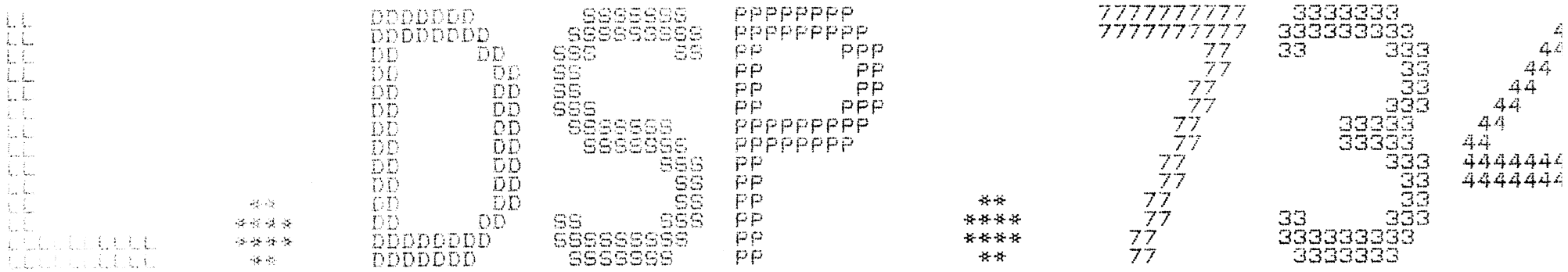

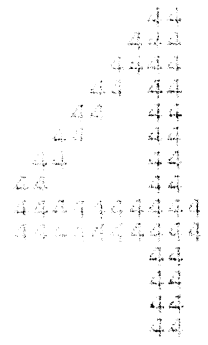

File: 6/L.DSP.7344
File size: 311 blocks

Printed: DEC 15, 1987 18:28:27
Copy 1 of 1

Printed for RELEASE CONTROL

```
.EDT   ;DSP FOR "IRIS"
.EDT
.EDT   ;  "DSP"   SOURCE #1
.EDT   ;  "DSP"   SOURCE #2
.END   ;  "DSP"   SOURCE #3
```

```
A## A DSP.7344,@L.DSP.7344',B330,-B331,B332,B333
DEC 15 1987  19:24.23

;       Batchfile.   R92JCL.DSP
;
;       ;D=7344   (YDDD)
;       ;  NAME = DSP
;       ;  TYPE = 77400
;
;       -R92DEFSPZ
;       R92DSP51A
;       R92DSP52B
;       R92DSP53A
;
                     EOT  ;DSP FOR "IRIS"
```

```
;                       << 8I = R92DSP51A; 80 = A.DSP.7344! >>

; 6 MAR 87, RB.

; "DSP" == DISC SERVICE PROCESSOR FOR "IRIS"
; SOURCE #1 OF 3
; WRITTEN  BY DAN PAYMAR
; MODIFIED BY D. FRENCH 6 JULY 1982
; EDITED 7-3-85 FOR POLYFILES BY RLB
; 22 AUG 86, R2. : USE SYMBOLIC TRANSLATOR FROM DBUG
;  4 MAR 87, RB. : RECODE MEANING OF DSPS0/1, TO FREE UP CHM2
```

```
                        ;Use by DSP of cells in active file header:
                        ;
                        ;   Real      Single     Passive     P. File     Active      A. File
                        ;   Core      Block       File       Header      File        Header
                        ;  --------  --------  ----------  ----------  --------  ----------
50 DSPS0=  DSPS+0       ;    -1        LU       100K+LU     140K+LU      -2          -3
                        ;
51 DSPS1=  DSPS+1       ;    -1        RDA        RDA         RDA        PCB         PCB
                        ;-------------------------------------------------------------------
52 DSPS2=  DSPS+2       ; Breakpoint address if <>0
53 DSPS3=  DSPS+3       ; First octal parameter (address counter)
54 DSPS4=  DSPS+4       ; Second octal parameter or temp storage
55 DSPS5=  DSPS+5       ; Third octal parameter or temp storage
56 DSPS6=  DSPS+6       ; Forth octal parameter or temp storage
57 DSPS7=  DSPS+7       ; Temp storage for MOVE, QUERY, READ, SEARCH
60 DSP10=  DSPS+10      ; MOVE direction flag, temp storage for READ
61 DSP11=  DSPS+11      ; READ TAPE checksum or line length for offset DUMP
62 DSP12=  DSPS+12      ; READ TAPE word counter or word counter for offset DUMP
63 DSP13=  DSPS+13      ; READ TAPE verify flag
                        ;  (-1 ==> not 'R' or 'V'; = 0 ==> 'R'; <> 0 ==> 'V')
64 DSP14=  DSPS+14      ; READ TAPE temporary storage
65 DSP15=  DSPS+15      ; READ TAPE byte counter
66 DSP16=  DSPS+16      ; BREAKPOINT snapshot address
67 DSP17=  DSPS+17      ; READ TAPE byte pointer

    ;FMAP               ; READ TAPE data buffer

13 BPC=    NITM         ; BREAKPOINT CONDITIONS, ALSO DISPLAY FLAGS:
                        ;  40000 = "C" FLAG, IE. CORE IMAGE OF DRIVER OR DISCSUB
                        ; 100000 = "-" FLAG, IE. BYTE ADDRESSING MODE

    ;LRCD               ; Conditional accumulator value
    ;NRPB               ; Conditional memory address
    ;NRCD               ; Conditional memory value
```

```
;                             << SI = R92DSPS1A; BO = A.DSP.7344! >>
               1               TXTM   1
             200              .LOC    INFO-400

      200  41000  .AAND:AANOS   ;A(AUTHORIZED ACCOUNT LIST)

                              ;CONSTANTS
      201       50 C50.    50
      202      232 C232:   232        ; ^Z
      203      247 C247:   247        ; '
      204      254 C254:   254        ; ,
      205      255 C255:   255        ; -
      206      256 C256:   256        ; .
      207      257 C257:   257        ; /
      210      272 C272:   272        ; :
      211     1400 C1400:  1400
      212    60000 C60K:   60000
      213   140000 C140K:  140000

; THE FOLLOWING ARE SET BY SWAP-IN:

      214        0 .AFH:            0         ;A(ACTIVE FILE HEADER)

; THE NEXT 4 CELLS ARE DERIVED FROM DSPS0/1 BY "COPYHDR2CORE"

      215        0 DSPLU:           0         ;LU OF SELECTED DOMAIN; -1 = CORE

      216        0 DSPDA:           0         ;RDA OF SELECTED DOMAIN; -1 = CORE

      217        0 DSPTYPE:         0         ;TYPE OF SELECTED DOMAIN
                                              ;      0 = CORE
                                              ;      1 = SINGLE BLOCK
                                              ;100000 = PASSIVE FILE
                                              ;100001 = PASSIVE FILE HEADER
                                              ;140000 = ACTIVE FILE
                                              ;140001 = ACTIVE FILE HEADER

      220        0 DSPPCB:          0         ;PCB IF ACTIVE FILE (OR AFH) SELECTED, ELSE 0

; SET IF A FILE HEADER IS LATCHED IN THE POOL:

      221        0 DSPHDR:          0         ;LOCATION IN BUFFER POOL OF HEADER IF A FILE SELECTED,
                                              ;  ELSE 0
```

<< SI = R92DSPS1A: BO = A.DSP.7344! >>

```
                .ICBF:ICBF              ;ITEM CONTROL BLOCK FOR FILE SELECTION
                .ICBO:ICBO              ;ICB FOR "OPEN" FOR READ

                BPASS.PASSW*2

                T6:     0       ;TEMPORARY STORAGE
                TS1:    0
                TS2:    0
                TS3:    0
                TS4:    0
                TS5:    0
                TS6:    0
                TS7:    0

                TS8:    0       ;TEMP STORAGE FOR SUBROUTINES
                TS91:   0
                TS92:   0
                TS93:   0
                TS94:   0       ;NOT USED
                TS95:   0       ;NOT USED
                TS96:   0       ;NOT USED
                TS97:   0       ;NOT USED
                TS910:  0
                TS911:  0
                TS912:  0       ;NOT USED
                TS913:  0       ;NOT USED
                TS914:  0       ;NOT USED
                TS915:  0       ;NOT USED
                TS916:  0       ;NOT USED
                TS917:  0

                .T4A:   PNT4A
```

<< SI = R92DSPS1A, BO = A.DSP.7344' >>

```
                2256 BEGIN=          JMP @     ;BEGIN CONTROL MODE
256   032465           BGIN

                6257 ILLEG=          JSR @.    ;ILLEGAL COMMAND
257   036304           ILEG

                6260 STOWD=          JSR @.    ;STORE WORD
260   035551           STOW

                6261 GETWD=          JSR @.    ;GET WORD
261   035545           GETW

                6262 VALUE=          JSR @.    ;GET VALUE OF OCTAL OR SYMBOLIC INPUT
262   036476           VALU

                6263 COTA=           JSR @.    ;CONVERT OCTAL TO ASCII
263   036341           COA

                6264 COTAA=          JSR @.    ;COTA FOR ADDRESS
264   036352           COAA

                6265 COTAD=          JSR @.    ;COTA FOR DUMP (6 DIGITS)
265   036342           COAD

                6266 COSYM=          JSR @.    ;CONVERT OCTAL TO SYMBOLIC
266   036565           COSY

                6267 OUTINSTR=       JSR @.    ;OUTPUT AN INSTRUCTION IN BOTH OCTAL AND SYMBOLIC FORM
267   037630           OINST

                6270 CATO=           JSR @.    ;CONVERT ASCII TO OCTAL
270   036374           CAO

                6271 PARAM=          JSR @.    ;GET OCTAL PARAMETERS
271   035507           PARA

                6272 ADERR=          JSR @.    ;NO SUCH ADDRESS
272   036263           ADER

                6273 ILLAD=          JSR @.    ;ILLEGAL ADDRESS
273   036246           ILLA

                6274 RELF=           JSR @.    ;RELEASE FILE HEADER
274   037614           RFH

                6275 CLBRK=          JSR @.    ;CLEAR BREAKPOINT
275   037651           CRBKA

                6276 SELCORE=        JSR @.    ;SELECT CORE
276   037663           SCORE

                6277 COPYHDR2CORE=JSR @.    ;COPY SELECTED DOMAIN INFO FROM AFH TO CORE
277   037750           CPYH2C

                6300 NOTME=          JSR @.    ;NOT MEMORY RESIDENT
300   036317           NOTM
```

```
;                          << SI = R92DSP61A, BO = A.DSP.7344! >>

          4301 CESF= JSR  .
  301    20073        LDA    0,ESCF    ;CHECK ESCAPE FLAG
  302   101015        SNZ    0,0       ;ESCAPE SEEN BUT IGNORED ?
  303     1400        JMP    0,3       ;   NO
  304   102400        SUB    0,0       ;ESCAPE ROUTINE
  305    40073        STA    0,ESCF    ;CLEAR ESCAPE FLAG
  306     6101        CALL
  307   100011        WONA
  310     2256        BEGIN

  311     6141        STOUTPUT
  312     6101 DEXIT: CALL             ;CONTROL C EXIT
  313   100017        XFIXBUFFERS
  314     6110        DATAPUMP
  315       17        ALLFLUSH
  316   100000        @0
  317     6101        CALL
  320   100000        SCOPE

; TEMP. STORAGE USED BY SYMBOLIC TRANSLATOR:

  321          0 VAL:   0
             322 MATCH:
  322          0 ADRMO: 0
  323          0 ADR1:  0
  324          0 CDVAL: 0
  325          0 MV:    0
  326          0 DELTA: 0
  327          0 TEMP.  0
  330          0 B.CNT: 0
  331          0 IBP:   0
  332          0 IBPNX: 0
  333          0 FLG:   0

  334    37146 .TEST: TEST
  335    37152 .ACIV: ACIV
  336    37176 .ACBY: ACBY
  337    37231 .TCHA: TPCHA
  340    37212 .TOCT: TPOCT
```

```
;                  << SI = R92DSPS1A; SO = A.DSP.7344! >>

341      37 .BLK   400-    ;PATCH SPACE

400    6101          CALL    ;BREAKPOINT ENTRY (*** DO NOT CHANGE THIS LOCATION !!!! ***)
401  100011          WONA    ;                   (SEE BREAK DISCSUB)
402    6133          OUTTEXT
403  106702 .TXTF ;<215>B
404  151305 RE
405  140713 AK
406  120301  A
407  152240 T
410       0 ;

411   34214          LDA     3,.AFH     ;PRINT BREAKPOINT ADDRESS
412   25452          LDA     1,DSPS2,3
413    6263          COTA
414   30210          LDA     2,C272     ;PRINT ":"
415    6132          OUTBYTE
416    6275          CLBRK
417   20214          LDA     0,.AFH     ;SET UP TO PRINT REGISTERS
420   24402          LDA     1,.+2
421  123001          ADD     1,0,SKP
422      53          DSPS3
423   40225          STA     0,TS
424   20024          LDA     0,C4
425   40226          STA     0,TS1
426   30056 BKPRL:LDA     2,C240     ;PRINT A SPACE
427    6132          OUTBYTE
430   26225          LDA     1,@TS      ;PRINT CONTENTS OF A REGISTER
431   10225          ISZ     TS
432    6263          COTA
433   14226          DSZ     TS1        ;PRINTED ALL REGISTERS ?
434     772          JMP     BKPRL      ;   NO
435    6133          OUTTEXT            ;   YES
436  120303  TXTF ; C
437  136400 =.

440   26225          LDA     1,@TS      ;PRINT CARRY
441  125200          MOVR    1,1
442  126560          SUBCL   1,1
443    6263          COTA
444    2256          BEGIN

445     123 .BLK   INFO-10-.          ;PAGE ZERO OVERFLOW CHECK

570  154000 PASSW:@"X*K   ;PASSWORD FOR DSP
```

<< 51 = R92DSPS1A, 80 = A.DSP.7344! >>

```
; MAIN ENTRY TO PROCESSOR

            32200           .LOC    3PS         ;ENTRY POINTERS

   32200   37676           SWPI                ;SWAP-IN
   32201   37740           SWPO                ;SWAP-OUT
   32202   36311           DESCP               ;ESCAPE
   32203      312           DEXIT               ;CTRL C

   32204   30005           LDA     2,RUP
   32205   21010           LDA     0,ACT,2
   32206 1226520           SUBZL   1,1
   32207 1064320           SGR     0,1         ;SPECIAL ACCOUNT (0 OR 1) ?
   32210      312           JMP     DEXIT       ;   YES
   32211   34213           LDA     3,C140K     ;NO
   32212 1160320           SGE     0,3         ;PRIVILEGE 3 ?
   32213      405           JMP     DSP1        ;   NO
   32214 1620150           ADC#    3,0,SNR     ;MANAGER ACCOUNT ?
   32215      415           JMP     DSP1A       ;   YES
   32216     6142           TRAPFAULT           ;NO, ILLEGAL PRIV 3 ACCOUNT !?
   32217 1074100           17#K!NOP
```

<< SI = R92DSPS1A: 30 = A.DSP.7344! >>

```
                    DSP1:  COM     3,2          ;PREPARE TO SCAN THE . . .
                           AND     2,0          ;AUTHORIZED ACCOUNTS LIST
                           LDA     3,.AAND
                    SCAAL: LDA     1,0,3
                           INC     3,3
                           SNZ     1,1          ;END OF LIST ?
                           JMP     DEXIT        ;   YES
                           AND     2,1          ;NO
                           SEQ     0,1          ;THIS USER'S ACCOUNT ?
                           JMP     SCAAL        ;   NO
                    DSP1A: LDA     1,BPASS      ;YES   << FROM GOOD MGR CHECK
                           CALL
                           PASSCOMPARE          ;CORRECT PASSWORD GIVEN ?
                           JMP     DSP4         ;   NO
                    DSP1B: STA     2,TS         ;YES
                           JSR     @.T4A        ;CHECKSUM FMAP CELLS
                           LDA     2,RUP
                           FLAGCHANGE           ;SET "DSP ACTIVE" FLAG
                           SET+FLW.
                    DMASK: 10000
                           LDA     0,TS
                           LDA     1,C215
                           LDA     2,C6         ;SIMULATE AN "F"
                           SEQ     0,1          ;END OF INPUT LINE ?
                           JMP     @.DGNB       ;   NO, LOOK FOR FILENAME VIA BRANCH TABLE
                           LDA     2,C240       ;YES
                           OUTBYTE
                           LDA     0,DSPTYPE    ;DETERMINE WHAT'S SELECTED
                           SNZ     0,0          ;REAL CORE SELECTED ?
                           JMP     DSP3         ;   YES
                           MOVZR#  0,0,SNR      ;NO, SINGLE BLOCK SELECTED ?
                           JMP     DSP2         ;   YES
                           ADDL#   0,0,SNC      ;NO, A PASSIVE FILE (OR HDR) SELECTED ?
                           JMP     DSP6         ;   YES
                           LDA     2,C300       ;NO, ACTIVE FILE, PRINT "@"
                           OUTBYTE
                           LDA     2,RUP
                           LDA     0,DSPPCB
                           SNE     0,2          ;THIS PORT'S ACTIVE FILE ?
                           JMP     DSP7         ;   YES
                           CALL                 ;NO, CALC. PORT NUMBER
                           CPPPN
                           TRAPFAULT            ;NO SUCH PORT !?
                           LDA     0,C12
                           SUB     2,2          ;PRINT PORT NUMBER
                           CALL
                           CIA
                           JMP     DSP7
```

```
                        << S1 = R92DSPS1A;  B0 = A.DSP.7344! >>

002300    6133  DSP2:  OUTTEXT             ;SINGLE BLOCK SELECTED
002301  155400         @"[*K
002302   24215         LDA     1,DSPLU    ;GET LOGICAL UNIT NUMBER
002303   20000         LDA     0,C10
002304  152400         SUB     2,2        ;PRINT LOGICAL UNIT NUMBER IN OCTAL
002305    6101         CALL
002306       7         CIA
002307   30207         LDA     2,C257     ;PRINT A "/"
002310    6135         OUTBYTE
002311   24216         LDA     1,DSPDA    ;PRINT BLOCK'S RDA
002312    6263         COTA
002313    6133         OUTTEXT
002314  155400         @"]*K
002315    2256         BEGIN


002316    6133  DSP3:  OUTTEXT             ;REAL CORE SELECTED
002317  155703  .TXTF  ;[C
002320  147782  OR
002321  142735  E3
002322       0  ;

002323    2256         BEGIN


002324   32512  .BGNB: BGINB

002325   34005  DSP4:  LDA     3,RUP      ;CORRECT PASSWORD NOT GIVEN
002326   25412         LDA     1,FLW.,3
002327   34714         LDA     3,DMASK
002330  137415         AND#    1,3,SNR    ;PREVIOUS ENTRY ?
002331     406         JMP     DSP5       ;   NO
002332   24054         LDA     1,C205     ;   YES
002333  106415         SNE     0,1        ;ANY PASSWORD GIVEN ?
002334     706         JMP     DSP1B      ;   NO
002335    2401         JMP     @.+1       ;YES, EXIT DSP
002336   35310         XITX

002337    6133  DSP5:  OUTTEXT             ;ACCESS ALLOWED BUT NO PASSWORD
002340  106677  .TXTF  ,<215>?
002341  120316   N
002342  147640  O
002343  150301  PA
002344  151723  SS
002345  153717  WO
002346  151304  RD
002347       0  ;

002350     311         JMP     DEXIT-1
```

```
                        << S1 = R92DSPS1A; B0 = A.DSP.7344! >>

022351   20221  DSP6:  LDA     0,DSPHDR ;A PASSIVE FILE (OR HEADER) IS SELECTED
022352   24026         LDA     1,C6     ;COPY FILENAME TO LOCAL BUFFER
022353  107000         ADD     0,1
022354   30500         LDA     2,.BUFFER
022355    6101         CALL
022356  100015         MOVEWORDS
022357   20002         LDA     0,C2     ;OPEN FILE ON CHANNEL 2
022360   24474         LDA     1,.BUFFER
022361  125120         MOVZL   1,1      ;BYTE POINTER TO FILENAME
022362   30222         LDA     2,.ICBF
022363   34215         LDA     3,DSPLU
022364   55001         STA     3,1,2
022365    6106         CHANNEL
022366   60025         OPENREF
022367     463         JMP     DSP6X    ;   CAN'T OPEN SELECTED FILE
022370   30221         LDA     2,DSPHDR
022371   50040         STA     2,SBA    ;SET A(SOURCE BYTE BASE)
022372  126400         SUB     1,1      ;STARTING OFFSET IS 0
022373   44215         STA     1,TS
022374   20032         LDA     0,C12
022375   25176         LDA     1,UNIT,2
022376  152400         SUB     2,2      ;PRINT LOGICAL UNIT NUMBER
022377    6101         CALL
022400       7         CIA
022401   30207         LDA     2,C257   ;PRINT A "/"
022402    6132         OUTBYTE
022403   20036         LDA     0,C16    ;MOVE 14 BYTES OF FILENAME
022404   40220         STA     0,TS1
022405   24225  DSP6P: LDA     1,TS
022406   10225         ISZ     TS
022407    6144         XGETBYTE
022410   24062         LDA     1,C300
022411   20051         LDA     0,C100
022412  147400         AND     2,1
022413  106414         SEQ     0,1      ;POLYFILE VOLUME ?
022414     414         JMP     DSP7Q    ;   NO
022415   14225         DSZ     TS       ;YES, BACK UP THE POINTER
022416   30062         LDA     2,C300
022417    6132         OUTBYTE          ;SET UP THE '@' CHAR FOR DISPLAY
022420   24225         LDA     1,TS     ;  OFFSET
022421    6144         XGETBYTE
022422  145000         MOV     2,1
022423   20051         LDA     0,C100   ;PICK UP '@' DELIMITER
022424  106400         SUB     0,1      ;EXTRACT THE VOLUME ID
022425   20032         LDA     0,C12    ;RADIX (10)
022426  152400         SUB     2,2      ;CONVERT WITH NO SPACES
022427    6101         CALL
022430       0         CIA
022431     404         JMP     DSP7
```

<< ST = R92DSPS1A: BD = A.DSP.7344! >>

```
32432    6132 DSP7Q: OUTBYTE
32433   14326          DSZ     TS1         ;COUNT CHARS OF NAME, DONE ?
32434     761          JMP     DSP6P       ;   NO
32435   20217 DSP7:  LDA     0,DSPTYPE   ;YES
32436  101213          SKO     0,0         ;IS FILE'S HEADER SELECTED ?
32437    2256          BEGIN               ;   NO
32440    6133          OUTTEXT             ;YES, TELL HIM SO
32441  120233 .TXTF / [
32442  144305 HE
32443  140704 AD
32444  142762 ER
32445  120303  0
32446  146217 LO
32447  141713 OK
32450  156400 ]/

32451    2256        BEGIN

32452    6226 DSP6X: SELCORE             ;CAN'T OPEN SELECTED FILE
32453    6257          ILLEGAL

32454  32455 .BUFFER:      +1
32455       7           BLK    7        ;ROOM FOR SELECTED FILENAME
32456       0           0               ;ENSURE THERE IS A TERMINATOR
```

```
                        <<  SI  =  R92DSPS1A;  EO  =  A.DSP.7344!  >>

032465  102400  BGIN:  SUB     0,0         ;BEGIN CONTROL MODE
032466   40073          STA     0,ESCF      ;CLEAR ESCAPE FLAG
032467    6132          OUTTEXT
032470  106653  .TXTF  ;<215>+
032471  137340  >
032472       0  ;

032473    6141          STOUTPUT            ;OUTPUT CARRIAGE RETURN
032474    6140          STINPUT             ;ALLOW INPUT
032475    4470          JSR     GADDR       ;MAY BE AN ADDRESS
032476   24210          LDA     1,C272
032477  146415          SNE     2,1         ;"," ?
032500   24617          JMP     @.COLON     ;  YES
032501  101014          SKZ     0,0         ;PARAMETER BEFORE LETTER ?
032502    6097          ILLEGAL             ;  YES
032503  132015          ADC#    1,2,SNR     ;";" ?
032504    2256          BEGIN               ;  YES, IGNORE LINE
032505   24055          LDA     1,C215      ;  NO
032506  146415          SNE     2,1         ;EMPTY LINE ?
032507    2255          BEGIN               ;  YES
032510    6130          ISA2LETTER          ;COMMAND LETTER ?
032511    6097          ILLEGAL             ;  NO
032512    4422  BGINB:  JSR     CTRL        ;AS = BRANCH TABLE ADDRESS

032513   332621         APEND   ; A = APPEND BLOCK TO FILE
032514   333034         BRKPT   ; B = SET OR CLEAR BREAKPOINT
032515   332216         CMAND   ; C = GIVE COMMAND TO "SCOPE"
032516   333034         DUMP    ; D = DUMP OCTAL
032517   333431         ENTR    ; E = ENTER OCTAL OR SYMBOLIC
032520   334034         FILE    ; F = FILE ID FOR VIRTUAL CORE
032521   336007         GBLK    ; G = GET DISC BLOCK AS VIRTUAL CORE
032522   336455         HEADR   ; H = USE FILE HEADER AS VIRTUAL CORE
032523   336776         INPUT   ; I = INPUT ASCII
032524   337030         JREL    ; J = SEARCH FOR RELATIVE REF SPANS
032525   340041         KONST   ; K = STORE BLOCK OF A CONSTANT
032526   340056         LIST    ; L = LIST SYMBOLIC
032527   341100         MOVEB   ; M = MOVE BLOCK IN MEMORY
032530   344006         NSRCH   ; N = NOT EQUAL SEARCH
032531   344211         OUTPT   ; O = OUTPUT ASCII
032532   363304         ILEG    ; P =
032533   345320         QUERY   ; Q = QUERY (REPEATED DUMP OF ONE CELL)
032534   345550         REEDP   ; R = READ PAPER TAPE
032535   351120         SRCHM   ; S = SEARCH MEMORY
032536   363304         ILEG    ; T =
032537   351700         UDUMP   ; U = PRINT BREAKPOINT CORE DUMP
032540   352234         VERFY   ; V = VERIFY PAPER TAPE
032541   352241         WSBLK   ; W = WRITE SELECTED BLOCK ON DISC
032542   353006         XITD    ; X = EXIT FROM DSP
032543   353405         YBCD    ; Y = SET BREAKPOINT CORE DUMP ADDRESS
032544   354111         ZREL    ; Z = SEARCH FOR RELATIVE REFERENCES
```

```
32545 157000 CTRL: ADD     2,3          ;BRANCH ON CONTROL CHARACTER
32546  35777       LDA     3,-1,3
32547  54225       STA     3,TS
32550  24750       LDA     1,BGINB+6
32551 166415       SNE     3,1          ;NO OCTAL PARAMETER IF "F"
32552    404       JMP     CTRLO
32553  24742       LDA     1,BGINB+3
32554 166414       SEQ     3,1          ;NO OCTAL PARAMETER IF "C"
32555   4410       JSR     GADDR
32556  34214 CTRLO:LDA     3,.AFH     ;  (A0) = ADDRESS PARAMETER
32557  41453       STA     0,DSPS3,3;  (A1) = 215 (RETURN CODE)
32560 126000       ADC     1,1          ;CLEAR R&V SWITCH (-1==> NOT 'R' OR 'V')
32561  45463       STA     1,DSP13,3
32562  24055       LDA     1,C215     ;  (A2) = FIRST NON-DIGIT CODE
32563   2225       JMP     @TS        ;  (A3) = .AFH

32564  33327 .COLON:       COLON

32565  54226 GADDR:STA     3,TS1        ;GET ADDRESS PARAMETER
32566   6270       CATO
32567  40227       STA     0,TS2        ;SAVE PARAMETER'S VALUE
32570  21413       LDA     0,BPC,3
32571 103100       ADDL    0,0          ;PREPARE TO SHIFT IN THE FLAGS
32572  24203       LDA     1,C247
32573 146414       SEQ     2,1          ;"'" ?
32574 101221       MOVZR   0,0,SKP    ;   NO
32575 101240       MOVOR   0,0        ;   YES, REFER TO CORE COPY
32576  24205       LDA     1,C255
32577 146414       SEQ     2,1          ;"-" ?
32600 101221       MOVZR   0,0,SKP    ;   NO
32601 101240       MOVOR   0,0        ;   YES, COMPUTE THE BYTE ADDRESS
32602  41413       STA     0,BPC,3
32603 103113       ADDL#   0,0,SNC    ;WAS "'" FOUND ?
32604    410       JMP     GADR1      ;   NO
32605  34005       LDA     3,RUP      ;   YES
32606  21410       LDA     0,ACT.,3 ;CHECK USER'S ACCOUNT #
32607  34213       LDA     3,C140K
32610 162014       ADC#    3,0,SZR    ;MANAGER ?
32611   6257       ILLEGAL            ;   NO
32612  34214       LDA     3,.AFH     ;   YES
32613  21413       LDA     0,BPC,3
32614 101113 GADR1:SSN     0,0        ;WAS EITHER "-" ...
32615 103112       ADDL#   0,0,SZC    ;OR "'" FOUND ?
32616   6125       INBYTE             ;   YES
32617  20227       LDA     0,TS2      ;RECOVER PARAMETER VALUE
32620   2226       JMP     @TS1
```

<< S1 = R92DSPS1A; BO = A.DSP.7344! >>

```
                        APPEND: LDA     0,DSPTYPE;APPEND A BLOCK TO THE FILE
                                LDA     2,DSPHDR
                                ADDL#   0,0,SNC   ;IS A PASSIVE FILE SELECTED,
                                SNZ     2,2       ;  AND ITS HEADER LATCHED IN POOL ?
                                ILLEGAL           ;     NO, CAN'T APPEND !
                                LDA     0,STAT,2
                                LDA     1,KCFM
                                AND     1,0,SZR   ;CONTIGUOUS ?
                                ILLEGAL           ;  YES, CAN'T APPEND
                                LDA     0,DSPLU   ;NO, FIND HEADER INFO
                                LDA     1,DSPDA
                                LDA     2,.HBA
                                READBLOCK         ;MOVE FILE HEADER TO HBA (FOR ALLOCATE)
                                LDA     3,.AFH
                                LDA     0,DSPS3,3
                                LDA     1,CORA,2
                                SGE     0,1
                                ADERROR
                                LDA     3,C400    ;DETERMINE BLOCK CONTAINING ADDRESS
                        APND1:  ADD     3,1
                                INC     2,2
                                SLS     0,1
                                JMP     APND1
                                SUB     3,1
                                STA     1,TS      ;BASE ADDRESS OF THE BLOCK
                                LDA     3,C177
                                ADD     3,2
                                STA     2,TS1     ;POINTER TO HEADER ENTRY
                                LDA     1,.HBA
                                LDA     3,C400
                                ADD     3,1
                                SLS     2,1       ;WITHIN THE HEADER ?
                                ADERROR           ;  NO
                                LDA     1,0,2     ;  YES
                                SKZ     1,1       ;BLOCK THERE NOW ?
                                JMP     APNDA     ;  YES
                                SUBZL   0,0       ;  NO, ALLOCATE ONE
                                CALL
                                ALLOCATE
                                JMP     APNDE     ;  ERROR IN ALLOCATE
                                LDA     0,DSPLU
                                LDA     1,DSPDA
                                LDA     2,.HBA
                                WRITBLOCK         ;MOVE FILE HEADER TO BUFFER
                                LDA     1,@TS1    ;READ THE NEW BLOCK
                                DATAPUMP          ;INTO A LATCHED PUBLIC BUFFER
                                GETBLOCK
                                @0
```

```
;                       <<C $1 = P92DSPS1A: $0 = A.DSP.7344! >>

    32701   24020           LDA     1,CM400
    32702   20446           LDA     0,KHALT
    32703  101400           INC     0,0
    32704  155000           MOV     2,3
    32705   41400 APND2:    STA     0,0,3       ;FILL THE BLOCK WITH SPECIAL HALTS
    32706  175400           INC     3,3
    32707  125404           INC     1,1,SZR     ;DONE ?
    32710     775           JMP     APND2       ;   NO
    32711    6110           DATAPUMP
    32712  100014           BUFFLUSH!UL         ;FLUSH THE BLOCK TO DISC AND UNLATCH
    32713  100000           @0
    32714    6133           OUTTEXT
    32715  135240  .TXTF /;
    32716  120503   C
    32717  147220  OR
    32720  142640  E
    32721  140704  AD
    32722  142220  DR
    32723  120275   =
    32724  120054   ,

    32725   24225           LDA     1,T8
    32726    6263           CDTA
    32727    6133           OUTTEXT
    32730  126240   .TXTF /,
    32731  142311  DI
    32732  151703  SC
    32733  120301   A
    32734  142304  DD
    32735  151240  R
    32736  136640  =
    32737       0  ;

    32740   30011           LDA     2,.H8A
    32741   25176           LDA     1,UNIT,2
    32742    6263           CDTA
    32743   30207           LDA     2,C257
    32744    6132           OUTBYTE
    32745   26226           LDA     1,@TS1
    32746    6263           CDTA
    32747    2256           BEGIN


    32750   77376 KHALT:    77376               ;CAN'T USE 77377 BECAUSE PAPER TAPE PUNCH SKIPS IT
    32751       2 KCFM:     CFM                 ;CONTIGUOUS FILE MASK
```

<< SI = R92DSPS1A, BD = A.DSP.7344! >>

```
032752    6133 APNDA: OUTTEXT           ;BLOCK ALREADY EXISTS
032753  120240   .TXTF ;
032754  141314 BL
032755  147703 OC
032756  145440 K
032757  140714 AL
032760  151305 RE
032761  140704 AD
032762  154640 Y
032763  140714 AL
032764  146317 LO
032765  141701 CA
032766  152305 TE
032767  142000 D:

032770    2256         BEGIN

032771  101113 APNDE: SSN     C,0       ;NO DISC BLOCK AVAILABLE
032772     454         JMP     APNDD
032773    6133         OUTTEXT
032774  120240   .TXTF ;
032775  140703 AC
032776  141717 CO
032777  152716 UN
033000  152240 T
033001  144301 HA
033002  151440 S
033003  147317 NO
033004  120302   B
033005  146317 LO
033006  141713 CK
033007  151440 S
033010  140726 AV
033011  140711 AI
033012  146301 LA
033013  141314 BL
033014  142400 E

033015    2256         BEGIN

033016    6133 APNDD: OUTTEXT           ;LOGICAL UNIT FULL
033017  120240   .TXTF ;
033020  146317 LO
033021  143711 GI
033022  141701 CA
033023  146240 L
033024  152716 UN
033025  144724 IT
033026  120311   I
033027  151440 S
033030  143325 FU
033031  146314 LL
033032       0 .

033033    2256         BEGIN
```

```
;                       << SI = R92DSFS1A; BO = A.DSP.7344! >>

  33034  20217 BRKPT:LDA    0,DSPTYPE;SET OR CLEAR BREAKPOINT
  33035 103294       ADDOR# 0,0,SZR  ;A PASSIVE FILE SELECTED (DSPTYPE = 100000) ?
  33036   6257       ILLEGAL         ;   NO
  33037  50225       STA    2,TS     ;YES, REMEMBER TERMINATOR CHAR
  33040  21453       LDA    0,DSPS3,3;GET FIRST PARAMETER
  33041 101014       SKZ    0,0      ;CLEAR BREAKPOINT ?
  33042    405       JMP    BRKPO    ;   NO, SET BREAKPOINT
  33043 146414       SEQ    2,1      ;   MAYBE
  33044    545       JMP    BRKPE    ;   NO, ERROR
  33045   6275       CLBRK           ;   YES
  33046   2256       BEGIN

  33047  24053 BRKPO:LDA    1,C200   ;CHECK BREAKPOINT ADDRESS
  33050  30100       LDA    2,.INFO
  33051 112033       SLS    0,2      ;ADDRESS < INFO ?
  33052    404       JMP    BRKP1    ;   NO
  33053 106032       SGE    0,1      ;YES, IS IT < 200 ?
  33054    535       JMP    BRKPE    ;   YES, ILLEGAL
  33055    406       JMP    BRKP2    ;   NO, OK

  33056  24537 BRKP1:LDA    1,.BPS4  ;NOT PAGE ZERO
  33057  30440       LDA    2,.MEPS
  33060 112032       SGE    0,2      ;ADDRESS < MEPS . . .
  33061 106032       SGE    0,1      ;AND >= BPS+4 ?
  33062    527       JMP    BRKPE    ;   NO
  33063  30221 BRKP2:LDA    2,DSPHDR ;LOOK AT FILE'S HDR
  33064  21007       LDA    0,ACNT,2
  33065  25010       LDA    1,TYPE,2
  33066   6101       CALL            ;IS IT COPY PROTECTED ?
  33067 100014       CHKCP
  33070    521       JMP    BRKPE    ;   YES
  33071  30225       LDA    2,TS     ;NO, RECOVER TERMINATOR
  33072 102400       SUB    0,0
  33073  40225 BRKP3:STA    0,TS
  33074  20055       LDA    0,C215
  33075 142414       SEQ    2,0      ;END OF COMMAND ?
  33076    422       JMP    BRKP4    ;   NO
  33077  34214       LDA    3,.AFH   ;YES
  33100  20225       LDA    0,TS     ;COPY CONDITIONS TO ACTIVE HDR.
  33101  41413       STA    0,BPC,3
  33102  20226       LDA    0,TS1
  33103  41414       STA    0,BPC+1,3
  33104  20227       LDA    0,TS2
  33105  41415       STA    0,BPC+2,3
  33106  20230       LDA    0,TS3
  33107  41416       STA    0,BPC+3,3
  33110  21453       LDA    0,DSPS3,3;COPY BREAKPOINT ADDR.
  33111  41452       STA    0,DSPS2,3
```

<< S1 = R92DSPG1A; B0 = A.DSP.7344! >>

```
33112   30005           LDA     2,RUP
33113    6102           FLAGCHANGE              ;SET BREAKPOINT FLAG
33114  140015           SET+FLW
33115   20000           20000
33116    2256           BEGIN

33117   43600 .MEPS:    MEPS

33120   20204 BRKP4:    LDA     0,C254          ;PROCESS CONDITIONALS
33121  142404           SUB     2,0,SZR         ;COMMA ?
33122     467           JMP     BRKPE           ;   NO
33123    6126           INSTBYTE                ;YES, GET NEXT CHAR
33124   20052           LDA     0,C300
33125  142414           SEQ     2,0             ;"@" ?
33126     420           JMP     BRKP6           ;   NO
33127    6126           INSTBYTE                ;YES
33130   20225           LDA     0,TS
33131   24460           LDA     1,C10K
33132  107416           AND#    0,1,SNR         ;SET "I" FLAG
33133  123000           ADD     1,0
33134   40225           STA     0,TS
33135    6270           CATO
33136   24456           LDA     1,C275
33137  146414           SEQ     2,1             ;"=" ?
33140     451           JMP     BRKPE           ;   NO
33141   40227 BRKP5:    STA     0,TS2           ;YES
33142    6270           CATO
33143   40230           STA     0,TS3           ;SAVE VALUE
33144    4437           JSR     BRKP8           ;SET "M" FLAG
33145   20000           20000

33146  112014 BRKP6:    ADC#    0,2,SZR         ;"A" ?
33147     420           JMP     BRKP7           ;   NO
33150    6126           INSTBYTE                ;YES
33151    6270           CATO
33152   24440           LDA     1,C275
33153  146414           SEQ     2,1             ;"=" ?
33154     435           JMP     BRKPE           ;   NO
33155   24034           LDA     1,C4            ;YES
33156  109032           SLS     0,1             ;LEGAL REGISTER ?
33157     432           JMP     BRKPE           ;   NO
33160  123120           ADDZL   1,0             ;YES, ADD FLAG
33161  101300           MOVS    0,0             ;SHIFT INTO POSITION
33162   40404           STA     0,BRKFL         ;SAVE FOR 'OR'
33163    6270           CATO
33164   40225           STA     0,TS1           ;SAVE VALUE
33165    4416           JSR     BRKP8           ;SET "A" FLAG
33166    4000 BRKFL:    4000
```

<< 21 = RP2DSPS1A. BO = A.DSP.7344! >>

```
 30167    6127 BRKP7: ISA2DIGIT          ;NUMERIC ?
 30170     421        JMP     BRKPE      ;   NO
 30171    6270        CATO               ;YES
 30172  244275        LDA     1,C275
 30173  146415        SNE     3,1        ;"=" ?
 30174     725        JMP     BRKP5      ;   YES
 30175  240577        LDA     1,C1000    ;NO
 30176  106033        SLS     0,1        ;LEGAL COUNT ?
 30177     413        JMP     BRKPE      ;   NO
 30200   40402        STA     3,  +2     ;YES, SAVE FOR 'OR'
 30201    4402        JSR     BRKP8
 30202       1        1
 30203  214000 BRKP8: LDA     0,0,3      ;'OR' ((A3)) WITH (TS)
 30204  242255        LDA     1,TS
 30205  124000        COM     1,1
 30206  123400        AND     1,0
 30207  122000        ADC     1,0
 30210     642        JMP     BRKP3


 30211    6275 BRKPE: CLSBK              ;ERROR IN BREAKPOINT COMMAND
 30212    6257        ILLEGAL


 30213   10000 C10K:  10000
 30214     275 C275:  275

 30215   32204 .BPS4: BPS+4


 30216   34005 CMAND: LDA     3,RUP      ;GIVE COMMAND TO "SCOPE"
 30217   31423        LDA     2,DFT,3
 30220   34100        LDA     3,.INFO
 30221   25445        LDA     1,DSCO,3
 30222   45071        STA     1,FDA+CHM1,2
 30223    6101        CALL               ;CLEAR ALL DATA CHANNELS
 30224  100003        ALLCLEAR
 30225    6101        CALL
 30226  100017        XFIXBUFFERS
 30227    6110        DATAPUMP
 30230      17        ALLFLUSH
 30231  100000        @0
 30232   34763        LDA     3,.BPS4
 30233    2117        JMP     @BUMPU&377;CHAIN""
```

<< SI = R92DSPS1A; BO = A.DSP.7344! >>

```
33234   34214 DUMP:  LDA     3,.AFH      ;DUMP OCTAL
33235  102400        SUB     0,0
33236   41461        STA     0,DSPS+11,3;SET MODULO 10 ADDRESS MODE
33237  146415        SNE     2,1         ;END OF LINE ?
33240     420        JMP     DUMPO       ;  YES, MODULO 10 ADDRESSING
33241   24204        LDA     1,C254      ;  NO, OFFSET ADDRESSING
33242  146414        SEQ     2,1         ;COMMA ?
33243    6257        ILLEGAL             ;  NO, SYNTAX ERROR
33244    6270        CATO                ;CONVERT LINE LENGTH TO OCTAL
33245   24055        LDA     1,C215
33246  132414        SEQ     1,2         ;END OF LINE ?
33247    6257        ILLEGAL             ;  NO, SYNTAX ERROR
33250  126400        SUB     1,1
33251   30034        LDA     2,C14
33252  106414        SEQ     0,1         ;LINE LENGTH > ZERO..
33253  112433        SLE     0,2         ;..AND <= 10 (OCTAL) ?
33254    6257        ILLEGAL             ;  NO, SYNTAX ERROR
33255   34214        LDA     3,.AFH      ;  YES, INIT OFFSET ADDRESSING MODE
33256   41461        STA     0,DSPS+11,3;LINE LENGTH
33257   41462        STA     0,DSPS+12,3;LINE COUNTER
33260   30055 DUMPO: LDA     2,C215
33261    6132        OUTBYTE
33262   34214        LDA     3,.AFH      ;PRINT ADDRESS
33263   25453        LDA   1,DSPS+3,3
33264    6264        COTAA
33265    6261 DUMP1: GETWD               ;GET DATA WORD [FROM (AO)]
33266    6272        ADERR
33267  105000        MOV     0,1
33270   21413        LDA     0,BPC,3
33271  101113        SSN     0,0         ;BYTE ADDRESS ?
33272     406        JMP     DUMP2       ;  NO
33273   20030        LDA     0,C10       ;  YES
33274   30025        LDA     2,C5
33275    6101        CALL
33276       7        CIA
33277     402        SKIP
33300    6265 DUMP2: COTAO
33301   30214        LDA     2,.AFH
33302   21061        LDA     0,DSPS+11,2
33303  101015        SNZ     0,0         ;OFFSET ADDRESS MODE ?
33304     405        JMP     DUMP3       ;  NO
33305   15062        DSZ     DSPS+12,2;END OF LINE ?
33306     757        JMP     DUMP1       ;  NO, CONTINUE
33307  152400        SUB     2,2         ;  YES, TERMINATE BUFFER
33310     405        JMP     DUMP4
```

```
                         << SI = R92DSPS1A; SO = A.DSP.7344! >>

33311   21053 DUMP3: LDA    0.DSPS+3,2
33312   30027        LDA    2,C7
33313  113404        AND    0,2,SZR   ;END OF A LINE ?
33314     751        JMP    DUMP1     ;   NO
33315    6132 DUMP4: OUTBYTE          ;   YES
33316    4301        CESF             ;CHECK FOR ESC
33317    6141        STOUTPUT         ;NONE SEEN, OUTPUT DATA
33320    6101        CALL
33321  100011        WONA
33322   34214        LDA    3,.AFH
33323   21461        LDA    0,DSPS+11,3
33324  101014        SKZ    0,0       ;OFFSET ADDRESS MODE ?
33325   41462        STA    0,DSPS+12,3;  YES, RESET LINE COUNTER
33326     732        JMP    DUMP0

33327   34214 COLON: LDA    3,.AFH    ;ENTER SINGLE CELL
33330   41450        STA    0,DSPS3,3;SAVE ADDRESS
33331    6252        VALUE            ;CONVERT TO OCTAL VALUE
33332     404        JMP    COLN2     ;  NOT A VALID ENTRY
33333    6260        STOWD            ;VALID, STORE IT
33334    6272        ADERR            ;  ADDRESS ERROR
33335    2256        BEGIN

33336  101014 COLN2: SKZ    0,0       ;WAS IT A NULL ENTRY ?
33337    6257        ILLEGAL          ;  NO, ILLEGAL
33340   30056        LDA    2,C240
33341    6132        OUTBYTE
33342     410        JMP    ENTR3     ;YES, DISPLAY CURRENT CONTENT

33343  146414 ENTR:  SEQ    2,1       ;ENTER OCTAL OR SYMBOLIC
33344    6257        ILLEGAL
33345   30055 ENTR0: LDA    2,C215    ;ISSUE A CR
33346    6132        OUTBYTE
33347   30214        LDA    2,.AFH    ;PRINT THE CURRENT ADDRESS
33350   25053        LDA    1,DSPS3,2
33351    6264        COTAA
33352   34005 ENTR3: LDA    3,RUP
33353  102400        SUB    0,0
33354   41433        STA    0,OCC.,3 ;INITIALIZE OCC FOR TABBING
33355    6261        GETWD            ;GET CONTENT OF CURRENT LOCATION (INCREMENTS ADDRESS)
33356    6272        ADERR            ;  ADDRESS ERROR
33357   15453        DSZ    DSPS3,3   ;RESTORE ADDRESS
33360  100010        NOP
33361  105000        MOV    0,1
33362    6267        OUTINSTR         ;OUTPUT CONTENT IN BOTH OCTAL AND SYMBOLIC FORM
33363   34005 ENTR2: LDA    3,RUP
33364   21433        LDA    0,OCC.,3
33365   24406        LDA    1,CTAB
33366  106033        SLS    0,1       ;IS OCC AT PROPER PLACE ?
33367     405        JMP    ENTR5     ;  YES, PROCEED
33370   20056        LDA    0,C240    ;NO, TAB OVER
33371    6327        JSR    @.TCHA
33372     771        JMP    ENTR2

33373      16 CTAB:  16
```

<< SI = R92DSPS1A; BO = A.DSP.7344! >>

```
 33374    6133 ENTR5: OUTTEXT
 33375  135240  .TXTF ;;
 33376       0 ;

 33377    6141        STOUTPUT
 33400    6140        STINPUT             ;GET THE INPUT VALUE
 33401    6252        VALUE
 33402     404        JMP     ENTR1       ;ABNORMAL VALUE
 33403    6250        STORD               ;STORE THE VALUE
 33404    6272        ADERR
 33405     740        JMP     ENTRO       ;GET NEXT

 33406   34214 ENTR1: LDA     3,.APH
 33407 101015        SNZ     0,0         ;BLANK ENTRY ?
 33410     413        JMP     ENTR4       ;   YES
 33411 101415        INC#    0,0,SNR     ;NO, WAS "^" ENTERED ?
 33412     415        JMP     ENTR6       ;   YES, OPEN AND EXAMINE PREVIOUS CELL
 33413 100285        COM2R#  0,0,SNR     ;NO, WAS "@" ENTERED ?
 33414     414        JMP     ENTR7       ;   YES, OPEN CELL POINTED AT
 33415    6133        OUTTEXT             ;NO, INVALID
 33416 103640  .TXTF ,<2077
 33417 137577 77
 33420 137400 0;

 33421     724        JMP     ENTRO

 33422   11453 ENTR4: ISZ     DSPS3,3     ;BLANK INPUT, STEP TO NEXT ADDRESS
 33423     722        JMP     ENTRO
 33424     721        JMP     ENTRO

 33425   15453 ENTR6: DSZ     DSPS3,3     ;"^" WAS ENTERED: STEP TO PREVIOUS ADDRESS
 33426     717        JMP     ENTRO
 33427     716        JMP     ENTRO

 33430    6261 ENTR7: GETWD               ;"@" WAS ENTERED
 33431    6272        ADERR
 33432   41453        STA     0,DSPS3,3   ;SET CURRENT CONTENT ---> ADDRESS
 33433     713        JMP     ENTRO
```

```
                       <. SI = R92DSPS1A, BD = A.DSP.7344! >>

33434 102400 FILE:  SUB      0,0        ;SELECT A FILE AS OUR DOMAIN
33435   6126        INSTBYTE
33436  24206        LDA      1,C256     ;CHECK FOR A "."
33437 146415        SNE      2,1        ;RE-SELECT A FILE ?
33440    452        JMP      FILE4      ;   YES
33441   6276        SELCORE             ;CLEAR PREV. SELECTION, SELECT CORE
33442 102400        SUB      0,0
33443   6126        INSTBYTE            ;EXAMINE INPUT STRING
33444  24055        LDA      1,C215
33445 146415        SNE      2,1        ;SELECT REAL CORE ?
33446   2256        BEGIN               ;   YES, DONE
33447  20062        LDA      0,C300     ;NO, CHECK FOR AN "@"
33450 142415        SNE      2,0        ;SELECT AN ACTIVE FILE ?
33451    462        JMP      FILE5      ;   YES
33452  34005        LDA      3,RUP      ;NO
33453  25404        LDA      1,ISP.,3   ;LOOK UP A FILE BY FILENAME
33454 125400        INC      1,1        ;BYTE ADDRESS OF FILENAME
33455  20002        LDA      0,C2       ;OPEN IT ON CHANNEL 2
33456  30222        LDA      2,.ICBF    ;ITEM CONTROL BLOCK
33457 176400        SUB      3,3
33460  55001        STA      3,1,2      ;DEFAULT LU = 0
33461   6106        CHANNEL
33462  60025        OPENREF
33463   6257        ILLEGAL             ;   CAN'T OPEN FILE
33464  21000        LDA      0,FLU,2
33465  25001        LDA      1,FDA,2
33466   6110        DATAPUMP            ;READ FILE'S HEADER
33467      0        GETBLOCK
33470 100000        @0
33471  50221        STA      2,DSPHDR   ;SAVE BUFFER LOCATION
33472  21007        LDA      0,ACNT,2
33473  25010        LDA      1,TYPE,2
33474   6101        CALL                ;IS FILE READ PROTECTED ?
33475 100012        CHKRP
33476    412        JMP      FILE2      ;   YES, ACCESS IS DENIED
33477  30221        LDA      2,DSPHDR   ;NO
33500  21176        LDA      0,UNIT,2
33501 103240        ADDOR    0,0        ;SET FLAG THAT FILE IS SELECTED
33502  25177        LDA      1,DHDR,2
33503  34214 FILE1: LDA      3,.AFH     ;SET SELECTION PARAMETERS INTO OWN AF HEADER
33504  41450        STA      0,DSPS0,3
33505  45451        STA      1,DSPS1,3
33506   6277        COPYHDR2CORE        ;COPY PARAMETERS INTO CORE
33507   2256        BEGIN
```

```
                        << SI = R92DSPS1A: 00 = A.DSP.7344! >>

033510    6276 FILE2: SELCORE           ;RELEASE FILE IF SELECTED
033511    6297        ILLEGAL

033512    6135 FILE4: INBYTE            ;RE-SELECT SELECTED FILE
033513    6135        INBYTE
033514  240055        LDA     1,C215    ;CHECK FOR "F." ONLY
033515 1464414        SEQ     2,1       ;END OF COMMAND LINE ?
033516    6297        ILLEGAL           ;   NO
033517   20217        LDA     0,DSPTYPE ;YES
033520 1011115        SSN     0,0       ;IS A FILE SELECTED ?
033521     775        JMP     FILE2     ;   NO
033522 1031110        ADDL#   0,0,SZC   ;YES, ACTIVE FILE ?
033523     405        JMP     FIL42     ;   YES
033524   20213        LDA     0,DSPLU   ;NO, PASSIVE FILE
033525 1032440        ADDOR   C,0       ;SET FILE FLAG IN DSPS0 IN AFH
033526   24216        LDA     1,DSPDA
033527     754        JMP     FILE1

033530 1061120 FIL42: ADCZL   C,0       ;ACTIVE FILE SELECTED (DSPS0 = -2)
033531   24550        LDA     1,DSPPCB
033532     754        JMP     FILE1

033533    6133 FILE9: INSTBYTE          ;SELECT AN ACTIVE FILE
033534 1020000        ADC     0,0
033535    6133        INSTBYTE          ;GET NEXT CHARACTER AFTER "@"
033536  240055        LDA     1,C215
033537 1464414        SEQ     2,1       ;THIS PORT'S ACTIVE FILE ?
033540     403        JMP     FIL60     ;   NO
033541   30005        LDA     2,RUP     ;YES, READ HDR FOR LATCHING SYMMETRY
033542     453        JMP     FIL80
```

<< SI = R92DSPS1A; BO = A.DSP.7344! >>

```
33543  34005 FIL60:LDA     3,RUP      ; << FROM FILES
33544  25410       LDA     1,ACT.,3  ;CHECK USER'S ACCOUNT
33545  20213       LDA     0,C140K
33546 106004       ADC     0,1,SZR   ;MANAGER ?
33547   6257       ILLEGAL           ;   NO
33550  44225       STA     1,TS      ;   YES, CLEAR THE PORT # ACCUM.
33551   6127 FILE6:ISADIGIT          ;PORT # GIVEN A DIGIT?
33552    413       JMP     FILE7     ;   NO, CHECK FOR END
33553 132400       SUB     1,2       ;DECIMAL DIGIT
33554  20225       LDA     0,TS      ;PREV INPUT
33555 105120       MOVZL   0,1       ;*10
33556 125120       MOVZL   1,1
33557 123120       ADDZL   1,0
33560 143000       ADD     2,0       ;PLUS THIS DIGIT
33561  40225       STA     0,TS
33562 102000       ADC     0,0       ;GET NEXT DIGIT
33563   6126       INSTBYTE
33564    765       JMP     FILE6

33565  20033 FILE7:LDA     0,C215    ;CHECK FOR END OF LINE
33566 142414       SEQ     2,0       ;END OF LINE SEEN?
33567   6257       ILLEGAL           ;   NO, ILLEGAL CHAR IN COMMAND LINE
33570  20225       LDA     0,TS      ;PORT NUMBER
33571   6101       CALL
33572 100023       CPNPP
33573    715       JMP     FILE2     ;NO SUCH PORT, RELEASE ANY SELECTED FILE
33574 111000       MOV     0,2       ;PCB POINTER
33575  50220 FIL80:STA     2,DSPPCB  ;SAVE PCB
33576 102400       SUB     0,0
33577  25027       LDA     1,AHA.,2
33600   6110       DATAPUMP          ;READ ACTIVE FILE'S HEADER
33601      0       GETBLOCK
33602 100000       @0
33603  50221       STA     2,DSPHDR
33604    724       JMP     FIL42     ;ENTER NEW SELECTION PARAMETERS INTO AFH & CORE

       33605 ICBF:         ;ITEM CONTROL BLOCK FOR "OPEN" SELECTED FILE
33605 177777       -1      ;EXPECTED FILE TYPE = ANY
33606      0       0       ;DEFAULT LU
```

<< SI = R92DSPS1A; SO = A.DSP.7344! >>

```
33607 146404 GBLK:  SUB     2,1,SZR    ;GET DISC BLOCK AS VIRTUAL CORE
33610    405        JMP     GBLK0
33611   4436        JSR     GBLK2      ;RELEASE FILE IF SELECTED
33612 126400        SUB     1,1        ;LU #
33613  45450        STA     1,DSPS0,3; NO "/" ==> L.U. #0
33614    412        JMP     GBLK1

33615  24206 GBLK0: LDA     1,C256
33616 132014        ADC#    1,2,SZR    ;"/" ?
33617    671        JMP     FILE2      ;   NO, ILLEGAL
33620   4427        JSR     GBLK2      ;RELEASE FILE IF SELECTED
33621  41450        STA     0,DSPS0,3; SAVE LU #
33622   6270        CATO
33623  24055        LDA     1,C215
33624 146414        SEQ     2,1        ;END OF LINE ?
33625    663        JMP     FILE2      ;   NO, ILLEGAL
33626  41451 GBLK1: STA     0,DSPS1,3; REMEMBER RDA
33627  21450        LDA     0,DSPS0,3
33630   6123        FINDLUT            ;LU ACTIVE ?
33631    657        JMP     FILE2      ;   NO
33632  21410        LDA     0,FUDA,3   ;MAX RDA+1
33633  30214        LDA     2,.AFH
33634  25051        LDA     1,DSPS1,2; GIVEN RDA
33635 122032        SLS     1,0        ;RDA EXIST ?
33636    652        JMP     FILE2      ;   NO
33637  30005        LDA     2,RUP      ;CHECK USER'S ACCOUNT
33640  25010        LDA     1,ACT.,2
33641  20213        LDA     0,C140K
33642 106014        ADC#    0,1,SZR    ;MANAGER ?
33643    645        JMP     FILE2      ;   NO, ILLEGAL
33644   6277        COPYHDR2CORE       ;YES, COPY SELECTION PARAMETERS TO CORE
33645   2256        BEGIN

33646      0        0
33647  54777 GBLK2: STA     3,.-1
33650  40225        STA     0,TS       ;PRESERVE A0
33651   6276        SELCORE            ;GIVE UP PRIOR SELECTION (DEFAULT = CORE)
33652  20225        LDA     0,TS
33653  34214        LDA     3,.AFH
33654   2772        JMP     @GBLK2-1
```

```
;                         << SI = R92DSPS1A; DO = A.DSP.73441 >>

   33655 146414 HEADR:SEG     2,1        ;USE FILE HEADER AS VIRTUAL CORE
   33656    632       JMP     FILE2      ;   MORE THAN "H" ENTERED
   33657  20217       LDA     0,DSPTYPE
   33660 101113       SSN     0,0        ;IS A FILE SELECTED ?
   33661    627       JMP     FILE2      ;   NO
   33662 103112       ADDL#   0,0,SZC    ;YES, ACTIVE FILE ?
   33663    407       JMP     HDRAF      ;   YES
   33664   6275       CLBRK              ;NO, CLEAR BREAKPOINT IF ANY
   33665  20215       LDA     0,DSPLU
   33666  24213       LDA     1,C140K
   33667 123000       ADD     1,0        ;SET FILE & HDR FLAGS (IN DSPS0)
   33670  24216       LDA     1,DSPDA    ;DSPS1 = RDA
   33671    612       JMP     FILE1

   33672  20403 HDRAF:LDA     0,CM3      ;SELECT ACTIVE FILE HEADER
   33673  24220       LDA     1,DSPPCB
   33674    607       JMP     FILE1

   33675 177775 CM3.  -3

                .EOT  ; "DSP"  SOURCE #1
```

```
;                               << SI = R72DSPS2B; BO = A.DSP.7344! >>

; 9 MAR 87, RB
; 10 DEC 87, RDC

; "DSP" SOURCE #2 OF 3 FOR "IRIS"

   33676  24210 INPUT: LDA    1,C272     ;INPUT ASCII STRING
   33677 146414        SEQ    2,1        ;COLON ?
   33700   6257        ILLEGAL           ;  NO
   33701 102400 INPT1: SUB    0,0        ;  YES
   33702  40225        STA    0,TS
   33703   4410        JSR    INPT2      ;GET FIRST BYTE OF WORD
   33704 151300        MOVS   2,2
   33705  50225        STA    2,TS
   33706   4405        JSR    INPT2      ;GET SECOND BYTE OF WORD
   33707 143000        ADD    2,0        ;COMBINE THE BYTES
   33710   6260        STOWD
   33711   6272        ADERR
   33712    767        JMP    INPT1

   33713  54226 INPT2: STA    3,TS1      ;GET ONE INPUT BYTE
   33714 102000        ADC    0,0
   33715   6126        INSTBYTE
   33716  20225        LDA    0,TS
   33717  34055        LDA    3,C215
   33720  24202        LDA    1,C232
   33721 146415        SNE    2,1        ;CTRL-Z ?
   33722 171001        MOV    3,2,SKP    ;  YES, SUBSTITUTE A RETURN
   33723 156414        SEQ    2,3        ;  NO, END OF INPUT ?
   33724   2226        JMP    @TS1       ;    NO, CONTINUE
   33725   6260        STOWD             ;    YES, STORE LAST WORD
   33726   6272        ADERR
   33727   2256        BEGIN
```

```
033730   24204 JREL:  LDA     1,C264    ;SEARCH FOR RELATIVE REFERENCES
033731 1464414        SEQ     2,1
033732   62257        ILLEGAL
033733   60770        CATO
033734   24055        LDA     1,C215
033735 1464414        SEQ     2,1
033736   62257        ILLEGAL
033737   41454        STA     0,DSPS4,3
033740   21453        LDA     0,DSPS3,3
033741   24052        LDA     1,C177
033742 1224000        SUB     1,0
033743   41453        STA     0,DSPS3,3
033744   45456        STA     1,DSPS6,3
033745   24053        LDA     1,C400
033746   45455        STA     1,DSPS5,3
033747   21450 JREL1: LDA     0,DSPS3,3
033750 1011100        SSN     0,0
033751   60511        GETWD
033752     451        JMP     JREL4
033753 1011100        SSP     0,0       ;REGISTER REFERENCE ?
033754     457        JMP     JREL4     ;   YES
033755   24012        LDA     1,C60K    ;   NO
033756 1060000        SLS     0,1       ;INPUT/OUTPUT ?
033757     454        JMP     JREL4     ;   YES
033760   24211        LDA     1,C1400   ;MUST BE MEMORY REFERENCE
033761 1074000        AND     0,1
033762   30065        LDA     2,C400
033763 1324414        SEQ     1,2       ;RELATIVE REFERENCE ?
033764     447        JMP     JREL4     ;   NO
033765   40265        STA     0,TS      ;   YES
033766   30064        LDA     2,C377
033767 1434000        AND     2,0
033770   25456        LDA     1,DSPS6,3
033771   30058        LDA     2,C200
033772 1251102        SSP     1,1       ;AHEAD OF DESIGNATED ADDRESS ?
033773     411        JMP     JREL2     ;   NO
033774 1120002        SGE     0,2       ;   YES, POSITIVE REFERENCE . . .
033775 1060000        SGE     0,1       ;THAT SPANS DESIGNATED ADDRESS ?
033776     435        JMP     JREL4     ;   NO
033777   25454        LDA     1,DSPS4,3;   YES
034000 1230000        ADD     1,0
034001 1120002        SGE     0,2       ;EXCEED SPECIFIED LIMITS ?
034002     431        JMP     JREL4     ;   NO
034003     414        JMP     JREL3     ;   YES
```

```
;                       <<< SI = R92DSPS2B;  30 = A.DSP.7344! >>

   340004 112033  JREL2: SGE     0,2         ;NEGATIVE REFERENCE ?
   340005    426         JMP     JREL4       ;   NO
   340006 151120          MOVZL   2,2         ;   YES
   340007 133000          ADD     1,2
   340010 112433          SLE     0,2         ;REFERENCE SPAN DESIGNATED ADDRESS ?
   340011    422         JMP     JREL4       ;   NO
   340012  25454          LDA     1,DSPS4,3;  YES
   340013 122400          SUB     1,0
   340014  24053          LDA     1,C200
   340015 106033          SLS     0,1         ;EXCEED SPECIFIED LIMITS ?
   340016    416         JMP     JREL4       ;   NO
   340017  30055  JREL3:  LDA     2,C215      ;   YES, PRINT A RETURN,
   340020   6132          OUTBYTE
   340021  34214          LDA     3,.AFH      ;   THE ADDRESS,
   340022  25453          LDA     1,DSPS3,3
   340023 124400          NEG     1,1
   340024 124000          COM     1,1
   340025   6264          COTAA
   340026  24035          LDA     1,TS        ;   AND THE INSTRUCTION,
   340027   6067          OUTINSTR
   340030   6141          STOUTPUT
   340031   6101          CALL
   340032 100011          WONA
   340033  34214  JREL4:  LDA     3,.AFH      ;TRY NEXT LOCATION
   340034  15456          DSZ     DSPS6,3
   340035 100010          NOP
   340036  15455          DSZ     DSPS5,3
   340037    410         JMP     JREL1
   340040   2256          BEGIN
```

<< SI = R92DSPS20; BO = A.DSP.7344! >>

```
034041    6271 KONST PARAM              ;STORE BLOCK OF A CONSTANT
034042   21756       LDA     0,DSPS6,3
034043 1014140       INC#    0,0,SZR   ;WAS A 4TH PARAMETER ENTERED ?
034044    6287       ILLEGAL           ;   YES, ERROR
034045   21453 KLOOP:LDA     0,DSPS3,3;NO, START OF BLOCK
034046   25454       LDA     1,DSPS4,3;END OF BLOCK
034047 1064433       SLE     0,1
034050    2256       BEGIN
034051   21455       LDA     0,DSPS5,3;CONSTANT VALUE
034052    6260       STOND
034053    6270       ADERR
034054     771       JMP     KLOOP


034055     316       "N!200
034056   20777 LIST: LDA     0,-1      ;LIST SEMI-SYMBOLIC
034057 1424000       SUB     2,0
034060   41454       STA     0,DSPS4,3;0 ==> EXCLUDE NUMERIC FIELD
034061 1010115       SNZ     0,0
034062    6125       INBYTE
034063   24055       LDA     1,C215
034064 1464414       SEQ     2,1
034065    6287       ILLEGAL
034066   30055 LIST1:LDA     2,C215
034067    6133       OUTBYTE
034070   34214       LDA     3,.AFH    ;OUTPUT ADDRESS
034071   25453       LDA     1,DSPS0,3
034072    6264       COTAA
034073    6261       GETWD
034074    6275       ADERR
034075   25454       LDA     1,DSPS4,3
034076 1250154       SNZ     1,1       ;EXCLUDE NUMERIC ?
034077     404       JMP     LIST2     ;   YES
034100 1050000       MOV     0,1       ;NO
034101    6267       OUTINSTR
034102     402       JMP     LIST3

034103    6266 LIST2:COSYM             ;OUTPUT SYMBOLIC
034104    6141 LIST3:STOUTPUT
034105    6101       CALL
034106 1000114       NONA
034107     757       JMP     LIST1
```

```
;                       << SI = R92DSPS2B; BO = A.DSP.7344! >>

041110    06271  MOVEB: PARAMETERS          ;MOVE BLOCK IN STORAGE
041111    21456         LDA     0,DSPS6,3
041112  1014414         INC#    0,0,SZR     ;IS THERE A FOURTH PARAMETER ?
041113    06257         ILLEGAL             ;  YES, ILLEGAL
041114    21453         LDA     0,DSPS3,3;BEGINNING ADDRESS OF SOURCE
041115    25455         LDA     1,DSPS5,3;BEGINNING ADDRESS OF DESTINATION
041116  1064415         SNE     0,1         ;MOVE IN PLACE ?
041117    02256         BEGIN               ;  YES, DON'T BOTHER
041120  1064433         SLE     0,1         ;WHICH DIRECTION ?
041121     407          JMP     MOVEO       ;  BACKWARD
041122    31454         LDA     2,DSPS4,3;  FORWARD, MODIFY POINTERS
041123    51450         STA     2,DSPS3,3;FIRST WORD TO MOVE <-- ENDING SOURCE ADDRESS
041124    41454         STA     0,DSPS4,3;LAST WORD TO MOVE <-- BEGINNING SOURCE ADDRESS
041125  1124400         SUB     0,2         ;SIZE OF SOURCE (ALWAYS > 0)
041126  1470000         ADD     2,1
041127    45455         STA     1,DSPS5,3;FIRST DESTINATION <-- ENDING DESTINATION ADDRS
041130  1064400 MOVEO: SUB      0,1
041131    45460         STA     1,DSP10,3;SET DIRECTION FLAG
041132    34070 MOVE1: LDA      3,ESCF    ;COPY LOOP
041133  1750114         SKZ     3,3
041134     435          JMP     MOVE4
041135    06261         GETWD
041136    06270         ADERR
041137    34214         LDA     3,.AFH
041140    25453         LDA     1,DSPS3,3;SAVE SOURCE POINTER
041141    45457         STA     1,DSPS7,3
041142    25455         LDA     1,DSPS5,3;GET DESTINATION POINTER
041143    45453         STA     1,DSPS3,3
041144    06260         STOWD
041145    06270         ADERR
041146    34214         LDA     3,.AFH
041147    25457         LDA     1,DSPS7,3;SOURCE POINTER +1
041150    31454         LDA     2,DSPS4,3;SOURCE LIMIT
041151    21460         LDA     0,DSP10,3
041152  1011125         SSP     0,0         ;WHICH DIRECTION ?
041153     411          JMP     MOVE3       ;  BACKWARD, CHECK FOR DONE
041154  1021100         ADCZL   0,0         ;  FORWARD
041155  1070000         ADD     0,1         ;SOURCE POINTER -1
041156  1320032         SGE     1,2         ;DONE ?
041157    02256         BEGIN               ;  YES
041160    15455         DSZ     DSPS5,3   ;DEST. POINTER -1
041161  1000010         NOP
041162    45453 MOVE2: STA      1,DSPS3,3;NEW SOURCE POINTER
041163     747          JMP     MOVE1       ;CONTINUE COPYING

041164  1324300 MOVE3: SLE      1,2         ;BACKWARD MOVE DONE ?
041165    02256         BEGIN               ;  YES
041166    11455         ISZ     DSPS5,3   ;  NO, DEST. POINTER + 1
041167  1000010         NOP
041170     773          JMP     MOVE2       ;(SOURCE POINTER ALREADY +1)
```

```
;                         << SI = R92DSPS2B; BO = A.DSP.7344! >>

   34171    6133 MOVE4:OUTTEXT
   34172  103615 .TXTF ;<207><215>
   34173  140702 AB
   34174  147722 OR
   34175  152305 TE
   34176  142240 D
   34177  140724 AT
   34200  120000  ;

   34201   34214        LDA     3,.AFH
   34202   25453        LDA     1,DSPS3,3
   34203    6263        COTA
   34204    2236        BEGIN


   34205  132414        SEQ     1,2
   34206   20777 NSRCH:LDA      0,.-1      ;SEARCH FOR NOT EQUAL
   34207    2401        JMP     @.+1
   34210   35121        SRCHM+1
```

<< SI = R920SP92B; BO = A.DSP.7344! >>

```
044211  146414 OUTPT: SEQ     3,1         ;OUTPUT ASCII STRING
044212    46257        ILLEGAL
044213   306210        LDA     2,C272      ;COLON (:)
044214    61134        OUTBYTE
044215   300005        LDA     2,RUP
044216   210005        LDA     0,OSP,,2
044217   250003        LDA     1,LBA,,2
044220  1064400        SUB     0,1
044221   200235        LDA     0,C5
044222  1064400        SUB     0,1
044223    44235        STA     1,TS1
044224    60261 OUTP1: GETWD
044225    63723        ADERR
044226    40235        STA     0,TS
044227    24002        LDA     1,C2
044230    31411        LDA     2,BPC,3
044231  1511100        SSN     2,2         ;BYTE ADDRESS GIVEN ?
044232     4004        JMP     .+3         ;  NO
044233  1265000        SUBZL   1,1         ;  YES
044234  1014000        MOVS    0,0
044235    44235        STA     1,TS2
044236  1110000        MOVS    0,2
044237    20063 OUTP2: LDA     0,C177
044240  1134056        AND     0,2,SNR     ;NULL (= TERMINATOR) ?
044241     2256        BEGIN               ;  YES
044242  1014000        INC     0,0         ;NO, FORM 200
044243  1130000        ADD     0,2         ;SET MSB
044244    20056        LDA     0,C240
044245    34055        LDA     3,C215
044246  1400000        SGE     2,0         ;CONTROL CHARACTER ...
044247  1564151        SNE     2,3         ;... OTHER THAN RETURN ?
044250      414        JMP     OUTP3       ;  NO, OUTPUT AS IS
044251    50230        STA     2,TS3       ;YES, SAVE THE CHARACTER
044252    20235        LDA     0,TS1
044253    24002        LDA     1,C2
044254  1060002        SGE     0,1         ;ROOM FOR 2 MORE CHARACTERS ?
044255     4025        BEGIN               ;  NO
044256    14235        DSZ     TS1         ;YES
044257    30416        LDA     2,C.UP      ;OUTPUT AN UP-ARROW (^)
044260    61132        OUTBYTE
044261    30230        LDA     2,TS3       ;RECOVER THE SAVED CONTROL CHARACTER
044262    20051        LDA     0,C100
044263  1130000        ADD     0,2         ;CONVERT TO PRINTING CHARACTER
044264    61132 OUTP3: OUTBYTE
044265    14235        DSZ     TS1         ;END OF I/O BUFFER ?
044266     4002        SKIP
044267     2256        BEGIN               ;  YES
044270    30235        LDA     2,TS        ;NO
044271    14235        DSZ     TS2
044272      745        JMP     OUTP2
044273      731        JMP     OUTP1

034274      036 C.UP:  "^+200
```

```
                        << SI = R92DSPS2B;  BO = A.DSP.7344! >>

; ****** PAPER TAPE PUNCH FUNCTION HAS BEEN DELETED ******

044275 146415 PUNCH: SNE     2,1        ;PUNCH PAPER TAPE
044276    541        JMP     PNCHE      ;DONE ALL,  OUTPUT END BLOCK
044277  24204        LDA     1,C254
044300 146414        SEQ     2,1
044301   6257        ILLEGAL
044302   6270        CATO
044303  24055        LDA     1,C215
044304 101400        INC     0,0
044305  41454        STA     0,DSPS4,3
044306  35453        LDA     3,DSPS3,3
044307 146415        SNE     2,1
044310 116433        SGR     0,3
044311   6257        ILLEGAL
044312 102520        SUBZL   0,0
044313  40330        STA     0,TS3
044314   6106        CHANNEL
044315     27        CLEAR
044316   6142        TRAPFAULT
044317   4404        JSR     PNCH0-1
044320 122320  TXTF ;$P
044321 152320  TP
044322      0 ;

044323 165120        MOVZL   3,1
044324  30223 PNCH0: LDA     2,.ICB0    ;OPEN A PUNCH DRIVER
044325 102520        SUBZL   0,0
044326   6106        CHANNEL
044327  40022        OPEN
044330    461        JMP     PNCH2      ;NO SUCH FILE
044331  34214 PNCH1: LDA     3,.AFH     ;PUNCH DATA BLOCKS
044332  21453        LDA     0,DSPS3,3; BEGINNING ADDR
044333  25454        LDA     1,DSPS4,3; END ADDR
044334  30073        LDA     2,ESCF     ;TEST FOR ESCOPL.
044335 151015        SNZ     2,2        ;ESCAPE SEEN?
044336 106033        SLS     0,1        ;BEG ADDR < END ADDR ?
044337   2256        BEGIN              ;   NO, CAN'T PUNCH BACKWARDS
044340 106400        SUB     0,1        ;   YES, COMPUTE # WORDS
044341  20042        LDA     0,C20
044342 122433        SLE     1,0        ,BLOCK < 20 WORDS ?
044343 105000        MOV     0,1        ;   NO, PUNCH (ALL) WORDS
044344  44225        STA     1,TS
044345  44226        STA     1,TS1
044346 102400        SUB     0,0        ;CLEAR # OF BYTES MOVED
044347  40227        STA     0,TS2
044350  20547        LDA     0,WICB+4
044351  40233        STA     0,TS6      ;BYTE ADDR OF INTERMEDIATE PUNCH BUFFER
044352 120400        NEG     1,0
044353   4446        JSR     PWORD      ; STORE [-WC]
```

```
                            << SI = R92DSPS2B; BO = A.DSP.7344! >>
34354   4445                JSR     PWORD     ;ADDRESS
34355  24225                LDA     1,TS
34356 122400                SUB     1,0
34357  40232                STA     0,TS5
34360   6261                GETWD
34361   6272                ADERR
34362  24232                LDA     1,TS5     ;FORM CHECKSUM
34363 123000                ADD     1,0
34364  14226                DSZ     TS1       ;COUNT # WORDS, DONE ?
34365    772                JMP     .-6       ;   NO
34366 100400                NEG     0,0
34367   4432                JSR     PWORD     ;CHECKSUM
34370  24225                LDA     1,TS
34371 122400                SUB     1,0
34372  41453                STA     0,DSPS3,3
34373   6261                GETWD
34374   6272                ADERR
34375   4424                JSR     PWORD     ;DATA WORD
34376  14225                DSZ     TS
34377    774                JMP     .-4
34400 102400                SUB     0,0
34401   4420                JSR     PWORD     ;TWO BLANK FRAMES
34402  20227                LDA     0,TS2
34403 101120                MOVZL   0,0       ;BYTE COUNT
34404   4460                JSR     PWRIT
34405  24074                LDA     1,ETSF
34406 125014                SKZ     1,1       ;END OF TIME SLICE ?
34407   6117                BUMPUSER          ;   YES
34410    721                JMP     PNCH1

34411  14230 PNCH2: DSZ     TS3       ;DRIVER NOT OPENED
34412   6257                ILLEGAL
34413   4404                JSR     .+4       ;TRY MASTER TTY
34414 122220 .TXTF ;$P
34415 152315 TM
34416      0 ;

34417 165120                MOVZL   3,1
34420    704                JMP     PNCHO

34421  54230 PWORD: STA     3,TS3     ;PUT ONE WORD IN BUFFER
34422  40231                STA     0,TS4     ;HOLD THE [-WC]
34423  24233                LDA     1,TS6     ;GET B(BUFFER)
34424  10233                ISZ     TS6
34425   6134                PUTBYTE
34426  20231                LDA     0,TS4     ;GET WORD
34427 101300                MOVS    0,0       ;POSITION NEXT BYTE
34430  24233                LDA     1,TS6
34431  10233                ISZ     TS6
34432   6134                PUTBYTE
34433  10227                ISZ     TS2       ;BUMP XFER COUNT
34434  34214                LDA     3,.AFH    ;PICK UP BLOCK ADDR
34435  21453                LDA     0,DSPS3,3
34436   2230                JMP     @TS3
```

```
                        << SI = R92DSPS2B, RO = A.DSP.7344' >>
034437   20460 PNCHE: LDA     0,WICB+4 ;PUNCH END BLOCK
034440   40232        STA     0,TS6
034441 1025320        SUBZL   0,0
034442    4757        JSR     PWORD    ; 1
034443 1010150        SNZ     0,0
034444 1026220        SUBZR   0,0
034445    4754        JSR     PWORD    ;ADDRESS
034446 1010150        SNZ     0,0
034447 1026220        SUBZR   0,0
034450 1014000        INC     0,0
034451 1004000        NEG     0,0
034452    4747        JSR     PWORD    ;CHECKSUM
034453 1024000        SUB     0,0
034454    4748        JSR     PWORD    ;RECORD GAP
034455   20030        LDA     0,C10
034456    4406        JSR     PWRIT
034457 1025320        SUBZL   0,0      ;PUNCH TRAILER
034460    6106        CHANNEL
034461      37        CLEAR
034462    6140        TRAPFAULT        ;CHANNEL #1 IS ILLEGAL !?
034463    2256        BEGIN

034464   30214 PWRIT: LDA     2,.AFH   ;WRITE TO PUNCH
034465   55056        STA     3,DSPS6,2
034466   41057        STA     0,DSPS7,2;BYTE COUNT
034467   40422 PWRI1: STA     0,WICB+3 ;SET B(SOURCE BUFFER)
034470 1025320        SUBZL   0,0
034471   30421        LDA     2,WICB-1
034472    6106        CHANNEL
034473   20034        WRITITEM
034474     404        JMP     PWRIE    ;RECORD LOCKED OR CHANNEL NOT OPEN
034475   34214        LDA     3,.AFH
034476    3456        JMP     @DSPS6,3

034477      27        27
034500   20777 PWRIE: LDA     0,-1     ;CHANNEL ERROR
034501 1624140        SEQ     3,0
034502    6257        ILLEGAL          ;CHANNEL #1 NOT OPEN
034503   20003        LDA     0,C3     ;RECORD LOCKED
034504    6101        CALL
034505      57        SIGPAUSE
034506    6117        BUMPUSER
034507   30214        LDA     2,.AFH
034510   21057        LDA     0,DSPS7,2;RECOVER B(SOURCE BUFFER)
034511     756        JMP     PWRI1
```

```
;                                   << SI = R920SPS2B; SO = A.DSP.7344! >>
034512  034513                      WICB
034513       0  WICB:   0           ;WRITE ITEM CONTROL BLOCK
034514       0          0           ;ITEM #
034515      12          12          ;TYPE = BINARY
034516       0          0           ;B(SOURCE)
034517     162          FMAP+1*2


034520  146414  QUERY:  SEQ     2,1         ;REPEATED DUMP OF ONE CELL
034521    6257          ILLEGAL
034522  200030  QRY0:   LDA     0,C10
034523  041457          STA     0,DSPS7,3
034524  300056          LDA     2,C215
034525    6132          OUTBYTE
034526    6261  QRY1:   GETWD
034527    6277          ADERR
034530  105000          MOV     0,1
034531    6265          COTAD
034532    6141          STOUTPUT
034533    6101          CALL
034534  100011          WONA
034535  034214          LDA     3,.AFH
034536  154553          DSZ     DSPS3,3     ;DECREMENT INCREMENTED 'Q' ADDRESS
034537  100010          NOP
034540  154557          DSZ     DSPS7,3     ;COUNT # OF ITEMS AT CURRENT LINE; AT END ?
034541     765          JMP     QRY1        ;   NO
034542     760          JMP     QRY0


034543  177760  CM20:   -20
034544  035010  .ACTB:  ACTB
034545  035071  .REDG:  READG


034546      36  ICB0:   36          ;ITEM CONTROL BLOCK FOR "OPEN"
034547       0          0
```

```
                        ;<< SI = R92DSPS20; 80 = A DSP 7344! >>
034550 146404 REEDP: SUB     2,1,SZR   ;READ PAPER TAPE
034551   6357         ILLEGAL
034552  45463         STA     1,DSP13,3 ;SET R&V SWITCH (0==> 'R')
034553  45461         STA     1,DSP11,3 ;<< ENTRY FROM "V" COMMAND
034554  45455         STA     1,DSPS5,3
034555  25453         LDA     1,DSPS3,3
034556  45454         STA     1,DSPS4,3
034557 102520         SUBZL   0,0
034560  41465         STA     0,DSP15,3
034561  40230         STA     0,TS3
034562 102400         SUB     0,0
034563   6106         CHANNEL
034564     27         CLEAR
034565   6142         TRAPFAULT         ;CHANNEL #0 IS ILLEGAL !?
034566   4404         JSR     READO
034567 122320  TXTF  ;$P
034570 152323  TR
034571      0  ,

034572 165120 READO: MOVZL   3,1        ;OPEN A READER DRIVER
034573 102400        SUB     0,0
034574  30283         LDA     2,.ICBO
034575   6106         CHANNEL
034576  40022         OPEN
034577    545         JMP     READ4
034600   6744 READ1: JSR     @.ACTB    ;SCAN PAST LEADER
034601 151015        SNZ     2,2
034602    776        JMP     .-2
034603  30214         LDA     2,.AFH
034604  15047         DSZ     DSP17,2   ;BACKUP B(DSP BUFFER)
034605  11065         ISZ     DSP15,2   ;AND CHAR. COUNTER
034606  20403         LDA     0,.+2     ;SET BUFFER POINTER
034607 143001        ADD     2,0,SKP
034610     70        FMAP
034611  41070         STA     0,FMAP,2
034612   4566         JSR     RWORD     ;-WC
034613 101113         SSN     0,0       ;IS THIS A DATA BLOCK ?
034614    536         JMP     READN     ;   NO
034615  24726         LDA     1,CM20
034616 106038         SGE     0,1       ;WORD COUNT >20 ?
034617   2726         JMP     @.REDG    ;   YES
034620  41462         STA     0,DSP12,3 ;   NO
034621   4553         JSR     RWORD     ;ADDRESS
034622  25454         LDA     1,DSPS4,3
034623 125015         SNZ     1,1       ;NEED TO COMPUTE DISPLACEMENT ?
034624    405         JMP     REDO      ;   NO
034625 106400         SUB     0,1       ;   YES
034626  45455         STA     1,DSPS5,3
034627 126400         SUB     1,1
034630  45454         STA     1,DSPS4,3
034631  25455 REDO:  LDA     1,DSPS5,3 ;DISPLACEMENT
034632 123000         ADD     1,0
034633  41453         STA     0,DSPS3,3
034634   4540         JSR     RWORD     ;CHECKSUM WORD
```

```
                                 ;<< SI = R92DSPS2B,  BO = A.DSP.7344! >>
034635    04537 READ2: JSR      RWORD     ;DATA WORD
034636    25463        LDA      1,DSP13,3;PICK UP THE R&V SWITCH
034637   125014        SKZ      1,1       ;VERIFYING TAPE ?
034640      404        JMP      RED1
034641    11470        ISZ      FMAP,3    ;   NO
034642    43470        STA      0,@FMAP,3
034643      407        JMP      READ3

034644    41464 RED1:  STA      0,DSP14,3;   YES
034645     6261        GETWD
034646     6272        ADERR
034647    25464        LDA      1,DSP14,3;WORD FROM TAPE
034650   106414        SEQ      0,1       ;DOES IT VERIFY ?
034651      451        JMP      READV     ;   NO
034652    11462 READ3: ISZ      DSP12,3   ;END OF DATA BLOCK ?
034653      762        JMP      READ2     ;   NO
034654    21461        LDA      0,DSP11,3;   YES
034655   101014        SKZ      0,0       ;CHECKSUM ERROR ?
034656      423        JMP      REDCH     ;   YES
034657    21463        LDA      0,DSP13,3;   NO, PICK UP R&V SWITCH
034660   101014        SKZ      0,0       ;VERIFYING ?
034661      717        JMP      READ1     ;   YES
034662    20402        LDA      0,.+2     ;   NO
034663   163001        ADD      3,0,SKP
034664       70        FMAP
034665    25470        LDA      1,FMAP,3
034666    41470        STA      0,FMAP,3
034667   122433        SUBZ     1,0,SZC
034670     6143        TRAPFAULT          ;NO DATA IN BUFFER !?
034671    41462        STA      0,DSP12,3
034672    11470 REDCL: ISZ      FMAP,3    ;COPY BUFFER TO DESTINATION
034673    23470        LDA      0,@FMAP,3
034674     6260        STOWD
034675     6278        ADERR
034676    11462        ISZ      DSP12,3   ;DONE STORING ?
034677      773        JMP      REDCL     ;   NO, LOOP TILL DONE
034700      700        JMP      READ1     ;   YES

034701     6101 REDCH: CALL               ;CHECKSUM ERROR
034702   100011        WONA
034703     6133        OUTTEXT
034704   106700 .TXTF  /C215/C
034705   144305 HE
034706   141713 CK
034707   151725 SU
034710   146640 M
034711   142722 ER
034712   151317 RO
034713   151240 R
034714   140724 AT
034715   120000  /

034716    34214        LDA      3,.AFH
034717    25453        LDA      1,DSPS3,3
034720     6263        CDTA
034721      441        JMP      READ0+2
```

```
                        ;<< SI = R92DSPS2B, B0 = A.DSP.7344! >>
034722    6101 READV: CALL                ;VERIFICATION ERROR
034723  100011        NONA
034724   30055        LDA     2,C215
034725    6132        OUTBYTE
034726   34214        LDA     3,.AFH
034727  125453        LDA     1,DSPS3,3   ;BACK UP CURR. ADDRESS WORD
034730  124400        NEG     1,1
034731  124000        COM     1,1
034732    6263        COTA                ;DISPLAY CORE ADDR.
034733    6135        OUTTEXT
034734  135240  .TXTF ;!
034735       0 ;

034736   34214        LDA     3,.AFH
034737   21464        LDA     0,DSP14,3
034740    6266        COSYM               ;DISPLAY INCORRECT WORD FROM TAPE
034741    6141        STOUTPUT
034742   34214        LDA     3,.AFH
034743     707        JMP     READ3

034744  142330 READ4: DSZ     TS3         ;DRIVER NOT OPENED
034745    6257        ILLEGAL
034746    4624        JSR     READD       ;TRY MASTER TTY
034747  122320  .TXTF ;$P
034750  152315 TM
034751       0 ;

034752  101234 READN: MOVZR#  0,0,SZR     ;NOT A DATA BLOCK
034753     414        JMP     READE
034754    4420        JSR     RWORD       ;START OR HALT, READ CHECKSUM
034755    4417        JSR     RWORD       ;READ ADDRESS WORD
034756  125014        SKZ     1,1
034757     722        JMP     REDCH

034760    6101 READD: CALL
034761  100011        NONA
034762  102400        SUB     0,0         ;CLEAR THE CHANNEL << FROM REDCH
034763    6106        CHANNEL
034764      27        CLEAR
034765    6142        TRAPFAULT           ;CHANNEL #0 IS ILLEGAL !?
034766    2256        BEGIN

034767    4421 READE: JSR     ACTB        ;ERROR BLOCK
034770   24064        LDA     1,C377
034771  146414        SEQ     2,1         ;END OF ERROR BLOCK ?
034772     775        JMP     READE       ;   NO
034773     605        JMP     READ1       ;   YES
```

```
                                ;<< SI = R92DSPS2B; BO = A DSP.7344! >>
034774   30214 RWORD: LDA     2,.AFH    ;READ ONE WORD INTO AO AND
034775   55057        STA     3,DSPS7,2;ADD TO CHECKSUM IN BUF+11
034776    4412        JSR     ACTB
034777   51460        STA     2,DSP10,3
035000    4410        JSR     ACTB
035001   21460        LDA     0,DSP10,3
035002  145300        MOVS    2,1
035003  123000        ADD     1,0
035004   25461        LDA     1,DSP11,3
035005  107000        ADD     0,1
035006   45461        STA     1,DSP11,3
035007    3457        JMP     @DSPS7,3


035010   30214 ACTB:  LDA     2,.AFH    ;ACCESS TAPE BYTE
035011   55056        STA     3,DSPS6,2
035012   25067        LDA     1,DSP17,2;PICK UP B(DSP BUFFER)
035013  150065        DSZ     DSP15,2   ;BUFFER EMPTY ?
035014     417        JMP     ACTB1     ;   NO
035015   24074        LDA     1,ETSF    ;   YES
035016  125014        SKZ     1,1       ;END OF TIME SLICE ?
035017    6117        BUMPUSER          ;   YES
035020    6101        CALL
035021  100011        WONA
035022  102400 ACTBR: SUB     0,0       ;READ INTO BUFFER
035023   30425        LDA     2,RICB-1
035024    6106        CHANNEL
035025      33        READITEM
035026     412        JMP     ACTBL
035027   30214        LDA     2,.AFH
035030   41065        STA     0,DSP15,2;PRESERVE # BYTES TRANSFERED
035031   24424        LDA     1,RICB+4  ;B(DSP'S BUFFER)
035032   45067        STA     1,DSP17,2
035033   11067 ACTB1: ISZ     DSP17,2
035034    6124        GETBYTE           ;BRING IN FIRST BYTE
035035   34214        LDA     3,.AFH    ;AND RETURN TO CALLER
035036    3456        JMP   @DSPS6,3

035037      30        30
035040   30777 ACTBL: LDA     2,-1      ;RECORD LOCKED ?
035041  172014        ADC#    3,2,SZR
035042     414        JMP     READT     ;   NO
035043   20003        LDA     0,C3      ;   YES, PAUSE
035044    6101        CALL
035045      57        SIGPAUSE
035046    6117        BUMPUSER
035047     753        JMP     ACTBR


035050   35051        RICB
035051  177777 RICB:  -1        ;READ ITEM CONTROL BLOCK
035052       0        0         ;ITEM #
035053      12        12        ;TYPE = BINARY
035054     200        200       ;# OF BYTES TO TRANSFER
035055  102400        TBUF*2    ;B(DSP'S BUFFER)
```

```
                                ;<< S[ = R92DSPS2B;  BO = A.DSP_7344! >>
035056  151400 READT: INC     2,2             ;OUT OF TAPE ?
035057  156014         ADC#    2,3,SZR
035060     430         JMP     RDMSG           ;   NO
035061    6133         OUTTEXT;   YES
035062  106677  .TXTF ;<215>?
035063  120316  N
035064  147640  O
035065  152301  TA
035066  150305  PE
035067       0  ;

035070     672         JMP     READD+2


035071    6101 READG: CALL                    ;WORD COUNT >20
035072  100011         WDNA
035073    6133         OUTTEXT
035074  106677  .TXTF ;<215>?
035075  120327  W
035076  147720  OR
035077  142240  D
035100  141717  CO
035101  152716  UN
035102  152240  T
035103  137240  ?
035104  131260  20
035105       0  ;

035106     654         JMP     READD+2


035107     144         144
035110   24777 RDMSG: LDA     1,.-1          ;PRINT ERROR MESSAGE
035111  167000         ADD     3,1
035112  102120         ADCZL   0,0
035113    6101         CALL
035114      13         MESSAGE
035115     645         JMP     READD+2
035116     644         JMP     READD+2
```

```
                                << SI = R92DSPS2B; BO = A.DSP.7344! >>
35117 132415        SNE     1,2
35120  20777 SRCHM: LDA     0,.-1     ,SEARCH MEMORY
35121  41460        STA     0,DSP10,3;<< ENTRY FROM "N" COMMAND
35122   6271        PARAMETERS
35123   4301 SRCH0: CESF
35124   6261        GETWD
35125    412        JMP     SRCH1
35126  34214        LDA     3,.AFH
35127  25460        LDA     1,DSP10,3;PICK UP S OR N INSTR.
35130  44405        STA     1,SRCHI   ;>>> ** SELF MODIFYING !!! ** <<<
35131    401        JMP      +1       ;(TO RELOAD MARK 12 PREFETCH QUEUE)
35132  25455        LDA     1,DSPS5,3;VALUE TO MATCH
35133  31456        LDA     2,DSPS6,3;MASK (IF ANY)
35134 113400        AND     0,2
35135 132415 SRCHI: SNE     1,2       ;('S'==>SNE ,  'N'==>SEQ)
35136    413        JMP     SRCH2     ;PATTERN FOUND-PUT IT OUT
35137  34214 SRCH1: LDA     3,.AFH
35140  21453        LDA     0,DSPS3,3
35141  25454        LDA     1,DSPS4,3
35142 101015        SNZ     0,0       ;REQUEST FILLED ?
35143    403        JMP     SRCH3     ;   (YES)
35144 106432        SGR     0,1
35145    756        JMP     SRCH0     ;   NO, CONTINUE
35146   6101 SRCH3: CALL              ;   YES
35147 100011        WONA
35150   2256        BEGIN

35151  41457 SRCH2: STA     0,DSPS7,3;(LOC)&MASK=VALUE
35152   6101        CALL
35153 100011        WONA
35154  30055        LDA     2,C215
35155   6132        OUTBYTE
35156  34214        LDA     3,.AFH
35157  25453        LDA     1,DSPS3,3
35160 124400        NEG     1,1
35161 124000        COM     1,1
35162   6264        COTAA
35163  25457        LDA     1,DSPS7,3
35164   6267        OUTINSTR
35165   6141        STOUTPUT
35166    751        JMP     SRCH1
```

```
35167      70          FMAP
35170  146414 UDUMP:SEQ      2,1       ;PRINT BREAKPOINT SNAPSHOT
35171    6257          ILLEGAL
35172   25466          LDA     1,DSP16,3
35173   30051          LDA     2,C100
35174  133000          ADD     1,2
35175  106033          SLS     0,1
35176  112433          SLE     0,2
35177    6257          ILLEGAL
35200   30055 UDMP1:LDA      2,C215
35201    6132          OUTBYTE
35202   34214          LDA     3,.AFH
35203   25453          LDA     1,DSPS3,3
35204    6264          COTAA
35205   11453 UDMP2:ISZ      DSPS3,3
35206   25466          LDA     1,DSP16,3
35207  122400          SUB     1,0
35210   30757          LDA     2,UDUMP-1
35211  173000          ADD     3,2
35212  113000          ADD     0,2
35213   25000          LDA     1,0,2
35214    6265          COTAD
35215   34214          LDA     3,.AFH
35216   21453          LDA     0,DSPS3,3
35217   25466          LDA     1,DSP16,3
35220   30051          LDA     2,C100
35221  133000          ADD     1,2
35222  112433          SLE     0,2
35223    2256          BEGIN
35224   30027          LDA     2,C7
35225  113404          AND     0,2,SZR
35226     757          JMP     UDMP2
35227    4301          CESF
35230    6141          STOUTPUT
35231    6101          CALL
35232  100011          WDNA
35233     745          JMP     UDMP1


35234  146404 VERFY:SUB      2,1,SZR   ;VERIFY PAPER TAPE
35235    6257          ILLEGAL
35236   55463          STA     3,DSP13,3;SET R&V SWITCH (<>0 ==> 'V')
35237    2401          JMP     @.+1
35240   34553          REEDP+3
```

```
                        << SI = R92DSPS2B;  BO = A.DSP.7344! >>

 035241  146404 WSBLK: SUB     2,1,SZR   ;WRITE SELECTED BLOCK ON DISC
 035242     404         JMP     WSBLO
 035243   45454         STA     1,DSPS4,3;NO LU GIVEN,  ASSUME LU#0
 035244 1210000         MOV     1,0       ;GET LU # IN ACO FOR FINDLUT CALL
 035245     412         JMP     WSBL1

 035246   24207 WSBLO: LDA     1,C257
 035247  146414         SEQ     2,1       ;"/" GIVEN ?
 035250    6257         ILLEGAL           ;   NO
 035251   41454         STA     0,DSPS4,3;  YES,  USE THE LU GIVEN
 035252    6270         CATO
 035253   41453         STA     0,DSPS3,3;REMEMBER THE RDA
 035254   21454         LDA     0,DSPS4,3;RECOVER LU #
 035255   24055         LDA     1,C215
 035256  146416         SNE     2,1       ;END OF INPUT ?
 035257    6122 WSBL1: FINDLUT           ;   YES,  BE SURE LU IS ACTIVE
 035260    6257         ILLEGAL
 035261   31410         LDA     2,FUDA,3
 035262   34214         LDA     3,.AFH
 035263   25453         LDA     1,DSPS+3,3;RECOVER RDA
 035264 1320000         SLS     1,2       ;RDA BELOW FUDA ?
 035265    6257         ILLEGAL           ;   NO
 035266   30005         LDA     2,RUP     ;CHECK USER'S ACCOUNT
 035267   25010         LDA     1,ACT,,2
 035270   20215         LDA     0,C140K
 035271 1060014         ADC#    0,1,SZR   ;MANAGER ?
 035272    6257         ILLEGAL           ;   NO
 035273   21450         LDA     0,DSPS0,3;  YES
 035274   25451         LDA     1,DSPS1,3
 035275 1011112         SSP     0,0       ;SINGLE BLOCK SELECTED ?
 035276    6257         ILLEGAL           ;   NO
 035277   30010         LDA     2,.BSA    ;   YES,  GET THAT BLOCK
 035300    6135         READBLOCK
 035301   34214         LDA     3,.AFH
 035302   21454         LDA     0,DSPS4,3
 035303   25453         LDA     1,DSPS3,3
 035304    6143         WRITBLOCK
 035305    2256         BEGIN
```

```
;                       << SI = R92DSPS2B,  80 = A DSP 7344! >>

 055306 132414 XITD:  SEQ     1,2          ;ANYTHING FOLLOWING 'X' ?
 055307    407        JMP     XCKSM        ;   YES, DO CHECKSUM
 055310  30005 XITX:  LDA     2,RUP        ;EXIT FROM DSP
 055311   6102        FLAGCHANGE           ;RESET "DSP ACTIVE"
 055312 100016        RESET+FLW.
 055313  10000        10000
 055314   6276        SELCORE              ;SELECT REAL CORE
 055315    315        JMP     DEXIT

 055316   6271 XCKSM: PARAMETERS           ;CHECKSUM
 055317  30430        LDA     2,TBLCH      ;GET A(TABLE)
 055320  41001        STA     0,1,2        ;BEGINNING ADDRESS
 055321  45002        STA     1,2,2        ;ENDING ADDRESS
 055322  21435        LDA     0,DSPS5,3
 055323  25436        LDA     1,DSPS6,3
 055324 101016        SNZ     0,0          ;THIRD PARAMETER,
 055325 125414        INC#    1,1,SZR      ;OR 4TH PARAMETER ENTERED ?
 055326   6257        ILLEGAL              ;   YES, ERROR
 055327  20217        LDA     0,DSPTYPE    ;NO
 055330  25413        LDA     1,BPC,3
 055331 127116        ADDL#   1,1,SZC      ;BYTE ADDRESSING MODE ?
 055332   6257        ILLEGAL              ;   YES, ILLEGAL
 055333 103055        ADDOR#  0,0,SNR      ;IS A FILE SELECTED (DSPTYPE = 100000),
 055334 125113        SSP     1,1          ;   AND DISK COPY TO BE CHECKSUMMED ("C" FLAG = 0) ?
 055335    417        JMP     XCKS1        ;     NO, CAN'T USE DISCSUB
 055336  24215        LDA     1,DSPLU      ;YES, LU NUMBER
 055337  45000        STA     1,0,2
 055340  20216        LDA     0,DSPDA      ;HBA
 055341  41003        STA     0,3,2
 055342   6101        CALL
 055343  40213        CHSUM
 055344   6257        ILLEGAL              ;   LAST ADDRESS BELOW CORA !?
 055345   6265 XCKSD: COTAD                ;CHECKSUM DONE, PRINT OUT RESULT
 055346   2256        BEGIN

 055347  35350 TBLCH:  +1                  ;TABLE TO PASS TO CHECKSUM DSUB
 055350      0         0                   ;LU NUMBER
 055351      0         0                   ;BEGINNING ADDRESS
 055352      0         0                   ;ENDING ADDRESS
 055353      0         0                   ;HBA (-1=MEMORY)
```

<< SI = R92DSPS2B, DO = A.DSP.7344! >>

```
 035354   34214 XCKS1: LDA     3,.AFH    ;NOT A DISK FILE
 035355 1264000       SUB     1,1
 035356   45455       STA     1,DSPS5,3 ;INITIALIZE CHECKSUM
 035357   45456       STA     1,DSPS6,3 ;  AND CARRY
 035360    4301 XCKS2: CESF              ;CHECK ESCAPE FLAG
 035361    6061       GETWD             ;GET NEXT WORD FROM SELECTED DOMAIN
 035362     410       JMP     XCKS3     ;  POSSIBLE END !
 035363   25456       LDA     1,DSPS6,3
 035364 1252000       MOVR    1,1       ;RESTORE CARRY
 035365   25455       LDA     1,DSPS5,3 ;AND A1
 035366 1065000       SUBL    0,1       ;THE ROTATING CHECKSUM
 035367   45455       STA     1,DSPS5,3 ;STORE IT AWAY
 035370 1261000       MOVL    1,1
 035371   45456       STA     1,DSPS6,3 ;CARRY TOO
 035372   21453 XCKS3: LDA     0,DSPS3,3
 035373   25454       LDA     1,DSPS4,3
 035374 1064400       SGR     0,1       ;DONE,
 035375 1010150       SNZ     0,0       ;  OR WRAP-AROUND ?
 035376     402       SKIP
 035377     761       JMP     XCKS2     ;  NO, CONTINUE
 035400   25455       LDA     1,DSPS6,3 ;YES, DONE
 035401 1252000       MOVR    1,1       ;RESTORE CARRY
 035402   25455       LDA     1,DSPS5,3
 035403 1252000       MOVR    1,1       ;ADJUST CHECKSUM
 035404     741       JMP     XCKSD     ;PRINT IT OUT
```

```
                        << ST = R72DSPS2B:  DU = A.DSP.7344' >>

 035405 146414 YBCD:  SEQ     2,1        ;SET BP SNAPSHOT ADDRESS
 035406   06257       ILLEGAL
 035407   41466       STA     0,DSP16,3
 035410   02256       REGIN

 035411   41456 ZREL  STA     0,DSPS6,3;SEARCH FOR RELATIVE REFERENCES
 035412   24204       LDA     1,C254
 035413 146415       SNE     2,1        ;COMMA ?
 035414   06270       CATO               ;   YES, GET END ADDRESS
 035415   41457       STA     0,DSPS7,3
 035416   25456       LDA     1,DSPS6,3
 035417 106032       SGE     0,1
 035420   06257       ILLEGAL
 035421   24055       LDA     1,C215
 035422 146414       SEQ     2,1
 035423   06257       ILLEGAL
 035424   24052 ZREL1:LDA     1,C177     ;PREPARE TO SCAN FOR REFERENCES
 035425   45454       STA     1,DSPS4,3;  TO CELL AT (BUF+6)
 035426   21456       LDA     0,DSPS6,3
 035427 122400       SUB     1,0
 035430   41453       STA     0,DSPS3,3
 035431   24053       LDA     1,C400
 035432   45455       STA     1,DSPS5,3
 035433   21453 ZREL2:LDA     0,DSPS3,3
 035434 101113       SSN     0,0
 035435   06261       GETWD
 035436   00436       JMP     ZREL3
 035437 101112       SSP     0,0        ;REGISTER REFERENCE ?
 035440   00434       JMP     ZREL3      ;   YES
 035441   24212       LDA     1,C60K     ;   NO
 035442 106033       SLS     0,1        ;INPUT/OUTPUT ?
 035443   00431       JMP     ZREL3      ;   YES
 035444   24211       LDA     1,C1400    ;MUST BE MEMORY REFERENCE
 035445 107400       AND     0,1
 035446   30055       LDA     2,C400
 035447 132414       SEQ     1,2        ;RELATIVE REFERENCE ?
 035450   00424       JMP     ZREL3      ;   NO
 035451   40255       STA     0,TS       ;   YES
 035452   30064       LDA     2,C377
 035453 143400       AND     2,0
 035454   25454       LDA     1,DSPS4,3
 035455 147400       AND     2,1
 035456 106414       SEQ     0,1        ;REFERENCE TO DESIGNATED ADDR ?
 035457   00415       JMP     ZREL3      ;   NO
 035460   30055       LDA     2,C215     ;   YES, PRINT A RETURN,
 035461   06132       OUTBYTE
 035462   34214       LDA     3,.AFH     ;   THE ADDRESS,
 035463   25453       LDA     1,DSPS3,3
 035464 124400       NEG     1,1
 035465 124000       COM     1,1
 035466   06264       COTAA
 035467   24225       LDA     1,TS       ;   AND THE INSTRUCTION.
 035470   06267       OUTINSTR
 035471   06141       STOUTPUT
 035472   06101       CALL
 035473 105011       WONA
```

```
;                       << SI = R92DSPS2B,  BD = A.DSP.7344! >>

035474   034214  ZREL3: LDA     3,.AFH    ;TRY NEXT LOCATION
035475   015454         DSZ     DSPS4,3
035476   100010         NOP
035477   015455         DSZ     DSPS5,3
035500   000733         JMP     ZREL2
035501   011456         ISZ     DSPS6,3
035502   021456         LDA     0,DSPS6,3
035503   025457         LDA     1,DSPS7,3
035504   106432         SGR     0,1       ;DONE ?
035505   000717         JMP     ZREL1     ;  NO
035506   002256         BEGIN             ;  YES


035507   054226  PARA:  STA     3,TS1     ;GET OCTAL PARAMETERS
035510   034214         LDA     3,.AFH
035511   102000         ADC     0,0
035512   041456         STA     0,DSPS6,3
035513   102400         SUB     0,0
035514   041455         STA     0,DSPS5,3
035515   041454         STA     0,DSPS4,3
035516   020426         LDA     0,VDSP3
035517   117000         ADD     0,3       ;INCLUDE THE OFFSET
035520   054225         STA     3,TS      ;SET AS PARAMETER STORAGE PTR --> DSPS3
035521   020424         LDA     0,C4      ;SET MAX # OF PARAMETERS
035522   040227         STA     0,TS2
035523   024055  PARA1: LDA     1,C215
035524   146414         SEQ     2,1       ;END OF COMMAND LINE ?
035525   000407         JMP     PARA2     ;  NO
035526   034214         LDA     3,.AFH    ;RECOVER A(ACT. FILE HDR.)
035527   021453         LDA     0,DSPS3,3 ;START ADDRESS
035530   025454         LDA     1,DSPS4,3 ;FINISH ADDRESS
035531   106432         SGR     0,1       ;IS START < FINISH ?
035532   002236         JMP     @TS1      ;  YES
035533   006257         ILLEGAL

035534   024204  PARA2: LDA     1,C254
035535   014227         DSZ     TS2       ;TOO MANY PARAMETERS ...
035536   146414         SEQ     2,1       ;... OR NEXT CHAR NOT A COMMA ?
035537   006257         ILLEGAL           ;  YES
035540   006270         CATO
035541   102225         ISZ     TS        ;BUMP STORAGE PNTR
035542   042225         STA     0,@TS
035543   000760         JMP     PARA1

035544       52 VDSP3: DSPS3


          .EOT   ; "DSP"  SOURCE #2
```

```
;                        << SI = R92DSPS3A:  80 = A.DSP.7344! >>

;  9 MAR 87,  RB.

;  "DSP" SOURCE #3

035545   30214 GETW:  LDA     2,.AFH    ;GET WORD AT (DSPS3) INTO A0
035546   21053        LDA     0,DSPS3,2;   AND INCREMENT (DSPS3)
035547   40323        STA     0,ADR1    ;SAVE ADDRESS FOR LISTING (COSYM)
035550  126001        ADC     1,1,SKP

035551  126400 STOW:  SUB     1,1       ;STORE WORD IN A0 AT (DSPS3)
035552   54235        STA     3,TSS     ;AND INCREMENT (DSPS3)
035553   44237        STA     1,TSS2    ;(0 ==> STORE, -1 ==> GET)
035554   40236        STA     0,TSS1    ;VALUE TO BE STORED (IGNORED IN GET)
035555   34214        LDA     3,.AFH
035556   31453        LDA     2,DSPS3,3;PICK UP ADDR. COUNTER
035557   25413        LDA     1,BPC,3   ;PICK UP DISPLAY FLAGS
035560   20217        LDA     0,DSPTYPE
035561  101015        SNZ     0,0       ;CORE SELECTED ?
035562     410        JMP     GSCORE    ;   YES
035563  101205        MOVZR#  0,0,SNR   ;NO, SINGLE BLOCK SELECTED ?
035564     440        JMP     SBLK      ;   YES
035565  101213        SKE     0,0       ;NO, HEADER SELECTED ?
035566     451        JMP     FHDR      ;   YES
035567  103113        ADDL#   0,0,SNC   ;NO, PASSIVE FILE SELECTED ?
035570     516        JMP     GSFILE    ;   YES
035571     470        JMP     GSAF      ;   NO, ACTIVE FILE


035572           GSCORE:               ;CORE IS SELECTED
035572   30005        LDA     2,RUP
035573   31010        LDA     2,ACT,,2  ;CHECK USER'S ACCOUNT
035574   20213        LDA     0,C140K
035575  112016        ADC#    0,2,SNR   ;MANAGER,
035576  127112        ADDL#   1,1,SZC   ;   AND "C" FLAG = 0 ?
035577    62557        ILLEGAL           ;      NO ?!
035600   31453        LDA     2,DSPS3,3;YES, RECOVER ADDR COUNTER
035601  125113        SSN     1,1       ;BYTE ADDRESS ?
035602     411        JMP     GETS      ;   NO
035603  145000        MOV     2,1       ;YES
035604   20236 GETB:  LDA     0,TSS1
035605   10237        ISZ     TSS2      ;STORE ?
035606     400        JMP     PUTB
035607    6124        GETBYTE           ;   NO
035610  141001        MOV     2,0,SKP
035611    6134 PUTB:  PUTBYTE           ;   YES
035612     405        JMP     GETR
```

```
;                       << SI = R92DSPS3A; BQ = A.DSP.7344! >>

035613  020236 GETS:  LDA     0,TSS1      ;PICK UP DATA TO BE STORED (TENT.)
035614  010237         ISZ     TSS2        ;STORE ?
035615  041000         STA     0,0,2       ;   YES
035616  021000 GETRO: LDA     0,0,2
035617  010235 GETR.  ISZ     TSS         ;SKIP RETURN
035620  034214 GETR1: LDA     3,.AFH      ; << ENTRY HERE = NON-SKIP (ERROR) RETURN
035621  011453         ISZ     DSPS3,3     ;BUMP GIVEN ADDR.
035622    02235        JMP     @TSS        ;AND RETURN
035623    02235        JMP     @TSS        ;IN CASE ADDR WAS 177777


035624  125112 SBLK:  SSP     1,1         ;SINGLE BLOCK.  BYTE ADDRESS ?
035625  151221         MOVZR   2,2,SKP     ;   YES
035626  126001         ADC     1,1,SKP     ;   NO
035627  126560         SUBCL   1,1         ;LEFT/RIGHT BYTE FLAG
035630   44165         STA     1,DAS
035631   34064         LDA     3,C377
035632  156433         SLE     2,3         ;ADDRESS > 377 ?
035633    02235        JMP     GETR1       ;   YES, NON-SKIP (ERROR) RETURN
035634   50240         STA     2,TSS3      ;NO
035635   24216         LDA     1,DSPDA
035636     520        JMP     JVAD3
```

; <<< S1 = R920SPS3A. BD = A.DSP.7944! >>>

```
                35637 FHDR:                     ;FILE HEADER SELECTED (PASSIVE OR ACTIVE)
035637  125113        SSN     1,1             ;BYTE ADDRESS ...
035640  127112        ADDL#   1,1,SZC         ;   . OR "C" GIVEN ?
035641    6257        ILLEGAL                 ;   YES
035642   34064        LDA     3,C377          ;NO
035643  156433        SLE     2,3             ;ADDRESS > 377 ?
035644    6273        ILLADDRESS              ;   YES
035645   24821        LDA     1,DSPHDR        ;NO
035646  133000        ADD     1,2             ;CALC. DISPLACEMENT INTO BUFF
035647   20036        LDA     0,TSS1          ;PICK UP VALUE
035650   34037        LDA     3,TSS2          ;PICK UP (STORE/GET) SWITCH
035651  175014        SKZ     3,3             ;STORE ?
035652     744        JMP     GETRO           ;   NO, GET THE WORD
035653   41000        STA     0,0,2           ;YES, STORE THE WORD
035654   30221        LDA     2,DSPHDR
035655    6110        DATAPUMP
035656       7        SETDIRTY
035657  100000        @0
035660     737        JMP     GETR


035661   30220 GSAF:  LDA     2,DSPPCB        ;ACTIVE FILE IS SELECTED
035662  141005        MOV     2,0,SNR         ;PCB SET?
035663    6257        ILLEGAL                 ;   NO
035664   34100        LDA     3,.INFO         ;YES
035665   35454        LDA     3,.LSR.,3
035666    7765        JSR     @XLCPA,3        ;CHECK FOR PARTITION
035667  151015        SNZ     2,2             ;ACTIVE FILE RESIDE IN PART'N ?
035670     416        JMP     GSFILE          ;   NO, GO TO DISC
035671   21000        LDA     0,PAD.,2        ;YES, GET PART'N ADDR
035672   25001        LDA     1,SZP.,2        ;GET SIZE
035673  123000        ADD     1,0             ;COMPUTE END ADDR OF PART'N
035674  100400        NEG     0,0
035675  100000        COM     0,0
035676   34214        LDA     3,.AFH
035677   25453        LDA     1,DSPS3,3       ;GIVEN VIRTUAL ADDR
035700   31000        LDA     2,PAD.,2        ;RECOVER PART'N BASE ADDR
035701  147023        ADDZ    2,1,SNC         ;GIVEN ADDR WITHIN PART'N ?
035702  122433        SLE     1,0
035703     403        JMP     GSFILE          ;   NO, GO TO DISC
035704  131000        MOV     1,2             ;YES, ACCESS PART'N
035705     706        JMP     GETS
```

<< SI = R92DSPS3A; BO = A.DSP.7344! >>

```
        35706 QSFILE:                    ;A DISK FILE (PASSIVE OR ACTIVE)
35706   20237        LDA     0,TSS2     ;PICK UP (STORE/GET) SWITCH
35707  101415        INC#    0,0,SNR    ;STORE ?
35710     407        JMP     VAD12      ;   NO
35711   30221        LDA     2,DSPHDR   ;YES
35712   21007        LDA     0,ACNT,2
35713   25010        LDA     1,TYPE,2
35714    6101        CALL               ;IS FILE WRITE PROTECTED ?
35715  100013        CHKWP
35716    6257        ILLEGAL            ;   YES, CAN'T ACCESS
35717   34214 VAD12: LDA     3,.AFH
35720   21453        LDA     0,DSPS3,3;RECOVER THE ADDRESS
35721   25413        LDA     1,BPC,3    ;PICK UP DISPLAY FLAGS
35722  125112        SSP     1,1        ;BYTE ADDRESS ?
35723  101221        MOVZR   0,0,SKP    ;   YES
35724  126001        ADC     1,1,SKP    ;   NO
35725  126560        SUBCL   1,1
35726   40164        STA     0,DAC      ;WORD ADDRESS
35727   44165        STA     1,DAS      ;ADDRESS MODE
35730   30221        LDA     2,DSPHDR
35731   25012        LDA     1,STAT,2
35732   34426        LDA     3,KCFM1    ;CONTIGUOUS FILE MASK
35733  167415        AND#    3,1,SNR    ;CONTIGUOUS FILE ?
35734     425        JMP     VADR1      ;   NO
35735   25175        LDA     1,CORA,2
35736  122400        SUB     1,0        ;OFFSET BY CORA
35737   24064        LDA     1,C377     ;   YES
35740  107400        AND     0,1        ;DISPLACEMENT INTO A BLOCK
35741  122700        SUBS    1,0        ;DATA BLOCK NUMBER
35742  155000        MOV     2,3
35743  111400        INC     0,2        ;FILE BLOCK NUMBER
35744   21411        LDA     0,NBLK,3
35745  142033        SLS     2,0        ;IS BLOCK ALLOCATED ?
35746     652        JMP     GETR1      ;   NO
35747   44240        STA     1,TSS3     ;   YES
35750   25577        LDA     1,DHDR,3
35751  147000        ADD     2,1        ;CALCULATE BLOCK'S DISC ADDRESS
35752   21577        LDA     0,DHDR,3 ;   YES
35753   34100        LDA     3,.INFO
35754   35451        LDA     3,DSUB.,3
35755  116414        SEQ     0,3        ;"DISCSUBS" ?
35756     330 JVAD3: JMP     VADR3
35757     573        JMP     VADR7      ;   YES

35760       2 KCFM1: CFM        ;CONTIGUOUS FILE MASK
```

```
                         << SI = R92DSPS3A; BO = A.DSP.7344! >>

35761  25000 VADR1:LDA    1,NAME,2  ;NOT A CONTIGUOUS FILE
35762  35176       LDA    3,UNIT,2
35763 175015       SNZ    3,3       ;LOGICAL UNIT ZERO
35764 127112       ADDL#  1,1,SZC   ;AND "$" FILENAME ?
35765    406       JMP    VAD13     ;   NO
35766  34214       LDA    3,.AFH    ;YES, IT'S A DRIVER
35767  25453       LDA    1,DSPS3,3
35770  35413       LDA    3,BPC,3
35771 175112       SSP    3,3        ;BYTE ADDRESS GIVEN ?
35772   2512       JMP    @.GETB     ;   YES, IN REAL CORE
35773  25175 VAD13:LDA    1,CORA,2  ;NO
35774  34217       LDA    3,DSPTYPE
35775 177112       ADDL#  3,3,SZC   ;IS AN ACTIVE FILE SELECTED ?
35776 126400       SUB    1,1       ;   YES, ACT AS IF CORA = 0
35777 106032       SGE    0,1       ;ADDRESS LESS THAN CORA ?
36000    620       JMP    GETR1     ;   YES
36001  34065       LDA    3,C400    ;NO
36002 167022 VAD14:ADDZ   3,1,SZC   ;DETERMINE BLOCK FOR CORE ADDRESS
36003   6272       ADERR            ;   ADDRESS OVERFLOW
36004 151400       INC    2,2        ;BUMP HEADER POINTER
36005 106033       SLS    0,1        ;CORA GREATER THAN ADDRESS ?
36006    774       JMP    VAD14      ;   NO
36007 166400       SUB    3,1        ;   YES, COMPENSATE FOR OVERSHOOT
36010 122400       SUB    1,0
36011  40240       STA    0,TSS3     ;DISPLACEMENT INTO BLOCK
36012  50167       STA    2,DB+1     ;POINTER INTO HEADER
36013  34221       LDA    3,DSPHDR   ;FILE HEADER
36014 145000       MOV    2,1        ;PNTR INTO HDR (ABS-177)
36015 166400       SUB    3,1
36016  34052       LDA    3,C177
36017 167000       ADD    3,1        ;PNTR INTO HDR (REL)
36020  34065       LDA    3,C400
36021 136033       SLS    1,3        ;BEYOND LAST BLOCK ?
36022   6272       ADERR             ;   YES, ADDR ERROR
36023  25177       LDA    1,DHDR,2
36024 125015       SNZ    1,1        ;IS BLOCK ALLOCATED ?
36025   2456       JMP    @.GET1     ;   NO
36026  30221       LDA    2,DSPHDR   ;YES
36027  21176       LDA    0,UNIT,2
36030 101014       SKZ    0,0        ;LOGICAL UNIT ZERO ?
36031    455       JMP    VADR3      ;   NO
36032  21177       LDA    0,DHDR,2   ;YES
36033  34100       LDA    3,.INFO
36034  35451       LDA    3,DSUB.,3
36035 116415       SNE    0,3        ;"DISCSUBS" ?
36036    514       JMP    VADR7      ;   YES
36037  21000       LDA    0,NAME,2   ;NO
36040 103112       ADDL#  0,0,SZC    ;"$" FILENAME ?
36041    445       JMP    VADR3      ;   NO
36042  34214       LDA    3,.AFH     ;YES, IT'S A DRIVER
36043  35413       LDA    3,BPC,3
```

<< SI = R92DSP53A; BO = A.DSP.7344! >>

```
36044 177113     ADDL#   3,3,SNC    ;"C" FLAG SET ?
36045    445     JMP     VADR4      ;   NO
36046  34005     LDA     3,RUP      ;YES
36047  25410     LDA     1,ACT.,3   ;CHECK USER'S ACCOUNT
36050  20213     LDA     0,C140K
36051 106014     ADC#    0,1,SZR    ;MANAGER ?
36052   6257     ILLEGAL            ;   NO
36053  24077     LDA     1,.BPS     ;YES
36054  21175     LDA     0,CORA,2
36055 106414     SEQ     0,1        ;LEGITIMATE DRIVER ?
36056   6273     ILLADDRESS         ;   NO
36057 102400     SUB     0,0        ;YES
36060 155400     INC     2,3        ;READ FIRST BLOCK OF DRIVER
36061  25577     LDA     1,DHDR,3
36062  30010     LDA     2,.BSA
36063   6135     READBLOCK
36064  24415     LDA     1,.BPS5
36065  34221     LDA     3,DSPHDR   ;A(FILE HDR)
36066  21410     LDA     0,TYPE,3
36067 101212     SKE     0,0        ;PERIPHERAL DRIVER ?
36070  25002     LDA     1,2,2      ;   NO
36071  21372     LDA     0,STAD,3   ;GET CORE ADDRESS
36072 122400     SUB     1,0        ;DISPLACEMENT FROM FIRST WORD IN CORE
36073  30164     LDA     2,DAC
36074  34077     LDA     3,.BPS
36075 156032     SGE     2,3        ;LEGAL ADDRESS ?
36076   6273     ILLADDRESS         ;   NO
36077 113000     ADD     0,2        ;YES
36100   2404     JMP     @.GETS

36101  32205  .BPS5:BPS+5
36102  35617  .GETR:GETR
36103  35620  .GET1:GETR1
36104  35613  .GETS:GETS
36105  35604  .GETB:GETB
```

```
036106   34214 VADR3: LDA     3, _AFH    ;NOT A DRIVER OR "DISCSUBS"
036107   21413        LDA     0,BPC,3
036110 1031122        ADDL#   0,0,SZC    ;"C" FLAG SET ?
036111    6257        ILLEGAL            ;   YES
036112   20313 VADR4: LDA     0,DSPLU    ;NO
036113   30010        LDA     2,_BSA     ;READ BLOCK INTO BSA
036114    6136        READBLOCK
036115   34440        LDA     3,TSS3     ;ADD DISPLACEMENT INTO BLOCK
036116 1720000        ADD     3,2
036117   34165        LDA     3,DAS
036120   24054        LDA     1,C377
036121   10337        ISZ     TSS2       ;GET OR STORE ?
036122    4111        JMP     VADR5      ;   STORE
036123   21000        LDA     0,0,2      ;GET
036124 1754113        INC#    3,3,SNR    ;BYTE ADDRESS ?
036125    2758        JMP     @.GETR     ;   NO
036126 1074400        AND     0,1        ;YES
036127 1750113        SNZ     3,3        ;WHICH BYTE ?
036130 1222701        SUBS    1,0,SKP    ;   LEFT
036131 1221000        MOV     1,0        ;   RIGHT
036132    2750        JMP     @.GETR

036133   20336 VADR5: LDA     0,TSS1     ;STORE INTO FILE
036134 1750314        MOVZR   3,3,SZR    ;STORE BYTE ?
036135    4104        JMP     VADR6      ;   NO
036136 1234400        AND     1,0        ;YES
036137   35000        LDA     3,0,2      ;GET THE WORD
036140 1674400        AND     3,1
036141 1364403        SUBC    1,3,SNC    ;WHICH BYTE ?
036142 1013011        MOVS    0,0,SKP    ;   LEFT
036143 1650000        MOV     3,1        ;   RIGHT
036144 1230000        ADD     1,0        ;COMBINE WITH OTHER BYTE

036145   41000 VADR6: STA     0,0,2      ;STORE WORD INTO FILE
036146   34010        LDA     1,_BSA
036147 1460033        SLS     0,1        ;BSA CHANGED ?
036150   44075        STA     1,BSACF    ;   YES
036151    2731        JMP     @.GETR

036152   34214 VADR7: LDA     3, _AFH    ;"DISCSUBS" IS SELECTED
036153   31413        LDA     2,BPC,3
036154 1531122        ADDL#   3,2,SNC    ;"C" FLAG SET ?
036155    7335        JMP     VADR4      ;   NO
036156   20002        LDA     0,C2       ;YES
036157   40162        STA     0,DB
```

<< SI = R92DSPS3A, SO = A.DSP.7344! >>

```
36160   30100 VADR8: LDA     2,.INFO   ;PREPARE TO SCAN DAT
36161   21016        LDA     0,SDS8.,2
36162   40172        STA     0,DBC
36163   35097        LDA     3,.STK,2
36164   31402        LDA     2,2,3     ;.DAT
36165   50170        STA     2,DB+2
36166   21403        LDA     0,3,3     ;.SAT
36167   40173        STA     0,DBS
36170   21000 VADR9: LDA     0,0,2     ;SCAN DISC ADDRESS TABLE
36171  114000        COM     0,3
36172  106414        SEQ     0,1       ;IS THIS THE BLOCK ?
36173  166415        SNE     3,1
36174     411        JMP     VAD10     ;   YES
36175  151400        INC     2,2       ;NO
36176   14172        DSZ     DBC       ;END OF DAT ?
36177     771        JMP     VADR9     ;   NO
36200  124400        NEG     1,1       ;YES, MUST BE EXTENDED
36201  124000        COM     1,1       ;GET PREVIOUS DISC ADDRESS
36202   14166        DSZ     DB        ;SCANNED DAT TWICE ALREADY ?
36203     755        JMP     VADR8     ;   NO, SCAN DAT AGAIN
36204    6273        ILLADDRESS        ;YES

36205   30010 VAD10: LDA     2,.BSA    ;FOUND THE BLOCK
36206  102400        SUB     0,0
36207    6135        READBLOCK         ;READ BLOCK INTO BSA
36210   20166        LDA     0,DB
36211   24240        LDA     1,TSS3    ;DISPLACEMENT INTO BLOCK
36212   34065        LDA     3,C400
36213  101235        MOVZR#  0,0,SNR   ;SECOND BLOCK OF EXTENDED ?
36214  167000        ADD     3,1       ;   YES
36215   21002 VAD1L: LDA     0,2,2
36216  101112        SSP     0,0       ;LAST SUBROUTINE ?
36217     407        JMP     VAD11     ;   YES
36220   21003        LDA     0,3,2     ;NO
36221  106433        SLE     0,1       ;THIS SUBROUTINE ?
36222     404        JMP     VAD11     ;   YES
36223  151400        INC     2,2       ;NO
36224  151400        INC     2,2
36225     770        JMP     VAD1L

36226   21001 VAD11: LDA     0,1,2     ;THIS IS THE SUBROUTINE
36227  106423        SUBZ    0,1,SNC   ;LEGAL DISPLACEMENT ?
36230    6300        NOTMEMORYRES      ;   NO
36231   21000        LDA     0,0,2     ;YES
36232   34066        LDA     3,C777    ;EXTRACT SUBROUTINE NUMBER
36233  163400        AND     3,0
36234   34170        LDA     3,DB+2    ;GET POINTER TO DAT
36235  117000        ADD     0,3
36236   31400        LDA     2,0,3
36237  151112        SSN     2,2       ;IS IT CORE-RESIDENT ?
36240    6300        NOTMEMORYRES      ;   NO
36241   34172        LDA     3,DBS     ;YES
36242  117000        ADD     0,3       ;GET POINTER TO SAT
36243   31400        LDA     2,0,3     ;GET CORE STARTING ADDRESS
36244  133000        ADD     1,2       ;ACTUAL CORE ADDRESS
36245    2637        JMP     @.GETS
```

```
;                       << SI = R92DSPS3A, SO = A.DSP.7344! >>

36246     6141 ILLA:  STOUTPUT           ;ILLEGAL ADDR
36247     6101        CALL
36250   100011        WONA
36251     6133        OUTTEXT
36252   120311  .TXTF ; I
36253   146314 LL
36254   142707 EG
36255   140714 AL
36256   120301  A
36257   142304 DD
36260   151256 R.
36261        0 ;

36262     2256        BEGIN


36263     6141 ADER:  STOUTPUT           ;NO SUCH ADDR
36264     6101        CALL
36265   100011        WONA
36266   102400        SUB     0,0
36267     6106        CHANNEL
36270       27        CLEAR
36271     6142        TRAPFAULT          ;CHANNEL #0 IS ILLEGAL !?
36272     6133        OUTTEXT
36273   120316  .TXTF ; N
36274   147640 O
36275   151725 SU
36276   141710 CH
36277   120301  A
36300   142304 DD
36301   151256 R.
36302        0 ;

36303     2256        BEGIN

36304     6133 ILEG:  OUTTEXT;ILLEGAL COMMAND
36305   103640  .TXTF ;<207>
36306   137677 ??
36307   137400 ?;

36310     2256        BEGIN


36311    30005 DESCP:LDA     2,RUP       ;ESCAPE ENTRY
36312     6102        FLAGCHECK
36313    20012        FLW.+SKIP0
36314    10000        10000
36315      312        JMP     DEXIT      ;DSP NOT ACTIVE
36316     2256        BEGIN
```

```
;                                   << SI = R92DSPS3A; DO = A.DSP.7344! >>

     36317    6141 NOTM:  STOUTPUT          ;NOT MEMORY RESIDENT
     36320    6101        CALL
     36321  100011        WONA
     36322    6133        OUTTEXT
     36323  120316 .TXTF ; N
     36324  147724 OT
     36325  120315  M
     36326  142715 EM
     36327  147722 OR
     36330  154640 Y
     36331  151305 RE
     36332  151711 SI
     36333  142305 DE
     36334  147324 NT
     36335       0 ;

     36336    2256        BEGIN
```

```
;                                  << SI = R92DSPS3A; BO = A.DSP.7344! >>

    36337   30026 COADR:LDA     2,C6
    36340     403       JMP     COAD+1

    36341 152401 COA:   SUB     2,2,SKP   ;CONVERT OCTAL TO ASCII

    36342   30030 COAD: LDA     2,C10     ;CONVERT OCTAL TO ASCII FOR DUMP
    36343   20030       LDA     0,C10
    36344   54245       STA     3,TSS10
    36345    6101       CALL
    36346       7       CIA
    36347   34214       LDA     3,.AFH
    36350   21453       LDA     0,DSPS3,3
    36351    2245       JMP     @TSS10

    36352   54246 COAA: STA     3,TSS11   ;COTA FOR ADDRESS
    36353    4764       JSR     COADR
    36354   30205       LDA     2,C255
    36355   25413       LDA     1,BPC,3
    36356 125112       SSP     1,1       ;BYTE ADDRESS ?
    36357    6132       OUTBYTE           ;   YES, OUTPUT "-"
    36360   34214       LDA     3,.AFH
    36361   30203       LDA     2,C247
    36362   25413       LDA     1,BPC,3
    36363 127112       ADDL#   1,1,SZC   ;CORE COPY OF FILE ?
    36364    6132       OUTBYTE           ;   YES, OUTPUT "'"
    36365    6133       OUTTEXT
    36366 135240   .TXTF .
    36367       0 ;

    36370   34214       LDA     3,.AFH
    36371   21453       LDA     0,DSPS3,3
    36372    2246       JMP     @TSS11

    36373     267       267
    36374   54235 CAO:  STA     3,TSS     ;CONVERT ASCII TO OCTAL
    36375 102400       SUB     0,0
    36376   40236       STA     0,TSS1
    36377    6125       INBYTE
    36400   20773       LDA     0,CAO-1
    36401 142432       SGR     2,0
    36402    6127       ISA2DIGIT
    36403     410       JMP     CAOR
    36404 132400       SUB     1,2
    36405   20236       LDA     0,TSS1
    36406 101120       MOVZL   0,0
    36407 101120       MOVZL   0,0
    36410 101120       MOVZL   0,0
    36411 143000       ADD     2,0
    36412     764       JMP     CAO+2

    36413   20236 CAOR: LDA     0,TSS1
    36414   34214       LDA     3,.AFH
    36415    2235       JMP     @TSS
```

```
;                             << 51 = R92DSPS3A: B0 = A.DSP.7344! >>

;PICO-N TEST4A: CHECKSUM FMAP CELLS.

;READ CONFIG HEADER AND CHECKSUM THE FMAP CELLS.
;IF OK, CONTINUE.
;IF BAD, PRINT "?? NO PICO-N ??" & EXIT TO SCOPE.

   36416      0         0
   36417  54777 PNT4A: STA     3, -1
   36420  30100         LDA     2, INFO
   36421  25053         LDA     1,DCON.,2;H(CONFIG)
   36422 125415         INC#    1,1,SNR   ;CONFIG FILE PRESENT?
   36423    430         JMP     OK+1      ;   NO
   36424 102400         SUB     0,0       ;LU#
   36425   6110         DATAPUMP          ;READ CONFIG HEADER
   36426      0         GETBLOCK
   36427     23         OK-.              ;ERROR VECTOR
   36430  50254         STA     2,TSS17
   36431  20444         LDA     0,C70     ;A2 = A(CONFIG HDR)
   36432 143000         ADD     2,0       ;A0 = LIMIT
   36433 126400         SUB     1,1       ;A1 = CHECKSUM
   36434  35070 CKSL.   LDA     3,FMAP,2
   36435 167000         ADD     3,1       ;SUM THE FMAP CELLS
   36436 151405         INC     2,2,SNR
   36437 102620 FNCS:  SUBZR   0,0       ;NEVER EXECUTED
   36440 142432         SGR     2,0       ;DONE ?
   36441    773         JMP     CKSL      ;   NO
   36442  30254         LDA     2,TSS17   ;   YES, UNLATCH BUFFER
   36443  44254         STA     1,TSS17
   36444   6110         DATAPUMP
   36445      3         UNLATCH
   36446 100000         @0
   36447  20770         LDA     0,PNCS
   36450  24254         LDA     1,TSS17
   36451 122415         SNE     1,0       ;CHECKSUM OK ?
   36452   2744 OK:     JMP     @PNT4A-1  ;   YES
   36453  30120         LDA     2,DECIMAL&377;A($DEC)
   36454  24121         LDA     1,FIX&377;A(FIX)
   36455 132415         SNE     1,2       ;MINIMUM CONFIG ?
   36456   2740         JMP     @PNT4A-1  ;   YES, LET HIM USE DSP
   36457   6101         CALL              ;   NO
   36460 100011         WONA
```

```
;                                   << BI = R92DSPS3A; BD = A DSP.7344! >>

    36461    6132             OUTTEXT
    36462  106677  .TXTF ;C215??
    36463  137640  ?
    36464  147317  NO
    36465  120320   F
    36466  144703  IC
    36467  147655  O-
    36470  147240  N
    36471  137677  ??
    36472       0

    36473    2401             JMP     @.+1
    36474   35310             XITX

    36475      70 070:        70

; END OF 'FNTEST4A'
```

STOUT PUT

```
;                          << ST = R92DDFS3A; SO = A.DSP.7344! >>
;
; VALUE = CONVERT OCTAL OR SYMBOLIC INPUT TO OCTAL VALUE
;
; USED BY ENTER AND COLON
;
; NO ENTRY PARAMETERS (INPUT IS IN IOB)
; NON-SKIP RETURN IF NOT A VALID INPUT
;    AO = 0 INDICATES NULL INPUT (IE  CR ONLY WAS PRESSED)
;    AO = -1 MEANS ^ WAS INPUT (OPEN & EXAMINE PREVIOUS CELL)
;    AO = -2 MEANS @ WAS INPUT (CURRENT CONTENT --> ADDRESS)
;    ELSE ILLEGAL INPUT
; SKIP RETURN, AO = OCTAL VALUE OF INPUT

  36476   54237 VALU:  STA    3,TSS2
  36477  102400        SUB    0,0
  36500    6126        INSTBYTE          ;GET FIRST INPUT BYTE W/O ADVANCING IBP.
  36501   20055        LDA    0,C215
  36502  142405        SUB    2,0,SNR    ;IS FIRST BYTE = CR ?
  36503    2237        JMP    @TSS2      ;  YES, NON-SKIP RETURN WITH AO = 0
  36504   24063        LDA    1,C334
  36505  146415        SNE    2,1        ;IS FIRST BYTE = "\" ?
  36506    2256        BEGIN             ;  YES, EXIT "ENTER" MODE
  36507  102000        ADC    0,0        ;NO
  36510   24427        LDA    1,X.UP
  36511  146415        SNE    2,1        ;IS FIRST BYTE = "^" ?
  36512    2237        JMP    @TSS2      ;  YES, RETURN NON-SKIP WITH AO = -1
  36513  102120        ADCZL  0,0        ;NO
  36514   24434        LDA    1,X.AT
  36515  146415        SNE    2,1        ;IS FIRST BYTE = "@" ?
  36516    2237        JMP    @TSS2      ;  YES, RETURN NON-SKIP WITH AO = -2
  36517    6270        CATO              ;NO, READ OCTAL INPUT, IF ANY
  36520   24055        LDA    1,C215
  36521  146415        SNE    2,1        ;IS TERMINATOR = CR ?
  36522     475        JMP    VALUR      ;  YES, RETURN OCTAL VALUE IN AO
  36523  101015        SNZ    0,0        ;NO, LEADING OCTAL,
  36524    6130        ISAZLETTER        ;OR NON-LETTER ?
  36525     474        JMP    ABEND      ;  YES, ERROR
  36526  133000        ADD    1,2        ;NO, RECONSTITUTE THE LETTER
  36527   24434        LDA    1,IBPO
  36530   44331        STA    1,IBP
  36531   20051        LDA    0,C100
  36532   40227        STA    0,TEMP
  36533   20052 VLOOP: LDA    0,C177     ;COPY REMAINING INPUT FROM IOB --> LOCAL IBUFF
  36534  143400        AND    2,0        ;MASKING TO 7 BITS
  36535    6134        PUTBYTE
  36536    6126        INSTBYTE          ;GET NEXT BYTE FROM IOB
  36537   10331        ISZ    IBP
  36540   24331        LDA    1,IBP
  36541   20055        LDA    0,C215
  36542  142405        SUB    2,0,SNR    ;TERMINATOR ?
  36543     406        JMP    VLAST      ;  YES
  36544   14327        DSZ    TEMP       ;NO, IBUFF FULL ?
  36545     766        JMP    VLOOP      ;  NO
  36546     453        JMP    ABEND      ;  YES

  36547     336 X.UP:  "^+200
  36550     300 X.AT:  "@+200
```

```
                        << 81 = R92DSPSSA, 90 = A DSP.7344! >>

 36551   6134 VLAST: PUTBYTE                ;STORE NULL TERMINATOR INTO IBUFF
 36552  24411        LDA     1,IBP0
 36553  44331        STA     1,IBP
 36554 1024000       SUB     0,0
 36555  40321        STA     0,VAL          ;INITIALIZE OUTPUT VALUE TO ZERO
 36556  40321        STA     0,VAL
 36557  34214        LDA     3,.AFH
 36560  21463        LDA     0,DSPSS-3
 36561  40321        STA     0,ADR1         ;SET UP ADDRESS FOR TRANSLATOR
 36562 1025520       SUBZL   0,0            ;SET MODE FLAG = 1 = ENTER (VALUE)
 36563    406        JMP     STPOP

 36564  76565 IBP0:  IBUFF*2
 36565  37332 .R:    R                      ;POINTER TO START OF TRANSLATION TABLE


; COSYM = CONVERT OCTAL TO SYMBOLIC INSTRUCTION
;
; USED BY LIST, SEARCH, ETC.
;
; ENTRY:  A0 = OCTAL PARAMETER
; CONVERTS TO SYMBOLIC FORM AND PUTS IT INTO IOB
; NON-SKIP RETURNS WITH NO PARAMETERS

 36566  54237 COSY:  STA     3,TSS2
 36567  40321        STA     0,VAL          ;OCTAL VALUE TO BE TRANSLATED
 36570 1024000       SUB     0,0            ;SET MODE FLAG = 0 = LIST (COSYM)
 36571  40335 STPOP: STA     0,FLG          ;INITIAL ENTRY INTO POP TABLE <<<<<<
                                            ;(FOLLOWING CODE IS STRANGE AS IT WAS LIFTED FROM DBUG)
 36572  30273        LDA     2,.R
 36573  20567 SAVRA: LDA     0,LPNTR        ;SAVE RETURN ADDRESS (FOR S/R)
 36574 101400        INC     0,0
 36575  40506        STA     0,RPNTR
 36576  50504        STA     2,LPNTR        ;  << FROM RTURN
 36577  34766 NXTPR: LDA     3,.R           ;PICK UP REFERENCE LOCATION
 36600  32503        LDA     2,@LPNTR
 36601 173000        ADD2    3,2,SNC        ;POINTS TO A POP OR INTO TABLE ?
 36602    774        JMP     SAVRA          ;   INTO TABLE - GO THERE
 36603  10477        ISZ     LPNTR          ;   TO A PROCEDURE
 36604 102400        SUB     0,0
 36605  40322        STA     0,MATCH
 36606  40532        STA     0,FLG1
 36607  24321        LDA     1,VAL
 36610   1000        JMP     0,2

 36611  14331 EXITD: DSZ     IBP
 36612  54334 EXIT:  JSR     @.TEST         ;DOING ENTER (VALUE) OR LIST (COSYM) ?
 36613  54237        JMP     @TSS2          ;   LIST:  NON-SKIP RETURN
 36614  54335        JSR     @.ACTV         ;ENTER:  CHECK NEXT CHARACTER ENTERED
 36615 101014        SKZ     0,0            ;END OF INPUT (IE. CR) ?
 36616    404        JMP     ABEND          ;   NO, ILLEGAL INPUT
 36617  20321        LDA     0,VAL          ;YES, A0 <-- OCTAL VALUE OF INPUT
 36620  34237 VALUR: LDA     3,TSS2         ;SKIP RETURN
 36621   1401        JMP     1,3

 36622 102220 ABEND: ADCZR   0,0            ;ILLEGAL INPUT, SET A0 <> 0, <> -1
 36623   2237        JMP     @TSS2          ;NON-SKIP RETURN
```

```
;                       << SI = R92DSPS3A; BO = A.DSP.7344! >>

; THE LIST AND ENTER FUNCTIONS EMPLOY A PROCEDURE-ORIENTED-PROGRAMMING
; (POP) TECHNIQUE USING THE DRIVING TABLE STARTING AT LOCATION R.
; THE PROCEDURES ARE:  MASKED MATCH (MMA), COUNT-DOWN WITH ONE OR THREE
; CHARACTERS (CD1,CD3), SPACE, COMMA, OPTIONAL COMMA, ADDRESS, EXIT.

; COUNT-DOWN   POP TABLE CONTAINS A MASK FOLLOWED BY A SERIES OF
; 1- OR 3-CHARACTER ENTRIES.
;     LIST. MASKS GIVEN BINARY VALUE WITH MASK IN TABLE, THEN
; COUNTS DOWN THE MASK AND COMPARES WITH MASKED VALUE.
; WHEN EQUAL, PRINTS THE 1 OR 3 CHARACTERS IN TABLE AT THAT POINT.
; IF TABLE EXHAUSTED WITHOUT MATCH, SKIP RETURN.
;     ENTER. COUNT DOWN GIVEN MASK AND GO THROUGH TABLE TILL MATCH FOUND
; BETWEEN CHARACTERS IN INPUT BUFFER AND THOSE IN TABLE - THEN ADD
; REMAINING MASK TO VALUE.  IF NO MATCH, AND REMAINING MASK (CDVAL) = 0,
; ABORT; OTHERWISE SKIP RETURN IN CD3, NON-SKIP RETURN IN CD1.

; MASKED MATCH.  CONVERTS A GIVEN 3-CHARACTER SET INTO A GIVEN
; (MASKED) BINARY VALUE OR VICE VERSA.

  36623   10514 MMA:   ISZ      FLG1       ;MASKED MATCH
  36624   10513 CD3:   ISZ      FLG1       ;COUNT-DOWN
  36625   22454 CD1:   LDA      0,@LPNTR
  36626  107400        AND      0,1
  36627   44325        STA      1,MV
  36630  104400        NEG      0,1        ;A0 = MASK
  36631  107400        AND      0,1        ; = DELTA BY WHICH MASK WILL BE C-D
  36632   44326        STA      1,DELTA
  36633  123000        ADD      1,0
  36634   40324        STA      0,CDVAL    ;VALUE TO BE COUNTED DOWN
  36635   10444 CDNXT: ISZ      LPNTR
  36636   26443        LDA      1,@LPNTR   ;A1 = NEXT LIST ENTRY
  36637  102000        ADC      0,0        ;SET BYTE COUNTER TO -1
  36640   40330        STA      0,B.CNT
  36641   20324 CDNXB: LDA      0,CDVAL
  36642  125142        MOVOL    1,1,SZC    ;LIST TERMINATED, OR
  36643  101015        SNZ      0,0        ;COUNTED DOWN ALL THE WAY ?
  36644     452        JMP      CDDON      ;  YES
  36645   30326        LDA      2,DELTA    ;CALCULATE NEW "COUNT-DOWN" VALUE
  36646  142400        SUB      2,0
  36647   30470        LDA      2,FLG1
  36650  151235        MOVZR#   2,2,SNR    ;DOING MASKED MATCH ?
  36651     403        JMP      .+3        ;  NO
  36652   10427        ISZ      LPNTR      ;  YES
  36653   22426        LDA      0,@LPNTR
  36654   40324        STA      0,CDVAL
  36655    6334        JSR      @.TEST     ;ENTER OR LIST ?
  36656     412        JMP      CDL        ;  LIST
  36657   30331        LDA      2,IBP      ;  ENTER
  36660    4460 CDE:   JSR      MVCHA      ;MOVE A CHARACTER FROM A1 TO A0
  36661     422        JMP      CDEM       ;A1 BECAME 0: MATCH FOUND
  36662   40327        STA      0,TEMP     ;SAVE THE CHARACTER
  36663    6336        JSR      @.ACBY     ;FETCH NEXT INPUT CHARACTER
  36664   34327        LDA      3,TEMP
  36665  116415        SNE      0,3        ;ARE THEY EQUAL ?
  36666     772        JMP      CDE        ;  YES: CHECK REM. CHAR.S, IF ANY
  36667     420        JMP      CDNX1      ;NO
```

```
                        (( S1 = R92DSPS3A;  S0 = A DSP.7344! ))

 36670   30025  CDL:   LDA     2,MV        ;   LIST
 36671  112414         SEQ     0,2         ; C-D VALUE = MASKED VALUE ?
 36672     415         JMP     CDNX1       ;   NO
 36673    4445         JSR     MVCHA       ; MOVE A CHARACTER FROM A1 TO A0
 36674     412         JMP     CDNX1-1     ; A1 BECAME 0:  DONE
 36675    6937         JSR     @.TCHA      ; TYPE THE CHARACTER
 36676     775         JMP      .-3

 36677   30403  RTURN: LDA     2,RPNTR
 36700     675         JMP     NXTPR-1

 36701       0  LPNTR: 0                   ;POINTER INTO POP TABLE
 36702       0  RPNTR: 0                   ;POP POINTER FOR SUBROUTINE RETURN

 36703   50332  CDEM   STA     2,IBPNX     ;C-D MATCH FOUND, SAVE NEW IBP
 36704   20034         LDA     0,CDVAL     ;ADD CDVAL TO VALUE
 36705   40335         STA     0,MV
 36706   10255         ISZ     MATCH       ;  << FROM CDL
 36707   26772  CDNX1: LDA     1,@LPNTR    ;PREPARE FOR SECOND CHARACTER
 36710  125300         MOVS    1,1
 36711   20026         LDA     0,FLG1
 36712  101015         SNZ     0,0         ;WANT SECOND CHARACTER ?
 36713   10330         ISZ     B.CNT
 36714     721         JMP     CDNXT       ;   NO
 36715     724         JMP     CDNXB       ;   YES

 36716   14332  CDDON: DSZ     MATCH       ;CD OR MMA DONE - MATCH FOUND ?
 36717     415         JMP     CDDN2       ;   NO
 36720   30332         LDA     2,IBPNX     ;YES - UPDATE INPUT BYTE POINTER
 36721   50331         STA     2,IBP
 36722   24325         LDA     1,MV
 36723   30330         LDA     2,B.CNT     ;  << FROM LADTP
 36724   20321  PRDON: LDA     0,VAL
 36725    6334         JSR     @.TEST
 36726  122401         SUB     1,0,SKP     ;LIST - REMOVE THE AMOUNT LISTED
 36727  123000         ADD     1,0         ;ENTER - INSERT THE NEW AMOUNT
 36730   40321         STA     0,VAL
 36731  151015         SNZ     2,2         ;IS LPNTR IN LAST TABLE ENTRY (CD1)?
 36732   10747  SKPPR: ISZ     LPNTR       ;   YES (OR ADRMO = BASE)
 36733     643  NXTP1: JMP     NXTPR       ;GO TO NEXT POP PROCEDURE

 36734  101014  CDDN2: SKZ     0,0         ;WAS LIST EXHAUSTIVE ?
 36735     775         JMP     SKPPR       ;   NO, SKIP A PROCEDURE
 36736     663         JMP     ABEND       ;   YES, ABORT

 36737       0  FLG1:  0                   ;FLAGS CD1 (0), CD3 (1), OR MMA (2)
```

```
;                          <<  SI = R92DSPSSA;  BO = A.DSP.7344!  >>

; MOVE A CHAR.  (5 OR 7 BITS) FROM LEFT END OF A1 TO RIGHT END OF AO

 36740  20067 MVCHA: LDA     0,C1000
 36741  10776         ISZ     FLG1        ;5 BIT CHARACTER OR 7 ?
 36742  14775         DSZ     FLG1
 36743    404         JMP     .+4         ;   5
 36744 125213         MOVR#   1,1,SNC     ;   7 - HAS CHAR.  BEEN DONE ALREADY ?
 36745   1400         JMP     0,3         ;     YES
 36746 101221         MOVZR   0,0,SKP     ;MAKE MASK = 400 FOR 7 BIT SHIFT
 36747 101140         MOVOL   0,0         ;MAKE MASK 2001 FOR 5 BITS + 100
 36750 101102         MOVL    0,0,SZC     ;SHIFTED N BITS YET ?
 36751 175401         INC     3,3,SKP     ;   YES,  PREPARE FOR SKIP RETURN
 36752 125128         MOVZL   1,1,SNR     ;   NO,  IS PUSHER BIT GONE ?
 36753   1400         JMP     0,3         ;     YES
 36754    774         JMP     .-4         ;     NO,  SHIFT SOME MORE


; ADDRESS.  CONVERTS THE ADDRESS PORTION OF AN INSTRUCTION,
; INCLUDING ABSOLUTE PAGE 0,  BASE 2 OR BASE 3,  AND RELATIVE.
; RELATIVE ADDRESSES MAY BE ENTERED AS ABSOLUTE AND WILL BE
; LISTED AS ABSOLUTE IF MORE THAN 7 AWAY.

 36755   4550 ADRND: JSR     BRNC7       ;ADDRESS CONTAINS NON-DIGIT CHAR.
 36756   1056         ADR  -.-1*Q+".      ;   (REL.  ADDR.)  SETS MSB OF ADRMO
 36757   1455 C.MN:   ADRM-.-1*Q+"-       ;  - COMPLEMENTS LSB OF ADRMO
 36760   1453 C.PL:   ADR-.-1*Q+"+        ;  + LEAVES ADRMO AS IS
 36761      0         0                   ;LIST TERMINATOR
 36762    637 ABEN1: JMP     ABEND

 36763 102620 ADR.:   SUBZR   0,0         ;10000X MEANS "."  (RELATIVE)
 36764  40322         STA     0,ADRMO
 36765    402         SKIP
 36766  10323 ADRM:   ISZ     ADRMO       ;ODD VALUE MEANS -

 36767   4557 ADR:    JSR     TEST        ;ADDRESS PROCEDURE STARTS HERE
 36770    441         JMP     LAD         ;   LIST
 36771   4561         JSR     ACIV        ;   ENTER.  ACCESS INPUT VALUE
 36772    763         JMP     ADRND       ;NON-DIGIT CHAR IN AO
 36773  30323         LDA     2,ADRMO
 36774 100443         NEGO    0,0,SNC     ;IS TERMINATOR = 0 = CR AND
 36775 151014         SKZ     2,2         ;NEITHER  NOR - ?
 36776    407         JMP     ADR.1       ;   NO
 36777  30064         LDA     2,C377      ;   YES
 37000 132432         SGR     1,2         ;IS ADDRESS IN PAGE 0 ?
 37001    723         JMP     PRDON       ;   YES - STORE IT
 37002  20323         LDA     0,ADR1      ;NO
 37003 106400         SUB     0,1         ;CALC.  DISPLACEMENT
 37004    406         JMP     ADR.2
```

```
;                       << SI = R92DSP83A; BO = A.DSP.7344! >>

37005 153013 ADR.1:ADD#    2,2,SNC    ;MODE=. AND TERM.=CR, OR NEITHER ?
37006    754       JMP     ABEN1      ;   NO
37007 151222       MOVZR   2,2,SZC    ;  - ?
37010 124400       NEG     1,1        ;   YES, NEGATE VALUE
37011 151014       SKZ     2,2        ;MODE = RELATIVE ?
37012  30065 ADR.2:LDA     2,C400     ;   YES
37013  20053       LDA     0,C200     ;TEST IF ADDRESS IS WITHIN +- 200
37014 122032       SGE     1,0
37015    404       JMP     ADR.3
37016 107023       ADDZ    0,1,SNC
37017    743       JMP     ABEN1
37020 107000       ADD     0,1
37021 147000 ADR.3:ADD     2,1        ;ADD 400 FOR RELATIVE ADDRESSING
37022    702       JMP     PRDON

37023  20323 LADAB:LDA     0,ADR1     ;LIST ADDRESS AS ABSOLUTE
37024 107000       ADD     0,1
37025   4565       JSR     TPOCT
37026   2401 EXIT1:JMP     @.+1
37027  36610       EXITD

37030     54 C.CMA:",

37031  24321 LAD:  LDA     1,VAL      ;LIST ADDRESS
37032  30064       LDA     2,C377
37033 132432       SGR     1,2
37034    426       JMP     LADTP      ;A1 <= 377 MEANS PAGE 0; TYPE AS IS
37035 147400       AND     2,1
37036 141620       INCZR   2,0
37037 123520       ANDZL   1,0        ;IS ADDRESS DISPLACEMENT NEGATIVE ?
37040 106400       SUB     0,1        ;   YES, EXTEND SIGN
37041 151520       INCZL   2,2
37042  20321       LDA     0,VAL
37043 143400       AND     2,0
37044 112405       SUB     0,2,SNR    ;IS ADDRESS RELATIVE ?
37045    407       JMP     LAD1       ;   NO (MUST BE BASE 2 OR 3)
37046  20003       LDA     0,C3
37047 106112       ADCL#   0,1,SZC    ;IS DISPLACEMENT <= 3,
37050 107112       ADDL#   0,1,SZC    ;AND >= -3 ?
37051    752       JMP     LADAB      ;   NO, LIST AS ABSOLUTE
37052  20206       LDA     0,C256     ;".
37053   4556       JSR     TPCHA
37054  20703 LAD1: LDA     0,C.MN
37055 125112       SSP     1,1
37056 124401       NEG     1,1,SKP
37057  20701       LDA     0,C.PL
37060 101040       MOVO    0,0
37061   4550       JSR     TPCHA
37062  50330 LADTP:STA     2,B.CNT    ;B.CNT=0 ==> SKIP A PROCEDURE
37063   4527       JSR     TPOCT
37064    637       JMP     PRDON-1
```

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;                          << SI = R92DSPS3A, BO = A.DSP.7344! >>

; DEVICE CODE PROCESSOR

037065   4461 DEVCD: JSR     TEST
037066    407        JMP     LDEVC
037067   4463        JSR     ACIV        ;DEVICE CODE, ENTER
037070    672        JMP     ABEN1       ;REMAINING INPUT ISN'T OCTAL
037071  30050        LDA     2,C77
037072 132433        SLE     1,2         ;OCTAL VALUE <= 77 ?
037073    667        JMP     ABEN1       ;   NO
037074    630        JMP     PRDON       ;   YES

037075  30050 LDEVC: LDA     2,C77       ;LIST DEVICE CODE
037076 147400        AND     2,1         ;MASK TO 6 BITS
037077    763        JMP     LADTP


; COMMA, OPTIONAL COMMA, AND SPACE PROCESSOR

037100   4446 OPT.C: JSR     TEST        ;OPTIONAL COMMA
037101 121001        MOV     1,0,SKP     ;LIST
037102   4450        JSR     ACIV        ;   ENTER
037103    402        SKIP
037104    656        JMP     ABEN1       ;INPUT VALUE IS A NUMBER
037105 101015        SNZ     0,0         ;IS ANYTHING LEFT TO PROCESS ?
037106    720        JMP     EXIT1       ;   NO
037107  14331        DSZ     IBP
037110  20720 COMMA: LDA     0,C.CMA
037111    402        SKIP
037112  20044 SPACE: LDA     0,C40
037113   4433        JSR     TEST        ;ENTER OR LIST ?
037114    407        JMP     SPCML       ;   LIST
037115 105000        MOV     0,1         ;   ENTER
037116  30331        LDA     2,IBP
037117   4457        JSR     ACBY
037120 122404        SUB     1,0,SZR
037121    641        JMP     ABEN1
037122  50331        STA     2,IBP
037123   4506 SPCML: JSR     TPCHA       ;   LIST
037124    607        JMP     NXTP1
```

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;                         << SI = R92DSPS3A; BO = A.DSP.7344! >>

; BRANCH.  BRANCHES TO THE DESTINATION INDICATED IN TABLE ENTRY IF THE
; RIGHT-MOST 7 OR 5 BITS THEREOF AGREE WITH AO.  CALLING SEQUENCE:
;     JSR    BRNC7     (OR BRNC5 FOR 5-BIT, WITH A1 = 37)
;     DEST1-.*Q+CHAR1 (OR F INSTEAD OF Q FOR 5-BIT)
;     DEST2-.*Q+CHAR2
;       ...
;     0          ;END OF LIST

; A -1 IN THE TABLE IS USED TO DETERMINE MAX ALLOWABLE NO. OF OPERANDS

             200 Q=     200     ;F=        40

   37125  24052 BRNC7:LDA    1,C177
   37126 123400 BRNC5:AND    1,0
   37127  31400       LDA    2,0,3      ; << LOOPS BACK TO HERE
   37130 175400       INC    3,3
   37131 147415       AND#   2,1,SNR    ;END OF LIST ?
   37132   1400       JMP    0,3        ;   YES
   37133 112420       SUBZ   0,2        ;NO
   37134 133414       AND#   1,2,SZR    ;MATCH ?
   37135    772       JMP    BRNC5+1    ;   NO
   37136 151112       SSP    2,2        ;IS DISPLACEMENT "POSITIVE" (IE., MSB OR ...
   37137 153113       ADDL#  2,2,SNC    ;          ... 2ND MSB = 0) ?
   37140 125620       INCZR  1,1        ;   YES - CHANGE A1 TO 100 (OR 20) AND SET C = 0
   37141 151200       MOVR   2,2
   37142 125224       MOVZR  1,1,SZR    ;SHIFTED 7 (OR 5) PLACES ?
   37143    776       JMP    .-2        ;   NO
   37144 157020       ADDZ   2,3        ;YES - ADD TO "." IN LIST & GO THERE
   37145   1400       JMP    0,3
```

```
;                          << SI = R92DSPS3A;  BO = A.DSP.7344! >>

;  TEST MODE FLAG

 037146   010333 TEST:  ISZ     FLG
 037147   014333        DSZ     FLG          ;IS MODE FLAG = 0 ?
 037150    01401        JMP     1,3          ;   NO:  ENTER (VALUE)
 037151    01400        JMP     0,3          ;   YES:  LIST (COSYM)


;  ACCESS INPUT VALUE.  NON-SKIP RETURN IF NON-DIGIT, WITH BYTE IN AO AND
;  IBP INCREMENTED
;  SKIP RETURN IF OCTAL DIGIT, WITH ENTIRE OCTAL VALUE IN A1, TERMINATOR
;  IN AO,  IBP POINTING TO TERMINATOR + 1

 037152   054437 ACIV:  STA     3,RTNTS
 037153   102000        ADC     0,0
 037154    40433        STA     0,FL.ND      ;SET NON-DIGIT FLAG
 037155   126400        SUB     1,1          ;A1 WILL ACCUMULATE OCTAL NUMBER
 037156    30331 ACIV1: LDA     2,IBP
 037157     4417        JSR     ACBY         ;FETCH A CHAR. FROM INPUT BUFFER
 037160    50331        STA     2,IBP
 037161    30427        LDA     2,C60
 037162   142400        SUB     2,0
 037163    34027        LDA     3,C7
 037164   116433        SLE     0,3          ;IS IT AN OCTAL DIGIT ?
 037165   143001        ADD     2,0,SKP      ;   NO - RECONSTITUTE CHAR. & RETURN
 037166   125131        MOVZL   1,1,SKP      ;  YES - SHIFT PREV. NO. LEFT 3 BITS
 037167     2422        JMP     @RTNTS
 037170   125120        MOVZL   1,1
 037171    10416        ISZ     FL.ND        ;CLEAR NON-DIGIT FLAG
 037172   125121        MOVZL   1,1,SKP
 037173    10416        ISZ     RTNTS        ;INCREMENT RETURN ADDRESS (ONLY ONCE)
 037174   107000        ADD     0,1          ;AND ADD NEW DIGIT TO PREV. NO.
 037175      761        JMP     ACIV1


;  ACCESS BYTE:  FETCHES THE BYTE POINTED TO BY A2 INTO AO,
;  INCREMENTS A2,  PRESERVES A1

 037176    54410 ACBY:  STA     3,RTNAB
 037177   155220        MOVZR   2,3          ;CONVERT BYTE ADDR. TO WORD ADDR.
 037200    21400        LDA     0,0,3        ;PICK UP WORD CONTAINING DESIRED BYTE
 037201   151403        INC     2,2,SNC      ;WANT LEFT BYTE ?
 037202   101300        MOVS    0,0          ;   YES,  SWAP WORD
 037203    34064        LDA     3,C377
 037204   163400        AND     3,0          ;MASK THE DESIRED BYTE
 037205     2401        JMP     @RTNAB

 037206        0 RTNAB: 0
 037207        0 FL.ND: 0
 037210       60 C60:   60
 037211        0 RTNTS: 0
```

```
;                       << S1 = R92DSPS3A;  B0 = A.DSP.7344! >>

 037213  152400  TPOCT: SUBZ    2,2          ;TYPE THE OCTAL NUMBER IN A1
 037214   54776         STA     3,RTNTS
 037215  102620         SUBZR   0,0          ;PREPARE TO MOVE MSB OF A1 INTO A0
 037216  101041         MOVO    0,0,SKP      ;SET CARRY TO FORM "PUSHER" BIT
 037217   20483  TPNXT: LDA     0,C20K       ;LEFT-SHIFT ONE DIGIT FROM A1 INTO A0
 037220  125105         MOVL    1,1,SNR      ;INITIALLY INSERTS "PUSHER" BIT
 037221    2771         JMP     @RTNTS       ;EXIT WHEN "PUSHER" BIT IS GONE
 037222  101102         MOVL    0,0,SNC
 037223     775         JMP     .-3
 037224  101015         SNZ     0,0          ;NON-ZERO DIGIT ...
 037225  125135         MOVZL#  1,1,SNR      ;    ... OR LAST DIGIT ?
 037226   30763         LDA     2,C60        ;   YES: ADDEND FOR ASCII DIGIT
 037227  143040         ADDO    2,0
 037230    4402         JSR     TPCHA
 037231     766         JMP     TPNXT

; CHARACTER TYPE-OUT SERVICE ROUTINE

 037232   54755  TPCHA: STA     3,RTNAB      ;TYPE 1 CHAR. IN A0 IF C=1, 2 IF C=0
 037233    4404  TPCH2: JSR     TOUTBYTE     ;(PRESERVES A1,A2)
 037234  101522         MOVCS   0,0,SZC      ;SECOND CHARACTER TO BE TYPED ?
 037235     775         JMP     TPCH2        ;   YES
 037236    2751         JMP     @RTNAB

           37237  TOUTBYTE:                  ;ROUTINE TO CALL OUTBYTE WITHOUT LOOSING CONTEXT
 037237   54425         STA     3,SAV3
 037240   40426         STA     0,SAV0
 037241   44426         STA     1,SAV1
 037242   50426         STA     2,SAV2
 037243  175100         MOVL    3,3
 037244   54421         STA     3,SAVC
 037245   30052         LDA     2,C177
 037246  113405         AND     0,2,SNR      ;MASK TO 7 BYTES; NULL ?
 037247     407         JMP     TOUT2        ;   YES, SKIP OUTPUT
 037250   20053         LDA     0,C200
 037251  113000         ADD     0,2          ;SET MSB
 037252    6133         OUTBYTE              ;OUTPUT THE BYTE
 037253   34006         LDA     3,RUP
 037254   11433         ISZ     CCC ,3       ;FOR TABBING
 037255  100010         NOP
 037256   34407  TOUT2: LDA     3,SAVC
 037257  175200         MOVP    3,3
 037260   20406         LDA     0,SAV0
 037261   24406         LDA     1,SAV1
 037262   30406         LDA     2,SAV2
 037263    2401         JMP     @SAV3

 037264       0  SAV3:  0
 037265       0  SAVC:  0
 037266       0  SAV0:  0
 037267       0  SAV1:  0
 037270       0  SAV2:  0
 037271   20000  C20K:  20000

 037272      41  IBUFF: .BLK   41           ;ROOM FOR 65. BYTES, PLUS TERMINATOR
```

```
;                              <<  SI = R92DSP53A;  DO = A.DSP.7344!  >>
;  TABLE DRIVING THE ENTER AND LIST FUNCTIONS

                  100  H=100
                   40  F=40
                  400  L=400

 073332  177271  R:      MMA-R                ;ONE-WORD INSTRUCTIONS (ABBREV.)
 073333  173777          173777
 073334  122766          @"I-H*F+"O-H*F+"R-H
 073335   62677          IORST
 073336  120624          @"H-H*F+"L-H*F+"T-H
 073337   63077          HALT
 073340  122256          @"I-H*F+"E-H*F+"N-H
 073341   60177          INTEN
 073342  122223          @"I-H*F+"D-H*F+"S-H
 073343   60277          INTDS
 073344  146568          @"S-H*F+"K-H*F+"U-H
 073345  102257          102257               ;"SKU" = UNCONDITIONAL SKIP

 073346     256          .EXIT-R

 073347  177271          MMA-R                ;ALU SKIPS
 073350  103777          103777
 073351  146362          @"S-H*F+"G-H*F+"R-H
 073352  102433          SGR     0,0
 073353  146345          @"S-H*F+"G-H*F+"E-H
 073354  102033          SGE     0,0
 073355  146623          @"S-H*F+"L-H*F+"S-H
 073356  102033          SLS     0,0
 073357  146605          @"S-H*F+"L-H*F+"E-H
 073360  102433          SLE     0,0
 073361  146732          @"S-H*F+"N-H*F+"Z-H
 073362  101015          SNZ     0,0
 073363  146576          @"S-H*F+"K-H*F+"Z-H
 073364  101015          SKZ     0,0
 073365  146241          @"S-H*F+"E-H*F+"Q-H
 073366  102414          SEQ     0,0
 073367  146705          @"S-H*F+"N-H*F+"E-H
 073370  102413          SNE     0,0
 073371  147160          @"S-H*F+"S-H*F+"P-H
 073372  101113          SSP     0,0
 073373  147156          @"S-H*F+"S-H*F+"N-H
 073374  101113          SSN     0,0
 073375  146543          @"S-H*F+"K-H*F+"E-H
 073376  101213          SKE     0,0
 073377  146557          @"S-H*F+"K-H*F+"O-H
 073400  101213          SKO     0,0
 073401  146732          @"S-H*F+"G-H*F+"Z-H
 073402  100533          SGZ     0,0
 073403  147515          @"S-H*F+"Z-H*F+"N-H
 073404  100533          SZN     0,0

 073405     204          .ACC-R
```

```
                        <<  S1  =  R92DSPS3A;  B0  =  A.DSP.7344!  >>

037406  177272          CD3-R               ;ALU INSTRUCTIONS
037407  103400          103400
037410  102704          @"A-H*F+"N-H*F+"D-H
037411  102204          @"A-H*F+"D-H*F+"D-H
037412  147245          @"S-H*F+"U-H*F+"B-H
037413  102203          @"A-H*F+"D-H*F+"C-H
037414  122703          @"I-H*F+"N-H*F+"C-H
037415  132746          @"M-H*F+"O-H*F+"V-H
037416  134247          @"N-H*F+"E-H*F+"G-H
037417  106755          @"C-H*F+"O-H*F+"M-H

037420     171          .ALU-P

037421  177271          MMA-R               ;SPECIAL CPU I/O INSTRUCTIONS
037422  163777          163777
037423  144223          @"R-H*F+"D-H*F+"S-H
037424   60477          READS   0
037425  123201          @"I-H*F+"T-H*F+"A-H
037426   61477          INTA    0
037427  133153          @"M-H*F+"S-H*F+"K-H
037430   62077          MSKO    0

037431     227          .1ACC-R

037432  177271          MMA-R               ;I/O SKIP
037433  163400          163400
037434  146560          @"S-H*F+"K-H*F+"P-H
037435   63400          63400

037436     237          .SKP-R

037437  177271          MMA-R               ;NIO
037440  163400          163400
037441  124457          @"N-H*F+"I-H*F+"O-H
037442   60000          60000

037443     235          .NIO-R

037444  177272          CD3-R               ;I/O DATA TRANSFER
037445   63400          63400
037446  146560          @"S-H*F+"K-H*F+"P-H
037447  110743          @"D-H*F+"O-H*F+"C-H
037450  110443          @"D-H*F+"I-H*F+"C-H
037451  110742          @"D-H*F+"O-H*F+"B-H
037452  110442          @"D-H*F+"I-H*F+"B-H
037453  110741          @"D-H*F+"O-H*F+"A-H
037454  110441          @"D-H*F+"I-H*F+"A-H

037455     231          .I O-R
```

```
                        << ST = R92DSPS3A, BD = A.DSP.7344! >>

 37456 177278           CD3-R                   ;LOAD AND STORE
 37457  60000           60000
 37460 134457           @"N-H*F+"I-H*F+"O-H
 37461 147201           @"S-H*F+"T-H*F+"A-H
 37462 130201           @"L-H*F+"D-H*F+"A-H

 37463    142           .STLD-R

 37464 177278           CD3-R                   ;JMP, JSR, ISZ, AND DSZ
 37465  14000           14000
 37466 111172           @"D-H*F+"S-H*F+"Z-H
 37467 123172           @"I-H*F+"S-H*F+"Z-H
 37470 125162           @"J-H*F+"S-H*F+"R-H
 37471 124660           @"J-H*F+"M-H*F+"P-H

 37472 177560           SPACE-R

 37473    144           .ADR-R


; STORE AND LOAD

 37474    156  .STLD:  SRACC-R;SPACE, ACCUMULATOR
 37475 177556           COMMA-R

 37476 177273  .ADR:   CD1-R                    ;INDIRECT SYMBOL (@)
 37477   2000           2000
 37500 140000           @"@*L

 37501 177435           ADR-R                   ;PROCESS ADDRESS
 37502 177256           EXITD-R
 37503 177555           COMMA-1-R

 37504 177273           CD1-R                   ;BASE REGISTER FOR ADDRESS
 37505   1400           1400
 37506 131662           @"3*L+Q+"2

 37507    226           .EXIT-R


; FOP SUBROUTINES

 37510 177560 SRACC:    SPACE-R                 ;SPACE
 37511 177273           CD1-R                   ;ACCUMULATOR
 37512  14000           14000
 37513 131662           @"3*L+Q+"2
 37514 130660           @"1*L+Q+"0
 37515 177345           RTURN-R

 37516 177273 SRIOP:    CD1-R                   ;IO CONTROL PULSE
 37517    300           300
 37520 150300           @"P*L+Q+"C
 37521 151400           @"S*L
 37522 177345           RTURN-R
```

```
;                          << S1 = R92DSPS3A; BO = A.DSP.7344! >>

; ALU INSTRUCTIONS

   37523 177273 .ALU:  CD1-R               ;CARRY CONTROL
   37524     60        60
   37525 141717        @"C*L+Q+"O
   37526 155000        @"Z*L

   37527 177273        CD1-R               ;SHIFT CONTROL
   37530    300        300
   37531 151722        @"S*L+Q+"R
   37532 146000        @"L*L

   37533 177273        CD1-R               ;NON-ENTRY CONTROL
   37534     10        10
   37535 121400        @"#*L

   37536 177560 .2ACC:SPACE-R

   37537 177273        CD1-R               ;SOURCE ACCUMULATOR
   37540  60000        60000
   37541 131662        @"3*L+Q+"2
   37542 130660        @"1*L+Q+"0

   37543 177556        COMMA-R
   37544    157        SRACC+1-R           ;DESTINATION ACCUMULATOR
   37545 177546        OPT.C-R             ;OPTIONAL COMMA

   37546 177272        CD3-R               ;ALU SKIP CONDITION
   37547      7        7
   37550 146116        @"S-H*F+"B-H*F+"N-H
   37551 146272        @"S-H*F+"E-H*F+"Z-H
   37552 146722        @"S-H*F+"N-H*F+"R-H
   37553 147522        @"S-H*F+"Z-H*F+"R-H
   37554 146703        @"S-H*F+"N-H*F+"C-H
   37555 147503        @"S-H*F+"Z-H*F+"C-H
   37556 146560        @"S-H*F+"K-H*F+"P-H

   37557    226        .EXIT-R

   37560 177257 .EXIT:EXIT-R
```

```
;                        << S1 = R92DSPS3A; S0 = A DSP.7344! >>

; I/O INSTRUCTIONS

037561     156   .IACC: SRACC-R              ;SPECIAL CPU I/O INSTRUCTIONS
037562  177257          EXIT-R

037563     164   .I.O:  SRIOP-R              ;S, C, OR P PULSE
037564     156          SRACC-R              ;SPACE, ACCUMULATOR
037565  177556          COMMA-R
037566     246          .DEVC-R              ;DEVICE CODE

037567     164   .NIO:  SRIOP-R              ;S, C, OR P PULSE
037570     245          .DEVC-1-R

037571  177073   .SKP:  CD1-R                ;I/O SKIP CONDITION
037572     200          200
037573  142302          @"D*L+@+"B

037574  177073          CD1-R
037575     100          100
037576  155316          @"Z*L+@+"N

037577  177560          SPACE-R              ;SPACE

037600  177221   .DEVC: MMA-R                ;I/O DEVICE CODE
037601      77          77
037602  151211          @"T-H*F+"T-H*F+"I-H
037603      10          TTI
037604  151217          @"T-H*F+"T-H*F+"O-H
037605      11          TTO
037606  107025          @"C-H*F+"P-H*F+"U-H
037607      77          CPU

037610     226          .EXIT-R
037611  177533          DEVCO-R
037612  177256          EXITD-R


;   *   *   *   *   *  END OF POP TABLE  *   *   *   *   *
```

```
                        << SI = R92DSPS3A; BG = A.DSP.7344! >>

37613      0            0
37614  54777 RFH        STA     3,.-1       ;RELEASE FILE HEADER IF LATCHED
37615  30221            LDA     2,DSPHDR
37616 151015            SNZ     2,2         ;IS A FILE HEADER LATCHED ?
37617   2774            JMP     @RFH-1      ;   NO, RETURN
37620   6110            DATAPUMP            ;YES, UNLATCH HEADER
37621      3            UNLATCH
37622 100000            @0
37623 152400            SUB     2,2
37624  50221            STA     2,DSPHDR
37625   2766            JMP     @RFH-1      ;RETURN

37626      0            0
37627      0            0
37630  54777 OINST:     STA     3,.-1       ;OUTPUT AN INSTRUCTION IN BOTH OCTAL AND SYMBOLIC FORM
37631  44775            STA     1,OINST-2;SAVE THE GIVEN INSTRUCTION WORD
37632  20030            LDA     0,C10       ;SET OUTPUT RADIX = 8
37633  30026            LDA     2,C6        ;FILL OUT TO 6 SPACES
37634   6101            CALL
37635      7            CIA
37636  34214            LDA     3,.AFH
37637  21413            LDA     0,BPC,3
37640 101112            SSP     0,0         ;BYTE ADDRESSING MODE ?
37641   2766            JMP     @OINST-1 ;    YES, DONE
37642   6133            OUTTEXT             ;OUTPUT 2 SPACES
37643 120240            240*K+240
37644      0            0
37645  20761            LDA     0,OINST-2;RETRIEVE THE INSTRUCTION
37646   6266            CDSYM               ;OUTPUT IN SYMBOLIC FORM
37647   2760            JMP     @OINST-1 ;RETURN

37650      0            0
37651  54777 CRBKX:     STA     3,.-1       ;CLEAR BREAKPOINT
37652  30005            LDA     2,RUP
37653   6102            FLAGCHANGE
37654 100012            RESET+FLW.
37655  20000            20000
37656  30214            LDA     2,.AFH      ;CLEAR BREAKPOINT ADDRESS IN HEADER
37657 102400            SUB     0,0
37660  41052            STA     0,DSPS2,2
37661   2767            JMP     @CRBKX-1

37662      0            0
37663  54777 SCORE:     STA     3,.-1       ;SELECT CORE
37664   6274            RELF                ;RELEASE FILE HEADER, IF ANY
37665   6275            CLBRK               ;CLEAR BREAKPOINT, IF ANY
37666   6101            CALL                ;CLEAR CHANNEL 2 IF IN USE
37667 100003            ALLCLEAR
37670  34214            LDA     3,.AFH
37671 102000            ADC     0,0
37672  41450            STA     0,DSPS0,3;SET DOMAIN CODE IN AFH = CORE
37673  41451            STA     0,DSPS1,3
37674   6277            COPYHDR2CORE        ;COPY DOMAIN PARAMETERS INTO CORE
37675   2765            JMP     @SCORE-1
```

```
;  SWAP-IN ROUTINE

 37676  54225 SWPI:  STA     3,TS        ;START UP AFTER SWAP-IN
 37677  25027        LDA     1,AHA.,2
 37700 102400        SUB     0,0         ;READ ACTIVE FILE HEADER
 37701   6110        DATAPUMP
 37702      0        GETBLOCK
 37703 100000        @0
 37704  50214        STA     2,.AFH      ;REMEMBER ITS BUFFER ADDRESS
 37705   6277        COPYHDR2CORE        ;COPY SELECTION PARAMETERS INTO CORE
 37706  30005        LDA     2,RUP
 37707   6103        FLAGCHECK           ;DSP ACTIVE ?
 37710  20012        SKIPO+FLW.
 37711  10000        10000
 37712     42        JMP     SWPIC       ;   NO, SELECT CORE
 37713  20217        LDA     0,DSPTYPE   ;YES
 37714 101015        SNZ     0,0         ;IS CORE SELECTED ?
 37715     40        JMP     SWPID       ;   YES, SWAP-IN IS DONE
 37716  20215        LDA     0,DSPLU     ;NO
 37717   6130        FINDLUT             ;IS LU STILL AVAILABLE ?
 37720     41        JMP     SWILL       ;   NO, SELECTION IS NOW ILLEGAL
 37721  20217        LDA     0,DSPTYPE   ;YES
 37722 101110        SSN     0,0         ;SINGLE BLOCK SELECTED ?
 37723     41        JMP     SWPID       ;   YES, SWAP-IN IS DONE
 37724  20215        LDA     0,DSPLU
 37725  24216        LDA     1,DSPDA
 37726   6110        DATAPUMP            ;READ FILE HEADER
 37727      0        GETBLOCK
 37730 100000        @0
 37731  50221        STA     2,DSPHDR    ;SET CURRENT HEADER ADDR
 37732     40        JMP     SWPID

 37733  30005 SWILL: LDA     2,RUP       ;PREVIOUS SELECTION IS NOW ILLEGAL
 37734  20257        LDA     0,ILLEGAL&377
 37735  41014        STA     0,URA.,2    ;ALERT USER
 37736   6276 SWPIC: SELCORE             ;SELECT CORE
 37737   2225 SWPID: JMP     @TS


;  SWAP-OUT ROUTINE

 37740  54225 SWPO.  STA     3,TS        ;SWAP OUT
 37741   6274        RELF                ;RELEASE FILE HEADER IF SELECTED
 37742  30214        LDA     2,.AFH      ;UNLATCH ACT. FILE HDR AND SET IT DIRTY
 37743   6110        DATAPUMP
 37744 100007        SETDIRTY!UL.
 37745 100000        @0
 37746   2225        JMP     @TS
```

```
;                    << SI = R92DSPS3A; BO = A.DSP.7344! >>

; COPYHDR2CORE -- THIS ROUTINE DECODES THE DOMAIN SELECTION PARAMETERS
; IN THE ACTIVE FILE HEADER AND SETS UP CORRESPONDING VALUES IN CORE
;
; IN AF HEADER: DSPS0, DSPS1
; IN CORE     : DSPTYPE, DSPLU, DSPDA, DSPPCB
;
;             CORE     SINGLE    FILE     FILE HDR  ACT.FILE   A.F.HDR
;            ------    ------   -------   --------  --------   -------
; DSPS0        -1        LU     100K+LU   140K+LU      -2         -3
; DSPS1        -1        RDA      RDA       RDA        PCB        PCB
;
; DSPLU        -1        LU       LU        LU          0          0
; DSPDA        -1        RDA      RDA       RDA        RDA        RDA
; DSPTYPE       0         1     100000    100001     140000     140001
; DSPPCB        0         0        0         0         PCB        PCB

  37747         0          0
            37750 CPYH2C:                      ;COPY DOMAIN SELECTION PARAMETERS FROM AFH INTO CORE
  37750     54777          STA     3,.-1
  37751    102400          SUB     0,0         ;PRESET DSPTYPE AND DSPPCB TO 0
  37752     40217          STA     0,DSPTYPE
  37753     40220          STA     0,DSPPCB
  37754     34214          LDA     3,.AFH
  37755     21450          LDA     0,DSPS0,3;PICK UP CONTROL PARAMS FROM HEADER
  37756     31451          LDA     2,DSPS1,3
  37757     40215          STA     0,DSPLU     ;TENTATIVELY PRESET DSPLU AND DSPDA
  37760     50216          STA     2,DSPDA
  37761    105405          INC     0,1,SNR     ;IS CORE SELECTED ?
  37762       430          JMP     C.DONE      ;   YES, THEN WE'RE DONE
  37763    125405          INC     1,1,SNR     ;NO, IS AN ACTIVE FILE SELECTED ?
  37764       417          JMP     C.AF        ;   YES
  37765    125405          INC     1,1,SNR     ;NO, AN ACTIVE FILE HEADER ?
  37766       413          JMP     C.AFH       ;   YES
  37767    126520          SUBZL   1,1         ;NO, ASSUME SINGLE BLOCK
  37770    101112          SSP     0,0         ;IS A FILE OR HEADER SELECTED ?
  37771    126620          SUBZR   1,1         ;   YES
  37772    103112          ADDL#   0,0,SZC     ;IS A FILE HEADER SELECTED ?
  37773    125400          INC     1,1         ;   YES, DSPTYPE = 100001
  37774     44217          STA     1,DSPTYPE;SET DSPTYPE
  37775     24032          LDA     1,C177
  37776    123400          AND     1,0         ;MASK LOGICAL UNIT
  37777     40215          STA     0,DSPLU     ;AND SAVE LU
  40000       412          JMP     C.DONE

  40001     20213 C.AFH:LDA    0,C140K     ;AN ACTIVE FILE HEADER IS SELECTED
  40002    101401          INC     0,0,SKP     ;DSPTYPE = 140001
  40003     20213 C.AF:  LDA     0,C140K     ;ACTIVE FILE SELECTED, DSPTYPE = 140000
  40004     40217          STA     0,DSPTYPE
  40005     50220          STA     2,DSPPCB    ;FOR ACTIVE FILE, DSPS1 = PCB
  40006    102400          SUB     0,0
  40007     40215          STA     0,DSPLU     ;LU = 0          (OF A.F.)
  40010     25577          LDA     1,DHDR,3;GET RDA FROM HEADER BLOCK
  40011     44216          STA     1,DSPDA
            40012 C.DONE:
  40012      2735          JMP     @CPYH2C-1
```

(1,AHA.,2

```
;                       << SI = R92DSPS3A; BO = A.DSP.7344! >>

                  ; PATCH SPACE (HERE TO AANOS)  * * * * * *

        41000           .LOC    ./400+2*400

        41000 AANOS=.           ;AUTHORIZED ACCOUNT NUMBERS
  41000     0         0         ;LIST TERMINATOR

        41200 TBUF= AANOS+200   ;TAPE BUFFER FOR "R" AND "V"

              .END  ; "DSP"  SOURCE #3
```

AANDS	41000	ABEN1	36762	ABEND	36621	ACBY	37176	ACIV	37152
ACIV1	37156	ACTB	35010	ACTB1	35033	ACTBL	35040	ACTBR	35022
ADER	36263	ADERR	6272	ADR	36767	ADR1	323	ADRM	36766
ADRMO	322	ADRND	36755	ADR.	36763	ADR.1	37005	ADR.2	37012
ADR.3	37021	APEND	32621	APND1	32644	APND2	32705	APNDA	32752
APNDD	33016	APNDE	32771	BEGIN	2256	BGIN	32465	BGINB	32512
BINDI	6115	BINMU	6116	BKPRL	426	BPASS	224	BPC	13
BPI	16	BRKFL	33166	BRKP0	33047	BRKP1	33056	BRKP2	33063
BRKP3	33073	BRKP4	33120	BRKP5	33141	BRKP6	33146	BRKP7	33167
BRKP8	33203	BRKPE	33211	BRKPT	33034	BRNC5	37126	BRNC7	37125
BSACF	75	BUMPU	6117	B.CNT	330	C10	30	C100	51
C1000	67	C10K	33213	C11	31	C12	32	C13	33
C14	34	C1400	211	C140K	213	C15	35	C16	36
C160	174	C163	175	C166	176	C17	37	C170K	21
C171	177	C177	52	C1777	70	C2	2	C20	42
C200	53	C2000	71	C205	54	C20K	37270	C215	55
C232	202	C240	56	C244	57	C247	203	C254	204
C255	205	C256	206	C257	207	C260	60	C271	61
C272	210	C275	33214	C3	3	C300	62	C334	63
C37	43	C377	64	C4	24	C40	44	C400	65
C4000	72	C5	25	C50	201	C6	26	C60	37210
C600	100	C60K	212	C7	27	C70	36475	C77	50
C7740	22	C777	66	CALL	6101	CAO	36374	CAOR	36413
CATO	6270	CD1	36625	CD3	36624	CDDN2	36734	CDDON	36716
CDE	36660	CDEM	36703	CDL	36670	CDNX1	36707	CDNXB	36641
CDNXT	36635	CDVAL	324	CESF	4301	CHANN	6106	CKSL	36434
CLBRK	6275	CM20	34543	CM3	33675	CM400	23	CMAND	33216
COA	36341	COAA	36352	COAD	36342	COADR	36337	COLN2	33336
COLON	33327	COMMA	37110	COPYH	6277	COSY	36565	COSYM	6266
COTA	6263	COTAA	6264	COTAD	6265	CPYH2	37750	CRBKX	37651
CTAB	33373	CTRL	32545	CTRLO	32556	C.AF	40003	C.AFH	40001
C.CMA	37030	C.DON	40012	C.MN	36757	C.PL	36760	C.UP	34274
DA	160	DAC	164	DAS	165	DATAP	6110	DB	166
DBA	41	DBC	172	DBS	173	DECIM	6120	DELTA	326
DESCP	36311	DEVCO	37065	DEXIT	312	DFTCA	34106	DMASK	32243
DMCAL	34110	DQUEU	6105	DSP1	32220	DSP10	60	DSP11	61
DSP12	62	DSP13	63	DSP14	64	DSP15	65	DSP16	66
DSP17	67	DSP1A	32232	DSP1B	32236	DSP2	32300	DSP3	32316
DSP4	32325	DSP5	32337	DSP6	32351	DSP6P	32405	DSP6X	32452
DSP7	32435	DSP7Q	32432	DSPDA	216	DSPHD	221	DSPLU	215
DSPPC	220	DSPS0	50	DSPS1	51	DSPS2	52	DSPS3	53
DSPS4	54	DSPS5	55	DSPS6	56	DSPS7	57	DSPTY	217
DUMP	33234	DUMP0	33260	DUMP1	33265	DUMP2	33300	DUMP3	33311
DUMP4	33315	ENTR	33343	ENTR0	33345	ENTR1	33406	ENTR2	33363
ENTR3	33352	ENTR4	33422	ENTR5	33374	ENTR6	33425	ENTR7	33430
ERRF	76	ESCF	73	ETSF	74	EXIT	36611	EXIT1	37026
EXIT0	36610	F	40	FHOR	35637	FIL42	33530	FIL60	33543
FIL80	33575	FILE	33434	FILE1	33503	FILE2	33510	FILE4	33512
FILE5	33533	FILE6	33551	FILE7	33565	FINDL	6123	FIX	6121
FLAGC	6102	FLG	333	FLG1	36737	FLOAT	6122	FL.ND	37207
FREEN	6107	GADDR	32565	GADR1	32614	GBLK	33607	GBLK0	33615
GBLK1	33626	GBLK2	33647	GETB	35604	GETBY	6124	GETR	35617
GETR0	35616	GETR1	35620	GETS	35613	GETW	35545	GETWD	6261
GSAF	35661	GSCOR	35572	GSFIL	35706	H	100	HDRAF	33672
HEADR	33655	IBP	331	IBP0	36563	IBPNX	332	IBUFF	37271
ICBF	33605	ICB0	34546	ILEG	36504	ILLA	36246	ILLAD	6273
ILLEG	6257	INBYT	6125	INPT1	33701	INPT2	33713	INPUT	33676
INSTR	6126	IOCAL	34103	IOP	6	ISA2D	6127	ISA2L	6130

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JFLTO    151    JREL     33700    JREL1    33747    JREL2    34004    JREL3    34017
JRELJ  34033    JVAD3    35756    KCFM     32751    KCFM1    35760    KHALT    32750
KLOOP  34045    KONST    34041    L          400    LAD      37031    LAD1     37054
LADAB  37023    LADTP    37062    LDEVC    37075    LIST     34056    LIST1    34066
LIST2  34103    LIST3    34104    LOADD     6131    LPNTR    36701    MATCH      322
MMA    36623    MOVEO    34130    MOVE1    34132    MOVE2    34162    MOVE3    34164
MOVE4  34171    MOVEB    34110    MV         325    MVCHA    36740    NOTM     36317
NOTMC   6300    NSRCH    34206    NXTP1    36733    NXTPR    36576    OINST    37630
OK     36452    OPT.C    37100    OUTBY     6132    OUTIN     6267    OUTP1    34224
OUTP2  34237    OUTP3    34264    OUTPT    34211    OUTTE     6133    PARA     35507
PARA1  35523    PARA2    35534    PARAM     6271    PASSW      570    PIB         4
PNCH1  34331    PNCH2    34411    PNCHE    34437    PNCHO    34324    PNCS     36437
PNTBA  36417    PRDON    36724    PUNCH    34275    PUTB     35611    PUTBY     6134
PWORD  34421    PWRI1    34467    PWRIE    34500    PWRIT    34464    Q          200
QCHAR   6103    QRYO     34522    QRY1     34526    QUERY    34520    QUEUE     6104
R      37332    RDMSG    35110    READ1    34600    READ2    34635    READ3    34652
READ4  34744    READB     6135    READD    34760    READE    34767    READG    35071
READR  34752    READO    34572    READT    35056    READV    34722    REDO     34631
REDT   34644    REDCH    34701    REDCL    34672    REEDP    34550    RELF      6274
RELJM   6136    RFH      37614    RICB     35051    RJSR      6136    RPNTR    36702
RTN&S  37206    RTNTS    37211    RTP           7    RTURN    36677    RUP         5
RWORD  34774    SAVO     37265    SAV1     37266    SAV2     37267    SAV3     37263
SAVRA  37264    SAVRA    36572    SBA          40    SBLK     35624    SCAAL    32223
SCORA  34147    SCORE    37663    SELCO     6276    SKPPR    36732    SPACE    37112
SPCHR  37123    SPINP     6146    SRACC    37510    SRCH0    35123    SRCH1    35137
SRCH2  35151    SRCH3    35146    SRCHI    35135    SRCHM    35120    SRIOP    37516
STINP   6140    STINT     6147    STORD     6137    STOUT     6141    STOW     35551
STOWC   6260    STPOP    36570    SWILL    37733    SWPI     37676    SWPIC    37736
SWPTO  37737    SWPO     37740    TASKQ        15    TBLCH    35347    TBUF     41200
TEMP    327    TEST     37146    TOUT2    37255    TOUTB    37236    TPCH2    37232
TPCHA  37231    TPNXT    37216    TPOCT    37212    TRAPF     6142    TS          225
TS1     226    TS2         227    TS3         230    TS4         231    TS5         232
TS6     233    TS7         234    TS8         235    TSS1        236    TSS10       245
TSS11   246    TSS12       247    TSS13       250    TSS14       251    TSS15       252
TSS16   253    TSS17       254    TSS2        237    TSS3        240    TSS4        241
TSS5    242    TSS6        243    TSS7        244    UDMP1    35200    UDMP2    35205
UDUMS  35170    VAD10    36205    VAD11    36226    VAD12    35717    VAD13    35773
VADR5  36002    VAD1L    36215    VADR1    35761    VADR3    36106    VADR4    36112
VADR5  36133    VADR6    36145    VADR7    36152    VADR8    36160    VADR9    36170
VAL      321    VALU     36476    VALUE     6262    VALUR    36617    VDSP3    35544
VERIF  35234    VLAST    36551    VLOOP    36533    WICB     34513    WRITB     6143
WSBLK  35246    WSBL1    35257    WSBLK    35241    XCKS1    35354    XCKS2    35360
XCKSD  35372    XCKSD    35345    XCKSM    35316    XGETB     6144    XITD     35306
XITX   35310    XPUTB     6145    X.AT     36550    X.UP     36547    YBCD     35405
ZDELL  35411    ZREL1    35424    ZREL2    35433    ZREL3    35474    .1ACC    37561
.AAD   37536    .AAND      200    .ABA         14    .ACBY      336    .ACIV      335
.ADDR  34544    .ADR     37476    .AFH        214    .ALU     37523    .BGNB    32324
.BPS   77       .BPS4    33215    .BPS5    36101    .BRKP      150    .BSA        10
.BUFF  32454    .COLD    32564    .DA         174    .DA3       175    .DB        176
.DEV   177      .DEVC    37600    .EXIT    37560    .FLTO      152    .GET1    36103
.GETB  36105    .GETR    36102    .GETS    36104    .HBA        11    .HXA        12
.ICBF    222    .ICBO      223    .INFO       100    .INTR      111    .I.O     37563
.LFM     114    .MEPS    33117    .NIO     37567    .NRET      112    .R       36564
.SKIP  34545    .SKP     37571    .SRET       113    .SSA        13    .STLD    37474
.T4A     255    .TCHA       33?    .TEST       334    .TOCT      340
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File: q/x.DSP 7344
File size: 98 blocks

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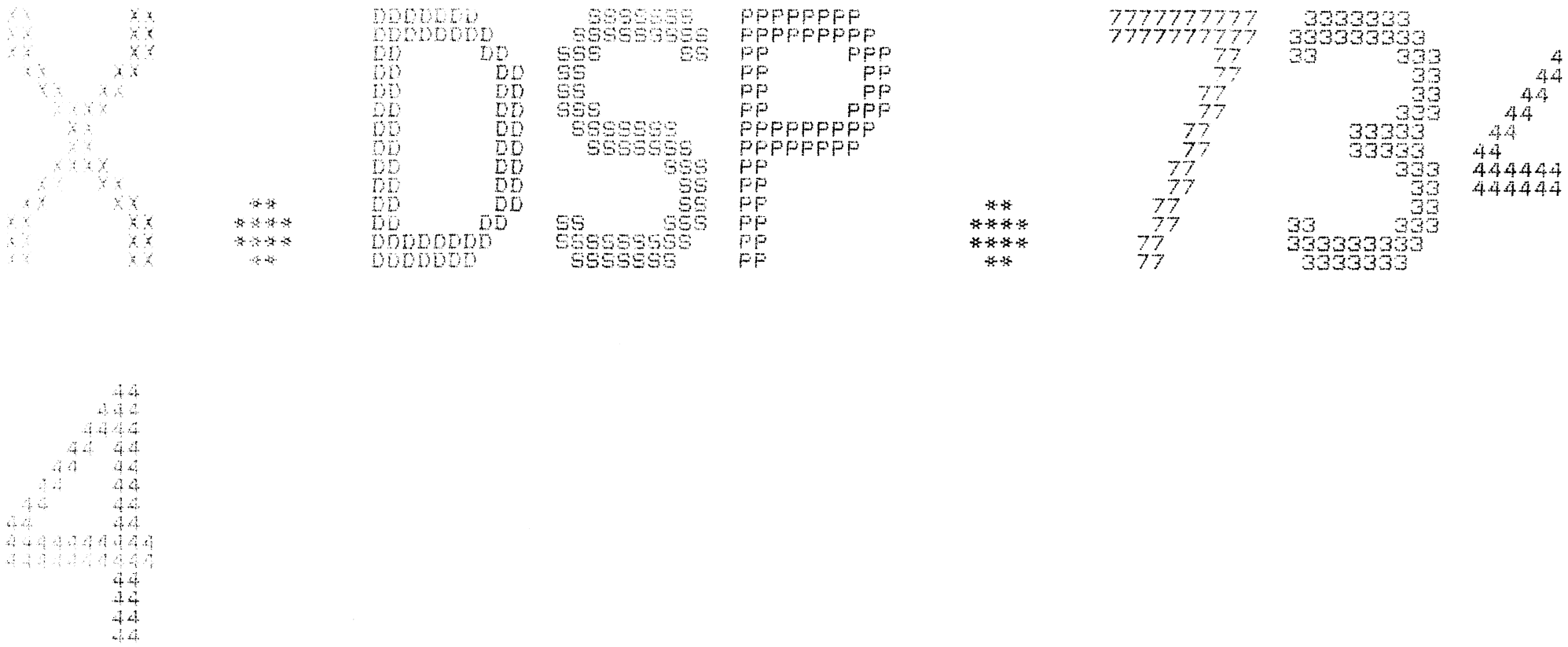

File: 6/X.DSP 7344
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                    *****  J O B    S T A T I S T I C S  *****

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    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 015
    *** DUPLICATE IDENTIFIER 'F      ' ON PAGE 76 AT LINE 015
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 015
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    *** DUPLICATE IDENTIFIER 'F      ' ON PAGE 76 AT LINE 036
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 036
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 038
    *** DUPLICATE IDENTIFIER 'F      ' ON PAGE 76 AT LINE 038
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 038
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 040
    *** DUPLICATE IDENTIFIER 'F      ' ON PAGE 76 AT LINE 040
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 040
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 042
    *** DUPLICATE IDENTIFIER 'F      ' ON PAGE 76 AT LINE 042
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 042
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 044
    *** DUPLICATE IDENTIFIER 'F      ' ON PAGE 76 AT LINE 044
    *** DUPLICATE IDENTIFIER 'S      ' ON PAGE 76 AT LINE 044
    *** DUPLICATE IDENTIFIER 'S      ' ON PAGE 76 AT LINE 046
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 046
    *** DUPLICATE IDENTIFIER 'F      ' ON PAGE 76 AT LINE 046
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 046
    *** DUPLICATE IDENTIFIER 'S      ' ON PAGE 76 AT LINE 048
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 048
    *** DUPLICATE IDENTIFIER 'F      ' ON PAGE 76 AT LINE 048
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 048
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 050
    *** DUPLICATE IDENTIFIER 'F      ' ON PAGE 76 AT LINE 050
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 050
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 052
    *** DUPLICATE IDENTIFIER 'F      ' ON PAGE 76 AT LINE 052
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 052
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 054
    *** DUPLICATE IDENTIFIER 'F      ' ON PAGE 76 AT LINE 054
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 054
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 056
    *** DUPLICATE IDENTIFIER 'F      ' ON PAGE 76 AT LINE 056
    *** DUPLICATE IDENTIFIER 'H      ' ON PAGE 76 AT LINE 056
*** DUPLICATE IDENTIFIER 'H      ' ON PAGE 77 AT LINE 009
    *** DUPLICATE IDENTIFIER 'F      ' ON PAGE 77 AT LINE 009
```

*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 010
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 010
*** DUPLICATE IDENTIFIER 'D ' ON PAGE 77 AT LINE 010
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 010
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 011
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 011
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 011
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 012
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 012
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 012
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 013
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 013
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 013
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 014
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 014
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 014
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 015
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 015
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 015
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 016
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 016
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 016
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 022
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 022
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 022
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 024
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 024
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 024
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 026
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 026
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 026
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 033
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 033
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 033
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 040
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 040
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 040
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 047
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 047
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 047
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 048
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 048
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 048
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 049
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 049
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 049
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 050
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 050
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 050
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 051
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 051
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 051
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 052
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 052
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 052
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 053
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 77 AT LINE 053
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 77 AT LINE 053
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 78 AT LINE 009
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 78 AT LINE 009
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 78 AT LINE 009
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 78 AT LINE 010
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 78 AT LINE 010
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 78 AT LINE 010
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 78 AT LINE 011
*** DUPLICATE IDENTIFIER 'F ' ON PAGE 78 AT LINE 011
*** DUPLICATE IDENTIFIER 'H ' ON PAGE 78 AT LINE 011

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*** DUPLICATE IDENTIFIER: 'F'  ON PAGE  76 AT LINE 017
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  78 AT LINE 017
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  78 AT LINE 018
*** DUPLICATE IDENTIFIER: 'F'  ON PAGE  78 AT LINE 018
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  78 AT LINE 018
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  78 AT LINE 019
*** DUPLICATE IDENTIFIER: 'F'  ON PAGE  78 AT LINE 019
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  78 AT LINE 019
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  78 AT LINE 020
*** DUPLICATE IDENTIFIER: 'F'  ON PAGE  78 AT LINE 020
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  78 AT LINE 020
*** DUPLICATE IDENTIFIER: 'L'  ON PAGE  79 AT LINE 017
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  79 AT LINE 036
*** DUPLICATE IDENTIFIER: 'F'  ON PAGE  79 AT LINE 036
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  79 AT LINE 036
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  79 AT LINE 037
*** DUPLICATE IDENTIFIER: 'F'  ON PAGE  79 AT LINE 037
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  79 AT LINE 037
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  79 AT LINE 038
*** DUPLICATE IDENTIFIER: 'F'  ON PAGE  79 AT LINE 038
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  79 AT LINE 038
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  79 AT LINE 039
*** DUPLICATE IDENTIFIER: 'F'  ON PAGE  79 AT LINE 039
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  79 AT LINE 039
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  79 AT LINE 040
*** DUPLICATE IDENTIFIER: 'F'  ON PAGE  79 AT LINE 040
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  79 AT LINE 040
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  79 AT LINE 041
*** DUPLICATE IDENTIFIER: 'F'  ON PAGE  79 AT LINE 041
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  79 AT LINE 041
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  79 AT LINE 042
*** DUPLICATE IDENTIFIER: 'F'  ON PAGE  79 AT LINE 042
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  79 AT LINE 042
*** DUPLICATE IDENTIFIER: 'T'  ON PAGE  80 AT LINE 032
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  80 AT LINE 032
*** DUPLICATE IDENTIFIER: 'F'  ON PAGE  80 AT LINE 032
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  80 AT LINE 032
*** DUPLICATE IDENTIFIER: 'T'  ON PAGE  80 AT LINE 034
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  80 AT LINE 034
*** DUPLICATE IDENTIFIER: 'F'  ON PAGE  80 AT LINE 034
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  80 AT LINE 034
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  80 AT LINE 036
*** DUPLICATE IDENTIFIER: 'F'  ON PAGE  80 AT LINE 036
*** DUPLICATE IDENTIFIER: 'H'  ON PAGE  80 AT LINE 036
       177    TOTAL # DUPLICATE KEYS
         0    TOTAL # DIR  RE-ORGS
     2,972    TOTAL # KEYS INSERTED
         0    TOTAL # ASSEMBLY ERRS
```

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.STK    60.010

.1ACC   77.029  80.009:

.2ACC   76.059  79.023:

.AANC    4.009:  10.059

.ACSV    7.044:  68.054

.ACIV    7.043:  67.054

.ACTD   40.040:  41.031

.ADR    78.024  78.032:

.AFH     4.027:   9.019   8.025  15.016  15.046  16.020  19.044
        22.009  22.023  22.030  22.045  23.016  23.022  23.040
        24.019  25.045  28.028  28.045  32.020  32.030  33.033
        34.030  34.037  35.016  37.038  38.057  39.029  39.038
        39.049  40.031  41.034  42.058  43.010  43.019  43.023
        44.006  44.020  44.035  44.041  46.013  46.022  46.038
        47.018  47.029  48.025  48.040  50.007  51.053  52.007
        52.022  52.036  53.011  53.020  54.012  55.041  56.017
        57.012  57.056  59.007  59.046  63.017  63.028  63.037
        63.060  67.012  81.027  81.044  81.055  82.015  82.050
        83.029

.AIO    77.018  79.009:

.BANS   10.031  11.032:

.BPC    58.014  58.031:

.BPC4   19.027  21.034  21.050

.BPCT   58.023  58.038:

.BSA    48.038  58.021  59.012  59.041  60.029

.BUFFE  12.010  12.014  13.028:

.COLON  14.019  15.023:

.DCHC   80.015  80.018  80.030:

.EXIT   76.026  78.044  79.044  79.046:  80.039

.GET    57.043  58.040:

.GETS   57.016  58.043:
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.GETF	58.039:	59.022	59.027	59.044			
GETS	58.035	58.041:	60.062				
.HBA	16.018	16.035	16.049	17.040			
I.O	77.055	80.012.					
ICDP	5.007:	12.016	25.025				
ICEC	5.008:	37.033	41.027				
.INFO	19.020	21.040	55.031	56.045	57.049	60.007	64.016
LSN	55.032						
RCPS	19.028	20.013:					
.NIO	77.043	80.017'					
.R	67.019:	67.035	67.040				
RCDG	40.041:	41.046					
SKP	77.036	80.020'					
.STLG	78.013	78.029:					
T4A	5.038:	10.022					
TCHA	7.045'	23.058	69.012				
.TEAT	7.042:	67.058	68.052	69.040			
TOCT	7.046:						
.TXTF	8.012	8.040	11.024	11.046	13.014	14.010	17.019
	17.031	18.008	18.027	18.048	24.008	24.027	35.008
	37.028	38.039	41.021	42.047	43.016	43.030	45.010
	45.023	61.011	61.031	61.043	62.011	63.034	65.008
A	77.009	77.010	77.012	77.024	77.052	77.053	78.010
	78.011						
AANCE	4.009	84.014=	84.017				
ABENI	70.034:	71.008	71.017	72.012	72.015	72.029	72.042
ABEND	66.042	66.059	67.056	67.061:	69.050	70.034	
ACBS	7.044	72.040	74.025	74.045:			

ACIV	7.043	70.043	72.011	72.027	74.020:		
ACIV1	74.024:	74.039					
ACNT	19.033	25.037	56.012				
ACT	9.017	15.042	27.008	28.033	48.030	53.037	58.010
ACTB	40.040	43.049	44.008	44.010	44.020:		
ACTB1	44.024	44.039:					
ACTBL	44.034	44.045:					
ACTBP	44.030:	44.052					
ADEF	6.044	61.023.					
ADERR	6.043=	22.034	23.027	23.047	24.016	24.042	30.024
	30.038	33.017	33.037	34.029	34.036	36.019	38.011
	38.022	40.025	42.016	42.039	57.025	57.040	
ADERRO	16.024	16.039					
ADR	70.032	70.041:	78.036				
ADR	70.030	70.036:					
ADR 1	70.048	71.007:					
ADR 2	70.054	71.012:					
ADR 3	71.015	71.019:					
ADR1	7.032:	53.013	67.014	70.052	71.022		
ADRM	70.031	70.039.					
ADRMC	7.031:	70.037	70.039	70.045			
ADRNC	70.029:	70.044					
AHA	27.036	82.010					
ALLOLE	21.044	81.054					
ALLFLU	7.021	21.048					
ALLOCA	16.045						
APEND	14.031	16.077					

APND1	16.026:	16.027					
APND2	17.011:	17.014					
APNDA	16.042	18.007:					
APNDD	18.025	18.047:					
APNDE	16.046	18.024:					
B	77.011	77.050	77.051	79.036	80.022		
B.CNT	7.037:	68.029	69.029	69.038	71.055		
BEGIN	6.007=	7.015	8.047	11.020	11.029	13.012	13.023
	14.023	14.026	17.047	18.022	18.045	18.061	19.017
	20.011	23.028	25.017	25.050	28.038	30.039	32.035
	33.014	34.014	34.046	34.053	35.019	36.031	36.043
	36.053	37.044	39.026	43.047	46.031	47.035	48.044
	49.040	51.010	52.017	61.020	61.040	61.047	61.055
	62.023	66.027					
BGIN	6.008	14.007:					
BGINB	11.032	14.029.	15.010	15.013			
BKFPL	8.032:	8.038					
BPASS	5.010.	10.017					
BPC	3.034=	15.028	15.038	15.047	19.046	19.048	19.050
	19.052	22.036	36.022	49.026	53.022	56.019	57.014
	57.057	59.008	59.047	63.025	63.030	81.028	
BPS	9.009	21.034	58.038				
BRKP	20.050	20.054:					
BRKP0	19.013	19.019:					
BRKP1	19.022	19.027.					
BRKP2	19.025	19.032:					
BRKP3	19.040.	21.024					
BRKP4	19.043	20.019:					
BRKP5	20.032:	21.012					
BRKP6	20.021	20.035					

[illegible]	20.039	21.007:					
[illegible]	20.035	20.053	21.017	21.019:			
BRKPE	19.015	19.024	19.031	19.037	20.017	20.031	20.044
	20.047	21.008	21.015	21.027:			
[illegible]	14.032	19.007:					
[illegible]	73.020:	73.027					
[illegible]	70.029	73.019:					
[illegible]	59.043						
[illegible]	17.016						
[illegible]	21.051						
BUMPUS	38.033	39.048	44.027	44.051			
[illegible]	77.012	77.013	77.016	77.048	77.049	78.058	79.011
	79.040	79.041	80.036				
[illegible]	83.037	83.053:					
[illegible]	83.039	83.051:					
[illegible]	71.028:	72.033					
[illegible]	83.035	83.049	83.060:				
[illegible]	70.031:	71.049					
[illegible]	70.032:	71.052					
[illegible]	36.045	36.059					
[illegible]	11.010	22.039	39.020	40.020	63.012	63.013	81.023
[illegible]	12.039	12.049	36.048	47.011	47.032	66.046	
[illegible]	21.013	70.009					
[illegible]	20.024	21.031:					
[illegible]	10.050	12.026	12.051				
[illegible]	22.021						
[illegible]	4.021:	31.031	51.039				

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0140    4.023:   9.021   15.043   27.009   28.034   29.016   48.031
       53.038   58.011   63.051   83.053

016     13.033

0177    16.032   31.016   36.029   51.023   57.036   66.048   73.019
       75.038   83.046

02      12.013   25.024   36.021   36.041   59.050

030     37.046

0200    19.019   31.040   32.015   71.013   75.041

0213    11.039

0220    75.011   75.059:

0235    10.028   14.024   15.020   19.041   22.017   22.028   23.038
       25.015   26.012   26.032   27.026   28.020   30.031   31.011
       32.019   33.028   33.031   36.035   37.015   40.022   43.008
       46.036   47.016   48.020   51.020   51.051   52.033   66.022
       66.037   66.054

0333    4.014:   30.032

0240    9.032   10.032   23.032   23.057   36.034

0247    4.015:   15.030   63.029

0254    4.016:   20.015   22.013   31.007   37.011   51.013   52.043

0265    4.017:   15.034   63.024

0356    4.018:   25.009   28.014   71.047

0287    4.019:   11.014   12.031   17.043   48.013

0272    4.020:    9.022   14.017   30.013   36.009

0275    20.029   20.042   21.010   21.032:

03      39.045   44.048   71.043

0300    10.041   12.038   13.044   20.019   25.018

0324    66.025

0377    31.037   43.050   51.045   54.033   58.011   56.033   59.017
       70.049   71.031   74.050
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C4          5.030    20.045    52.031
C40        72.035
C400       16.025    16.036    21.020    21.033    51.026    51.041    57.023
           57.038    60.034    71.012
C5         22.040    36.015
C50         4.013:
C6         10.029    12.008    63.007    81.024
C60        74.027    74.056.   75.018
C6or        4.022:   31.028    51.036
C7         23.008    47.036    74.029
C70        64.025    65.021:
C77        72.013    72.018
C777       60.051
CAL:        7.013     7.018     7.023     8.009    10.018    10.047    10.052
           11.012    12.011    12.029    12.053    16.044    19.035    21.043
           21.045    22.041    23.014    25.039    27.030    32.028    33.047
           39.046    40.029    42.044    43.006    43.041    44.028    44.049
           45.020    45.041    46.029    46.034    47.041    49.036    51.061
           56.014    61.008    61.024    62.008    63.015    64.047    81.025
           81.053
CAC         6.038    63.043:   63.047    63.057
CAOR       63.050    63.069
CATO        6.037=   15.026    20.028    20.033    20.041    20.051    21.009
           23.016    28.019    31.010    37.014    48.017    51.015    52.047
           66.036
CO1        66.028:   78.032    78.040    78.050    78.056    79.009    79.014
           79.019    79.025    80.020    80.024
CO3        65.027:   77.007    77.045    78.007    78.015    79.034
CONE       69.034    69.045:
COOM       65.045    69.033:
COR        62.035:   68.061
```

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CDEM      68.036    69.021:
CDL       68.053    69.007:
CDNX1     68.062    69.009    69.011    69.025'
CDNXB     68.040:   69.031
CDNXY     68.036:   69.030
CDVAL      7.033:   68.035    68.040    68.051    69.022
CESF       7.007=   23.012    46.010    47.039    50.011
CFM       17.051    56.051
CHANNE    12.019    25.028    37.024    37.035    39.023    39.035    41.017
          41.026    43.044    44.032    61.027
CHKCF     19.036
CHKRF     25.040
CHKWF     56.015
CHM1      21.042
CHSUM     49.037
CIA       10.053    11.013    12.030    12.054    22.042    63.016    81.026
CXBL      64.028:   64.033
CLBRK      6.052=    8.024    19.016    21.027    29.014    81.052
CLEAR     37.025    39.024    41.018    43.045    61.028
CM20      40.039.   41.044
CM3       29.021    29.025:
CM40C     17.007
CMAND     14.033    81.038:
COA        6.023    63.010:
COAA       6.026    63.022:
COAD       6.029    63.008    63.012:
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COADR	63.007:	63.023					
COLNG	23.025	23.030:					
COLON	15.023	23.022:					
COMMA	72.033:	78.030	78.038	79.030	80.014		
COPYMD	6.058=	25.047	28.037	81.059	82.016		
CORA	16.022	56.031	57.017	58.015			
COSY	6.032	67.030:					
COSYM	6.031=	33.045	43.021	81.035			
COTA	6.022=	8.021	8.036	8.046	11.017	17.029	17.042
	17.046	35.019	42.060	43.014			
COTAA	6.025=	22.032	23.042	32.024	33.035	46.042	47.020
	51.057						
COTAD	6.028=	22.044	40.027	47.028	49.039		
CPNFF	27.031						
CPPPN	10.048						
CPU	80.037						
CPYMSC	6.059	83.024:	83.061				
CRSMX	6.053	81.039:	81.047				
CTAB	23.054	23.061:					
CTRL	14.029	15.007:					
CTRLC	15.012	15.016:					
D	76.021	77.009	77.010	77.012	77.022	77.048	77.049
	77.050	77.051	77.052	77.053	78.011	78.017	80.022
DAC	56.024	58.030					
DAS	54.022	56.025	59.016				
DATAPU	7.020	16.052	17.015	21.047	25.033	27.037	55.022
	64.021	64.036	81.012	82.012	82.033	82.051	
DB	57.032	59.051	60.012	60.025	60.032	60.053	

DBC	60.009	60.021					
DBB	60.014	60.058					
DCON	64.017						
DECIMA	64.043						
DELTA	7.035	68.033	68.044				
DESCP	9.013	61.050:					
DEVCS	72.009:	80.040					
DEXIT	7.018:	9.014	9.020	10.013	11.055	49.014	61.054
DFT.	21.039						
DHDR	28.045	56.042	56.044	57.041	57.048	58.020	83.058
DMASK	10.026:	11.036					
DSCO	21.041						
DSP1	9.023	10.007:					
DSP10	3.022=	34.024	34.040	44.009	44.011	46.008	46.014
DSP11	3.023=	41.009	42.022	44.014	44.016		
DSP12	3.024=	41.047	42.020	42.035	42.040		
DSP13	3.025=	15.019	41.008	42.007	42.025	47.049	
DSP14	3.027=	42.014	42.017	43.020			
DSP15	3.028=	41.014	41.036	44.023	44.036		
DSP16	3.029=	47.010	47.022	47.031	51.009		
DSP17	3.030=	41.035	44.022	44.038	44.039		
DSP1A	9.025	10.017:					
DSP1B	10.021:	11.041					
DSP2	10.038	11.007:					
DSP3	10.036	11.023:					
DSP4	10.020	11.034:					

```
DSP3        11.038    11.045:

DSP4        10.040    12.007:

DSP4P       12.035:   13.009

DSP4A       12.021    13.025:

DSP7        10.046    10.054    12.055    13.010:

DSP7Q       12.048    13.007:

DSPDA        4.033:   11.016    16.017    16.048    26.022    29.018    49.034
            84.027    82.032    83.033    83.059

DSPHOR       4.047:   12.007    12.022    16.008    19.032    25.036    25.042
            37.040    55.014    55.021    56.011    56.026    57.033    57.044
            59.024    81.009    81.016    82.036

DSPLU        4.031:   11.009    12.017    16.016    16.047    26.020    29.015
            49.032    59.011    82.025    82.031    83.032    83.048    83.057

DSPPCB       4.043:   10.044    26.026    27.034    29.022    55.028    83.028
            83.055

DSPS         3.016     3.014     3.016     3.017     3.018     3.019     3.020
             3.021     3.022     3.023     3.024     3.025     3.027     3.028
             3.029     3.030    22.010    22.026    22.027    22.031    22.046
            22.049    23.007    23.017    23.019    48.026

DSPSD        3.012=   25.047    28.011    28.018    28.024    48.034    81.057
            83.030

DSPST        3.014=   25.048    28.023    28.029    48.035    81.058    83.031

DSPS2        3.016=    8.020    19.054    81.046

DSPSS        3.017=    8.028    15.017    16.021    19.011    19.053    23.023
            23.041    23.046    24.033    24.037    24.043    31.015    31.018
            31.022    32.021    33.011    33.034    34.011    34.018    34.031
            34.034    34.049    35.017    37.018    37.039    38.020    38.058
            40.030    41.011    41.058    42.059    43.011    46.023    46.039
            47.019    47.021    47.030    48.018    48.042    50.021    51.027
            51.030    51.054    52.037    53.058    53.018    53.021    53.042
            54.013    55.042    56.018    57.013    63.018    63.038    67.013

DSPS4        3.018=   31.014    31.046    32.013    33.012    33.025    33.038
            34.017    34.019    34.039    37.017    37.040    41.012    41.049
            45.033    46.024    48.009    48.016    48.019    48.041    50.022
            51.024    51.047    52.005    52.007    52.038
```

```
DSPSS    3 019=  31.021  32.033  33.015  34.012  34.022  34.033
         34.047  34.054  41.010  41.055  41.056  46.017  49.020
         50.009  50.016  50.018  50.029  51.029  52.010  52.026

DSPSS    3 020=  31.019  31.039  32.031  33.008  34.008  39.030
         39.038  44.021  44.042  46.018  49.021  50.010  50.014
         50.020  50.027  51.012  51.017  51.025  52.012  52.013
         52.034

DSPST    3 021=  34.032  34.038  39.031  39.050  40.021  40.034
         44.007  44.017  46.023  46.043  51.016  52.014

DSPTVP   4 035:  10.034  13.010  16.007  19.007  26.015  29.009
         45.025  53.023  57.018  82.022  82.028  83.027  83.045
         83.054

DSUB.    56.046  57.050

DUMP     14.034  22.006:

DUMP0    22.013  22.028:  23.020

DUMP1    22.033:  22.050  23.010

DUMP2    22.038  22.044:

DUMP3    22.048  23.007:

DUMP4    22.052  23.011:

E        76.019  76.032  76.036  76.042  76.044  76.050  77.015
         79.037

ENTR     14.025  23.036:

ENTR0    23.038:  24.017  24.031  24.034  24.035  24.038  24.039
         24.044

ENTR1    24.014  24.019:

ENTR2    23.052:  23.059

ENTR3    23.034  23.043:

ENTR4    24.021  24.032.

ENTR5    23.056  24.007:

ENTR6    24.023  24.037.

ENTR7    24.025  24.041:
```

```
ESCT        7.006    7.012   14.008   34.025   37.041
ETSF       38.031   44.025
EXIT       67.052:  79.046   80.010
EXIT1      71.025:  72.031
EXIT0      67.051   71.026   78.037   80.041
F          76.010=  76.015   76.017   76.019   76.021   76.023   76.030
           76.032   76.034   76.036   76.038   76.040   76.042   76.044
           76.046   76.048   76.050   76.052   76.054   76.056   77.009
           77.010   77.011   77.012   77.013   77.014   77.015   77.016
           77.022   77.024   77.026   77.033   77.040   77.047   77.048
           77.049   77.050   77.051   77.052   77.053   78.009   78.010
           78.011   78.017   78.018   78.019   78.020   79.036   79.037
           79.038   79.039   79.040   79.041   79.042   80.032   80.034
           80.036
FDA        21.042   25.032
FMDR       53.029   55.007:
FIL40      26.019   26.025:  27.041
FIL45      26.034   27.007:
FIL80      25.036   27.034:
FILE       14.036   25.007:
FILE1      25.046:  26.023   26.027   29.019   29.023
FILE3      25.041   26.007:  26.017   27.032   28.016   28.022   28.026
           28.031   28.036   29.008   29.011
FILE4      25.011   26.010:
FILE5      25.020   26.029:
FILE6      27.013:  27.024
FILE7      27.014   27.026:
FIMOLU     25.025   48.022   62.026
FIX        64.044
FL.NO      74.022   74.035   74.055:
```

```
GBCORE      53.025    53.035:

GBFILE      53.031    55.035    55.046    56.007:

H           76.009=   76.015    76.017    76.019    76.021    76.023    76.030
            76.032    76.034    76.036    76.038    76.040    76.042    76.044
            76.046    76.048    76.050    76.052    76.054    76.056    77.009
            77.010    77.011    77.012    77.013    77.014    77.015    77.016
            77.022    77.024    77.026    77.033    77.040    77.047    77.048
            77.049    77.050    77.051    77.052    77.053    78.009    78.010
            78.011    78.017    78.018    78.019    78.020    79.036    79.037
            79.038    79.039    79.040    79.041    79.042    80.032    80.034
            80.036

HDRAF       29.013    29.021:

HEADR       14.038    29.007:

I           76.015    76.019    76.021    77.013    77.024    77.040    77.049
            77.051    77.053    78.009    78.018    80.032

ISP          7.038:   66.045    66.052    66.053    67.009    67.051    68.054
            69.036    72.032    72.039    72.043    74.024    74.026

ISP.        25.022

IOPO        66.044    67.008    67.018:

IOPNR        7.039:   69.021    69.035

IOPRF       67.018    75.061:

IOOF         5.007    37.043:

IOOO         5.008    40.044:

ILEG         6.011    14.046    14.050    61.042:

ILLA         5.047    61.007:

ILLAD        5.046=

ILLADD      56.013    58.017    58.033    60.007

ILLEG        5.010=

ILLEGA      13.026    14.021    14.028    15.045    16.011    16.015    19.009
            21.028    22.015    22.019    23.024    23.031    23.037    25.030
            25.008    25.014    27.011    27.026    30.015    31.009    31.013
            33.010    33.030    34.010    36.008    37.013    37.021    38.037
            39.044    40.019    41.007    43.029    47.009    47.015    47.048
```

```
LAD1        71.042   71.049:
LADAB       71.022:  71 046
LADTP       71.033   71.055:  72.020
LBA         36.013
LDEVC       72.010   72.018:
LIST        14.042   33.023:
LIST1       33.031:  33.049
LIST2       33.040   33.045:
LIST3       33.043   33.046:
LPNTR       67.036   67.039   67.041   67.044   68.028   68.036   68.037
            68.049   68.050   69.018:  69 025   69.045
M           77.014   77.016   77.026   78.020
MATCH        7.030:  67.046   69.024   69.033
MEPS        20.013
MESSAG      45.042
MMA         68.026:  76.013   76.028   77.020   77.031   77.039   80.030
MOVE0       34.016   34.023:
MOVE1       34.025:  34.050
MOVE2       34.049:  34.056
MOVE3       34.042   34.052:
MOVE4       34.027   35.007:
MOVE5       11.043   34.007:
MOVEW0      11.012
MV           7.034:  68.030   69.007   69.023   69.037
MVCHA       68.055   69.010   70.009:
N           73.023   76.019   76.038   76.044   76.048   76.056   77.009
            77.013   77.013   77.040   78.009   79.036   79.038   79.040
```

N	(CONTD)	80.026					
NAME	57.007	57.053					
NBLK	56.038						
NITM	3.054						
NOP	9.027	23.049	32.032	34.048	34.055	40.033	52.009
	75.046						
NOTM	6.062	62.007					
NOTME	6.061=						
NOTMEM	60.045	60.057					
NSRCH	14.044	35.024					
NXTP1	69.046:	72.045					
NXTPR	67.040:	69.016	69.046				
O	76.015	76.052	77.014	77.016	77.040	77.048	77.050
	77.052	78.009	79.011	80.034			
OBP.	36.018						
OCC	23.045	23.053	75.045				
OINST	6.035	81.021:	81.022	81.030	81.034	81.036	
OK	64.019	64.023	64.042:				
OPEN	37.036	41.029					
OPENRE	12.020	25.029					
OPT.C	72.025:	79.032					
OUTBYT	8.023	8.033	10.033	10.042	11.015	12.032	12.045
	13.007	17.044	22.029	23.011	23.033	23.039	32.019
	33.032	36.010	36.046	36.050	40.023	43.009	46.037
	47.017	51.052	63.027	63.032	75.043		
OUTINS	6.054=	23.051	32.026	33.042	46.044	51.059	
OUTP1	36.018:	36.057					
OUTP2	36.029	36.056					

```
OUTPS       34.038    36.050
OUTPT       14.045    36.007:
OUTTEX       8.011     8.039   11.007   11.018   11.023   11.045   13.013
            14.009    17.018   17.030   18.007   18.026   18.047   24.007
            24.026    35.007   42.046   43.015   45.009   45.022   61.010
            61.030    61.042   62.010   63.033   65.007   81.031
P           76.046    77.033   77.047   78.020   78.058   79.042   80.036
PAD.        55.036    55.043
PARA         6.041    52.021:
PARA1       52.033:   52.050
PARA2       53.035    52.043:
PARAM        6.040=   33.007
PASAME      34.007    46.009   49.016
PASSCD      10.019
PASSW        8.010     8.053:
PNCH1       37.038:   38.034
PNCH2       37.037    38.036:
PNCHE       37.010    39.006:
PNCHO       37.027    37.033:  38.044
PNCS        64.031.   64.039
PNT4A        8.038    64.015:  64.042   64.046
PRDSN       69.039:   70.051   71.020   71.057   72.016
PUNCH       37.009:
PUTB        53.048    53.051.
PUTBYT      38.050    38.055   53.051   66.050   67.007
PWORD       37.036    38.006   38.017   38.023   38.027   38.046:  39.009
            39.013    39.017   39.019
PWRIT       39.032.   37.051
```

```
SAVRA       67.036:   67.043
SBA         18.022
SBLK        55.027    54.015:
SCAAL       10.010:   10.016
SCOPE        7.024
SCORE        6.056    81.050:   81.060
SDSB.       60.008
SELCOR       6.055=   13.025    35.012    26.007    28.043    49.013    82.042
SET         10.025    20.009
SETDIR      55.023    82.052
SIGPAU      39.047    44.050
SKIPD       61.052    82.019
SKPPR       69.045:   69.049
SPACE       72.035:   78.022    78.049    79.023    80.028
SPCML       72.037    72.044:
SRACL       78.029    78.049:   79.031    80.009    80.013
SRCMC       46.010:   46.028
SRCML       46.012    46.022:   46.046
SRCM2       46.021    46.033:
SRCM3       46.026    46.029.
SRCNI       46.015    46.020:
SRCMM       14.049    35.026    46.007:
SRIOP       78.056:   80.012    80.017
STAD        58.028
STAT        16.012    56.027
STINPU      14.015    24.012
```

```
STCMP       7.017   14.014   53.015   24.011   32.027   33.046   40.028
           43.022   46.045   47.040   51.060   61.007   61.023   62.007

STOW        6.014   53.016:

STRNG       5.013=  23.026   24.015   30.023   30.037   33.016   34.035
           42.038

STPOP      67.016   67.033:

SWILL      82.027   82.039:

SWPI        9.011   82.009:

SWPIC      82.021   82.042.

SWPID      82.024   82.030   82.037   82.043.

SWPO        9.012   82.048.

SZP        55.037

T          76.017   77.024   78.010   80.032   80.034

TBLOK      49.017   49.042:

TPOF       44.060   84.017=

TEMP        7.036:  66.047   66.057   68.057   68.059

TEST        7.042   70.041   72.009   72.025   72.036   74.009:

TOUT2      75.040   75.047.

TOUTBY     75.026   75.031:

TPCH2      75.026:  75.028

TPCHA       7.045   71.048   71.054   72.044   75.020   75.025:

TPNXT      75.011   75.021

TPOUT       7.046   71.024   71.056   75.007.

TRAPFA      9.026   10.049   37.026   39.025   41.019   42.034   43.046
           61.029

TS          5.012    8.027    8.034    8.035    8.043   10.021   10.027
           12.025   12.035   12.036   12.043   12.046   15.009   15.021
           16.031   17.028   19.010   19.038   19.040   19.045   20.023
           20.027   21.020   27.012   27.016   27.021   27.029   28.042
```

```
TS          (CONTD)    28.044     30.017     30.020     30.030     31.036     32.025
             36.020     36.054     37.049     38.007     38.018     38.024     51.044
             51.058     52.030     52.048     52.049     82.009     82.043     82.048
             82.054

TS1          5.013:     8.031      8.037     12.034     13.008     15.025     15.052
             16.034     16.051     17.045     19.047     20.052     30.027     30.036
             36.017     36.040     36.044     36.051     37.050     38.014     52.021
             52.040

TS2          5.014:    15.027     15.051     19.049     20.032     36.027     36.055
             37.052     38.028     38.056     52.032     52.044

TS3          5.015:    19.051     20.034     36.039     36.047     37.023     38.036
             38.046     38.059     41.015     43.027

TS4          5.016:    38.047     38.051

TS5          5.017:    38.009     38.012

TS6          5.018:    37.054     38.048     38.049     38.053     38.054     39.007

TS7          5.019:

TS8          5.021:    53.017     54.011     54.014     54.015     63.043     63.061

TS9          5.022:    53.019     53.046     54.007     55.016     59.029     63.045
             63.052     63.059

TS10         5.029:    63.014     63.019

TS11         5.030:    63.022     63.039

TS12         5.031:

TS13         5.032:

TS14         5.033:

TS15         5.034:

TS16         5.035:

TS17         5.036:    64.024     64.034     64.035     64.040

TS8A         5.023:    53.018     53.047     54.008     55.017     56.008     59.018
             66.019     66.024     66.031     66.035     67.030     67.053     67.058
             67.062

TS9A         5.024:    54.026     56.041     57.031     59.014     60.033
```

```
TSS4          5.025:
TSS5          5.026:
TSS6          5.027:
TSS7          5.028:
TT!          80.033
TTO          80.035
TYPE         19.034    25.038    56.013    58.025
U            78.023    77.011    80.036
UDMP1        47.016:   47.043
UDMP2        47.021:   47.038
UDUMP        14.051    47.008    47.024
UL           17.016    82.052
UNIT         12.027    17.041    25.043    57.008    57.045
UNLATC       64.037    81.013
UNA          82.041
V            77.014
VAD10        60.019    60.029:
VAD11        60.039    60.042    60.047:
VAD12        56.010    56.017:
VAD13        57.011    57.017:
VAD14        57.024:   57.028
VADIL        60.037:   60.045
VADR1        56.030    57.007:
VADR2        56.048    57.047    57.055    59.007:
VADR4        58.008    59.011:   59.049
VADR5        59.019    59.027:
```

XCKSB	50.013	50.021:					
XCKSD	49.039:	50.031					
XCKSM	49.008	49.016:					
XFIXBU	7.019	21.046					
XGETBY	12.037	12.047					
XITD	14.054	49.007:					
XITX	11.043	49.009	65 019				
XLOPA	55.033						
YBCD	14.035	51.007:					
Z	76.038 77.037	76.040 79.039	76.054 79.041	76.056 80.026	78.017	78.018	79.012
ZREL	14.056	51.012:					
ZREL1	51.023:	52.016					
ZREL2	51.030:	52.011					
ZREL3	51.033	51.035	51.038	51.043	51.050	52.007:	