -)H71                                   GPLA0429
06221  H72     SYN     -)H72                                   GPLA0430
06222  H73     SYN     -)H73                                   GPLA0431
06223  H74     SYN     -)H74                                   GPLA0432
06224  H75     SYN     -)H75                                   GPLA0433
06225  H76     SYN     -)H76                                   GPLA0434
06226  H77     SYN     -)H77                                   GPLA0435
10772   AND    SYN     -)002
10762   F1     SYN     -)003
10752   F18    SYN     -)004
10742   APVAL  SYN     -)005
10742  APVAL1  SYN     -)005
10735   ARRAY  SYN     -II1
10725   ATOM   SYN     -)007
10715   F29    SYN     -)008
06155   F      SYN     H26
06212   T      SYN     H63
10675   CAR    SYN     -)011
10665   CDR    SYN     -)012
06222   COMMA  SYN     H73
10460   COND   SYN     -)016
10450   CONSN  SYN     -)017
10323  DUMP    SYN     -DMP0B
10440   F12    SYN     -)019
10430   COPYN  SYN     -)020
10420   F35    SYN     -)021
10261   EQ     SYN     -)030
10241   F8     SYN     -)032
10231   F21    SYN     -)034
10177   F19    SYN     -)035
10167  EVLISL  SYN     -)036
10157   EXPR   SYN     -)037
10152   F32    SYN     -)038
10142   FEXPR  SYN     -)040
10135   BIN    SYN     -)041
10135   FIX    SYN     -)041
10120   FLOAT  SYN     -)042
10103   FSUBR  SYN     -)043
10076  FUNARG  SYN     -)044
10071   FUNCT  SYN     -)045
10057  SYMGEN  SYN     -)046
10047   CGET   SYN     -)231
10037   GO     SYN     -)047
10015   F16    SYN     -)052
10005   LABEL  SYN     -)054
07775  LAMBDA  SYN     -)055
07770  LAP     SYN     -)LAP
07736   LIST   SYN     -)057
07716   LOADA  SYN     -)234A
07646  PMAPCA  SYN     -)065
07614   MAXP   SYN     -II7
```

```
07574   MINUS SYN     -)070
07604   MINP  SYN     -II8
07544   F3    SYN     -)071
00000   NIL   SYN     0
07534   NOT   SYN     -)074
07524   NULL  SYN     -)075
07472   OBLBA SYN     -)079A
07435   OR    SYN     -)079
07415   F2    SYN     -)080
07405   PAUSE SYN     -)234C
07365   PLB   SYN     -)234B
07355   PLUS  SYN     -)081
07335   PNAME SYN     -)083
07320   F4    SYN     -)087
07300   PROG  SYN     -)089
07260   PROPO SYN     -)090
07250   QUOTE SYN     -)094
07226   F13   SYN     -)096
07206   RCLAM SYN     -)234D
07140  PRPLCA SYN     -)100
07130  PRPLCD SYN     -)101
07150  RETATM SYN     -)102
07052   SASCO SYN     -)106
07061  SLIST  SYN     -)LST
07110  SPECAL SYN     -)SPCL
07101  SMOVE  SYN     -)MOV
07072  SRETUR SYN     -)RTRN
07042   SRCH  SYN     -)236
07032   SET   SYN     -)107
07022   SETQ  SYN     -)108
06772   STOP  SYN     -)111
07002   F34   SYN     -)109
06733   SUBR  SYN     -)113
06726   F17   SYN     -)114
06716   F30   SYN     -)115
06671   F27   SYN     -)122
06706  SYM    SYN     -)SYM
06657   TIMES SYN     -)124
06647  TRACE  SYN     -)213
06642   F36   SYN     -)127
10655   CAAR  SYN     -)201
10645   CDAR  SYN     -)202
10635   CADR  SYN     -)203
10625   CDDR  SYN     -)204
10615   CAAAR SYN     -)205
10605   CAADR SYN     -)206
10575   CADAR SYN     -)207
10565   CADDR SYN     -)208
10555   CDAAR SYN     -)209
10545   CDADR SYN     -)210
10535   CDDAR SYN     -)211
10525   CDDDR SYN     -)212
07162  REMPP  SYN     -)250
10410  PJ1    SYN     -)PJ1                                          0000
11013  PJ2    SYN     -)PJ2                                          0001
10221  PJ4    SYN     -)PJ4                                          0003
```

```
10251  PJ5    SYN     -)PJ5                                                    0004
10470  PJ6    SYN     -)PJ6                                                    0005
07656  PJ7    SYN     -)PJ7                                                    0006
07120  PJ8    SYN     -)PJ8                                                    0007
07375  PJ9    SYN     -)PJ9                                                    0008
10333  PJ10   SYN     -)PJ10                                                   0009
07345  PJ11   SYN     -)PJ11                                                   0010
10705  PJ12   SYN     -)PJ12                                                   0011
07012  PJ14   SYN     -)PJ14                                                   0013
06765  PJ15   SYN     -)PJ15                                                   0014
10375  PJ16   SYN     -)PJ16                                                   0015
07726  PJ17   SYN     -)PJ17                                                   0016
07445  PJ18   SYN     -)PJ18                                                   0017
10353  PJ19   SYN     -)PJ19                                                   0018
06755  PJ21   SYN     -)PJ21                                                   0020
06701  PJ23   SYN     -)PJ23                                                   0022
07425  PJ24   SYN     -)PJ24                                                   0023
07502  PJ25   SYN     -)PJ25                                                   0024
07554  PJ26   SYN     -)PJ26                                                   0025
10502  PJ27   SYN     -)PJ27                                                   0026
07462  PJ28   SYN     -)PJ28                                                   0027
10313  PJ30   SYN     -)PJ30                                                   0029
06630  PJ31   SYN     -)PJ31                                                   0030
10515  PJ32   SYN     -)PJ32                                                   0031
07330  PJ33   SYN     -)PJ33                                                   0032
10301  PJ34   SYN     -)PJ34                                                   0033
10271  PJ35   SYN     -)PJ35                                                   0034
07676  PJ36   SYN     -)PJ36                                                   0035
07706  PJ37   SYN     -)PJ37                                                   0036
07666  PJ38   SYN     -)PJ38                                                   0037
07310  PJ39   SYN     -)PJ39                                                   0038
10211  ERSETO SYN     -)PJ41
07760   PVW1  SYN     -PVV1            LEFTSHIFT
07462   OCT   SYN     PJ28
07216   RECIP SYN     -II18
14401   ADD1  SYN     Q$ADD1
14126   ADDP  SYN     Q$ADDP
15016   APP2  SYN     A$APP2
14663   APPLY SYN     A$APPLY
10011   APROP SYN     R$PROP
15230   ATOMP SYN     R$ATOMP
15212   CARP  SYN     R$CARP
15222   CDRP  SYN     R$CDRP
06370   CELL  SYN     I$CELL
12635   CHACT SYN     F$CHACT
12201   CLEAR SYN     F$CLEAR
04345   COPY  SYN     R$COPY
07343   CP1   SYN     C$CP1
12634   CURC  SYN     F$CURC
12633   CURC1 SYN     F$CURC1
04111   DECON SYN     E$DECON
12337   DIGIT SYN     F$DIGIT
15445   EQP   SYN     R$EQP
04461   EQUAL SYN     L$EQUAL
12346   EROR1 SYN     F$EROR1
15454   EVAL  SYN     A$EVAL
```

```
                    11310   EVALQ SYN     S$EVALQ
                    15370   EVAND SYN     R$EVA8
                    15154   EVCON SYN     A$EVCON
                    15774  EVLIS  SYN     A$EVLIS
                    15416   EVOR  SYN     R$EVR8
                    13530   EXPT  SYN     Q$EXPT
                    14466   FIXP  SYN     Q$FIXP
                    00663   INPUT SYN     B$INPUT
                    16130   INTER SYN     R$INTER
                    15264   LABP  SYN     R$LABP
                    15250   LAMP  SYN     R$LAMP
                    12321   LITER SYN     F$LITER
                    12662   LOGOR SYN     H$LOGOR
                    14150    MAX  SYN     Q$MAX
                    07620   MAP   SYN     MAPCAR
                    14142   MIN   SYN     Q$MIN
                    12147   MKNAM SYN     F$MKNAM
                    12636   MKNO  SYN     F$MKNO
                    14134   MULT  SYN     Q$MULT
                    07675   NCONC SYN     R$NCONC
                    10150   NOTS  SYN     R$NOTS
                    15243   NULLP SYN     R$NULLP
                    06622   NUMBR SYN     F$NUMBR
                    12071   NUMOB SYN     F$NUMOB
                    06543   NUTRN SYN     T$NUTRN
                    14533   ONEP  SYN     Q$ONEP
                    10220   OVBGN SYN     S$OVBGN            OVERLORD BEGINNING
                    12032   PACK  SYN     F$PACK
                    07562   PAIR  SYN     A$PAIR
                    13572   POWR  SYN     G$POWR
                    04620   PRIN0 SYN     T$PRIN0
                    04703   PRIN1 SYN     T$PRIN1
                    05110   PRIN2 SYN     T$PRIN2
                    04604   PRINT SYN     T$PRINT
                    10011   PROP  SYN     R$PROP
                    05341   PUN2  SYN     T$PUN2
                    05325   PUNCH SYN     T$PUNCH
                    06026   RD    SYN     I$RD
                    05732   READ  SYN     I$READ
                    05757   READ1 SYN     I$READ1
                    15346   SETP  SYN     R$SETP
                    15311   SETQP SYN     R$SETQP
                    02077   SETUP SYN     E$SETUP
                    14430   SUB1  SYN     Q$SUB1
                    07367   SUBST SYN     R$SUBST
                    14565   UNFIX SYN     Q$UNFIX
                    06533   VALUE SYN I$VALUE
                    14507   ZEROP SYN     Q$ZEROP
                    10042  APSSOC SYN SASSOC
                           *      DECK                      BUTCH REGION AND END
                                  HEAD    0
                           *
                           *      BUTCH, A HOME FOR PATCHES
                           *
71652  0 00000 0 00000    BUTCH
                    05766  BUTCHL EQU     NILSXX-*+1        LENGTH OF BUTCH REGION
```

```
                  77724          TCD     LOADER              GO TO RW TML FOR OCTAL CORRECTION CDS
                         *
                         *               THE FOLLOWNG PRODUCE A ROW BINARY TRASNFER CARD TO CONTIN
                         *
                                 FUL
                  00000          ORG     0
                  00174    AAAAA EQU     CONTIN
                  00000    BBBBB EQU     AAAAA-AAAAA/2*2
                  00000    CCCCC EQU     AAAAA/2-AAAAA/4*2
                  00001    DDDDD EQU     AAAAA/4-AAAAA/8*2
                  00001    EEEEE EQU     AAAAA/8-AAAAA/16*2
                  00001    FFFFF EQU     AAAAA/16-AAAAA/32*2
                  00001    GGGGG EQU     AAAAA/32-AAAAA/64*2
                  00001    HHHHH EQU     AAAAA/64-AAAAA/128*2
                  00000    IIIII EQU     AAAAA/128-AAAAA/256*2
                  00000    JJJJJ EQU     AAAAA/256-AAAAA/512*2
00000 +000000000000              OCT     0,0,0,0,0,0,0,0,0
00001 +000000000000
00002 +000000000000
00003 +000000000000
00004 +000000000000
00005 +000000000000
00006 +000000000000
00007 +000000000000
00010 +000000000000
00011  0 00000 0 00001           PZE     HHHHH+4096*IIIII,,64*JJJJJ
00012  0 00100 0 10001           PZE     EEEEE+4096*FFFFF,,64*GGGGG
00013  0 00100 0 00000           PZE     BBBBB+4096*CCCCC,,64*DDDDD
                  00000  ENDEND  END     0
```

POST PROCESSOR ASSEMBLY DATA

77712 IS THE FIRST LOCATION NOT USED BY THIS PROGRAM

0REFERENCES TO DEFINED SYMBOLS

```
 6155      F 71652
 6212      T 71652
10261     EQ 66470,71652
10762     F1  3346,66434,71652
 7415     F2 66540,71652
 7544     F3 66530,71652
 7320     F4  4674,66545,71652
10241     F8  4600,66471,71652
10037     GO  3413,66510,71652
 7435     OR  3435,66537,71652
  371     Q1  2110, 2125, 2131, 2136, 3001, 3005, 3060, 4014, 5022, 5170,10617,12262,13166,13174,13221,13561,14426
              14427,14546,16537
  372     Q2
  373     Q3
  374     Q4 13234
  375     Q5 12350,13211
  376     Q6  6312
  377     Q7  6206
  400     Q8  7241
  401     Q9 11161
 6026     RD  5733, 5760, 6006, 6011,71652
10772    AND  3343,66433,71652
 2300    BBT  2135, 2215, 2241
 1624    BEX  1622, 1643
 2276    BFS  2126, 2133, 2140, 2152, 2156, 2173, 2206, 2221
 2302    BFW  2142, 2175, 2177, 2234
10135    BIN   475,71652
  355    BSR   267,  307,  615,  730
10675    CAR 66442,71652
10665    CDR 66443,71652
 7343    CP1  6505,67343,71652
 4110    CTG  3757
 1676    DCT  4160, 6432,13444,14651
15445    EQP 67522,71652
 1661    ERM  1576
 1664    ERN  1604
 1656    ERO  1607
 1655    ERT  1574, 1613
 1561    ERX  1567, 1570
10440    F12  3361,66464,71652
 7226    F13  3451,66553,71652
10015    F16 66512,71652
 6726    F17  3464,66577,71652
10752    F18 66435,71652
10177    F19 66473,71652
10231    F21 66472,71652
 6671    F27 66602,71652
10715    F29 66441,71652
 6716    F30 66600,71652
10152    F32 66476,71652
 7002    F34 66566,71652
```

POST PROCESSOR ASSEMBLY DATA

```
10420    F35 66465,71652
 6642    F36 66605,71652
10135    FIX 12647,12650,14374,14400,14550,14551,66500,71652
 4042    FRX  4037
 6127    H00   521,12260,12324,66611,71652
 6130    H01   515,66612,71652
 6131    H02   515,66613,71652
 6132    H03   516,66614,71652
 6133    H04   516,66615,71652
 6134    H05   517,66616,71652
 6135    H06   517,66617,71652
 6136    H07   520,66620,71652
 6137    H10   520,66621,71652
 6140    H11   524,66622,71652
 6141    H12   522,66623,67502,71210,71652
 6142    H13 66624,67536,71652
 6143    H14   525,66626,71652
 6144    H15 66625,71652
 6145    H16 66627,71652
 6146    H17 66630,71652
 6147    H20 66631,70442,71652
 6150    H21 66632,71652
 6151    H22 66633,71652
 6152    H23 66634,71652
 6153    H24 66635,71652
 6154    H25 16707,16710,66636,71652
 6155    H26 66637,71652
 6156    H27 66640,71652
 6157    H30 66641,71652
 6160    H31 66642,71652
 6161    H32 66643,71652
 6162    H33   526,66644,70412,71652
 6163    H34   527,66645,70667,71652
 6164    H35 66646,71652
 6165    H36 66647,71652
 6166    H37 66650,71652
 6167    H40   530,66651,67406,71652
 6170    H41 66652,71652
 6171    H42 66653,71652
 6172    H43 66654,71652
 6173    H44 66655,71652
 6174    H45 66656,71652
 6175    H46 66657,71652
 6176    H47 66660,71652
 6177    H50 66661,71652
 6200    H51 66662,71652
 6201    H52 66663,71652
 6202    H53 66664,67454,71652
 6203    H54 66665,71022,71652
 6204    H55 66666,71652
 6205    H56 66667,71652
 6206    H57 66670,71652
 6207    H60 66671,67102,71652
 6210    H61 66672,70775,71652
 6211    H62 66673,71652
```

POST PROCESSOR ASSEMBLY DATA

```
 6212    H63 66674,71652
 6213    H64 66675,71652
 6214    H65 66676,71652
 6215    H66 66677,71652
 6216    H67 66700,71652
 6217    H70 66701,71652
 6220    H71 66702,71652
 6221    H72   523,66703,67512,71525,71652
 6222    H73 66704,67317,71652
 6223    H74   531,66705,70131,71652
 6224    H75 66706,71652
 6225    H76 66707,71652
 6226    H77 66710,71652
67043    II1 66437,71652
67751    II3 66511
70032    II4 66516
70164    II7   513,66524,71652
70174    II8   513,66525,71652
70323    II9 66536
 7770    LAP 66515,71652
 2311    LBT  2132, 2134, 2154
  362    LCH   215,  571,11212
 7620    MAP 71652
14150    MAX 70167,71652
 2275    MFS  2224
14142    MIN 70177,71652
    0    NIL 66531,71652
 7534    NOT 66532,71652
 7462    OCT   503,71652
 2304    ORG  2101, 4007, 4017,16356,16405,16635
10410    PJ1 66711,71652
11013    PJ2 66712,71652
10221    PJ4 66713,71652
10251    PJ5 66714,71652
10470    PJ6 66715,71652
 7656    PJ7 66716,71652
 7120    PJ8 66717,71652
 7375    PJ9 66720,71652
 7365    PLB 66542,71652
  402    Q10  3227, 4131, 6604, 7241,12123
  403    Q12  6315
  404    Q13
  405    Q14
  406    Q17
  407    Q20  1225, 2117
  410    Q21   422
  411    Q22
  412    Q36 12517
  413    Q63   431, 5732,12374
  414    Q64  5005
  442    QD1  2227, 2244, 4516, 4535, 6305,10072,10155,12327,12342,14441,14450,14464,14476,14527,15243,15445,16130
             16274,16316,17037,17335
  443    QD2
  444    QD5  5312
  445    QD6 10634
```

POST PROCESSOR ASSEMBLY DATA

```
  446    QD7  7241
  454    QF1 14424,14425,14545,14645
  451    QP5  1627,11633
  436    QT1  4556,12651,13102
  437    QT2  4740,12654
  440    QT4  4743
  441    QT5 12646
  361    RCH   233,  557,  716, 1212, 1244,11210
  350    RDS   230,  304,  671,  731,11206
  352    REW   172,  306,  644,  661
  702    RTX   672, 1200
  354    SDN   313,  314
 7032    SET 13020,13021,66564,71652
 1410    SLF
 6706    SYM   510,16446,16447,16670,16671,66603,67004,70704,70715,70724,71425,71652
 2277    TBT  2124, 2164
  357    TCO   221,  222,  247,  250,  546,  547,  717,  720, 1227, 1230,11204
  356    TEF   227,  257,  554,  712,  722
 2274    TFS  2122, 2147, 2171, 2202
 2301    TFW  2137, 2160
 2303    TPG  2100, 2145
  360    TRC   226,  256,  553,  573,  724
  353    WEF   310,  643,10502,10507
  351    WRS   305,  555, 1211, 1242
14401   ADD1 66760,71652
14126   ADDP 70426,71652
15016   APP2 14724,71652
 3317   ARG1  4222, 4237,12011,12020
 3320   ARG2  7715, 7716, 7724, 7726,10106,10127,12012
 3321   ARG3  4406, 4440, 4452, 4453, 7371, 7461, 7725, 7741,10031,10034,10035,10036,10754,11375,11567,11774,12025
             13014,13023,13367,13404,13435,13450,13461,13477,13515,13523,13533,14343,14356,14710,14715,14726,14752
             14773,15011,15017,15072,15103,15327,15352,15520,15521,15711,15746,16232,16641,17124,17215,17441
 3322   ARG4  4410, 4436, 4446, 4451, 4456, 7457,10743,13025,17216,17437
 3323   ARG5 13027,17217,17435
 3324   ARG6 17220,17433
 3325   ARG7 17221,17431
 3326   ARG8 17222,17427
 3327   ARG9 17223,17425
10725   ATOM 66440,71652
 1646   BACD  1616, 1653
 1667   BACE  1652
  475   BIND   476
 4010   BKOR  4055
 4022   BLKB  4006, 4011
 4023   BLKC  4012
 4026   BLKX  4004, 4047
10655   CAAR 66444,71652
10635   CADR 66446,71652
15212   CARP 16760,67106,70533,71652
10645   CDAR 66445,71652
10625   CDDR 66447,71652
15222   CDRP 16645,67116,71652
 6370   CELL 71652
10047   CGET 66607,71652
 3747   CNSX  3730
```

POST PROCESSOR ASSEMBLY DATA

```
 4064   CNTA  4060
 4076   CNTB  4063
 4107   CNTM  3754, 3761, 3777, 4001, 4061, 4103
 4106   CNTS  3755, 3760, 3776, 4073,11577,11607,11646,11652
 4074   CNTX  4064
 4075   CNTY  4065
10460   COND  3364,16177,16200,66460,71652
 3730   CONS  1640, 4373, 4454, 6002, 6507, 6512, 6515, 6520, 7366, 7514, 7561, 7611,10203,10205,10210,10213,11472
              11475,11623,12021,12166,12175,12407,12643,13264,13266,13271,13276,13301,13315,13455,13464,14770,14772
              15254,15263,15302,15304,15523,15526,16163,16252,16457,16462,16565,16567,16742,16745,16764,16773,16776
              17055,67333
 4345   COPY 67353,71652
 2317   CPPI  1623, 1634, 1642, 2112, 2321, 2331, 2340, 2411, 2537, 2605, 4216, 4221, 4267, 4303, 4605, 5210,11613
              11630,11640,15640,15663,15666,15713,15725,17332,17337,17351,17353,17360,17445,17454
 2413   CSSI  2113, 2410, 2603
 3723   CSWO  3721
 3726   CSWQ  3713, 3723, 4031, 4035
 3724   CSWX  3710
12634   CURC 12265,67402,71652
10323   DUMP 66463,71652
 2403   END0
 2401   END1 12667,12703,12717,15112,16036,16311,17147
 2377   END2  4360, 4637, 5765, 7354, 7405, 7546,14157,15062,15132,15313,15623,15745
 2375   END3  4510, 7623,14706,15375,15423,16000
 2373   END4  7500, 7650,15157,16127
 2371   END5  4344, 4402,16132
 2367   END6
 2365   END7
 2363   END8 11562
 2361   END9
 1556   ERAC  3161
 1557   ERMQ  1565
15454   EVAL 11621,14713,14747,15171,15202,15310,15324,15404,15432,15773,16214,16223,16312,67604,71652
15416   EVOR 70346,71652
10157   EXPR 11450,11451,15034,15035,15513,15514,17113,17114,66475,71652
13530   EXPT 67631,71652
  475   FIXD   476, 3765, 4002, 6602,12603,13557,13562,14340
14466   FIXP 67653,71652
 1717   FLXT  1702, 1703, 1711, 1712, 1727
 1722   FPTA  1705
 1763   FPTD  1736
 1761   FPTF  1734
 3751   FREE  2226, 2712, 3143, 3731, 3737, 4244, 4251, 4313, 4317, 7430, 7434,17270,17312,17323
  521   H00A  6607,12417
  524   H11D 12417
  522   H12A 12417
  525   H14D 12417
  526   H33D  6024
  527   H34D  6023
  530   H40D 12417
  523   H72A 12417
  531   H74D   532, 6022
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71171   HH01 71650
71172   HH02 71647
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POST PROCESSOR ASSEMBLY DATA

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71176   HH06 71643
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71200   HH10 71641
71201   HH11 71640
71202   HH12 71637
71211   HH13 71636
71215   HH14 71635
71221   HH15 71634
71225   HH16 71633
71231   HH17 71632
71235   HH20 71631
71241   HH21 71630
71245   HH22 71627
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71255   HH24 71625
71261   HH25 71624
71265   HH26 71623
71275   HH27 71622
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71321   HH34 71615
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71331   HH36 71613
71335   HH37 71612
71341   HH40 71611
71345   HH41 71610
71351   HH42 71607
71355   HH43 71606
71361   HH44 71605
71365   HH45 71604
71371   HH46 71603
71375   HH47 71602
71401   HH50 71601
71405   HH51 71600
71411   HH52 71577
71415   HH53 71576
71421   HH54 71575
71427   HH55 71574
71433   HH56 71573
71437   HH57 71572
71443   HH60 71571
71447   HH61 71570
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POST PROCESSOR ASSEMBLY DATA

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71546   HH77 71552
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67650   II11 66501
67665   II12 66503
70264   II13 66534
66755   II14 66431
71035   II15 66576
70214   II16 66527
70562   II18 66554,71652
67413   IJ01 66466
67435   IJ02 66467
70540   IJ03 66552
70604   IJ04 66560
70510   IJ05 66550
67006   )002 71652
67016   )003 71652
67026   )004 71652
67036   )005 71652
67053   )007 71652
67063   )008 71652
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67113   )012 71652
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67360   )021 71652
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67636   )040 71652
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POST PROCESSOR ASSEMBLY DATA

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67163   )205 71652
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70736   )236 71652
70616   )250 71652
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71633   )H16 71652
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POST PROCESSOR ASSEMBLY DATA

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71563   )H66 71652
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71552   )H77 71652
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70717   )LST 71652
70677   )MOV 71652
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66765   )PJ2 71652
67557   )PJ4 71652
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POST PROCESSOR ASSEMBLY DATA

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67310   )PJ6 71652
70122   )PJ7 71652
70660   )PJ8 71652
70403   )PJ9 71652
71072   )SYM 71652
15264   LABP 67776,71652
15250   LAMP 67712,71652
 7736   LIST 13135,13136,66517,71652
77724   LOAD   173,  370
 7614   MAXP 14151,71652
 7604   MINP 14143,71652
12636   MKNO  3771, 4003, 6614,12107,12116,12133,12743,13001,13451,13462,13503,13526,13571,14337,14422,14632,14656
              16532,16562,71652
14134   MULT 71124,71652
10150   NOTS 70247,71652
 7524   NULL 66533,71652
66430   OBLB  2250
  503   OCTD  6576,12115,12742,13000,16531,16561
14533   ONEP 70326,71652
12032   PACK 70356,71652
 7562   PAIR 14736,70366,71652
10333   PJ10 66721,71652
 7345   PJ11 66722,71652
10705   PJ12 66723,71652
 7012   PJ14 66724,71652
 6765   PJ15 66725,71652
10375   PJ16 66726,71652
 7726   PJ17 66727,71652
 7445   PJ18 66730,71652
10353   PJ19 66731,71652
 6755   PJ21 66732,71652
 6701   PJ23 66733,71652
 7425   PJ24 66734,71652
 7502   PJ25 66735,71652
 7554   PJ26 66736,71652
10502   PJ27 66737,71652
 7462   PJ28 66740,71652
10313   PJ30 66741,71652
 6630   PJ31 66742,71652
10515   PJ32 66743,71652
 7330   PJ33 66744,71652
10301   PJ34 66745,71652
10271   PJ35 66746,71652
 7676   PJ36   511,66747,71652
 7706   PJ37   512,66750,71652
 7666   PJ38   512,66751,71652
 7310   PJ39 66752,71652
 7355   PLUS   514,14127,66543,71652
13572   POWR 13565,71652
 7300   PROG  3444,66546,71652
10011   PROP 11776,71652
 5341   PUN2  5110,71652
70020   PVV1 71652
 7760   PVW1 66754,71652
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POST PROCESSOR ASSEMBLY DATA

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  447   QD20  5312
  450   QD21
  416   QO14  6202, 7241
  417   QO17   607,11155
  420   QO20   603, 5732, 7241
  421   QO22  7241
  410   QO25   422, 5732, 7241
  422   QO33  5732, 7241
  423   QO40  4214, 5732, 6204, 7241
  424   QO41 12517
  425   QO43
  426   QO50  7241
  427   QO60  1277, 1521, 5732, 7241
  430   QO61  1521
  413   QO77   431
 5732   READ 11322,70555,71652
 2312   SAVE  4357, 4401, 4507, 4636, 5764, 7353, 7404, 7477, 7545, 7622, 7647,11561,12666,12702,12716,14156,14705
              15061,15111,15131,15156,15312,15374,15422,15622,15744,15777,16035,16131,16310,17146
 2337   SAVI  2335
 2336   SAVJ  2333
 2342   SAVK  2334
 2407   SAVT  2314, 2330, 2403
 2405   SAVY  2312, 2326
 2404   SAVZ  2313, 2327
  455   SBIT  1343, 7143, 7241
15346   SETP 70751,71652
 7022   SETQ  3461,66565,71652
 1404   SLN1
 1405   SLN2
 1406   SLN3
 1407   SLN4
 1411   SLT1
 1412   SLT2
 1413   SLT3
 1414   SLT4
 7042   SRCH  3454,66563,71652
 6772   STOP 11517,66567,71652
 2046   STRA  1771, 2007, 2025
 2050   STRD
 2035   STRF  2030, 2031, 2032
 2055   STRM  2001
 2053   STRN  2006
 2007   STRO
 2047   STRQ  1772
 2051   STRT  1766, 1773, 2036
 2035   STRX  1770, 2014
14430   SUB1 71040,71652
 6733   SUBR   506, 2434, 2435,11446,11447,15032,15033,15507,15510,16672,16673,17105,17106,66570,66756,66766,67017
             67027,67044,67054,67064,67104,67114,67124,67134,67144,67154,67164,67174,67204,67214,67224,67234,67244
             67254,67277,67331,67341,67351,67361,67414,67426,67436,67456,67466,67520,67540,67550,67560,67570,67602
             67612,67627,67651,67666,67722,67732,67752,67764,70011,70021,70033,70053,70063,70133,70143,70153,70205
             70215,70225,70235,70245,70255,70265,70277,70324,70334,70354,70364,70374,70414,70451,70461,70471,70511
             70521,70541,70553,70563,70573,70605,70617,70631,70641,70651,70727,70737,70747,70777,71024,71036,71053
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POST PROCESSOR ASSEMBLY DATA

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 1376   SWT1   670,  704
 1377   SWT2
 1400   SWT3  1247
 1401   SWT4
 1402   SWT5  1200, 1237
 1403   SWT6  2037
 1521   TIME  1554, 3150,11312,11342,11412,71112
  370   ZERO 77644, 1617, 5376, 6036, 6250, 6506,10076,10216,11354,11612,11622,12013,12517,12672,12722,13263,13265
             13454,13715,15016,15264,15445,16130,16151,16250,16763
  174  AAAAA     0
 3316  ALIST 11352,15062,15064,15132,15134,15623,15624,15745,15747,16020,16516,17123
  457  AMASK  3774, 4720,11576,11645,13244,13254,16272,16450,16540,16701
14663  APPLY  4460,10041,11365,12030,15015,15045,15110,15113,15537,15732,16041,17133,17155,67031,71652
10011  APROP 70523,71652
10742  APVAL 77645,  474,15551,15552,66436,71266,71460,71652
 3330  ARG10 17224,17423
 3331  ARG11 17225,17421
 3332  ARG12 17226,17417
 3333  ARG13 17227,17415
 3334  ARG14 17230,17413
 3335  ARG15 17231,17411
 3336  ARG16 17232,17407
 3337  ARG17 17233,17405
 3340  ARG18 17234,17403
 3341  ARG19 17235,17401
 3342  ARG20 10120,17236,17377
10735  ARRAY  2620, 2621,13347,71652
15230  ATOMP 67056,71652
 3763  AWHOA  3756
 1650  BACER  1611
 1644  BACTD  1624
    0  BBBBB     0,   13
    0  BCDIN  1200, 6230,10231,12234
 4030  BLKBB  4015, 4025
71652  BUTCH
10615  CAAAR 66450,71652
10605  CAADR 66451,71652
10575  CADAR 66452,71652
10565  CADDR 66453,71652
    0  CCCCC     0,   13
10555  CDAAR 66454,71652
10545  CDADR 66455,71652
10535  CDDAR 66456,71652
10525  CDDDR 66457,71652
12635  CHACT 12241,12261,12263,67275,71652
12201  CLEAR 67301,71652
 3742  CNTR1  3746, 3770, 3775, 4062, 4071, 4102, 4255, 4261, 4323, 4327,11575,11605,11644,11650,17274,17300
 4100  CNTST  3764, 4000, 4070
 6222  COMMA 71652
10450  CONSN 66461,71652
 3710  CONSW  2456, 2467, 2510, 7352,10201,12164,12173,12640,13274,16451
10430  COPYN  3357,66462,71652
 4057  COUNT 67363
12633  CURC1 12266,67372,71652
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POST PROCESSOR ASSEMBLY DATA

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12337  DIGIT 67430,71652
  460  DMASK  4400, 6514, 7562, 7675, 7713,10072,10104,10150,10216,11741,12642,15230,16421,16455,16730,16757
67455  DMP0B 71652
    1  EEEEE     0,   12
 2357  END10
 2355  END11
 2353  END12
 2351  END13
 2347  END14
 2345  END15
 2343  END16
 4461  EQUAL  4511, 7375, 7532,16733,67542,71652
 1560  ERIND  1566
12346  EROR1 67562,71652
 1562  ERROR  1577, 1700, 1701, 1721, 1747, 2043, 2044, 2071, 2072, 2415, 2416, 3133, 3160, 3163, 3766, 3772, 4713
              4716, 5747, 5755, 6057, 6060, 6237, 6274, 6557, 6564, 7612, 7613, 7615, 7616,10122,10123,12063,12064
             12316,12317,13107,13111,13323,13326,13542,13544,14357,14360,15115,15117,15205,15210,15342,15344,15363
             15365,15607,15611,16007,16012,16254,16260,16345,16347,16527,16533,16664,16666,17006,17007
11310  EVALQ 10435,10463,71652
15370  EVAND 67011,71652
15154  EVCON 67323,71652
15774  EVLIS 12670,12704,12720,14160,67614,70045,71652
10142  FEXPR 11455,11456,15515,15516,17115,17116,66477,71652
    1  FFFFF     0,   12
10120  FLOAT   476,12652,12653,14375,14552,14553,66502,71652
 1757  FPTAC  1724
 1760  FPTAD  1726
 1765  FPTDV  1704, 1720, 1735
 1754  FPTLO  1733
 1751  FPTTY  1740, 1742, 1745
 4037  FROUT  3733, 4246, 4315, 7432,17272
10103  FSUBR   477, 2436, 2437,11453,11454,15511,15512,16674,16675,17107,17110,66504,67007,67321,67710,67742,67774
             70043,70073,70103,70113,70165,70175,70344,70424,70501,70531,70757,71122,71652
10071  FUNCT 66506,71652
 3711  FWLOR  4036
 1415  GETTM  1554
    1  GGGGG     0,   12
    1  HHHHH     0,   11
    0  IIIII     0,   11
  663  INPUT  6227,10230,12233,71652
16130  INTER 70503,71652
70152  )069A  3430,66523
70142  )069B  3424,66522
70306  )079A 71652
70062  )234A 71652
70413  )234B 71652
70373  )234C 71652
70572  )234D 71652
66777  )ALST 66432
67445  )PJ10 71652
70433  )PJ11 71652
67073  )PJ12 71652
70766  )PJ14 71652
71013  )PJ15 71652
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POST PROCESSOR ASSEMBLY DATA

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71077  )PJ23 71652
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70276  )PJ25 71652
70224  )PJ26 71652
67276  )PJ27 71652
70316  )PJ28 71652
67465  )PJ30 71652
71150  )PJ31 71652
67263  )PJ32 71652
70450  )PJ33 71652
67477  )PJ34 71652
67507  )PJ35 71652
70102  )PJ36 12700,71652
70072  )PJ37 12664,71652
70112  )PJ38 12714,71652
70470  )PJ39 71652
67567  )PJ41 71652
70706  )RTRN 71652
70670  )SPCL 71652
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10005  LABEL   501,66513,71652
12321  LITER 70055,71652
 7716  LOADA 66520,71652
12662  LOGOR 70105,71652
 7574  MINUS 66526,71652
12147  MKNAM 12061,70227,71652
 7675  NCONC  7674,13310,14740,16147,70237,71652
 2415  NOPDL  2320
 4056  NROOM  4005, 4046, 4054
15243  NULLP 70257,71652
 6622  NUMBR  6571,10535,10540,10543,10546,10604,10610,10613,71652
12071  NUMOB 70301,71652
 6543  NUTRN  6160,71652
 7472  OBLBA 66535,71652
10220  OVBGN 71652
 7405  PAUSE 66541,71652
  461  PMASK  1626,11632
 7335  PNAME 77640,77650,  473,  504, 2440, 2441, 4724, 4725, 6456, 6457,66544,66761,66771,67000,67012,67022,67032
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              67471,67503,67513,67523,67530,67543,67553,67563,67573,67605,67615,67622,67632,67637,67644,67654,67661
              67671,67676,67703,67713,67725,67735,67745,67755,67767,67777,70004,70014,70024,70036,70046,70056,70066
              70076,70106,70116,70123,70136,70146,70156,70170,70200,70210,70220,70230,70240,70250,70260,70270,70302
              70312,70317,70327,70337,70347,70357,70367,70377,70404,70417,70427,70434,70444,70454,70464,70474,70504
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              70732,70742,70752,70762,70767,71002,71007,71014,71027,71041,71046,71056,71066,71073,71103,71113,71125
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              71401,71405,71411,71415,71421,71427,71433,71437,71443,71447,71453,71463,71467,71473,71477,71503,71507
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POST PROCESSOR ASSEMBLY DATA

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 4703  PRIN1  4632, 4655,70453,71652
 5110  PRIN2  4204, 4210, 4617, 4634, 4653, 4661, 4663, 4670, 4757, 4773, 5021, 5035, 5054, 5067, 5330, 5331, 5427
              5430, 5507, 5511, 5661, 5664,16057,16111,16113,71652
 4604  PRINT  1614, 1645, 2034, 7763, 7766,10744,11405,11436,16062,16071,16115,16120,16366,70463,71652
 7260  PROPO 66547,71652
 5325  PUNCH 70513,71652
  432  QO1Q9 14620
  415  QO200   431,13715
  510  QSYMD 16342
 7250  QUOTE   505,16715,16716,66551,71652
 7206  RCLAM 66555,71652
 5757  READ1 71652
 7216  RECIP 71652
 7162  REMPP 66610,71652
 7052  SASCO 66562,71652
15311  SETQP 70761,71652
 2077  SETUP 10551,71652
 7061  SLIST 66574,71652
 7101  SMOVE 66572,71652
 3774  SPEAK 71001
 2037  STREX  1767
 2070  STRMC  2021
 2060  STRMD  2024
 2052  STRXT  1775
  506  SUBRD 13350
 7367  SUBST 71065,71652
11665  TERA2 11672
 6657  TIMES   514,14135,66604,71652
 6647  TRACE 15030,15031,15505,15506,17111,17112,66571,71652
14565  UNFIX 13402,13411,14267,71652
 6533  VALUE  6420, 6423, 6463, 6504, 6547,71652
14507  ZEROP 71163,71652
  276  (IOS)   167,  246,  370,  636,  654,  667, 1205, 1232,10501,10506,11203
  346  (IOU)   217,  370
 1220 2SPACE
 1217 4SPACE
 1216 6SPACE 11347
 1215 8SPACE
15153 A    A 15020,15063,15074,15102,15133
15151 A    F 15022,15073,15116
15152 A   AL 15021,15055,15104,15126
15162 A   E1 15204
15203 A   E2 15173
15205 A   E3 15154
15046 A   R2 15033
16076 A  AGA 16052,16061,16105,16114
16100 A  AGM 16056
16102 A  AGO 16112
16077 A  AGQ 16053,16063,16106,16116
15144 A  APA 15122,15127
 3346 A  AS1  7544, 7560
 3315 A  CSV 15054,15067,15112,15140,15142,15621,15632,15743,15754,16025,16027
15150 A  FAS 15071
 3441 A  LIS  7563, 7566, 7575, 7601
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16064 A  PLL 16072
16074 A  PRX 16050
16073 A  PRY 16051,16064
15036 A  R21
15115 A  R33 15150
 3440 A  TEM  7574, 7604
16117 A  VAX 16104
15016 A APP2 71652
14722 A ASP1 14672
14725 A ASP2 14676
14750 A ASP3 14704
15000 A ASP4 14701
 3350 A ASS1 14663,14667,14720,14723,14746,14776,15014,15053,15123
 3352 A ASSA 14706,14711,14714
 3351 A ASSL 14707,14716
 3353 A AST1 14665,14712,14722,14725,14750,14764,14775,15000,15004,15012
 3354 A AST2 14751,14774
 3355 A AST3 14727,14737,14753,14771
 3356 A AST4 14733,14742,14757,14766
15147 A ATS1 15016,15044,15107
 3347 A CWR1  7546, 7551, 7555
  460 A DECM  7552, 7562
 3364 A ECS1 15155,15201
 3365 A ECS2 15160,15172
 3366 A ECS3 15163,15203,15206
 3367 A ECS4 15157,15166,15174
15763 A ELP1 15705,16002
15772 A ELT1 15764
15542 A EV1N 15463
15663 A EV27 15762
15454 A EVAL 71652
16127 A EVCM 15677
16125 A EVD1 15570,15604,15647,15650
 3412 A EVD2 15517,15530
15600 A EVI1 15565
15601 A EVI2 15567
15657 A EVI3 15643
15660 A EVI4 15645
15572 A EVL1 15600,15601
15651 A EVL2 15657,15660
15545 A EVP1 15465,15551,15552
15501 A EVP2 15515,15516,15541
 3372 A EVS1 15454,15467,15536,15543,15561,15605,15620,15667,15715,15731,15742,15774,15776,16005,16032,16036,16044
             16046
 3374 A EVSA 15673,15703,15710,15721,15771,16000,16001
 3373 A EVSE 15671,15702,15712,15717
16124 A EVT1 15617,15630,15646,15661,15707,15726,15741,15752,16010,16022,16037
16123 A EVTA 15563,15571
16121 A EVTE 15456,15542,15564,15610,16011
 7572 A FARG  7564
 7562 A PAIR 71652
 7612 A PERF  7567
 7615 A PERS  7576
16103 A VALV 16110
15136 AAPEXC 15114
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 7544 AAPNP1  7541
14663 AAPPLY 14721,14777,71652
15071 AAPSAL 15025
15024 AAPSES 15034,15035,15130
15121 AAPTRK 15031
15145 AAPTRT 15023,15042,15057,15105,15121
15131 AAPTSB 15060
15111 AAPTXP 15043,15106
16050 AARGOF 15125,16017,16034,17150
  500 AASFUN 14677,15016
  501 AASLBL 14702,15016
  502 AASLMD 14674,15016
  370 AASZRO 15016
15146 ACWADR 15052,15065,15135
  462 ADMASK
12211 ADVANC 66770
 3411 AEAG11
15731 AEVAPG 15736
 3376 AEVCDR
15154 AEVCON 71652
15733 AEVDCO 15730
15774 AEVLIS 71652
16126 AEVLNS 15461,15462,15472,15473
15563 AEVP11 15546
15607 AEVP12 15572
15553 AEVP13
15613 AEVP22 15512
15634 AEVP23 15514
15642 AEVP25 15502
16007 AEVP26 15474,15651
15756 AEVP27 15476,15510
15665 AEVP28 15641
  442 AEVQD1 15566,15644,16130
16122 AEVTAE 15466,15637,15642,15662,15701
 3411 AEVTDE 15470,15525,15627,15704,16016,16021,16031,16040
16014 AEVTFS 15626
 3375 AEVTRK 15477,15500,15534,15540,15625,15675,15723,15727,15733,15735,15737,15761,16127
15540 AEVTRT 15506
16031 AEVTXP 15535,15734
  370 AEVZRO 15522,16130
 7610 AFARGX  7573
 7570 APAIRX  7562
 7541 APPEND  7553,15257,67021
10042 APSSOC 70731,71652
10742 APVAL1 67100,67272,67315,67371,67404,67452,67500,67510,67534,70127,70307,70410,70440,70665,70773,71020,71206
             71523,71652
  474 APVALD
 3752 ARREST  3744, 4257, 4325,17276
13005 ARYGET 13331
13043 ARYGTX 13330
 3305 ARYLIS  2611,13314,13316
13113 ARYMAK 67046
  463 ATMASK
10134 ATTRIB 67066
16104 AVALOF 15143,16030,16047,17163
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3472 B    E  7445, 7447, 7452, 7470, 7474, 7531
7465 B    F  7456, 7460, 7462
3471 B    P  7451, 7463, 7505, 7511
7537 B   N1  7520, 7533
7540 B   N2  7527, 7530
7470 B   NF  7465
3464 B   X1  7455, 7475, 7516
3465 B   X2  7501, 7504
3466 B   X3  7503, 7510
3467 B   X4  7500, 7507, 7513
3470 B   X5  7525, 7535
 346 B  IOU   276,  303,  320,  370
7535 B  NF1  7466
7520 B  NF2  7467
 263 B  RCK   252,  254,  255
7451 B  SU1  7446
7455 B  SU2  7453
7477 B  SU3  7473
 574 B  WTX   543
 673 B CALL   665
 675 B INX4   664,  677
 320 B IOSA   323
 325 B IOSX   301
 324 B IOSY   302,  322
 234 B RTLC   240
 230 B RTRD   273
 533 B RTRX   203,  204,  260,  261,  270,  537
 201 B STRA   162,  202
 615 B WAGN   577
 627 B WERC   545,  600,  645
 620 B WERM   605,  610,  613
 576 B WRCK   572
 561 B WTAD   542
 630 B WTAG   544,  576,  616
 555 B WTWS   617
 177 B ZERO   174,  202,17074
1654 BACACT  1610, 1612, 1646
5313 BCDAD1  5324, 5373,10176
 364 BCDOUT   612, 1371, 1526, 1606, 1651, 1744, 2005, 2023, 2260, 3034, 3141, 5176, 5231, 5752, 6054, 6271, 6561
              7760, 7770,10251,10255,10261,10277,10565,10571,10664,10720,10771,11124,11223,11314,11402,11414,11433
             12137,12302,12305,12310
 473 BCONAT  3277
3304 BEGBLK  3303
 200 BFLTRA   164,  202
 663 BINPUT 71652
 347 BIOSBB   312
 472 BLANKS  4166, 5312, 5434, 5443, 6566,10652,10667,10714,11165,12227
4016 BLKETP  2107
4044 BLKOUT  4016
4004 BLOCKR 13216
 144 BOTTOM   144,  146,  151,  537,  640,  656,11205
5311 BRKOUT  5171
 534 BRTADR   210,  213,  214,  236,  237,  263,  266,  537
 274 BRTIOC   232
 275 BRTIOD   241
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  536 BRTIOU   220,  245,  537
  535 BRTLCH   216,  234,  242,  537
  205 BRTTWO   212
  366 BSRECL   144,  153,  537,  640,  656
  647 BTPDMX   633
  637 BTPRTY   646
66427 BUCKET  6434, 6523,66430
 6535 BUCKNO  6430
 7325 BUFFER  6554, 6567, 6621
 6417 BUKSRT  2517
 5766 BUTCHL 71653
  565 BWTACL   562
  631 BWTIOC   540,  541,  556,  560,  563
  632 BWTIOD   570
  276 B(IOS)   370
77671 C    L   747,  773, 1003, 1006, 1041, 1065, 1174
77672 C    R   754,  775, 1010, 1013, 1047, 1072
77665 C   8L   763, 1021, 1175,77673
77666 C   8R   765, 1027,77673
  747 C   B1
  757 C   B2   737,  751, 1104
  761 C   B3   740,  752, 1105
  770 C   B4   753
  762 C   B5   757
  773 C   B6   770
 1021 C   B7  1160
 1003 C   B8  1162
 1040 C   B9  1002, 1172
 1110 C   C1   756,  767, 1016, 1034, 1054, 1075, 1166
 1145 C   C2   761, 1120
 1144 C   C3   772, 1020, 1037, 1062, 1103, 1121, 1171
 1113 C   C4  1110, 1147, 1150, 1151
 1126 C   C5  1122
 1117 C   C6  1113
 1127 C   C7  1112, 1114, 1126, 1146
 1120 C   C8  1116
 1111 C   C9  1153
12031 C   CA 12015,12024
12024 C   CD 12017
12017 C   CL 12023
12026 C   CX 12007
12027 C   CY 12010
  710 C   H1   705
  727 C   H2   713,  714,  723,  732
  714 C   H3   733
 1174 C   LR   744,  762, 1000, 1024
77663 C   LS   750,  764,  774, 1004, 1007, 1022, 1026, 1040, 1045, 1067, 1117
77667 C   LZ  1025, 1044, 1064, 1176
16670 C   PA 16663
17047 C   PH 17036
17046 C   PL 17040
17050 C   PX 17034,17057
77664 C   RS   755,  766,  776, 1011, 1014, 1030, 1033, 1046, 1053, 1074, 1115
77670 C   RZ  1032, 1052, 1071
77662 C   TP  1056, 1060, 1077, 1101, 1123, 1124
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 1006 C  B10
 1013 C  B11
 1154 C  B12  1015
  777 C  B13  1017
 1000 C  B14  1035
 1063 C  B15  1055
 1104 C  B16  1076, 1164
 1163 C  B17  1005, 1012
 1160 C  B25   777
 1034 C  B40  1157
 1173 C  B50   742, 1106
 1175 C  BLR   745
 1153 C  C10
 1150 C  C11  1125
 7343 C  CP1  7360,71652
 3361 C  CR1  7344, 7365
 3362 C  CR2  7354, 7355, 7363
11771 C  GET 16343,16431,16761,67734
17327 C  LAN 17273,17301,17317,17321
16321 C  LAP 70013
16470 C  LAX 16321,16322
77665 C  LDS  1023, 1042, 1063,77673
16631 C  LEM 17022
17243 C  LER 17063,17072
17314 C  LFX 17306,17324
17241 C  LNN 17210
17275 C  LSC 17260
17320 C  LSE 17267
17261 C  LSN 17257
16353 C  LSO
17302 C  LSP 17266,17311
16351 C  LSQ 16340
17307 C  LSR 17326
17255 C  LST 16524,17212
17316 C  LX2 17255
16523 C  MOV 70705
16737 C  NON 16723
16754 C  NQT 16715,16716
16715 C  NTE 16707,16710
17053 C  PMK 17043
17042 C  PNL 17046,17047
17034 C  PRO 16427,17001
17060 C  PTR 17035,17051,17054
  736 C  RCD
77666 C  RDS  1031, 1050, 1070,77673
16515 C  REM 17014,17016,17025,17030
  702 C  RTX  1200
17001 C  SPP 16762
16513 C  SUM 17012,17023,17024
16501 C  TAB 16324,16365,16466,16566,16570,16642
16750 C  TRP 16753,17003
17351 C  UND 17343
17342 C  UNF 17346
17344 C  UNG 17340
17343 C  UNH 17336,17350
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17352 C  UNJ 17334
17354 C  UNR 17330,17331
 1176 C  ZLR  1161
16602 C AINS 16573
16620 C AINX 16602,16625
16516 C ALST 67005
16572 C AMBL 16552,16555
 1165 C B100  1156
 1172 C B200  1167
 3363 C CWRL  7347, 7356, 7361, 7362
16517 C ERCC 16657,16665
17032 C FELX 16622,16636,16651,16702,16706,16714,16751,17013,17021
16676 C FIND 16673
16703 C FINX 16671
12006 C GETL 11772,11775
12003 C GETX 11771,12005
16512 C HOLD 16725,16735,16743,16747,16752
16356 C INBP 16331,16334
16451 C IND2 16446,16447
16475 C INDC 16423,16425,16441,16444
16504 C INST 16467,16551,16564,16624,16627
16535 C JUST 16360,16606,16615
16502 C LCOM 16765,16772
16464 C LEND 16403,16414,16443
17321 C LFIX 17310
17061 C LINK   201
16477 C LIST 16323,16375,16406,16464,16465
17250 C LNAC 17137,17151
17247 C LNFN 17122,17131,17153
17122 C LNGN 17135
 3417 C LNKA 17061,17165,17203,17213,17244
 3420 C LNKB 17062,17166,17204,17214
17252 C LNKC 17073,17132,17144,17147,17160,17162,17201
17253 C LNKD 17067,17077,17134,17143,17207
17213 C LNKP 17211
17101 C LNLP 17115,17116,17152
17237 C LNLX 17206,17242
17134 C LNNF 17102
17136 C LNTR 17112
16544 C LOP1 16557,16571,16577
16660 C LOP2 16674,16675
17015 C LOPL 17026
16520 C LSAC 16640
16524 C LSTR 70725
16511 C MODE 16335,16357,16367,16402
17444 C MOVD 17374,17376
17357 C MOVE 16523
17364 C MOVY 17357,17443
16473 C NAME 16415,16426,16453
16707 C NATM 16633
16652 C NTAB 16644
16752 C ONQT 16734
16543 C PASS 16364,16401
16600 C PAUX 16543,16545
16503 C PROS 17041,17053,17056
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16505 C REST 16327,16377,16544,16547
16525 C RTRN 70716
  725 C RTXX   702,  734
16506 C STAR 16361,16371,16374,16404,16560,16574,16576,16604,16607,16613,16617,71426
17452 C STRW 17367,17447
17453 C TXLW 17363,17366,17370
16474 C TYPE 16420,16430,16445,16461
11672 CAAARX 67166
11705 CAADRX 16767,67176
11726 CAARXX 67126
11712 CADARX 16422,67206
11721 CADDRX 67216
11730 CADRXX 16712,17000,67146
16622 CAFELD 16603,16605,16610,16614
 1177 CCMMND   710,  715, 1200
11732 CDAARX 67226
11744 CDADRX 67236
11765 CDARXX 67136
11751 CDDARX 67246
11760 CDDDRX 67256
11767 CDDRXX 67156
12005 CFCN31 11773
17004 CFDLST 16754,16755
16724 CFLOOP 16736
  532 CHKSUM   155,  157,  235,  243,  244,  253,  274,  537,  567,  632
16526 CLBPTP  2105,16372
17206 CLNARS 17127,17140
17167 CLNDIS 17164
17117 CLNEXP 17114
17251 CLNRGL 17141,17154
17171 CLNSBR 17106,17110
17156 CLNTEN 17170
17153 CLNTEX 17126
17246 CLNTRS 17076,17125,17136,17175
17164 CLNTSB 17176
17254 CLNTSX 17177,17200
16444 CMKIND 16432
16646 CNEVAL 16656
16514 CNOCUR 16623,17004,17011,17027
 2420 CNSFWL  2251
  467 CNTMSK 17373
  363 COMAND   321
77662 COMMON 77640,77662, 1265, 1273, 1302, 1304, 1307, 1312, 1316, 1317, 1342, 1422, 1430, 1434, 1443, 1444, 1445
              1446, 1453, 1463, 1472, 1476, 1506, 1515, 1520, 1707, 1715,77662, 5521, 5527, 5532, 5535, 5545, 5550
              5554, 5561, 5563, 5573, 5574, 5576, 5600, 5602, 5606, 5612, 5623, 5626, 5645,77662,13547,13554,13573
             13574,14055,14056,14114,14115
12007 COMPAT  4335, 4341, 4417, 4430, 7633, 7660
  174 CONTIN 77727,11301,    0
16510 CPASWD 16363,16400,16556,16572
16476 CPATCH 16437
16477 CPROBE  3301,16477
16503 CPROEN  3301,16504
16500 CQTLST 16722,16744,16746
  741 CRDBCD   707
  402 CRITWN  2763, 3227
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  734 CRTXBE   721,  727
16507 CSTART 16362,16373,16424,16436
17330 CUNWND  1633,11637
 3423 D    F  7623, 7624, 7626, 7630
 3422 D    L  7625, 7635
 1533 D   TR  1523, 1524, 1527
 1510 D  EXA  1416
 1511 D  EXB  1417
 1473 D  EXC  1420
 3421 D  RET  7621, 7643
 1206 D  SPX  1203, 1213
 1531 D  TIR  1521
 1274 D BC01  1270, 1323, 1343
 1261 D BC02  1332
 1267 D BC03  1327
 1270 D BC04  1325
 1271 D BC05  1260
 1273 D BC06  1322
 1274 D BC07  1343
 1320 D BC08  1305, 1310, 1313
 1330 D BC15  1324, 1326
 1342 D BC49  1330
  455 D BC50  1267, 1343
 1436 D CONV  1447
 1434 D LOAD  1451
 7625 D MCPR  7641
 1520 D ONWD  1431
 7642 D RTRN
 1517 D SKP1  1450
 1516 D SKP3  1433
 1521 D TIME  1554
 1367 D WOTB  1235, 1257, 1367
 1367 D WOTC  1224, 1243, 1256
 1234 D WOTM  1226, 1236
 1341 D WOTS  1255, 1276, 1321
 1340 D WOTT  1254, 1262, 1331
 1334 D WOTU  1251
 1335 D WOTV  1252
 1336 D WOTW  1253
 1245 D WOTX  1222, 1241
 1513 D ZERO  1452, 1516, 1517
    4 DEBUGI  2546,10437
 1415 DGETTM  1522, 1554
13512 DIFFER 67416
13420 DIVIDE 67440
  431 DOCT33  1503, 1521
  427 DOCT60  1457, 1467, 1471, 1501, 1521
  430 DOCT61  1461, 1521
 1515 DSKP27  1424
10736 DUMPXX 67460
10760 DUMPYY
 1251 DWOTON
 2532 E    A  2155
 2533 E    B  2157
 2645 E    C  2161
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 2667 E    D  2166
 2677 E    E  2167
 2713 E    F  2172
 2720 E    G  2207
 2733 E    H  2176, 2745
 2734 E    I  2162
 3266 E  BIT  2656, 2661, 3125, 3267
 2474 E  CMK  2464
 3311 E  CNX  2463, 2472, 2500, 2520
 4130 E  DE1  4137
 4144 E  DE2  4136
 4127 E  DE4  4143
 4200 E  DE5  4162
 4121 E  DE7  4114
 4170 E  DEJ  4164
 4154 E  DEQ  4146
 4157 E  DEV  4145
 4211 E  DEY  4206
 3212 E  FSC  2710, 2722, 2773, 3025, 3217
 3210 E  FWC  2732, 2753, 2765, 3022, 3056, 3061, 3217
 2642 E  MAA  2641
 2644 E  MAB  2643
 2656 E  MAC  2660
 2671 E  MAD  2666
 2666 E  MAE  2670
 2674 E  MAF  2676
 2531 E  RCA
 2707 E  RCB  2612
 3217 E  RCC  3000, 3002
 3220 E  RCT  2756, 3004, 3221
 3043 E  RCX  2522, 3014, 3155
 3044 E  RCY  2523, 3156
 3045 E  RCZ  2524, 3157
 3221 E  RLC  3003, 3006
 2256 E  RST  2074, 2217, 2253
 2147 E  RSU  2076
 2461 E CMKO  2435, 2437
 2515 E CMPS  2504
 3313 E CNAT  2426, 2516
 3312 E CNFT  2505, 2513
 2452 E CNNM  2431
 2444 E CNNR  2453, 2460
 2442 E CNRS  2475
 2443 E CNRT  2473, 2521
 3314 E CNVA  2502, 2515
 3310 E CNXT  2424, 2444
77666 E DEMQ  4134, 4135
 3267 E MBIT  3047, 3267
 2665 E MBTT  2654
 3116 E MONE  2163, 3114
  471 E MONS  2665, 3224
 3127 E MOUT  3075, 3111, 3113, 3115
 2626 E MRKA  2621
 2702 E MRKE  2635, 2705
 2700 E MRKF  2663
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 3275 E MRKP  2637, 2700
 3131 E MRKX  3071
 3074 E MWIN  3112
 3306 E RCAC  2526, 3040, 3153
 3225 E RCBE  2530, 2764, 2767, 2775, 3007, 3036
 2770 E RCEA  2766
 2776 E RCEB  2774
 3014 E RCEC  3011
 3012 E RCED  3010
 2540 E RCIA  2536
 3307 E RCMQ  2527, 3041, 3154
 3201 E RCT1  3021
 3210 E RCT4  3024, 3217
 3212 E RCT5  3027, 3217
 3216 E RCT6  3032, 3217
 3174 E RCTM  3035
 3172 E RELX  3165
 2717 E SFSA  2727
 2724 E SFSC  2715
 2714 E SFSL  2720
 3057 E SFWA  2731, 2754, 3063
 2752 E SFWB  3054
 3055 E SFWC  3050
 3052 E SFWD  3065
 2252 E SUPX  2075, 2077, 2220, 2262
 3223 E TFSC  2776, 2777
 3222 E TFWC  2770, 2771
 2563 E TMLD  2557, 2604
 2565 E TMLE  2562, 2576
 2574 E TMLF  2571
 2576 E TMLG  2567
 2577 E TMLH  2563
 2552 E TMLJ  2600
 2562 E TMLK  2610
 3273 E TMLM  2550, 2553, 2577, 2601, 2606
 2761 E ZPDL  2116
 2503 ECMPLP  2514
 2476 ECMPNT  2441
 2447 ECNFWX  2420
 2450 ECNFWY  2421
 2423 ECNMLP  2445
 2432 ECNSLP  2443
  531 ECONAT   532, 3277
 4111 EDECON 71652
77665 EDEDIG  4127, 4133, 4140, 4147, 4152, 4156, 4163, 4200
77667 EDEINP  4122, 4144
 4176 EDEIR4  4113, 4116, 4211
77664 EDELOD  4112, 4141, 4150, 4170, 4207
  423 EDEMIN  4154, 4214
 4214 EDEORG  4214
77662 EDETS1  4111, 4115, 4161
77663 EDETS2  4121, 4142, 4151, 4171, 4205
 2616 EMARYA  2623
 2612 EMARYB  2625
 2624 EMARYC  2642, 2701, 2706
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 3226 EMARYT  2614, 2624
 3226 EMBITF  2674, 3267
 2662 EMBTTA  2165, 2657
 3113 EMLBBJ  2216
 3114 EMLBDW  2201
 3112 EMLBFA  2210
 3100 EMLEPD  2213
 3107 EMLEPE  2214, 3127
 3132 EMLEXT  3066, 3067
 3111 EMLIST  2205, 3073, 3102
 3102 EMLPDC  2541
 3103 EMLPDE  2540
 3126 EMLTBT  2170
  471 EMONES  2747, 3224
 2611 EMPDLF  2602
 3130 EMSRTN  3070
 3710 ENDBLK  3303
77711 ENDEND
 2414 ENDPDL  2121, 2211, 2535, 4220,15665,17446
12273 ENDRED 67470
 2263 ENOSET  2261
 3152 ERCBEX  3037
 3133 ERCERR  3103, 3166
 3142 ERCFEM  3137
 3224 ERCIND  2525, 3042, 3152
 3165 ERELOC  2757
11665 EREXIT  1564, 1647,11617,11672
11664 ERNULL  1563,11570
 2071 ERROR1 67552
   10 ERRORI  1572, 3146,10306
11560 ERRSET 67572
10211 ERSETO   511,11662,66753,71652
 2077 ESETUP 71652
 2753 ESFWDN
 2746 ESFWLD  2174, 2752
 3047 ESFWSC  2750, 3052
 2232 ESUPFS  2223
 2243 ESUPFV  2240
 2245 ESUPFW  2242, 2247
 3276 ETEMXX  3304
 3274 ETMPTM  2566
11421 EVALQT
10167 EVLISL  3370,15775,66474,71652
11423 EVQERR 11665
11516 EVQRTS  2545,11316,11343,11427,11431
 2760 EZPDLA  2542
  421 F    B  6776, 7241
  410 F    E  6773, 7241
77666 F    N  6631, 6633, 6674, 6751, 6753, 6757, 7007, 7016, 7025, 7201, 7203, 7204, 7226
  426 F    Q  6652, 7212, 7241
77665 F    T  6625, 6666, 6667, 7056, 7057, 7062, 7063, 7074, 7100, 7101, 7102, 7107, 7120, 7141, 7144, 7146, 7152
              7170, 7171,77666
12417 F   A1 12050,12152,12202,12517
12440 F   A2 12323,12517
12437 F   A3 12335,12517
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12252 F   A6
12053 F   B1 12044,12070
12056 F   B3 12047
12061 F   B4 12056
12044 F   B5 12040
12066 F   B6 12060
77662 F   BN  6672, 7021, 7023, 7114, 7234,77663
77664 F   CH  6750, 6755
 6765 F   CM  6746
77662 F   MQ  6637, 6670, 7172,77663
  400 F   Q8  6643, 6651, 7241
12574 F   T1 12162,12163,12377,12403
  412 F  A36 12517
12336 F  AL1 12321,12325,12333
12324 F  AL3 12336
12344 F  AL5 12340
12331 F  AL6 12326
12207 F  BB1 12147,12201
12167 F  BB2 12155
12202 F  BB3 12200
12170 F  BB4 12176
12156 F  BB5 12153
 6732 F  BN1  7000
 6672 F  BN2  6735, 7237
 6720 F  BN3  6705, 6736, 7240
77665 F  CHD 77666
 7033 F  CM2  6677, 6732, 6733, 7020, 7161
 7035 F  CM3  6702, 6706, 6707, 7033, 7163
 7017 F  CM4  7015
 7036 F  CM5  7017, 7034
 7106 F  CM6  6700, 6734, 7047, 7066
 7071 F  CM7  7050
 7067 F  CM8  7071, 7077, 7105, 7116
 7007 F  CV2  6747, 6766, 6771, 6774, 6777, 7002, 7005
 6743 F  CV3  6710, 6714, 6760, 6763
 6762 F  CV4  6761
 6760 F  CV5  6711, 6713, 6724, 6730, 6731, 6764
 6763 F  CV6  6712, 6725
 6751 F  CV7  6720, 6740, 7174
 6753 F  CV8  6721, 6726
 6757 F  CV9  6722
 7020 F  CX3  6703, 7011, 7142, 7232, 7233
 7026 F  CX5  7024
 6645 F  CY2  6657, 6662, 6665
 6641 F  CY3  6645, 6650
 6651 F  CY4  6644
  522 F  EOF 12271,12417
  523 F  EOR 12313,12417
12362 F  ERX 12355
 6715 F  EX1  6775
 6673 F  EX2  6717
 7011 F  EXS  6701, 6715, 6716, 7165, 7236
 7243 F  FL1  7036, 7043, 7045
 7244 F  FL2  7040, 7041, 7325
12134 F  GV1 12071,12110,12117,12130,12142
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12112 F  GV2 12104
12136 F  GV3 12103
12132 F  GV4 12122,12124,12125
12121 F  GV6 12113
12143 F  GVA 12140
 6737 F  MN1  6767, 7006
 6742 F  MN2  6741
 6727 F  MN3  6742
 7244 F  ONE  7054, 7060, 7073, 7076, 7325
 6764 F  OVF  6756
 6726 F  PL1  7003
 6706 F  PT1  6772
 6714 F  PT3  6723, 6743
 7155 F  PX1  6622, 7070
 7156 F  PX2  6623
 7157 F  PX4  6624
  402 F  Q10  6675, 7241, 7325
  446 F  QD7  7140, 7241
 7161 F  STZ  7010
 6766 F  SW1  6676, 7127, 7132, 7235
 7050 F  SW2
  402 F  TEN  6745, 7325
12401 F  UP1 12375,12376
12372 F  UP2 12400
12412 F  UP3 12402
12402 F  UP4 12411
 7153 F  XT1  7133
 7137 F  XT2  7134
 7133 F  XT3  7130
12552 F BUFF 12235,12244,12306
 7125 F CM12  7117
 7072 F CM13  7072
 7045 F CMF1  7042
 7046 F CMF2  7044
12634 F CURC 71652
 6755 F CV10  6727
  416 F DASH  6663, 7004, 7223, 7241
12363 F ERIR 12347
 7241 F EXC1  7064
 7242 F EXC2  7103
77663 F EXPN  6673, 7013
  475 F FIXS 12132,12603
  476 F FLOS 12106,12574
  524 F HOL9 12337,12417
  521 F HORG 12033,12126,12404,12417
 6674 F INTN  6704
12314 F JEAN 12272
12243 F LAMB 12215
12660 F MKIR 12636
12636 F MKNO 71652
 3656 F MKT1 12637,12644,12645,12655
 7176 F OCT1  7205, 7210
 7207 F OCT2  7206
 7226 F OCT3  7213, 7216, 7221, 7224
 7230 F OCT5  7217, 7225
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 7205 F OCT6  7222
 7211 F OCT8  7200
 7203 F OCT9  7175, 7231
12032 F PACK 71652
  455 F PBIT  6737, 7012, 7230, 7241
 3655 F PIND
  420 F PLUS  6660, 7001, 7220, 7241
12220 F PORK 12211,12221,12267,12273
  415 F Q128  7113, 7241
12316 F RIBS 12236
12271 F RUMP 12237
12230 F RUTH 12232
12276 F STEW 12220
12415 F UPI2 12366
12414 F UPI4 12365
12223 F VEAL 12217
  370 F ZERO 12165,12517
12261 FBACON 12315
12177 FBBIR2 12150,12170
 3654 FBBPNT 12171,12174,12206,12632
12045 FBFLOC 12052,12057,12077,12167,12205
  427 FBLANK  7241
12631 FBOFFO 12046,12100,12172,12573
12635 FCHACT 71652
12603 FCHARS 12035,12041,12051,12067,12073,12151,12203
12247 FCHOPS 12213
12236 FCHPOS 12212,12247,12274,12352
12417 FCHTYP 12324,12517
12201 FCLEAR 12111,12120,12131,12135,71652
12633 FCURC1 71652
77667 FDATUM  7053, 7055
 6666 FDECNO  6653, 6656, 6661, 6664
12337 FDIGIT 71652
12604 FEORTS 12216,12240,12314
12572 FERBFL 12230,12311,12360,12361
12535 FERBFU 12231,12303,12356
12346 FEROR1 71652
12517 FERSIG 12223,12225,12276,12346
 7131 FFSTOR  7106, 7164, 7166
  525 FHOL14 12417
  530 FHOL40 12417
 7127 FISTO1  7227
 7126 FISTOR  7030, 7032, 7035, 7162, 7167
14550 FIXFLO 13376,13437,13517,13534,14205,14224,14243,14301,14412,14460,14473,14521,14543,14643
13075 FIXVAL  4067,10746,10752,10755,11573,12765,13036,13050,13053,13060,13063,13143,13152,13160
12233 FJOYCE 12224
  200 FLAPCX   202,10270
  201 FLAPCY   202,10272
  177 FLAPCZ   202, 1713, 2002,10226,10274
 1707 FLAPTR   200
12321 FLITER 71652
  476 FLOATD  6022, 6612,12574,13420,13566,14340,14663
14453 FLOATP 67670
 5500 FLONAM  4765
14623 FLOTOL  4571,14520
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  423 FMINUS  6655, 6765, 7215, 7241
12147 FMKNAM 71652
  500 FNARGD 15016,15264
 6622 FNUMBR 12102,71652
12071 FNUMOB 71652
 7232 FOCT10  7214
  424 FOCT41 12351,12517
 7170 FOCTNO  6654
12573 FPARAM 12101
  422 FPOINT  6770, 7241
 1706 FPTGNR  1676, 1716
12572 FPWORD 12245,12251,12253
 7325 FREORG  7325
77670 FRESID  7046, 7061, 7075
  471 FSEVNS 12157,12321
12260 FSHANK 12255,12256
 7117 FSHIFT  7115
  477 FSUBRD
12313 FSUZIE 12277
10076 FUNARG   500,66505,71652
 3654 FUPLST 12401,12406,12410,12412,12413,12632
12237 FWDNUM 12214,12243,12275,12354
 4031 FWLOUT  3712
 3727 FWORDL  2236, 2730, 3144, 3711, 3715, 3720, 4021, 4051
13716 G    E 13604,13616,13643,13644,13646,13711
13714 G    N 13572,13645,13647,14016,14042,14103
13725 G    W 13656,13664,13677,13700,13701,13702,13703,13704,14077
13745 G   A5 13660,13661
13746 G   A6 13657,13667
13730 G   C1 13640
13732 G   C5 13634,13635
13733 G   C7 13633,13674,13770,14051
13706 G   EA
14022 G   EW 13756,13761,14010,14012,14014,14015,14111,14112,14113
13715 G   FN 13601,13620
13747 G   L1 14002,14006,14020,14044,14101
13651 G   M1 14013,14036,14045,14046,14054,14102
13652 G   M2 14037,14040,14074,14076
13653 G   M3 14033,14072
13654 G   M4 14035
13727 G   R2 13642,14001
13712 G   S1 13777,14000,14004,14007,14011
13713 G   S2 14003,14005
13724 G   S3 13775,14121
13726 G   SQ 13625
13755 G  AP6 13666
13737 G  CP7 13673,13767,14050
13723 G  LOG 13774,14075
13606 G  P01 13603,13610
13620 G  P02 13605
13610 G  P03 13607
13720 G  P04 13624,13626
13721 G  P05 13627,13630,13641
13722 G  P06 13631,13632
13637 G  P07 13636
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13632 G  P08 13637
14023 G  P09 13650
13663 G  P10 13662
13656 G  P11 13663
13671 G  P12 13670
13666 G  P13 13671
13676 G  P14 13675
13673 G  P15 13676
13756 G  P16 13705
13763 G  P17 13707
13644 G  P18 13760,13765
13575 G  P19 13762
14123 G  P20 13763
13711 G  P21 13764
13772 G  P22 13771
13767 G  P23 13772
13710 G  P24 13773,14124
14013 G  P25 13776
14113 G  P26 14017
14111 G  P27 14021
14106 G  P28 14027
14060 G  P29 14041
14047 G  P30 14043
14053 G  P31 14052
14050 G  P32 14053
14064 G  P33 14063
14062 G  P34 14064
14121 G  P35 14100
14074 G  P36 14105
14101 G  P37 14106,14107
14117 G  P38 14110
14031 G  P39 14117
14030 G  P40 14120
13655 G  P41 14122
13764 G  P42 14125
13717 G  RSQ 13623
  415 G L200 13600,13614,13715,14026,14032,14071
13707 G P171 13757
13572 G POWR 71652
  370 G ZERO 13575,13576,13602,13655,13665,13672,13715,13766,14023,14030,14047,14061
 3216 GCPDLC  2564, 2607, 3030, 3217
10174 GENSYM 67724
  435 GLL200 13622,13717
16276 GOGOGO 67744
14433 GRTRTP 14444,67754
11700 H    A 11720
11740 H    D 11757
11676 H   AA 11711
11716 H   AD 11725
11736 H   DA 11750
11755 H   DD 11764
12756 H   T1 12663,12665,12667,12673,12677,12701,12703,12707,12713,12715,12717,12723,12741,12744,12747,12750,12752
              12753,13005
12756 H   T2 12762,12773,13005
11710 H  AAX 11727
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11724 H  ADX 11731
12750 H  ANS 12710
11703 H  CAX 11672,11705,11712,11721,11726,11730
11742 H  CDX 11732,11744,11751,11760,11765,11767
11747 H  DAX 11766
11763 H  DDX 11770
12751 H  ERS 12724
12747 H  ORS 12674
11630 H HARP 11641
11662 H HORN 11560,11562,11563,11564,11565,11574,11600,11603,11604,11611,11614,11625,11643,11647,11653,11654,11655
             11656,11660
12730 H LOG1 12740,12754
12725 H LOG2 12675,12711
12745 H LOG4 12726
12737 H LOG5 12725
12741 H LOG6 12755
13003 H LSH1 12760
12771 H LSH2 12767
12777 H LSH3 12771,12772
13002 H LSH4 12761
11611 H OBOE 11601
11641 H TUBA 11626,11627
11625 HBSOON 11616
12662 HLOGOR 71652
11643 HSHAWM 11624
 6536 I   O1  6442, 6443, 6446
 6537 I   O2  6450, 6502
 6452 I   O3  6456, 6457
 6443 I   O4  6453, 6464, 6475, 6501
 6540 I   O5  6437, 6516, 6517, 6524
 6464 I   O7  6500
 6541 I   Q2  6471, 6477
 6542 I   Q4  6466, 6476
 6026 I   RD 71652
 6172 I  GET  6041, 6073, 6110, 6113, 6125
 6220 I  GTX  6172
 6504 I  OUT  6444
 6241 I  PUT  6103, 6120, 6124
 6106 I  RDT  6100
 6063 I  RDX  6032
 6070 I  RDY  6033
 6067 I  RDZ  6034
 6003 I  RP1  5763
 6006 I  RP2  5770
 3451 I  RS1  5757, 6001, 6004, 6020
 3452 I  RS2  5750, 5754, 5765, 5774, 5777, 6010, 6016
 6162 I  TPF  6144
 6534 I BSRT  6417, 6440, 6530, 6531
 6522 I BUCK  6435
 6370 I CELL  5753, 6176, 6210, 6562,71652
 6212 I GTMC  6223, 6226
 6222 I GTPC  6211
 6213 I GTPT  6207, 6214, 6215
 6525 I ITRX  6421, 6503
 6526 I ITRY  6422
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6354 I LWPO  6231
 504 I OPNA  6511, 6541
6256 I PUTX  6243, 6267
6032 I RDAA  6027
6110 I RDDD  6077
6041 I RDGC  6047
6122 I RDLT  6045
6123 I RDNM  6046
6124 I RDNN  6130, 6131, 6132, 6171
6024 I RDOT  5743, 5766
6353 I RDPB  6055
6164 I RDPD  6136
6140 I RDPS  6134, 6135, 6165, 6167
6062 I RDPU  6050, 6051, 6052, 6156
6142 I RDXT  6117, 6133
5732 I READ 71652
 505 I RLTR  6022
6154 I TPFA  6163
6175 IGETGO  6235
6236 IGTEOF  6233
6227 IGTGCD  6174
6352 IGTTBL  6212
6416 IGTVAL  6075, 6102, 6105, 6111, 6115, 6205, 6247
6530 IINTAD  6441
6516 IINTCN  6532
6025 ILRCIS  6173, 6224, 6234, 6311
6355 ILWCKS
6404 ILWDPB
6421 INTERN
6420 INTRN1  6161,12062,67766
6260 IPTRFP  6252
6330 IPTSFT  6146, 6251
6270 IPTTFA  6242
6255 IPUTGA
6246 IPUTMC  6142, 6150, 6253, 6261, 6310, 6314
6254 IPUTPC  6151, 6162, 6262, 6266, 6300
6335 IPUTVL  6154, 6155, 6303, 6306
6276 IPUTZB  6245
6413 IRDDDC  6076, 6104, 6112, 6114
6113 IRDDDL  6121
6072 IRDDLR  6044
6412 IRDDLS  6101
6064 IRDFIN
6414 IRDIND  6035, 6066
6053 IRDJT1  6043, 6137
6137 IRDJT2  6107, 6127
6415 IRDLST  6026, 6030, 6141, 6317
6335 IRDPNB  6152, 6255, 6263, 6272, 6301, 6336, 6337, 6340, 6341, 6342
6037 IRDPTS  6064, 6313
6025 IRDVAL  6062, 6140
6040 IRDWDS  6065, 6316
5757 IREAD1  5737, 5773, 5775,71652
5747 IREDER  5742, 5745, 6013, 6015
5735 IREDIS  6007
5734 IREDS1  5732
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 6022 IRLPAR  5735, 5771
  476 IRNUMB  6022
 6023 IRRPAR  5740, 5761, 6012
 6533 IVALUE 71652
77662 L   9L 77730,77747,77752,77753,77754,77712
77663 L   9R 77737,77744,77712
77706 L  11L 77772,77773,77712
 4524 L  EQA  4476
 4521 L  EQF  4467, 4471, 4505, 4513, 4530
 4532 L  EQP
 4516 L  EQT  4465, 4531
77645 L  STS 77777
 4527 L EQAR  4525
 4601 L EQL1  4463, 4466, 4501, 4503, 4514, 4524
 4602 L EQL2  4462, 4464, 4470, 4472, 4474, 4510
 4464 L EQLP  4515
 4542 L EQPE  4527
 4537 L EQPF  4532, 4534
 4577 L EQPS  4561, 4563
 4576 L EQPT  4545, 4554, 4557, 4566
 4574 L EQPX  4526, 4537, 4564
 4603 L EQTS
 4600 L EQXR  4461, 4517, 4522
77724 L LOAD 77721,77723,77745,77746,77762,77662,77712
  501 LABELD 15016
 7775 LAMBDA   502,66514,71652
  502 LAMDAD 15016
 2305 LBINPG  2102, 2144,10537
 4573 LEQPFX  4544, 4555, 4567
 4535 LEQPTX  4565, 4572
 4461 LEQUAL 71652
14443 LESSTP 70035
 2310 LFREES  2123,10550
 2307 LFULWS  2127, 2141,10545
77735 LLOAD2 77734,77740,77741
77737 LLOAD3 77743
77746 LLOAD4 77733
77747 LLOAD5 77725
77750 LLOAD8 77731
77751 LLOAD9 77761,77764
77756 LLOD10 77774,77775
77765 LLOD11 77755,77770,77776
77724 LOADER 77712,  370,70065,71653
12676 LOGAND 70075
12712 LOGXOR 70115
 3721 LOWARY  4052
66230 LOWERP  2275
  537 LOWREG   171,  537,  642,  660
 2306 LPBPDL  2115, 2143,10542
  202 LRTAPE   170,  655,  657
12760 LSHIFT 70023
  537 LWTAPE   637,  641
  456 MAGMSK
 7620 MAPCAR 70135,71652
 7645 MAPCON  7667,70145
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 4214 MAPLIS  7565,13114,15706,16003,16145,70155
14500 MINUSP 70217
14624 MNSPRG 70207
 3066 MRKLST  2200, 2204, 2547, 2573, 2575, 2704
77644 NILLOC
77640 NILSXX   177,71653
  200 NOBACT  1615, 1654
11670 NUBPDL  1620, 2114
14445 NUMBRP 16337,16653,70267
 4115 NUMNAM  4746
14342 NUMVAL 12734,12774,13352,13360,14172,14405,14446,14455,14470,14501,14511,14535,14625,14635,16352,16646
  452 OBLANK  1603, 1732, 2000, 2020, 3020,10654
66427 OBLIST  2543,66430,70311
11021 OCTALP  1602, 1723, 1725, 1731, 1777, 2010, 2012, 2016, 3017, 5061,11036
12333 OPCHAR 70336
 1222 OUTPUT   611, 1525, 1605, 1650, 1743, 2004, 2022, 2257, 3033, 3140, 5175, 5230, 5403, 5751, 6053, 6270, 6560
               7757, 7767,10250,10254,10260,10276,10564,10570,10663,10717,10770,11123,11222,11313,11401,11413,11432
              12136,12301,12304,12307
  651 OVLTXX 11036
10230 OVRLRD   176, 2041, 3151,10245,10253,10333,10436,10466,10471,10525,10560,10567,10573,10735,11126,11230,11307
10001 P PAL1  7752
10002 P PAL2  7754
 7777 P PAL3  7761
10010 P PAL4  7761
10010 P PAL5  7771
 7766 P PAP2
 7767 P PAP3  7764
 7774 P PAS1  7745
 7775 P PAS2  7746
 3442 P PAS3  7747, 7762, 7772
 3443 P PAS4  7750, 7765, 7773
 1554 PAUSEF 70376
  464 PDMASK
  465 PDTMSK  4072,11606,11651
 7646 PMAPCA  3421,66521,71652
  473 PNAMEA
  504 PNAMED  6541,10216
   40 PPTIND  5410,10476,10503,10526
  363 PPTOUT  1371, 5404
 3447 PRGVAR 15330,15353,16272
 7745 PRINAR 11357
 5104 PRINT2 70473
 5231 PRINTC
 5176 PRINTD
 3453 PRINTL  4610, 4613, 5333, 5336
 7140 PRPLCA 66556,71652
 7130 PRPLCD 66557,71652
 1371 PSHLDB 70416
  466 PTAMSK  2027
 5461 PUNACT  5326, 5421, 5423
13070 Q   AX 13016
14560 Q   FL 14553
14564 Q   FX 14551
14423 Q  A1T 14406,14411,14416
13256 Q  AAA 13261
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14403 Q  AD1 14432
13140 Q  ADA 13135,13136
13340 Q  ADO 13144,13164,13170,13173,13175,13177,13210,13235,13246
13341 Q  ADT 13153,13167,13201,13247
14316 Q  AFL 14303
13177 Q  AGA 13163,13172
13062 Q  AGD 13055
13032 Q  AGN 13020,13021
13065 Q  AGR 13054,13056
13071 Q  AGV 13022,13041
14300 Q  AMM 14203
 3503 Q  AMQ 14173,14204,14223,14242,14300
14340 Q  AMR 14271,14275
13164 Q  AOD 13146
13347 Q  ARY 13270
  506 Q  ASB 13300,13350
13173 Q  ATD 13155
13067 Q  AXS 13031
14424 Q  FAD 14414
14464 Q  FLT 14462
14150 Q  MAX 71652
14142 Q  MIN 71652
14450 Q  NPT 14504
13561 Q  OUT 13551
14621 Q  UFC 14565,14570,14610,14613
14576 Q  UFE 14567
14604 Q  UFF 14601,14606,14607
14620 Q  UFQ 14572,14574
14622 Q  UFS 14600,14603,14614
14524 Q  ZPF 14463,14475,14532
14514 Q  ZPG 14547
14527 Q  ZPT 14515,14531
13247 Q AADD 13252
13344 Q AARY 13232,13262
13240 Q ACLA 13243
14401 Q ADD1 71652
14426 Q ADDF 14415
14126 Q ADDP 71652
13335 Q ADOT 13202,13207,13240,13253
13342 Q ADTH 13161,13165,13203,13256
 3504 Q AFAT 13125,13303,13311,13317,13325
14233 Q AFLL 14207
14235 Q AFLR 14211
14262 Q AFLT 14247
14260 Q AFMP 14245
13320 Q AFRX 13116
13321 Q AFRY 13117,13324
13072 Q AGAO 13007,13017,13024,13035,13052,13057
13073 Q AGAT 13013,13026,13062
13056 Q AGDT 13034
13041 Q AGXE 13066
14322 Q AMIN 14310
 3500 Q AMIR 14126,14134,14142,14150,14155,14335
14164 Q AMLP 14217,14232,14257,14315,14327
14240 Q AMLT 14177
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14215 Q AMRT 14237
14255 Q AMRU 14265
13332 Q APWO 13222,13224
13333 Q APWT 13212,13215
13044 Q ARYY 13005
13045 Q ARYZ 13006
13343 Q ASBR 13225,13227,13273
13334 Q ATBZ 13223,13236
 3505 Q ATMP 13142,13145,13150,13154,13220,13272,13275
13337 Q ATMQ 13213,13226
13336 Q ATYP 13134,13137,13204,13205,13214
13527 Q DIFT 13516,13521,13522
13525 Q DIFX 13512
13476 Q DIVA 13446
13511 Q DIVT 13436,13441,13447,13457,13460,13463,13474
13501 Q DIVX 13432,13465,13505
13564 Q EXPA 13536
13546 Q EXPB 13537
13540 Q EXPC 13564
13530 Q EXPT 71652
13567 Q EXPX 13530,13541,13560,13563
13570 Q EXPY 13531,13540
14466 Q FIXP 71652
13106 Q FXVE 13075,13100,13103
14441 Q GRTT 14435
14631 Q MRXR 14624
14134 Q MULT 71652
14276 Q MXIR 14270
14451 Q NPIR 14445,14447,14453,14466,14500,14506,14507,14526,14533
14345 Q NVLP
14351 Q NVNO 14345,14364
14533 Q ONEP 71652
13556 Q OUT1 13552
  476 Q RCPS 14653,14663
14662 Q RCPT 14640,14647
14654 Q RRXR 14633,14661
14430 Q SUB1 71652
  433 Q UFMC 14571,14573,14620
  432 Q UFNC 14605,14620
14616 Q UFXR 14576
14266 Q UNFX 14213,14251,14273,14306
13366 Q UNUE 13414
13417 Q UNUR 13356,13364,13366,13375
13415 Q UNUS 13355,13370,13401
13416 Q UNUT 13351,13357,13373,13405
13371 Q UNUX 13350,13407
14525 Q ZPIR 14454,14465,14467,14477,14510,14530,14534
14531 Q ZPTS 14522,14523
  433 Q233Q9 14620
  434 Q777Q9 14620
14417 QA1IR1 14401,14430
14420 QA1IR2 14403
14421 QA1IR4 14404
13345 QACLAS 13245
13074 QAGATH 13015,13030,13047
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13047 QAGDTH 13033
13042 QAGXEX 13011,13032
14330 QAMEND 14165
13115 QAMFAG 13113
  476 QAMFLC 14333,14340
14220 QAMFRS 14175
  475 QAMFXC 14331,14340
 3501 QAMIND 14130,14136,14144,14152,14157,14334
14336 QAMIR2 14162
 3502 QAMLIS 14167,14216,14231,14256,14314,14326
14155 QAMMMF 14133,14141,14147
14307 QAMRNT 14321
14341 QAMSUM 14163,14214,14215,14222,14236,14253,14255,14264,14272,14274,14311,14312,14322,14325,14330
13346 QARSTO 13255
13323 QARYTL 13217
13524 QDIFX2 13513
13443 QDIVDC 13475
13504 QDIVEX 13453
13471 QDIVFX 13442
13510 QDIVND 13420,13423,13427,13467,13502,13506
13432 QDIVOP 13422,13426
13500 QDIVX2 13433,13466,13504
14437 QGRTIR 14433,14442
14270 QMIXFL 14235,14262,14320
14362 QNVATM 14350
14372 QNVIR4 14342,14354
14373 QNVTBL 14371
  435 QO2Q11 13717
  431 QO33Q2  1521
14657 QRCPFX 14646
14655 QRRXR2 14634
  507 QSPECD 16756,16775
  434 QUFMSK 14566,14620
14565 QUNFIX 71652
  476 QUNFLT 13403,13420
13373 QUNMXA 13365
13410 QUNMXB 13400
13406 QUNUX2 13374,13413
  505 QUOTED  6022
13427 QUOTEN 70543
14507 QZEROP 71652
 4357 R   C1  4353
 3477 R   ST  7373, 7377, 7402
 3475 R   SX  7367, 7443
 3476 R   SY  7370, 7374
 3474 R   SZ  7405, 7406, 7412, 7416, 7420, 7423, 7424, 7426, 7435
10146 R  AT1 10134
 4334 R  CMP  4242
 3357 R  CS1  4346, 4355, 4375
 3360 R  CS2  4360, 4363, 4366, 4367, 4372
 4377 R  CT1  4350, 4354, 4361
 3371 R  ELA
15445 R  EQP 71652
16316 R  GOT 16305
 3413 R  GOX 16276,16311,16317
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 3430 R  MS1  4215, 4223, 4301, 4304
 3431 R  MS2  4225, 4240, 4262, 4277, 4307
 3432 R  MS3  4227, 4241, 4243, 4275, 4310, 4312
 3433 R  MS4  4231, 4253, 4266, 4273
 3434 R  MS5  4233, 4254, 4271, 4330, 4332, 4344
 4344 R  MS6  4235
10131 R  NLY 10100
 4435 R  SR1  4421
 4404 R  SR3  4444
 4445 R  SR4  4404
 3473 R  SXT  7372, 7441
10130 R  TWA 10105
15241 R ATMX 15230
15236 R ATP1 15231
10140 R ATRB 10135,10143
  460 R BFDM 15225,15230
  442 R BFQ1 15236,15243,15246,15450
15221 R BFS1 15250,15262,15264,15307,15346,15360,15445,15446
 3415 R BFS2 15251,15256,15270,15277,15350,15356
 3416 R BFS3 15265,15303
 3414 R BFS4 15275,15306
15367 R BFS5 15347,15364
15212 R CARP 71652
15217 R CARX 15212
15222 R CDRP 71652
15226 R CDRX 15222
 4340 R CMP1  4311
 4345 R COPY  4365, 4371,71652
  460 R DECM  4364, 4400, 4443
 3343 R EVA1 15373,15410
 3344 R EVA2 15400,15412
15412 R EVA3 15406
15377 R EVA4 15413
15407 R EVA5 15415
15373 R EVA6 15370
15370 R EVA8 71652
 3345 R EVA9 15375,15403,15405
  370 R EVCF 15417,15443,15445
  442 R EVCT 15371,15414,15435,15445
 3370 R EVLX
 3435 R EVR1 15421,15437
 3436 R EVR2 15426,15441
15441 R EVR3 15434
15425 R EVR4 15442
15436 R EVR5 15444
15421 R EVR6 15416
15416 R EVR8 71652
 3437 R EVR9 15423,15431,15433
 3445 R INTB 16140,16167,16172,16210,16216,16237
16271 R INTE 16141,16152,16155
15264 R LABP 71652
15250 R LAMP 71652
 4244 R MAIN  4337
  460 R MCDM  7665, 7675
 3427 R MCN2  7650, 7662, 7671
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 3426 R MCN3  7651, 7663
 3425 R MCN4  7652, 7653, 7655, 7666
 3424 R MCN5  7646, 7673
  460 R NCDM  7704, 7713
 7700 R NCI1  7675
 7702 R NCI2  7705
 7711 R NCS1  7700
 7713 R NCS3  7701, 7710
10150 R NOTS 71652
10011 R PROP 71652
 3462 R REPV 15313,15317,15331,15343
15346 R SETP 71652
10113 R SPP1 10121
10132 R SPRX 10073
10126 R SPRY 10107
10125 R SPRZ 10110,10113
 3454 R SRS1  4400, 4433, 4450, 4457
 3455 R SRS2  4405, 4422, 4441
 3456 R SRS3  4403, 4412, 4414
 3457 R SRS4  4407, 4423, 4425, 4437
 3460 R SRS5  4402, 4411, 4435
 7372 R SUB1  7415, 7422
 7441 R SUB2  7403, 7444
 7437 R SUB3  7427
 7443 R SUB4  7376
15230 RATOMP 71652
  500 RBFFAG 15261,15264
  370 RBFZRO 15253,15264
 3040 RCEXIT  3013
14633 RCPPRG 70565
 3220 RCRLOC  3221, 4033, 4040, 4044
 3270 RCSGNL  2531
 3271 RCSGNM  2711
 3272 RCSGNN  2755
  460 RDMASK 10142,10150
 2522 RECLAM  4034, 4041, 4050,17322,70575
13423 REMAIN 70607
 7714 REMPRP 70621
 2074 RESETP
17454 RESTOR 16525
 7150 RETATM 66561,71652
16272 RETURN 70633
16166 RINTAA 16153
16202 RINTEB 16215
16130 RINTER 71652
16221 RINTEV 16177,16200
16242 RINTFB 16144
16253 RINTFC 16231
16251 RINTFX 16243
16167 RINTGA 16176,16202,16225,16241
 3446 RINTGL 16133,16166,16233,16257,16265
16152 RINTGM 16161,16165
 3450 RINTGS 16132,16135,16224,16226,16240,16255,16262,16264,16273,16301,16306,16315
 3447 RINTPL 16134,16146,16150,16213,16222,16272
16262 RINTRN 16170,16227
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 3444 RINTRX 16130,16267
 4313 RMAIN1  4343
 4262 RMLOP1  4333
 4306 RMPRG1  4265
 7675 RNCONC 71652
  442 RNOTC1 10153,10155
15243 RNULLP 71652
10155 RPLACA 70643
10164 RPLACD 70653
10170 RPLACW
15341 RREPP1 15326
 3461 RREPS1 15311,15337
 3463 RREPT1 15325,15334
 7724 RRMPR1  7734
 7726 RRMPR2  7723, 7743
 7737 RRMPRE  7732
 7735 RRMPRO
 7731 RRMPRT  7717, 7721
 7744 RRMPRX  7714, 7735
  460 RSASDM 10025,10072
10017 RSASL1 10023,10024
10024 RSASP1 10013
10023 RSASP2 10015
10030 RSASP3 10020,10071
10067 RSASP4 10052
10052 RSASP5 10060,10061
10060 RSASP6 10047
10061 RSASP7 10045
  442 RSASQ1 10014,10046,10072
10065 RSAST1 10011,10026,10033,10040,10042
10064 RSAST2 10043,10067
10062 RSAST3 10044,10070
15362 RSETP1 15351
15311 RSETQP 71652
 7367 RSUBST 71652
10652 S  OBQ 10672,10712
10700 S  ODC 10675
11050 S  OUP 10631,10640,10650,10655,10656,10665,10671,10707,10715,10721
11334 S EVQA 11330
 3653 S EVQB 11317,11327,11331,11332,11336,11337,11350,11351
11376 S EVQD 11364,11421,11512
11400 S EVQE
11346 S EVQS
11375 S EVQZ 11464,11500
11270 S GCRD 11302
  460 S GENC 10212,10216
10214 S GENX 10174
  370 S GENZ 10202,10204,10216
10631 S OAXT 10670
11042 S OBEG 10607,10621,10624,10626,10633,10635,10747,10765,11011
10770 S ODER 10605,10612,10615,10622
11045 S ODLT 10673,10676,10700,10701,10702,10703,10704
11043 S OEND 10611,10616,10753,10764,11014
11047 S OLDM 10674
10641 S OLDQ 10620,10660
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10673 S OLID 10645
10671 S OSTZ 10642
10723 S OVDC 10600
10725 S OVDI 10602
10472 S OVDN 10263,10317
10724 S OVDQ 10601
10726 S OVDX 10574,10722,10736,10760,10773,11017
10727 S OVDY 10575,10737,10761
10730 S OVDZ 10576,10740,10762
10616 S OVGE 10757,10767,11020
11116 S OVLA 11121
  651 S OVLT 10431,10445,10457,11036,11104
10434 S OVTA 10450,10531
10162 S REPL 10155,10164,10170
10042 SASSOC 15075,15332,15354,16234,16643,71652
10217 SDIGIT 10175,10177
 4400 SEARCH  7464,70741
 2257 SETERR  2146
11310 SEVALQ 71652
  471 SEVENS  3224, 4201, 5032, 5121, 5732, 6145,12066,12074,12321,12706
11416 SEVLQX 11310
11417 SEVLQY 11311
11513 SEVQAC 11367,11374
11534 SEVQAM 11403
 3506 SEVQAN 11323,11400,11404,11406,11435,11465,11477
11441 SEVQAT 11373,11455,11456
  144 SEVQBL 11320,11344,11517
11520 SEVQBM 11315
11412 SEVQDN 11410
11407 SEVQER 11345,11430
11501 SEVQFS 11447,11454
11377 SEVQFT 11363,11366,11505
11457 SEVQFX 11451
11345 SEVQLP 11411
11541 SEVQME 11415
11365 SEVQMP 11422
11514 SEVQMQ 11466,11474
11374 SEVQNF 11442
11341 SEVQOP 11326,11440
11321 SEVQRD 11333,11340
11546 SEVQRE 11434
11437 SEVQRX 11321
11517 SEVQSP 11324
11515 SEVQST 11445,11452,11463,11510
11410 SEVQTH 11341
11302 SGCIOC 11215
11273 SGCRDB 11207
11274 SGCRDC 11211
11276 SGCRDD 11213
11301 SGCRDE 11303
  504 SGENPN 10207,10216
10216 SLETTR 10200
10630 SOAXT1 10662
11021 SOCTLP 10637,10647,10651,10705,10710,11036
10774 SODBAD 10772
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11044 SODSAR 10706,10711
10646 SODXCL 10677
11046 SOLISD 10614,10644,10756,10766,11006
10373 SOVALF 10262
10220 SOVBGN 71652
10245 SOVBSW 10246,10247,10264,10265
10404 SOVBUF 10232,10235,10236,10252,10300,10402,11112,11113,11156,11166,11171
10341 SOVCEM 10566
10561 SOVCER 10536,10541,10544,10547,10554
11253 SOVCHN 11175
11256 SOVCLT 11216
11122 SOVCMP 11173
11270 SOVCTN 11217
10422 SOVDBG 10325
11041 SOVDEK 10733,11015
11040 SOVDEX 10577,10731,10741,10742,10745,10763,11016
10713 SOVDFN 10657
10717 SOVDLL 10713
10574 SOVDMP 10331
11036 SOVDSF 10630
10666 SOVDSH 10627
11037 SOVDZS 10643,10661,10666
11002 SOVENK 10606,10734
10260 SOVEOF 10234
10254 SOVERR 10233
11307 SOVEXS 10335
10235 SOVGOR 10257
10337 SOVIND 10224
10350 SOVNSM 10572
10570 SOVNSZ 10424,10440,10452,10527
10526 SOVONE 10307
10264 SOVPNT 10243
10402 SOVPOS 10534,10603
10362 SOVRDM 10256
10511 SOVRLX 10221
10512 SOVRLY 10222
10513 SOVRLZ 10223
10451 SOVSET 10311
10241 SOVSRC 10244
10437 SOVSST 10323
10336 SOVSVI 10220,10337,10510
10532 SOVSZE 10321
11143 SOVTAA 11120
11074 SOVTAP 10327
10336 SOVTBL 10241,10266,10337
11250 SOVTCT 11174
11107 SOVTJJ 11100
10525 SOVTOV 10514
11234 SOVTPO 11200
11231 SOVTPP 11220,11221,11224
11174 SOVTPS 11164
11225 SOVTPX 11074
11226 SOVTPY 11075
11227 SOVTPZ 11076
10305 SOVTRA 10267
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11131 SOVTRM 11122
11127 SOVTRN 11125
10423 SOVTST 10313,10315
11243 SOVTTB 11116,11177
11216 SOVTXX 11201
 1200 SPACEX 11346
 7110 SPECAL   507,16754,16755,66575,67401,71652
10122 SPPERR
10072 SPREAD 11511,15056,15751
 4452 SRCMPT  4447
 7072 SRETUR 66573,71652
10161 SRPLEX 10167,10173
 2064 STRAMA  2011
 2065 STRAMB  2013
 2032 STRBTM  2153
12221 STREAD 71026
 1766 STRPNT 17245
 2031 STRTOP  2151
 7445 SUBLIS  7506, 7512,71055
 2730 SWPFWS  2723
10057 SYMGEN 66507,71652
10340 SYSIND  1571, 1573, 2544, 3145, 3147, 5407, 5411,10225,10302,10304,10434,10462,10464,10470,10504,10552,10557
              10561,10563,11110
  365 SYSPIT   666
  364 SYSPOT  1204, 1371,10505
  363 SYSPPT  1371,10500
  367 SYSTAP   166,11202
  366 SYSTMP   601,  606,  635,  653
 5073 T    L  4754, 4760
 5717 T   A1  5534, 5560, 5562, 5565, 5566, 5572, 5575, 5601, 5607, 5625
 4662 T   A2  4651
 4640 T   A3  4666
 4645 T   A4  4671
 4656 T   A6  4646
 5731 T   C0  5510, 5551
 5730 T   C1
 5727 T   C2
 5726 T   C3
 5725 T   C4
 5724 T   C5
 5723 T   C6
 5722 T   C7  5547
 4702 T   L1  4623, 4630
 6557 T   NE  6572
  422 T  A33  5641, 5732
  413 T  A77  5673, 5732
 5312 T  ADT  5312, 5313, 5314, 5315, 5316, 5317, 5320, 5321, 5322, 5323
 5076 T  BQ0  5050
 4672 T  DOT  4652
 6550 T  NA1  6556
 6566 T  NA2  6555
 6601 T  NA3  6575
 6612 T  NA7  6573
 6614 T  NA8  6600, 6603, 6605, 6606
 6615 T  NX1  6545, 6611
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6616 T  NX2  6544
6617 T  NX4  6543
4750 T  PA3  4725
5350 T  PLP  5360
5364 T  PNX  5341, 5424
5365 T  PNY  5342, 5425
5366 T  PNZ  5343, 5426
5072 T  PR1  4703, 4762, 5066
4713 T  PR2
4720 T  PR3  4712
4753 T  PR4  4761
5056 T  PR5  4727
5253 T  PR7  5113, 5155, 5211
5254 T  PR8  5112, 5156, 5212, 5214, 5237
5255 T  PR9  5104, 5111, 5157, 5215, 5240
4674 T  PS1  4620, 4631, 4660
4675 T  PS2  4637, 4640, 4645, 4654, 4664
5457 T  PSS  5352
 444 T  QD5  5205, 5235, 5312
5307 T  REC  5162, 5177, 5224, 5232
4633 T  XA1  4627
 415 T A128  5526, 5732
 457 T ADDM  4710, 4711, 4720
5101 T BCIQ  5037
5075 T BQ10  5043
5146 T COMB  5152
4701 T CWRL  4625, 4635
5015 T FIFI  5011, 5026, 5030
5635 T FL01  5630
5623 T FL65  5635
5624 T FL67
5651 T FL70  5647
5524 T FL73
5534 T FL74
5542 T FL75  5533
5550 T FL76  5553
5564 T FL77  5557
5565 T FL78
5572 T FL79  5570
5576 T FL80  5571
5617 T FL81  5613, 5614
5621 T FL82  5603
5512 T FLNA  5503
5666 T FLNX  5500, 5504, 5662
5667 T FLNY  5512
5670 T FLNZ  5513
5245 T INIT  5115
5133 T JUST  5126
5720 T LOG2  5531
4767 T LUCY  4744
 410 T ONEE  5617, 5732
 471 T ONES  5654, 5732
5261 T PART  5144, 5147, 5203, 5220, 5242, 5247
5455 T PCNT  5355, 5372, 5374, 5437
5360 T PGRA  5371, 5420
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 5456 T PLIS  5400
 5460 T PNCQ  5375, 5417
 5476 T POUP  5356, 5401, 5402, 5405, 5414, 5440, 5444
 5361 T POUT  5354
 4733 T PR3N  4721
 4724 T PR3P  4732
 4762 T PR4E  4747, 4766, 5055
 4764 T PR4F  4741
 5070 T PRC1  5062
 4667 T PRP2  4642
 5071 T PRSS  4704, 4733, 5056
 5207 T PRTB  5173
 5341 T PUN2 71652
  447 T QD20  5201, 5204, 5233, 5245, 5312
 5260 T RCHM  5124, 5125
 5262 T TEMP  5117, 5120, 5127, 5131, 5133, 5142, 5143, 5166, 5200
 5222 T TER1  5223
 5230 T TER2  5225
 5224 T TER3  5227
 5074 T TONI  5007, 5012, 5020, 5023, 5027
 5435 T TPLP  5441
  470 TAGMSK  2430, 4543, 4553,14363,17070,17071
  370 TAPASG 11176
  633 TAPDMP 10427,10443,10455,10473,10533,11102
  100 TAPIND 10425,10441,10453,10475,11077,11107,11307
 5077 TBCI0Q  5053
 4776 TBETTY  4771
  472 TBLANK  5221, 5226, 5312
  472 TBLNKA  5202, 5241, 5246, 5312
 5153 TCOMB1
 5164 TCOMB3
 5116 TCOMB4  5252
 5151 TCOMB5  5165, 5206
 4700 TCOMM2  4662
11671 TCOUNT  3752, 3763, 4057, 4101,11615
 5032 TDEBBY  5013
 3304 TEMLIS  2551
 6311 TEREAD   634,11423
 2410 TERPDL 11426
 5214 TERPRI  4612, 4714,11424,12300,12312,16054,16107,71102
 5421 TERPUN  5335,11425
 5555 TFL76A  5544
 5706 TFLOPB  5516, 5517, 5520, 5655, 5663, 5675
 5702 TFLZET  5622, 5627, 5631, 5637
 5706 TFLZPZ  5506
 5007 TGRETA  5017
 5673 TINBCD  5604, 5611, 5616, 5620, 5633, 5640, 5642, 5644, 5651
 6621 TKBPOS  6570
 5721 TLOG10  5542
 4677 TLPAR2  4633
 5142 TLSHIF  5134
 5053 TMARIE  4777
 5041 TMICKY  5036
 5100 TMISGN  4772
 5155 TNOJOB  5123
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 6543 TNUTRN 71652
  427 TONEBL  5646, 5732
  423 TONEMI  5615, 5650, 5732
  420 TONEPL  5732
17462 TOPROG  2303
 5257 TPARTS  5145, 5153, 5216, 5236, 5251
 5054 TPATSY  5040, 5045, 5052
 5307 TPCPPI  4606, 5207
 5337 TPNCHX  5325
 5345 TPPRTS  5361, 5432
 4673 TPRBLW  4616, 4667
 4620 TPRIN0  4611, 4644,71652
 4703 TPRIN1 71652
 5110 TPRIN2 71652
 4604 TPRINT 71652
 4616 TPRNIL  4621
 5370 TPRPLP  5357, 5442, 5446
 4614 TPRPS1  4604
 4612 TPRTT1  5213
 5102 TPTPNT  4736, 4767
 5103 TPTTGR  4707, 4720, 4737, 4742
 5325 TPUNCH 71652
 5344 TPWRDS  5362, 5431
 5166 TRECFL  5163
 4676 TRPAR2  4657
 5046 TSANDY  5041
 5124 TSHIFL  5132
 5714 TTHSND
 5036 TVICKI  5031
 5162 TWFULL  5150
 5256 TWORDS  5114, 5154, 5217, 5234
 4101 UNCONT 71141
12365 UNPACK 71153
 2326 UNSAVE  1631, 4374, 4432, 4445, 4512, 4656, 6000, 6017, 7364, 7440, 7515, 7557, 7642, 7672,11635,11657,12671
              12705,12721,14161,14717,15066,15136,15200,15336,15407,15436,15631,15753,16004,16023,16042,16266,16313
              17156
13350 UNUMIX 13434,13514,13532,14434
71652 UPERML  2274
 3267 VERBOS  3012
 5310 WALLPC  4607, 5167, 5174
  453 ZBLANK  1215, 1216, 1217, 1220

0 NO ERROR IN ABOVE ASSEMBLY.
```

1

LOGICAL TAPE	MACHINE TAPE	TOTAL WRITES	TOTAL READS	NOISE RECORDS WRITING	NOISE RECORDS READING	TOTAL REDUNDANCIES WRITING	TOTAL REDUNDANCIES READING	POSITIONING ERRORS
2	A 4	407	407	0	0	0	0	0
3	B 4	290	290	0	0	0	0	0
4	A 3	447	447	0	0	0	0	0
5	A 2	0	1116	0	0	0	0	0
6	B 1	2931	0	0	0	0	0	0
7	B 2	446	0	0	0	0	0	0

14602 LINES OUTPUT THIS JOB.
0 FORTRAN MONITOR RETURNING TO IBSYS
$PAUSE JOB DONE
OPER. ACTION PAUSE