## IDENTIFICATION

PRODUCT CODE:    DEC-9A-EUFC-D

PRODUCT NAME:    DECTAPE FORMAT GENERATOR

DATE CREATED:    JANUARY 1, 1971

MAINTAINER:      DIAGNOSTIC PROGRAMMING GROUP

AUTHOR:          EDWARE P. STEINBERGER

(13)

ABSTRACT

The DECTAPE FORMAT GENERATOR FOR PDP-9/15 is a program to allow
the creation of mark and timing tracks, block numbers, and an
initial data pattern on a reel of virgin DECtape.  Any block
size greater than 4 and divisible by 2 (up to 6866) may be
specified.  Any number of blocks greater than 1 may be specified
as long as there is sufficient room on tape.  Normally, standard
format is written on tape (256 words per block, 578 blocks,
numbered 000000 to 001101 (octal).  All communication between
the operator and the computer is done via  the Teletype.

## 2.    PRELIMINARY REQUIREMENTS

### 2.1    Storage

This program uses all of 8K memory for program or as a buffer
area to contain information written on a read from DECtape,
if non-standard format is specified.  Otherwise, only 4K of
memory is used to store and run the program.

### 2.2    Equipment

Requires standard PDP-9 or 15 computer with TC02-TC15 DECtape
Control Unit and at least one TU55/TU56 DECtape Transport.

## 3.    LOADING PROCEDURE

The program is loaded from paper tape using the  Macro-D
tape loading procedure.

1.    Place tape in reader with blank tape over the read diodes.
2.    Set the ADDRESS Switches to 17700.  (17726)
3.    Depress I/O RESET; set BANK MODE to a 1 (PDP-15)
4.    Depress READ IN key.
5.    Program will load and start itself.

## 4.    STARTING PROCEDURE

The program, when loaded as discussed in section 3 is self-starting.
However, if it is desired to restart the program, set 00100 in
the ADDRESS switches, depress STOP, I/O RESET, then START.

## 5.    OPERATING PROCEDURE

Upon starting, the program will type out its name:

DECTAPE FORMAT GENERATOR - PDP-9, TC02, TU55

Then it will start to interrogate the operator to ascertain his
desires.

a.  The first question asked the operator is to allow him
    to indicate on which transport he desires to mark tapes:

          MARK TAPE ON UNIT

    He responds by typing the decimal number (digit) of the
    proper transport and then any non-numerical character.

b.  The second question determines whether standard or
    non-standard format is to be written:

          DO YOU DESIRE STANDARD FORMAT (256 WORDS, 578 BLOCKS)?

          (TYPE Y-YES, N-NO)

    If standard format is to be written, the operator types Y;
    if non-standard format, he types N.

c.  Typing N in step b or f causes a series of questions
    to be asked to determine proper block size quantity:

          HOW MANY BLOCKS?
          HOW MANY DATA WORDS?

    Checks are made to assure that the answers provided are
    legitimate:

          NUMBER OF BLOCKS MUST BE 2 OR MORE.
          BLOCK FORMAT REQUIRES 4 OR MORE DATA WORDS.
          NUMBER OF DATA WORDS MUST BE EVEN.
          TAPE IS NOT LONG ENOUGH.
          8K OF MEMORY CAN'T CONTAIN THIS SIZE BLOCK.

d.  The program will then type out operating instructions to
    allow the operator to ready the unit to mark tape:*

          SET SWITCH LABLED WRTM-NORMAL-RDMK TO WRTM AND ENABLE.
          WRITE ON SPECIFIED UNIT THEN STRIKE A KEY ON THE
          KEYBOARD.
          AFTER MOUNTING A VIRGIN TAPE AND TAKING 2 WRAPS ON
          TAKEUP REEL.

    A check is made to assure that the directions have been
    properly followed and, if not, an error message is typed out:

          SELECT ERROR, CHECK FOR THESE CONDITIONS:

          WRITE NOT ENABLED
          NON EXISTENT UNIT
          MULTIPLY EXISTENT UNIT
          SWITCH NOT IN WRTM POSITION

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* This printout may be suppressed by setting AC switch 0 to 1 (up)

e.  After making one pass down the tape to write the mark track,
    further instructions are typed to the operator:*

        SET SWITCH LABLED WRTM-NORMAL-RDMK TO NORMAL, THEN
        STRIKE A KEY ON THE KEYBOARD.

    If the tape has run off the reel, it should be remounted
    before the key is struck.

f.  Three more passes will be made on the tape to complete the
    marking and vigin pattern procedure, after which time the
    end of the tape will be allowed to run off the takeup reel
    and the format of the tape will be typed out:

        DONE!  TAPE HAS MMMMMM BLOCKS (OCT) EACH NNNNNN WORDS
        (OCT) LONG

    The operator will then be asked if he wishes to mark another
    tape to this format:

        DO YOU DESIRE TO MARK ANOTHER TAPE TO THIS FORMAT
        (TYPE Y-YES N-NO)?

    If the operator types Y the program returns to step d,
    if he types N the program returns to step c.

5.1  Details of Operation

a.  First the name of the program is printed on the teleprinter.
b.  The operator is asked to indicate the number of the transport
    to be used to mark tape.  This number is checked to make sure
    that it is between 1 and 8.  It is then moved into the
    proper bit position for combination into control words for
    the DECtape control.
c.  The operator is asked if standard format is desired.  If it is,
    the program proceeds to step f.  If standard format is not
    desired, the program proceeds to step d.
d.  The operator is asked to type in the number of blocks to be
    written on tape.  A check is made that at least 2 were
    specified.
e.  The operator is asked to type in the number of data words
    per block.  The number is checked to make sure it is at
    least 4.  It is then checked to make sure it is even, then
    that it is not too large (attempt to overflow 8K of memory).
    Then check is performed to make sure that the number of marks
    required to be written on tape (number of blocks times number
    of data words+10, plus expand codes, plus end zones) is not
    too large.  The program then goes to step g.
f.  Constants are then set up for the number of blocks and
    data words (standard format).
g.  Unless suppressed by ACS 0=1, operating instructions are
    printed on the teleprinter to instruct him as to what he
    should do after which time checks are made to assure that
    he has done as instructed.

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* This printout may be suppressed by setting AC switch 0 to 1 (up).

h. The DECtape control is then instructed to Write Timing and Mark Track and word count and current address are initialized so that 8192 reverse end zones are written on tape. Word count and current address are again initialized, this time for 199 expand codes.

i. Word count and current address are again initialized after which time the buffer area of memory is filled with the mark track pattern for one block of tape. This pattern consists of 1 expand code, 1 forward block mark, 1 reverse guard, 4 lock, (N-4) data marks, 4 prefinal, 1 guard, 1 reverse block mark, and 1 expand code. This pattern is written on tape for as many times as the number of blocks specified.

j. After initializing word count and current address, 199 expand codes, then 8192 forward end zones are written on tape. After this is completed the transport is stopped.

k. Unless suppressed by ACS 0=1, the operator is told to set the switch on the maintenance control panel back to NORMAL after which time a check is made to make sure this is done.

l. The DECtape control is then put in Search Continuous Reverse and is caused to search backwards 2 blocks. It is then put in Write All Continuous (forward) and the complement obverse of the last block number on tape is written into every mark until the tape unit shuts down in end zone. The DECtape control is then put in Search Normal Reverse until the first reverse block mark is found at which time it is put in Write All Continuous (reverse) and all the blocks are written to contain their block numbers (both forward and reverse) and a properly checksummed data pattern, all of which is generated and stored in memory. This is done until the tape unit shuts down in reverse end zone (beginning of tape).

m. The DECtape control is then put in Search Normal (forward) and the block numbers for all blocks are checked in the forward direction. Upon encountering the last block number, the control is put in Write All Continuous (forward) and the last block is re-patterned in the forward direction. The program then waits for the tape unit to shut down in end zone.

n. The reverse block numbers and data pattern are then checked in the reverse direction by alternating the DECtape control between Search Normal (reverse) to pick up block numbers, and Read Normal (reverse) to read the data pattern. After all blocks have been checked, the reel of DECtape is allowed to run off its end.

o. The operator is then informed via the teleprinter of the format written on tape (number of blocks and data words) after which time he is asked if he wishes to mark tape to the same format. If he answers "Yes", the program proceeds to step g. If he answers "No", the program proceeds to step c.

6.      ERRORS

6.1     Error Messages

Most error message prints are due to operator error, either in typing in information or status conditions of the DECtape control or tape drive.  These are discussed in the appropriate paragraph in section 4.  The errors discussed in this section pertain to program or hardware problems.

6.2     Unexpected Error Flag

If an unexpected error flag (hardware error) occurs, some of the following typeouts will occur (the header will always be present):

        THE FOLLOWING UNEXPECTED ERRORS WERE ENCOUNTERED:

        MARK TRACK ERROR
        END ZONE ERROR
        SELECT ERROR
        PARITY ERROR
        TIMING ERROR

These errors are non-recoverable.  The program must be restarted at 00100 to resume marking tapes.

6.3     Too Many Blocks Written

If for some unknown reason the number of blocks specified to be written on tape does not agree with the number of blocks actually written on tape (and is less) the following error typeout will occur:

        TO MANY BLOCKS WRITTEN, PROGRAM ERROR - RELOAD

This error is non-recoverable.  To resume marking tapes, load program into computer as in section 3.

6.4     Wrong Block Number

If during the check of block numbers, the sequence of numbers is unexpectedly broken, the following error typeout will occur:

        BLOCK NUMBER SEQUENCE BROKEN

The program will attempt to recover from this error by rewriting the block numbers and virgin data pattern.  If this error occurs again, the program should be reloaded into memory as in section 3, or a DECtape maintenance diagnostic should be run on the DECtape transport and control.

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                              .TITLE FORMAT
                              .ABS
                      /DECTAPE FORMAT GENERATOR - PDP-9 TC02 TU55
                      /TAPE 1
00100                         .LOC    100
00100    707704       BEGIN   LEM
00101    101174               JMS CRLF               /TYPE CR, LF
00102    761276               LAW MESS1
00103    101144               JMS MESAGE       /TYPEOUT FIRST MESSAGE
00104    761326               LAW MESS2
00105    101144               JMS MESAGE       /TYPE OUT SECOND MESSAGE
00106    700312               KRB     /CLEAR KEYBOARD FLAG
00107    101227               JMS DBCV           /GO TO DEC TO BIN ROUTINE
00110    042461               DAC UNIT           /RETURN WITH UNIT NUMBER
00111    342420               TAD M9
00112    740100               SMA     /IS IT LESS THAN 9?
00113    601272               JMP OVER           /NO
00114    202461               LAC UNIT
00115    745200               SNAICLL /IS IT NOT 0?
00116    601272               JMP OVER           /NO
00117    742020               RTR     /YES, MOVE IT
20120    742020               RTR     /4 RIGHT
00121    042461               DAC UNIT           /AND STORE AWAY
00122    101174       TMESS3  JMS CRLF           /CR, LF
00123    761340               LAW MESS3
00124    101144               JMS MESAGE       /TYPE 3RD MESSAGE
00125    101202               JMS GET /GET CHARACTER KEYED
00126    542462               SAD YYY /WAS IT Y?
00127    600223               JMP STAND         /YES
00130    542431               SAD NNN /WAS IT N?
00131    600135               JMP TMESS4-1       /YES
00132    760277               LAW 277 /IT WAS NEITHER
00133    101166               JMS TYPE           /TYPE "?"
00134    600122               JMP TMESS3         /AND ASK AGAIN
00135    101174               JMS CRLF           /CR-LF
00136    761407       TMESS4  LAW MESS4
00137    101144               JMS MESAGE         /TYPE OUT NEXT MESSAGE
00140    101227               JMS DBCV           /CALL DEC TO BIN
00141    042407               DAC BLOCKS         /STORE NUMBER OF BLOCKS
00142    340457               TAD FOURTH+5
00143    740100               SMA     /MAKE SURE AT LEAST 2 BLOCKS
00144    600150               JMP .+4
00145    762306               LAW MESS24         /NOT 2 OR MORE
00146    101144               JMS MESAGE
00147    600136               JMP TMESS4
00150    101174               JMS CRLF           /CR,LF
00151    761420       TMESS5  LAW MESS5
00152    101144               JMS MESAGE         /TYPE OUT NEXT MESSAGE
00153    101227               JMS DBCV           /CALL DEC TO BIN AGAIN
00154    042416               DAC DATAS          /STORE NUMBER OF DATA WORDS
00155    342432               TAD MINUS4
00156    740100               SMA     /IS IT AT LEAST 4
00157    600163               JMP .+4 /YES
00160    761433       TMESS6  LAW MESS6          /NO TYPE OUT ERROR
00161    101144               JMS MESAGE         /MESSAGE
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00162    600151                    JMP  TMESS5      /ASK QUESTION AGAIN
00163    202416                    LAC  DATAS
00164    742020                    RAR
00165    742420                    SNL      /IS NUMBER DIVISIBLE BY 2?
00166    600172                    JMP  .+4 /YES
00167    761462          TMESS7    LAW  MESS7       /NO, TYPE OUT
00170    101144                    JMS  MESAGE      /ERROR MESSAGE
00171    600151                    JMP  TMESS5      /ASK AGAIN
00172    202404                    LAC  AA
00173    744000                    CLL
00174    342416                    TAD  DATAS
00175    740400                    SNL      /IS NUMBER OF DATAWORD TOO LARGE?
00176    600202                    JMP  .+4 /NO
00177    762332          TMESS8    LAW  MESS25      /YES, TYPE OUT
00200    101144                    JMS  MESAGE      /ERROR MESSAGE
00201    600151                    JMP  TMESS5      /TRY AGAIN
00202    202416                    LAC  DATAS       /THIS
00203    342456                    TAD  TEN /LITTLE
00204    740001                    CMA      /BIT
00205    342434                    TAD  ONE
00206    042414                    DAC  CNTR1       /OF
00207    754000                    CLA!CLL /CODING
00210    342407                    TAD  BLOCKS      /MULTIPLIES
00211    442414                    ISZ  CNTR1       /BLOCK NUMBER
00212    600210                    JMP  .-2 /TIMES DATA WORD+10
00213    741400                    SZL
00214    600220                    JMP  .+4
00215    342463                    TAD  MAGCON      /ADD THIS TO (.) MAX NUMBER OF MARKS
00216    740400                    SNL      /TOO MANY?
00217    600230                    JMP  NEXT        /NO
00220    761524                    LAW  MESS8       /YES, TYPE OUT
00221    101144                    JMS  MESAGE      /ERROR MESSAGE
00222    600136                    JMP  TMESS4      /GO 'WAY BACK
00223    101174          STAND     JMS  CRLF
00224    202411                    LAC  CONST1
00225    042407                    DAC  BLOCKS      /SET UP BLOCKS
00226    202412                    LAC  CONST2
00227    042416                    DAC  DATAS       /AND DATAS
00230    101174          NEXT      JMS  CRLF
00231    750004                    LAS
00232    741100                    SPA
00233    600236                    JMP  .+3
00234    761521                    LAW  MESS9
00235    101144                    JMS  MESAGE      /TYPE OUT NEXT MESSAGE
00236    700312                    KRB      /CLEAR KEYBOARD FLAG
00237    101202                    JMS  GET /WAIT FOR KEY STRIKE
00240    202461                    LAC  UNIT
00241    242377                    XOR  WTMT
00242    242400                    XOR  STOPGO      /FORM UNIT, WTMT, STOP
00243    707545                    707545   /CLEAR AND LOAD "A
00244    740000                    NOP      /WAIT FOR XSA DELAY
00245    740000                    NOP
00246    740000                    NOP
00247    740000                    NOP
00250    740000                    NOP
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00251    740000              NOP
00252    707561              707561  /ERROR CONDITION? (E,F)
00253    620263              JMP FIRST        /NO, PROCEED TO MAIN PROGRAM
00254    707572              707572  /YES, READ STATUS B
00255    502424              AND MASK2
00256    741200              SNA     /SELECT ERROR
00257    601044              JMP ERROR1       /NO
00260    761654              LAW MESS10       /YES
00261    101144              JMS MESAGE       /TYPE OUT ERROR MESSAGE
00262    600232              JMP NEXT
                    /ROUTINE TO WRITE MARK TRACK
00263    202377    FIRST     LAC WTMT         /LOAD AC WITH WTMT FWD GO CONT
00264    242461              XOR UNIT         /COMBINE UNIT NUMBER
00265    707545              707545  /CLEAR AND LOAD "A"
00266    760000              LAW
00267    040030              DAC WC  /SET WC TO = 8192 (DEC)
00270    202362              LAC REVEND
00271    042466              DAC BUFFER       /SET BUFFER TO "55"
00272    202465              LAC BUFFER=1
00273    040031              DAC CA  /SET CA TO "BUFFER=1"
00274    200030              LAC WC  /GET WC
00275    740200              SZA     /IS IT 0?
00276    600272              JMP .=4 /NO, RESET CA
00277    707544              707544  /YES, CLEAR DTF (DONE REV,END)
00300    777471              LAW -307
00301    040030              DAC WC  /SET WC TO =199 (DEC)
00302    202363              LAC EXPAND
00303    042466              DAC BUFFER       /SET BUFFER TO "25"
00304    202465              LAC BUFFER=1
00305    040031              DAC CA  /SET CA TO BUFFER=1
00306    200030              LAC WC  /GET WC
00307    740200              SZA     /IS IT 0?
00310    600304              JMP .=4 /NO, RESET CA
00311    707544              707544  /YES, CLEAR DTF (DONE EXPAND)
00312    202407    SECOND    LAC BLOCKS       /GET NUMBER OF BLOCKS
00313    740001              CMA
00314    342434              TAD ONE /TAKE 2'S COMPLEMENT
00315    042450              DAC SAVE1        /SAVE
00316    042413              DAC CNTR         /AND STORE IN COUNTER
00317    202465              LAC BUFFER=1
00320    040031              DAC CA  /SET CA TO BUFFER=1
00321    040310              DAC 10  /ALSO 10
00322    202416              LAC DATAS        /GET NUMBER OF DATA WORDS
00323    342456              TAD TEN /ADD 10
00324    740001              CMA
00325    342434              TAD ONE /2'S COMPLEMENT
00326    042447              DAC SAVE         /SAVE
00327    040030              DAC WC  /AND STORE IN WC
00330    202363              LAC EXPAND
00331    060010              DAC* 10 /STORE EXPAND CODE IN BUFFER
00332    202364              LAC MARK
00333    060010              DAC* 10 /STORE MARK
00334    202365              LAC REVGRD
00335    060010              DAC* 10 /STORE REVERSE GUARD
00336    202366              LAC LOCK
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00337   260212              DAC* 10 /STORE LOCK,
00340   260210              DAC* 10 /REVERSE CHECK,
00341   260210              DAC* 10 /REVERSE FINAL,
00342   260010              DAC* 10 /AND REVERSE PREFINAL
00343   202416              LAC DATAS
00344   342430              TAD MINUS4
00345   741200              SNA
00346   600356              JMP .+10
00347   740001              CMA
00350   342434              TAD ONE
00351   242414              DAC CNTR1          /SET UP COUNTER FOR N=4 DATA WORDS
00352   202367              LAC DATAM
00353   260010              DAC* 10 /STORE N=4 DATA MARKS
00354   442414              ISZ CNTR1
00355   600353              JMP .-2
00356   202370              LAC PREFIN
00357   060010              DAC* 10 /STORE PREFINAL,
00360   060010              DAC* 10 /FINAL,
00361   060010              DAC* 10 /CHECK,
00362   060010              DAC* 10 /AND REVERSE LOCK
00363   202371              LAC GUARD
00364   060010              DAC* 10 /STORE GUARD
00365   202372              LAC REVMRK
00366   060010              DAC* 10 /STORE REVERSE MARK
00367   202363              LAC EXPAND
00370   060010              DAC* 10 /STORE EXPAND
00371   200030              LAC WC
00372   740200              SZA      /HAS WHOLE BLOCK BEEN TRANSFERRED?
00373   600371              JMP .-2 /NO
00374   707544              707544  /YES, CLEAR DTF (DONE WITH THIS BLOCK)
00375   202465              LAC BUFFER-1    /AND SET UP FOR BLOCK AGAIN
00376   240031              DAC CA
00377   202447              LAC SAVE
00400   240030              DAC WC
00401   442413              ISZ CNTR           /WRITTEN ALL BLOCKS?
00402   600371              JMP .-11           /NO
00403   777471      THIRD   LAW -307           /YES, SET UP FOR 199 EXPANDS
00404   240030              DAC WC
00405   202363              LAC EXPAND
00406   242466              DAC BUFFER         /SET BUFFER TO "25"
00407   202465              LAC BUFFER-1
00410   240031              DAC CA  /SET CA
00411   200030              LAC WC  /GET WC
00412   740200              SZA     /IS IT 0?
00413   600407              JMP .-4 /NO, RESET CA
00414   707544              707544  /YES, CLEAR DTF (DONE EXPAND)
00415   767200              LAW
00416   240030              DAC WC  /SET WC TO -8192(DEC)
00417   202373              LAC END
00420   242466              DAC BUFFER         /SET BUFFER TO "22"
00421   202465              LAC BUFFER-1
00422   240031              DAC CA  /SET CA TO BUFFER-1
00423   200030              LAC WC  /GET WC
00424   740200              SZA     /IS IT 0?
00425   600421              JMP .-4 /NO
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00426    202377                      LAC .TMT          /YES, THEN
00427    707544                      707544 /STOP TAPE
00430    700312           TMES11     KRB       /CLEAR KEYBOARD OF EXTRANEOUS CHARACTERS
00431    750004                      LAS
00432    741100                      SPA
00433    600436                      JMP .+3
00434    761757                      LAW MESS11
00435    101144                      JMS MESAGE        /TYPE OUT NEXT MESSAGE
00436    101202                      JMS GET /WAIT FOR A KEY TO BE STRUCK
00437    202461                      LAC UNIT
00440    707545                      707545 /CLEAR AND LOAD "A" WITH MOVE
00441    740000                      NOP       /WAIT FOR XSA DELAY
00442    740000                      NOP
00443    740000                      NOP
00444    740000                      NOP
00445    740000                      NOP
00446    740000                      NOP
00447    707561                      707561 /ERROR FLAG?
00450    741000                      SKP       /NO
00451    600430                      JMP TMES11        /YES, TYPE MESSAGE AGAIN
                          /ROUTINE TO WRITE LAST BLOCK NUMBER IN REVERSE MARK
                          /THEN ALL BLOCK MARKS AND A VIRGIN PATTERN IN REVERSE DIRECTION
00452    202376           FOURTH     LAC RESERC        /LOAD AC WITH SEARCH, CONTINUOUS GO, REVERSE
00453    242461                      XOR UNIT          /COMBINE WITH UNIT NUMBER
00454    707545                      707545 /CLEAR AND LOAD "A"
00455    202464                      LAC BUFFER-2
00456    040031                      DAC CA /SET CA TO BUFFER
00457    777776                      LAW -2
00460    040030                      DAC WC /SET WC TO -2
00461    200030                      LAC WC
00462    741200                      SNA       /WAIT FOR WC = 0
00463    600467                      JMP .+4
00464    707561                      707561 /ERROR FLAG?
00465    600461                      JMP .-4 /NO
00466    600452                      JMP FOURTH        /YES, START AGAIN
00467    202375                      LAC FWDWAC        /LOAD AC WITH WRITE ALL, FWD, GO, CONT,
00470    242461                      XOR UNIT          /COMBINE WITH UNIT NUMBER
00471    707545                      707545 /CLEAR AND LOAD "A"
00472    140030                      DZM WC /ZERO WC
00473    750001                      CLA!CMA
00474    342407                      TAD BLOCKS        /COMPUTE LAST BLOCK NUMBER
00475    042452                      DAC SAVE3
00476    101115                      JMS CALQL8        /FIND COMPLEMENT OVBERSE
00477    042451                      DAC SAVE2
00500    042466                      DAC BUFFER        /STORE IN BUFFER
00501    202465                      LAC BUFFER-1
00502    040031                      DAC CA /SET CA TO BUFFER-1
00503    707561                      707561 /WAIT FOR ERROR FLAG
00504    600501                      JMP .-3
00505    707572                      707572 /READ STATUS "B"
00506    502423                      AND MASK1
00507    741200                      SNA       /END ZONE?
00510    601044                      JMP ERROR1        /NO
00511    202376                      LAC RESERC        /YES, LOAD SEARCH REV GO CONTINUOUS
00512    242402                      XOR NORCON        /MAKE NORMAL
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00513    242461                      XOR UNIT          /COMBINE WITH UNIT
00514    707545                      707545  /CLEAR AND LOAD "A"
00515    202464                      LAC BUFFER-2
00516    040031                      DAC CA  /SET CA TO BUFFER
00517    707601                      707601
00520    600517                      JMP .-1 /WAIT FOR DTF
00521    707552                      707552  /READ "A"
00522    502443                      AND POINT+3
00523    707544                      707544  /CLEAR FUNCTION BITS
00524    202401                      LAC WAC /LOAD AC WITH WRITE ALL CONT
00525    707544                      707544  /TRANSFER INTO "A"
00526    202465                      LAC BUFFER-1
00527    040010                      DAC 10  /SET UP 10
00530    342460                      TAD THREE
00531    040031                      DAC CA  /AND CA
00532    202447                      LAC SAVE
00533    342460                      TAD THREE
00534    040030                      DAC WC  /SET WC TO 2 LESS THAN USUAL
00535    160010                      DZM* 10 /SET UP EXPAND
00536    750001                      CLA!CMA
00537    342407                      TAD BLOCKS
00540    060010                      DAC* 10 /SETUP BLOCK NUMBER INTO BUFFER+1
00541    202416                      LAC DATAS
00542    342457                      TAD TWO
00543    740001                      CMA
00544    042414                      DAC CNTR1         /SET UP COUNTER FOR # OF 0'S
00545    160010                      DZM* 10 /(DATA WORDS+3) IN MEMORY
00546    442414                      ISZ CNTR1         /AND THEN STORE IN BUFFER
00547    600545                      JMP .-2
00550    750001                      CLA!CMA
00551    060010                      DAC* 10 /SET UP REVERSE CHECKSUM
00552    160010                      DZM* 10 /SET UP LOCK
00553    160010                      DZM* 10 /SET UP REVERSE GUARD
00554    202451                      LAC SAVE2
00555    060010                      DAC* 10 /STORE COMP. OBVERSE IN BLOCK MARK
00556    750001                      CLA!CMA
00557    060010                      DAC* 10 /SETUP EXPAND
00560    202450                      LAC SAVE1
00561    042413                      DAC CNTR          /SET UP BLOCKS COUNTER
00562    750001                      CLA!CMA
00563    340010                      TAD 10
00564    042435                      DAC PNTR          /SET UP PNTR FOR BLOCK NUMBER
00565    200030           HERE1      LAC WC  /WAIT FOR BLOCK TO FINISH
00566    741200                      SNA
00567    600573                      JMP .+4
00570    707561                      707561
00571    600565                      JMP .-4
00572    601344                      JMP ERROR1
00573    707544                      707544  /CLEAR DTF
00574    202465                      LAC BUFFER-1
00575    040031                      DAC CA  /SETUP CA
00576    202447                      LAC SAVE
00577    040032                      DAC WC  /AND WC
00600    750001                      CLA!CMA
00601    342452                      TAD SAVE3         /COMPUTE NUMBER OF CURRENT BLOCK
```

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00602   042452              DAC SAVE3
00603   042467              DAC BUFFER+1    /AND STORE IN APPROPRIATE PLACE
00604   101115              JMS CALQL8      /FORM COMPLEMENT OBVERSE
00605   062435              DAC* PNTR       /AND STORE IT
00606   442413              ISZ CNTR        /HAVE ALL BLOCKS BEEN PATTERNED?
00607   600565              JMP HERE1       /NO
00610   222472              LAC NORCON
00611   707544              707544  /CLEAR CONTINUOUS
00612   707552              707552  /READ "A"
00613   502443              AND POINT+3
00614   707544              707544  /CLEAR FUNCTION REGISTER
00615   202403              LAC SERNOM      /LOAD AC WITH SEARCH NORMAL
00616   707544              707544  /XOR INTO "A"
00617   202464              LAC BUFFER-2
00620   040031              DAC CA  /SET UP CA
00621   707601              707601  /SKIP IF BLOCK MARK FOUND
00622   741000              SKP     /NO DTF, CHECK ERROR FLAG
00623   601106              JMP ERROR2      /DTF, ERROR
00624   707561              707561  /SKIP ON ERROR FLAG
00625   600621              JMP .-4 /NO FLAGS, CHECK ALL AGAIN
00626   707572              707572  /READ STATUS "B"
00627   502423              AND MASK1
00630   741200              SNA     /IS DECTAPE IN END ZONE?
00631   601044              JMP ERROR1       /NO, ERROR
                    /ROUTINE TO CHECK FORWARD BLOCK MARKS AND
                    /REWRITE LAST BLOCK
00632   202450      FIFTH   LAC SAVE1
00633   042413              DAC CNTR        /SET COUNTER TO + NUMBER OF BLOCKS
00634   142417              DZM EXPECT      /ZERO EXPECTED BLOCK NUMBER
00635   202403              LAC SERNOM      /LOAD AC WITH SEARCH NORMAL
00636   242400              XOR STOPGO      /XOR GO
00637   242461              XOR UNIT        /COMBINE WITH UNIT
00640   707545              707545  /CLEAR AND LOAD "A"
00641   202464              LAC BUFFER-2
00642   040031              DAC CA  /SET UP CA
00643   140030              DZM WC  /AND WC
00644   707601      HERE2   707601  /WAIT FOR DTF
00645   600644              JMP .-1
00646   707554              707554  /CLEAR IT
00647   202466              LAC BUFFER      /GET BLOCK NUMBER
00650   542417              SAD EXPECT      /COMPARE AGAINST EXPECTED
00651   741000              SKP     /OK
00652   601112              JMP ERROR3      /ERROR
00653   442417              ISZ EXPECT      /SET UP EXPECT FOR NEXT
00654   442413              ISZ CNTR        /WILL THERE BE A NEXT?
00655   600644              JMP HERE2       /YES
00656   707552              707552  /NO, READ "A"
00657   502443              AND POINT+3
00660   707544              707544  /CLEAR FUNCTION BITS
00661   222401              LAC WAC /LOAD AC WITH WRITE ALL CONT
00662   707544              707544  /TRANSFER INTO "A"
00663   202465              LAC BUFFER-1
00664   040010              DAC 10  /SET UP 10
00665   342462              TAD THREE
00666   040031              DAC CA  /AND CA
```

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00667    202447                    LAC SAVE
00670    342465                    TAD THREE
00671    742232                    DAC WC   /SET UP WC
00672    160012                    DZM* 10 /SET UP EXPAND (NOT NEEDED)
00673    750001                    CLA!CMA
00674    342407                    TAD BLOCKS
00675    060012                    DAC* 10 /SET UP FORWARD BLOCK MARK
00676    202416                    LAC DATAS
00677    342457                    TAD TWO
00700    740001                    CMA
00701    042414                    DAC CNTR1         /SET UP COUNTER FOR # OF 1'S
00702    750001                    CLA!CMA /(DATAWORDS*3) IN MEMORY
00703    060010                    DAC* 10 /AND THEN STORE IN BUFFER
00704    442414                    ISZ CNTR1
00705    600703                    JMP .-2
00706    160010                    DZM* 10 /SET UP CHECKSUM
00707    060010                    DAC* 10 /REVERSE LOCK
00710    060010                    DAC* 10 /GUARD
00711    342407                    TAD BLOCKS
00712    101115                    JMS CALQL8        /FORM COMP. OBVERSE
00713    060010                    DAC* 10 /STORE IN REV, MARK
00714    160010                    DZM* 10 /SET UP EXPAND
00715    200030                    LAC WC  /WAIT FOR BLOCK TO BE WRITTEN
00716    741200                    SNA
00717    600723                    JMP .+4
00720    707561                    707561
00721    600715                    JMP .-4
00722    601044                    JMP ERROR1
00723    707552                    707552 /READ "A"
00724    502443                    AND POINT+3
00725    707554                    707554 /CLEAR FUNCTION REGISTER
00726    707561                    707561 /WAIT FOR ERROR FLAG
00727    600726                    JMP .-1
00730    707572                    707572 /READ STATUS "B"
00731    502423                    AND MASK1
00732    741200                    SNA     /IS DECTAPE IN END ZONE?
00733    601044                    JMP ERROR1        /NO, ERROR
                   /ROUTINE TO CHECK REVERSE BLOCK MARK AND READ DATA BACKWARDS
00734    750001    SIXTH           CLA!CMA
00735    342407                    TAD BLOCKS        /CREATE HIGHEST BLOCK NUMBER
00736    042417                    DAC EXPECT        /AND STORE IN EXPECT
00737    202461                    LAC UNIT          /FORM WORD
00740    242400                    XOR STOPGO        /TO SELECT UNIT
00741    242424                    XOR MASK2         /AND GO REVERSE
00742    707545                    707545 /CLEAR AND LOAD "A"
00743    707552    HERE3           707552 /READ "A"
00744    502443                    AND POINT+3
00745    707544                    707544 /CLEAR FUNCTION REGISTER
00746    202423                    LAC SERNOM        /LOAD AC WITH SEARCH NORMAL
00747    727544                    727544 /XOR INTO "A"
00750    202464                    LAC BUFFER-2
00751    742031                    DAC CA /SET UP CA
00752    707601                    707601 /WAIT FOR DTF
00753    600752                    JMP .-1
00754    202466                    LAC BUFFER        /GET BLOCK NUMBER
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20755   542417              SAD EXPECT      /COMPARE AGAINST EXPECTED
20756   741000              SKP      /SAME ALL OK
20757   601112              JMP ERROR3      /DIFFERENT, ERROR
00760   707552              707552  /READ "A"
00761   502443              AND POINT+3
00762   707544              707544  /CLEAR FUNCTION REGISTER
00763   202374              LAC REDNOM      /LOAD AC WITH READ NORMAL
00764   707544              707544  /XOR INTO "A"
00765   202465              LAC BUFFER-1
00766   040031              DAC CA  /SET UP CA
00767   140030              DZM WC  /ZERO WC
00770   707601              707601  /DECTAPE FLAG?
00771   600770              JMP .-1 /NO
00772   707561              707561  /ERROR FLAG?
00773   741000              SKP      /NO, ALL OK
00774   601044              JMP ERROR1       /YES, ERROR
00775   750001              CLAICMA /DECREMENT EXPECT
00776   342417              TAD EXPECT
00777   042417              DAC EXPECT
01000   740001              CMA
01001   750200              SZAICLA /HAS EXPECT GONE TO -0?
01002   600743              JMP HERE3        /NO, REPEAT FOR NEXT BLOCK
01003   202461              LAC UNIT /YES
01004   740001              CMA
01005   502445              AND POINT+5
01006   707545              707545  /DESELECT UNIT
                    /ROUTINE TO INQUIRE OF OPERATORS INTENTIONS
01007   762210      LAST    LAW MESS20
01010   101144              JMS MESAGE       /TYPE OUT MESSAGE
01011   202407              LAC BLOCKS
01012   101207              JMS TYPOUT       /TYPE OUT NUMBER OF BLOCKS
01013   202461              LAC UNIT
01014   242424              XOR MASK2
01015   707545              707545  /STOP DRIVE
01016   760240              LAW 240
01017   101166              JMS TYPE
01020   762221              LAW MESS21
01021   101144              JMS MESAGE       /TYPE OUT MESSAGE
01022   202416              LAC DATAS
01023   101207              JMS TYPOUT       /TYPE OUT NUMBER OF DATA WORDS
01024   760240              LAW 240
01025   101166              JMS TYPE
01026   762232              LAW MESS22
01027   101144              JMS MESAGE       /TYPE OUT MESSAGE
01030   762243      TMES23  LAW MESS23
01031   101144              JMS MESAGE       /TYPE OUT MESSAGE
01032   700312              KRB
01033   101202              JMS GET /GET TYPED CHARACTER
01034   542462              SAD YYY /WAS IT Y
01035   602230              JMP NEXT         /YES
01036   542431              SAD NNN /NO, WAS IT N
01037   602122              JMP TMESS3       /YES
01040   760277              LAW 277 /NO
01041   101166              JMS TYPE         /TYPE (?)
01042   101174              JMS CRLF         /CR-LF
```

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    01043    601053          JMP TMES23       /TRY AGAIN
                       /UNEXPECTED ERROR FLAG TYPE OUT ROUTINE
    01044    762232     ERROR1  LAW MESS12
    01045    101144          JMS MESAGE        /TYPE OUT MESSAGE HEADER
    01046    707572          707572   /READ "B"
    01047    740010          RAL
    01050    740100          SMA     /MARK TRACK ERROR?
    01051    601054          JMP .+3 /NO
    01052    762065          LAW MESS13        /YES
    01053    101144          JMS MESAGE
    01054    707572          707572   /READ "B"
    01055    742010          RTL
    01056    740100          SMA     /END ZONE ERROR?
    01057    601062          JMP .+3 /NO
    01060    762077          LAW MESS14        /YES
    01061    101144          JMS MESAGE
    01062    707572          707572   /READ "B"
    01063    502424          AND MASK2
    01064    741200          SNA     /SELECT ERROR?
    01065    601070          JMP .+3 /NO
    01066    762110          LAW MESS15        /YES
    01067    101144          JMS MESAGE
    01070    707572          707572   /READ "B"
    01071    502425          AND MASK3
    01072    741200          SNA     /PARITY ERROR?
    01073    601076          JMP .+3 /NO
    01074    762120          LAW MESS16        /YES
    01075    101144          JMS MESAGE
    01076    707572          707572   /READ "B"
    01077    502426          AND MASK4
    01100    741200          SNA     /TIMING ERROR?
    01101    601104          JMP .+3 /NO
    01102    762130          LAW MESS17        /YES
    01103    101144          JMS MESAGE
    01104    740040          XX
    01105    601104          JMP .-1
                       /TOO MANY BLOCKS WRITTEN ERROR ROUTINE
    01106    762140     ERROR2  LAW MESS18
    01107    101144          JMS MESAGE        /TYPE OUT ERROR MESSAGE
    01110    740040          XX      /AND STOP
    01111    601110          JMP .-1
                       /WRONG BLOCK NUMBER ERROR ROUTINE
    01112    762170     ERROR3  LAW MESS19
    01113    101144          JMS MESAGE        /TYPE OUT ERROR MESSAGE
    01114    602467          JMP FOURTH+15    /REPEAT VIRGIN PATTERN
                       /CALCULATE 18 BIT COMPLEMENT OBVERSE
    01115    000000     CALQL8  0
    01116    744001          CMA!CLL
    01117    042432          DAC NUMBER
    01120    142433          DZM OBVERS
    01121    777772          LAW -6
    01122    042453          DAC TALLY
    01123    202410          LAC CPOINT
    01124    042436          DAC PNTR1
    01125    202432          LAC NUMBER
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01126    741220              SKP
01127    742210     LOOP     RTL
01130    742210              RTL
01131    742010              RTL
01132    042432              DAC NUMBER
01133    522436              AND* PNTR1
01134    242433              XOR OBVERS
01135    242433              DAC OBVERS
01136    442436              ISZ PNTR1
01137    202432              LAC NUMBER
01140    442453              ISZ TALLY
01141    601127              JMP LOOP
01142    202433              LAC OBVERS
01143    621115              JMP* CALQL8
                    /MESSAGE PRINT SUBROUTINE
01144    000000     MESAGE   0
01145    502427              AND MASK5
01146    242437              DAC PNTR2
01147    222437              LAC* PNTR2
01150    742020              RTR
01151    742020              RTR
01152    742020              RTR
01153    742020              RTR
01154    740020              RAR
01155    101166              JMS TYPE
01156    542446              SAD RUBOUT
01157    621144              JMP* MESAGE
01160    222437              LAC* PNTR2
01161    101166              JMS TYPE
01162    542446              SAD RUBOUT
01163    621144              JMP* MESAGE
01164    442437              ISZ PNTR2
01165    601147              JMP MESAGE+3
                    /TYPE SUBROUTINE
01166    000000     TYPE     0
01167    502446              AND RUBOUT
01170    700406              TLS
01171    700401              TSF
01172    601171              JMP .-1
01173    621166              JMP* TYPE
                    /CRLF SUBROUTINE
01174    000000     CRLF     0
01175    760215              LAW 215
01176    101166              JMS TYPE
01177    760212              LAW 212
01200    101166              JMS TYPE
01201    621174              JMP* CRLF
01202    000000     GET      0
01203    700301              KSF
01204    601203              JMP .-1
01205    700312              KRB
01206    621202              JMP* GET
                    /OCTAL TYPEOUT SUBROUTINE
01207    000000     TYPOUT   0
01210    042454              DAC TEMP
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01211    777772              LAW -6
01212    042415              DAC CNTR2
01213    202454              LAC TEMP
01214    744010              RAL!CLL
01215    740010              RAL
01216    742010              RTL
01217    042454              DAC TEMP
01220    502440              AND POINT
01221    242406              XOR ASKII
01222    101166              JMS TYPE
01223    202454              LAC TEMP
01224    442415              ISZ CNTR2
01225    601215              JMP .-10
01226    621207              JMP* TYPOUT
                    /DECIMAL TO BINARY INPUT ROUTINE
01227    000000     DBCV     0
01230    142405              DZM ANSWER      /ZERO ANSWER
01231    101202              JMS GET /GET A CHARACTER
01232    042454     TEST     DAC TEMP        /SAVE IT
01233    342422              TAD M260        /SUBTRACT 260
01234    741100              SPA     /IS CHAR > 260
01235    601267              JMP DONE        /NO, DONE
01236    342421              TAD M12 /SUBTRACT 12
01237    740100              SMA     /CHAR < 271
01240    601267              JMP DONE        /NO, DONE
01241    202454              LAC TEMP        /GET CHARACTER
01242    242406              XOR ASKII       /MASK OFF ASCII CODE
01243    042454              DAC TEMP        /STORE BACK IN TEMP
01244    202405     MP10     LAC ANSWER      /GET PARTIAL ANSWER
01245    744010              RAL!CLL /MULTIPLY X 2
01246    741400              SZL     /OVERFLOW?
01247    601272              JMP OVER        /YES
01250    042455              DAC TEM1        /NO, STORE
01251    740010              RAL     /X 2 AGAIN
01252    741400              SZL     /OVERFLOW?
01253    601272              JMP OVER        /YES
01254    740010              RAL     /NO, X 2 AGAIN
01255    741400              SZL     /OVERFLOW?
01256    601272              JMP OVER        /YES
01257    342455              TAD TEM1        /ADD ANSWER X 2
01260    741400              SZL     /OVERFLOW?
01261    601272              JMP OVER        /YES
01262    342454              TAD TEMP        /NO, ADD NEW NUMBER
01263    741400              SZL     /OVERFLOW?
01264    601272              JMP OVER        /YES
01265    042405              DAC ANSWER      /NO
01266    601231              JMP TEST-1      /GO BACK FOR NEXT CHARACTER
01267    101174     DONE     JMS CRLF
01270    202405              LAC ANSWER      /GET ANSWER
01271    621227              JMP* DBCV       /EXIT
01272    760277     OVER     LAW 277
01273    101166              JMS TYPE        /TYPE "?"
01274    101174              JMS CRLF
01275    601230              JMP DBCV+1      /START AGAIN
                    /TAPE 2
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                        /DECTAPE FORMAT GENERATOR   -   PDP-9, TC02, TU55
                        /MESSAGES
   01276    324305      MESS1    304305    /D,E
   01277    303324               303324    /C,T
   01300    301320               301320    /A,P
   01301    305240               305240    /E,SP
   01302    306317               306317    /F,O
   01303    322315               322315    /R,M
   01304    301324               301324    /A,T
   01305    240307               240307    /SP,G
   01306    305316               305316    /E,N
   01307    305322               305322    /E,R
   01310    301324               301324    /A,T
   01311    317322               317322    /O,R
   01312    255320               255320    /-,P
   01313    304320               304320    /D,P
   01314    255271               255271    /-,9
   01315    254240               254240    /,,SP
   01316    324303               324303    /T,C
   01317    260262               260262    /0,2
   01320    254240               254240    /,,SP
   01321    324325               324325    /T,U
   01322    265265               265265    /5,5
   01323    215212               215212    /CR,LF
   01324    212212               212212    /LF,LF
   01325    212377               212377    /LF,R,O,
   01326    315301      MESS2    315301    /M,A
   01327    322313               322313    /R,K
   01330    240324               240324    /SP,T
   01331    301320               301320    /A,P
   01332    305240               305240    /E,SP
   01333    317316               317316    /O,N
   01334    240325               240325    /SP,U
   01335    316311               316311    /N,I
   01336    324240               324240    /T,SP
   01337    240377               240377    /SP,R,O,
   01340    304317      MESS3    304317    /D,O
   01341    240331               240331    /SP,Y
   01342    317325               317325    /O,U
   01343    240304               240304    /SP,D
   01344    325323               305323    /E,S
   01345    311322               311322    /I,R
   01346    305240               305240    /E,SP
   01347    323324               323324    /S,T
   01350    301316               301316    /A,N
   01351    304301               304301    /D,A
   01352    322304               322304    /R,D
   01353    240376               240376    /SP,F
   01354    317322               317322    /O,R
   01355    315301               315301    /M,A
   01356    324240               324240    /T,SP
   01357    250262               250262    /(,2
   01360    265266               265266    /5,6
   01361    240327               240327    /SP,W
   01362    317322               317322    /O,R
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01363    324323                304323    /D,S
01364    254240                254240    /,,SP
01365    265267                265267    /5,7
01366    270240                270240    /B,SP
01367    302314                302314    /B,L
01370    317323                317303    /O,C
01371    313323                313323    /K,S
01372    251277                251277    /),?
01373    215212                215212    /CR,LF
01374    240250                240250    /SP,(
01375    324331                324331    /T,Y
01376    320305                320305    /P,E
01377    240331                240331    /SP,Y
01400    255331                255331    /-,Y
01401    305323                305323    /E,S
01402    254240                254240    /,,SP
01403    316255                316255    /N,-
01404    316317                316317    /N,O
01405    251240                251240    /),SP
01406    240377                240377    /SP,R,O
01407    310317     MESS4      310317    /H,O
01410    327240                327240    /W,SP
01411    315301                315301    /M,A
01412    316331                316331    /N,Y
01413    240302                240302    /SP,B
01414    314317                314317    /L,O
01415    303313                303313    /CK
01416    323277                323277    /S,?
01417    240377                240377    /SP,R,O
01420    310317     MESS5      310317    /H,O
01421    327240                327240    /W,SP
01422    315301                315301    /M,A
01423    316331                316331    /N,Y
01424    240304                240304    /SP,D
01425    301324                301324    /A,T
01426    301240                301240    /A,SP
01427    327317                327317    /W,O
01430    322304                322304    /R,D
01431    323277                323277    /S,?
01432    240377                240377    /SP,R,O,
01433    302314     MESS6      302314    /B,L
01434    317303                317303    /O,C
01435    313240                313240    /K,SP
01436    306317                306317    /F,O
01437    322315                322315    /R,M
01440    301324                301324    /A,T
01441    240322                240322    /SP,R
01442    305321                305321    /E,Q
01443    325311                325311    /U,I
01444    322305                322305    /R,E
01445    323240                323240    /S,SP
01446    264240                264240    /4,SP
01447    317322                317322    /O,R
01450    240315                240315    /SP,M
01451    317322                317322    /O,R
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|---|---|---|---|---|
| 01452 | 305240 | | 305240 | /E,SP |
| 01453 | 324321 | | 304321 | /D,A |
| 01454 | 324321 | | 324321 | /T,A |
| 01455 | 240327 | | 240327 | /SP,W |
| 01456 | 317322 | | 317322 | /O,R |
| 01457 | 304323 | | 304323 | /D,S |
| 01460 | 215212 | | 215212 | /CR,LF |
| 01461 | 377000 | | 377000 | /R,0 |
| 01462 | 316325 | MESS7 | 316325 | /N,U |
| 01463 | 315302 | | 315302 | /M,B |
| 01464 | 305322 | | 305322 | /E,R |
| 01465 | 240317 | | 240317 | /SP,O |
| 01466 | 306240 | | 306240 | /F,SP |
| 01467 | 304301 | | 304301 | /D,A |
| 01470 | 324301 | | 324301 | /T,A |
| 01471 | 240327 | | 240327 | /SP,W |
| 01472 | 317322 | | 317322 | /O,R |
| 01473 | 304323 | | 304323 | /D,S |
| 01474 | 240315 | | 240315 | /SP,M |
| 01475 | 325323 | | 325323 | /U,S |
| 01476 | 324240 | | 324240 | /T,SP |
| 01477 | 302305 | | 302305 | /B,E |
| 01500 | 240305 | | 240305 | /SP,E |
| 01501 | 326305 | | 326305 | /V,E |
| 01502 | 316215 | | 316215 | /N,CR |
| 01503 | 212377 | | 212377 | /LF,R,0, |
| 01504 | 324301 | MESS8 | 324301 | /T,A |
| 01505 | 320305 | | 320305 | /P,E |
| 01506 | 240311 | | 240311 | /SP,I |
| 01507 | 323240 | | 323240 | /S,SP |
| 01510 | 316317 | | 316317 | /N,O |
| 01511 | 324240 | | 324240 | /T,SP |
| 01512 | 314317 | | 314317 | /L,O |
| 01513 | 316307 | | 316307 | /N,G |
| 01514 | 240305 | | 240305 | /SP,E |
| 01515 | 316317 | | 316317 | /N,O |
| 01516 | 325307 | | 325307 | /U,G |
| 01517 | 310215 | | 310215 | /H,CR |
| 01520 | 212377 | | 212377 | /LF,R,0, |
| 01521 | 323305 | MESS9 | 323305 | /S,E |
| 01522 | 324240 | | 324240 | /T,SP |
| 01523 | 323327 | | 323327 | /S,W |
| 01524 | 311324 | | 311324 | /I,T |
| 01525 | 303310 | | 303310 | /C,H |
| 01526 | 240314 | | 240314 | /SP,L |
| 01527 | 301302 | | 301302 | /A,B |
| 01530 | 305314 | | 305314 | /E,L |
| 01531 | 305304 | | 305304 | /E,D |
| 01532 | 240327 | | 240327 | /SP,W |
| 01533 | 322324 | | 322324 | /R,T |
| 01534 | 315255 | | 315255 | /M,- |
| 01535 | 316317 | | 316317 | /N,O |
| 01536 | 322315 | | 322315 | /R,M |
| 01537 | 301314 | | 301314 | /A,L |
| 01540 | 255322 | | 255322 | /-,R |

| | | | |
|---|---|---|---|
| 01541 | 324315 | 304315 | /D,M |
| 01542 | 313247 | 313240 | /K,SP |
| 01543 | 240324 | 240324 | /SP,T |
| 01544 | 317240 | 317240 | /O,SP |
| 01545 | 327322 | 327322 | /W,R |
| 01546 | 324315 | 324315 | /T,M |
| 01547 | 240301 | 240301 | /SP,A |
| 01550 | 316304 | 316304 | /N,D |
| 01551 | 240305 | 240305 | /SP,E |
| 01552 | 316301 | 316301 | /N,A |
| 01553 | 302314 | 302314 | /B,L |
| 01554 | 305240 | 305240 | /E,SP |
| 01555 | 215212 | 215212 | /CR,LF |
| 01556 | 327322 | 327322 | /W,R |
| 01557 | 311324 | 311324 | /I,T |
| 01560 | 305240 | 305240 | /E,SP |
| 01561 | 317316 | 317316 | /O,N |
| 01562 | 240323 | 240323 | /SP,S |
| 01563 | 320305 | 320305 | /P,E |
| 01564 | 303311 | 303311 | /C,I |
| 01565 | 306311 | 306311 | /F,I |
| 01566 | 305304 | 305304 | /E,D |
| 01567 | 240325 | 240325 | /SP,U |
| 01570 | 316311 | 316311 | /N,I |
| 01571 | 324240 | 324240 | /T,SP |
| 01572 | 324310 | 324310 | /T,H |
| 01573 | 305316 | 305316 | /E,N |
| 01574 | 240323 | 240323 | /SP,S |
| 01575 | 324322 | 324322 | /T,R |
| 01576 | 311313 | 311313 | /I,K |
| 01577 | 305240 | 305240 | /E,SP |
| 01600 | 301240 | 301240 | /A,SP |
| 01601 | 313305 | 313305 | /K,E |
| 01602 | 331240 | 331240 | /Y,SP |
| 01603 | 317316 | 317316 | /O,N |
| 01604 | 240324 | 240324 | /SP,T |
| 01605 | 310305 | 310305 | /H,E |
| 01606 | 240313 | 240313 | /SP,K |
| 01607 | 305331 | 305331 | /E,Y |
| 01610 | 302317 | 302317 | /B,O |
| 01611 | 301322 | 301322 | /A,R |
| 01612 | 304215 | 304215 | /D,CR |
| 01613 | 212301 | 212301 | /LF,A |
| 01614 | 306324 | 306324 | /F,T |
| 01615 | 305322 | 305322 | /E,R |
| 01616 | 240315 | 240315 | /SP,M |
| 01617 | 317325 | 317325 | /O,U |
| 01620 | 316324 | 316324 | /N,T |
| 01621 | 311316 | 311316 | /I,N |
| 01622 | 307240 | 307240 | /G,SP |
| 01623 | 301240 | 301240 | /A,SP |
| 01624 | 326311 | 326311 | /V,I |
| 01625 | 322307 | 322307 | /R,G |
| 01626 | 311316 | 311316 | /I,N |
| 01627 | 240324 | 240324 | /SP,T |

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01630    301320            301320   /A,P
01631    305240            305240   /E,SP
01632    301316            301316   /A,N
01633    304240            304240   /D,SP
01634    324301            324301   /T,A
01635    313311            313311   /K,I
01636    316307            316307   /N,G
01637    240262            240262   /SP,2
01640    240327            240327   /SP,W
01641    322301            322301   /R,A
01642    320323            320323   /P,S
01643    240317            240317   /SP,O
01644    316240            316240   /N,SP
01645    324301            324301   /T,A
01646    313305            313305   /K,E
01647    325320            325320   /U,P
01650    240322            240322   /SP,R
01651    305305            305305   /E,E
01652    314215            314215   /L,CR
01653    212377            212377   /LF,R,0
01654    323305   MESS10   323305   /S,E
01655    314305            314305   /L,E
01656    303324            303324   /C,T
01657    240305            240305   /SP,E
01660    322322            322322   /R,R
01661    317322            317322   /O,R
01662    254240            254240   /,,SP
01663    303310            303310   /C,H
01664    305303            305303   /E,C
01665    313240            313240   /K,SP
01666    306317            306317   /F,O
01667    322240            322240   /R,SP
01670    324310            324310   /T,H
01671    305323            305323   /E,S
01672    305240            305240   /E,SP
01673    303317            303317   /C,O
01674    316304            316304   /N,D
01675    311324            311324   /I,T
01676    311317            311317   /I,O
01677    316323            316323   /N,S
01700    272215            272215   /I,CR
01701    212327            212327   /LF,W
01702    322311            322311   /R,I
01703    324305            324305   /T,E
01704    240316            240316   /SP,N
01705    317324            317324   /O,T
01706    240305            240305   /SP,E
01707    316301            316301   /N,A
01710    302314            302314   /B,L
01711    305304            305304   /E,D
01712    215212            215212   /CR,LF
01713    316317            316317   /N,O
01714    316305            316305   /N,E
01715    330311            330311   /X,I
01716    323324            323324   /S,T
```

| | | | | |
|---|---|---|---|---|
| 01717 | 301316 | | 301316 | /A,S |
| 01720 | 324240 | | 324240 | /T,SP |
| 01721 | 325316 | | 325316 | /U,N |
| 01722 | 311324 | | 311324 | /I,T |
| 01723 | 215212 | | 215212 | /CR,LF |
| 01724 | 315325 | | 315325 | /M,U |
| 01725 | 314324 | | 314324 | /L,T |
| 01726 | 311320 | | 311320 | /I,P |
| 01727 | 314331 | | 314331 | /L,Y |
| 01730 | 240305 | | 240305 | /SP,E |
| 01731 | 330311 | | 330311 | /X,I |
| 01732 | 323324 | | 323324 | /S,T |
| 01733 | 301316 | | 301316 | /A,N |
| 01734 | 324240 | | 324240 | /T,SP |
| 01735 | 325316 | | 325316 | /U,N |
| 01736 | 311324 | | 311324 | /I,T |
| 01737 | 215212 | | 215212 | /CR,LF |
| 01740 | 323327 | | 323327 | /S,W |
| 01741 | 311324 | | 311324 | /I,T |
| 01742 | 303310 | | 303310 | /C,H |
| 01743 | 240316 | | 240316 | /SP,N |
| 01744 | 317324 | | 317324 | /O,T |
| 01745 | 240311 | | 240311 | /SP,I |
| 01746 | 316240 | | 316240 | /N,SP |
| 01747 | 327322 | | 327322 | /W,R |
| 01750 | 315324 | | 315324 | /M,T |
| 01751 | 240320 | | 240320 | /SP,P |
| 01752 | 317323 | | 317323 | /O,S |
| 01753 | 311324 | | 311324 | /I,T |
| 01754 | 311317 | | 311317 | /I,O |
| 01755 | 316215 | | 316215 | /N,CR |
| 01756 | 212377 | | 212377 | /LF,R,O, |
| 01757 | 323305 | MESS11 | 323305 | /S,E |
| 01760 | 324240 | | 324240 | /T,SP |
| 01761 | 323327 | | 323327 | /S,W |
| 01762 | 311324 | | 311324 | /I,T |
| 01763 | 303310 | | 303310 | /C,H |
| 01764 | 240314 | | 240314 | /SP,L |
| 01765 | 301302 | | 301302 | /A,B |
| 01766 | 305314 | | 305314 | /E,L |
| 01767 | 305304 | | 305304 | /E,D |
| 01770 | 240327 | | 240327 | /SP,W |
| 01771 | 322324 | | 322324 | /R,T |
| 01772 | 315255 | | 315255 | /M,= |
| 01773 | 316317 | | 316317 | /N,O |
| 01774 | 322315 | | 322315 | /R,M |
| 01775 | 301314 | | 301314 | /A,L |
| 01776 | 255322 | | 255322 | /=,R |
| 01777 | 304315 | | 304315 | /D,M |
| 02000 | 313240 | | 313240 | /K,SP |
| 02001 | 324317 | | 324317 | /T,O |
| 02002 | 240316 | | 240316 | /SP,N |
| 02003 | 317322 | | 317322 | /O,R |
| 02004 | 315301 | | 315301 | /M,A |
| 02005 | 314254 | | 314254 | /L,. |

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02006    240324              240324    /SP,T
02007    310305              310305    /H,E
02010    316240              316240    /N,SP
02011    323324              323324    /S,T
02012    322311              322311    /R,I
02013    313305              313305    /K,E
02014    240301              240301    /SP,A
02015    240313              240313    /SP,K
02016    305331              305331    /E,Y
02017    240317              240317    /SP,O
02020    316240              316240    /N,SP
02021    215212              215212    /CR,LF
02022    324310              324310    /T,H
02023    305240              305240    /E,SP
02024    313305              313305    /K,E
02025    331302              331302    /Y,B
02026    317301              317301    /O,A
02027    322304              322304    /R,D
02030    215212              215212    /CR,LF
02031    377000              377000    /R,O
02032    215212    MESS12    215212    /CR,LF
02033    324310              324310    /T,H
02034    305240              305240    /E,SP
02035    306317              306317    /F,O
02036    314314              314314    /L,L
02037    317327              317327    /O,W
02040    311316              311316    /I,N
02041    307240              307240    /G,SP
02042    325316              325316    /U,N
02043    305330              305330    /E,X
02044    320305              320305    /P,E
02045    303324              303324    /C,T
02046    305304              305304    /E,D
02047    240305              240305    /SP,E
02050    322322              322322    /R,R
02051    317322              317322    /O,R
02052    323240              323240    /S,SP
02053    327305              327305    /W,E
02054    322305              322305    /R,E
02055    240305              240305    /SP,E
02056    316303              316303    /N,C
02057    317325              317325    /O,U
02060    316324              316324    /N,T
02061    305322              305322    /E,R
02062    305304              305304    /E,D
02063    272215              272215    /:,CR
02064    212377              212377    /LF,RO
02065    315301    MESS13    315301    /M,A
02066    322313              322313    /R,K
02067    240324              240324    /SP,T
02070    322301              322301    /R,A
02071    303313              303313    /C,K
02072    240305              240305    /SP,E
02073    322322              322322    /R,R
02074    317322              317322    /O,R
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22275    215212                   215212   /CR,LF
22276    377000                   377000   /RO
22277    305315        MESS14      305316   /E,N
22100    304240                   304240   /O,SP
22101    332317                   332317   /Z,O
22102    316305                   316305   /N,E
22103    240305                   240305   /SP,E
22104    322322                   322322   /R,R
22105    317322                   317322   /O,R
22106    215212                   215212   /CR,LF
22107    377000                   377000   /R,O,
02110    323305        MESS15      323305   /S,E
02111    314305                   314305   /L,E
02112    303324                   303324   /C,T
02113    240305                   240305   /SP,E
02114    322322                   322322   /R,R
02115    317322                   317322   /O,R
02116    215212                   215212   /CR,LF
02117    377000                   377000   /R,O
02120    320301        MESS16      320301   /P,A
02121    322311                   322311   /R,I
02122    324331                   324331   /T,Y
02123    240305                   240305   /SP,E
02124    322322                   322322   /R,R
02125    317322                   317322   /O,R
22126    215212                   215212   /CR,LF
02127    377000                   377000   /RO
02130    324311        MESS17      324311   /T,I
02131    315311                   315311   /M,I
02132    316307                   316307   /N,G
02133    240305                   240305   /SP,E
02134    322322                   322322   /R,R
02135    317322                   317322   /O,R
02136    215212                   215212   /CR,LF
02137    377000                   377000   /RO
02140    324317        MESS18      324317   /T,O
02141    317240                   317240   /O,SP
02142    315301                   315301   /M,A
02143    316331                   316331   /N,Y
02144    240302                   240302   /SP,B
02145    314317                   314317   /L,O
02146    303313                   303313   /C,K
22147    323240                   323240   /S,SP
22150    327322                   327322   /W,R
02151    311324                   311324   /I,T
02152    324305                   324305   /T,E
02153    316254                   316254   /N,,
02154    240320                   240320   /SP,P
22155    322317                   322317   /R,O
22156    307322                   307322   /G,R
22157    301315                   301315   /A,M
22160    240305                   240305   /SP,E
22161    322322                   322322   /R,R
22162    317322                   317322   /O,R
22163    255322                   255322   /-,R
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| | | | | |
|---|---|---|---|---|
| ?2164 | 325314 | | 305314 | /E,L |
| ?2165 | 3173'1 | | 317301 | /O,A |
| 72166 | 304215 | | 304215 | /D,CR |
| ?2167 | 212377 | | 212377 | /LF,RO |
| ?2170 | 302314 | MESS19 | 302314 | /B,L |
| 02171 | 317303 | | 317303 | /O,C |
| 02172 | 313240 | | 313240 | /K,SP |
| 02173 | 316325 | | 316325 | /N,U |
| 02174 | 315302 | | 315302 | /M,B |
| 02175 | 305322 | | 305322 | /E,R |
| 02176 | 240323 | | 240323 | /SP,S |
| 02177 | 305321 | | 305321 | /E,Q |
| 02200 | 325305 | | 325305 | /U,E |
| 02201 | 316303 | | 316303 | /N,C |
| 02202 | 305240 | | 305240 | /E,SP |
| 02203 | 302322 | | 302322 | /B,R |
| 02204 | 317313 | | 317313 | /O,K |
| 02205 | 305316 | | 305316 | /E,N |
| 02206 | 215212 | | 215212 | /CR,LF |
| 02207 | 377000 | | 377000 | /RO |
| 02210 | 215212 | MESS20 | 215212 | /CR,LF |
| 02211 | 304317 | | 304317 | /D,O |
| 02212 | 316305 | | 316305 | /N,E |
| 02213 | 241240 | | 241240 | /!,SP |
| 02214 | 324301 | | 324301 | /T,A |
| 02215 | 320305 | | 320305 | /P,E |
| 02216 | 240310 | | 240310 | /SP,H |
| 02217 | 301323 | | 301323 | /A,S |
| 02220 | 240377 | | 240377 | /SP,RO |
| 02221 | 302314 | MESS21 | 302314 | /B,L |
| 02222 | 317303 | | 317303 | /O,C |
| 02223 | 313323 | | 313323 | /K,S |
| 02224 | 250317 | | 250317 | /(,O |
| 02225 | 303324 | | 303324 | /C,T |
| 02226 | 251240 | | 251240 | /),SP |
| 02227 | 305301 | | 305301 | /E,A |
| 02230 | 303310 | | 303310 | /C,H |
| 02231 | 240377 | | 240377 | /SP,RO |
| 02232 | 327317 | MESS22 | 327317 | /W,O |
| ?2233 | 322304 | | 322304 | /R,D |
| 02234 | 323250 | | 323250 | /S,( |
| 02235 | 317303 | | 317303 | /O,C |
| 02236 | 324251 | | 324251 | /T,) |
| 02237 | 240314 | | 240314 | /SP,L |
| 02240 | 317316 | | 317316 | /O,N |
| 02241 | 307215 | | 307215 | /G,CR |
| 02242 | 212377 | | 212377 | /LF,RO |
| 02243 | 304317 | MESS23 | 304317 | /D,O |
| ?2244 | 240331 | | 240331 | /SP,Y |
| ?2245 | 317325 | | 317325 | /O,U |
| ?2246 | 240304 | | 240304 | /SP,D |
| ?2247 | 305323 | | 305323 | /E,S |
| ?2250 | 311322 | | 311322 | /I,R |
| ?2251 | 305240 | | 305240 | /E,SP |
| ?2252 | 324317 | | 324317 | /T,U |

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22253    240315              240315    /SP,M
22254    301322              301322    /A,R
22255    313240              313240    /K,SP
22256    301316              301316    /A,N
02257    317324              317324    /O,T
02260    310305              310305    /H,E
02261    322240              322240    /R,SP
22262    324301              324301    /T,A
22263    320305              320305    /P,E
02264    240324              240324    /SP,T
22265    317240              317240    /O,SP
02266    324310              324310    /T,H
02267    311323              311323    /I,S
22270    240306              240306    /SP,F
02271    317322              317322    /O,R
22272    315301              315301    /M,A
32273    324250              324250    /T,(
02274    324331              324331    /T,Y
02275    320305              320305    /P,E
02276    240331              240331    /SP,Y
02277    255331              255331    /=,Y
02300    305323              305323    /E,S
02301    240316              240316    /SP,N
02302    255316              255316    /=,N
02303    317251              317251    /O,)
02304    277215              277215    /?,CR
02305    212377              212377    /LF,RO
02306    215212    MESS24    215212    /CRLF
02307    316325              316325    /N,U
02310    315302              315302    /M,B
02311    305322              305322    /E,R
02312    240317              240317    /SP,O
02313    306240              306240    /F,SP
02314    302314              302314    /B,L
02315    317303              317303    /O,C
02316    313323              313323    /K,S
02317    240315              240315    /SP,M
02320    325323              325323    /U,S
02321    324240              324240    /T,SP
02322    302305              302305    /B,E
02323    240262              240262    /SP,2
02324    240317              240317    /SP,O
02325    322240              322240    /R,SP
02326    315317              315317    /M,O
02327    322305              322305    /R,E
02330    215212              215212    /CR,LF
02331    377000              377000    /RO
02332    215212    MESS25    215212    /CR,LF
02333    270313              270313    /8,K
02334    240317              240317    /SP,C
02335    306240              306240    /F,SP
02336    315305              315305    /M,E
02337    315317              315317    /M,O
02340    322331              322331    /R,Y
02341    240303              240303    /SP,C
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22342     301316                    301316    /A,N
22343     247324                    247324    /',T
22344     247303                    240303    /SP,C
22345     317316                    317316    /O,N
22346     324301                    324301    /T,A
22347     311316                    311316    /I,N
02350     240324                    240324    /SP,T
02351     310311                    310311    /H,I
22352     323240                    323240    /S,SP
02353     323311                    323311    /S,I
02354     332305                    332305    /Z,E
02355     240302                    240302    /SP,B
02356     314317                    314317    /L,O
02357     303313                    303313    /C,K
02360     240215                    240215    /SP,CR
22361     212377                    212377    /LF,RO
                    /CONSTANTS AND VARIABLES
                    /WC AND CA DEFINITIONS
          000030    WC=30
          000031    CA=31
                    /MARK TRACK PATTERNS
02362     404404    REVEND    404404    /55
02363     040404    EXPAND    040404    /25
02364     040440    MARK      040440    /26
02365     044040    REVGRD    044040    /32
02366     004000    LOCK      004000    /10
02367     444000    DATAM     444000    /70
02370     444044    PREFIN    444044    /73
02371     404004    GUARD     404004    /51
02372     400404    REVMRK    400404    /45
02373     040040    END       040040    /22
                    /DECTAPE COMMAND
22374     002000    REDNOM    002000    /READ DATA NORM
22375     035000    FWDWAC    035000    /WRITE ALL FWD GO CONT
22376     271000    RESERC    071000    /SEARCH REVERSE GO CONT
22377     036000    WTMT      036000    /WRITE T & MT FWD GO CONT
22400     020000    STOPGO    020000    /STOP OR GO
22401     015000    WAC       015000    /WRITE ALL CONTINUOUS
22402     010000    NORCON    010000    /NORMAL CONTINUOUS
22403     001000    SERNOM    001000    /SEARCH NORMAL
                    /AASSORTED SUNDRY POINTERS, COUNTERS, CONSTANTS, VARIABLES, ETC.
22404     762514    AA        -A+1      /NUMBER OF DATA WORDS MAX (*)
22405     000000    ANSWER    0         /ANSWER TO DEC TO BIN TYPEIN (DBCV)
22406     000260    ASKII     260       /MAGIC CONSTANT
22407     001102    BLOCKS    1102      /NUMBER OF BLOCKS
22410     002442    CPOINT    POINT
22411     001102    CONST1    1102      /578 DEC
22412     000400    CONST2    400       /256 DEC
22413     000000    CNTR      0         /BLOCKS COUNTER
22414     000000    CNTR1     0         /DATA WORD COUNTER
22415     000000    CNTR2     0         /COUNTER FOR OCTAL TYPEOUT
22416     000400    DATAS     400       /NUMBER OF DATA WORDS
22417     000000    EXPECT    0         /NUMBER OF BLOCK EXPECTED
22420     777767    M9        -1-11+1
22421     777766    M12       -1-12+1
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02422    777527         M260     -1-260+1
02423    100000         MASK1    100000
02424    040000         MASK2    40000
02425    020000         MASK3    20000
02426    010000         MASK4    10000
02427    007777         MASK5    7777
02430    777774         MINUS4   -1-4+1
02431    000316         NNN      316
02432    000000         NUMBER   0         /NUMBER BEING OBVERSED
02433    000000         OBVERS   0         /COMP, OBVERSE CALCULATIONS
02434    000001         ONE      1
02435    000000         PNTR     0         /POINTER FOR STORAGE OF BLOCK NUMBER
02436    002440         PNTR1    POINT     /POINTER FOR MASKS OF CALQL8
02437    000000         PNTR2    0         /POINTER FOR MESAGE
02440    000007         POINT    7         /MASK FOR CALQL8
02441    000070                  70
02442    000700                  700
02443    007000                  7000
02444    070000                  70000
02445    700000                  700000
02446    000377         RUBOUT   377
02447    000000         SAVE     0         /# OF MARKS PER BLOCK (-)
02450    000000         SAVE1    0         /# OF BLOCKS (-)
02451    000000         SAVE2    0         /COMP, OBVERSE OF LAST BLOCK
02452    000000         SAVE3    0         /# OF PARTICULAR BLOCK
02453    000000         TALLY    0         /COMP, OBVERSE COUNTER
02454    000000         TEMP     0         /STORAGE FOR TYPEOUT AND TYPIN
02455    000000         TEM1     0         /STORAGE FOR DBCV
02456    000012         TEN      12
02457    000002         TWO      2
02460    000003         THREE    3
02461    000000         UNIT     0         /UNIT NUMBER
02462    000331         YYY      331
02463    323553         MAGCON   323553    /MINUS 153,749(DEC)
                                 /BEGINNING OF BUFFER AREA
02464    002466                  BUFFER
02465    002465                  BUFFER-1
02466    000000         BUFFER   0
         715265                  A=17763=BUFFER-10
         000100                  ,END BEGIN
         SIZE=02467    NO ERROR LINES
```

```
A        015265
AA        02404
ANSWER    02405
ASKII     02406
BEGIN     00104
BLOCKS    02407
BUFFER    02466
CA       000031
CALQL8    01115
CLOF     700004
CLON     700044
CLSF     700001
CNTR      02413
CNTR1     02414
CNTR2     02415
CONST1    02411
CONST2    02412
CPOINT    02412
CRLF      01174
DATAM     02367
DATAS     02416
DBCV      01227
DONE      01267
EEM      707702
END       02373
ERROR1    01044
ERROR2    01106
ERROR3    01112
EXPAND    02363
EXPECT    02417
FIFTH     00632
FIRST     00263
FOURTH    00452
FWDWAC    02375
GET       01202
GUARD     02371
HERE1     00565
HERE2     00644
HERE3     00743
KRB      700312
KSF      700301
LAST      01007
LEM      707704
LOCK      02366
LOOP      01127
MAGCON    02463
MARK      02364
MASK1     02423
MASK2     02424
MASK3     02425
MASK4     02426
MASK5     02427
MESAGE    01144
MESS1     01276
MESS10    01654
```

```
MESS11   01757
MESS12   02032
MESS13   02065
MESS14   02077
MESS15   02110
MESS16   02120
MESS17   02130
MESS18   02140
MESS19   02170
MESS2    01326
MESS20   02210
MESS21   02221
MESS22   02232
MESS23   02243
MESS24   02306
MESS25   02332
MESS3    01340
MESS4    01407
MESS5    01420
MESS6    01433
MESS7    01462
MESS8    01504
MESS9    01521
MINUS4   02430
MP10     01244
M12      02421
M260     02422
M9       02420
NEXT     00230
NNN      02431
NORCON   02402
NUMBER   02432
OBVERS   02433
ONE      02434
OVER     01272
PCF      700202
PNTR     02435
PNTR1    02436
PNTR2    02437
POINT    02440
PREFIN   02370
PSA      700204
PSB      700244
PSF      700201
RCF      700102
REDNOM   02374
RESERC   02376
REVEND   02362
REVGRD   02365
REVMRK   02372
RRB      700112
RSA      700104
RSB      700144
RSF      700101
RUBOUT   02446
```

```
SAVE      02447
SAVE1     02450
SAVE2     02451
SAVE3     02452
SECOND    00312
SERNOM    02403
SIXTH     00734
STAND     00223
STOPGO    02400
TALLY     02453
TCF      700402
TEMP      02454
TEM1      02455
TEN       02456
TEST      01232
THIRD     00403
THREE     02460
TLS      700406
TMESS3    00122
TMESS4    00136
TMESS5    00151
TMESS6    00160
TMESS7    00167
TMESS8    00177
TMES11    00430
TMES23    01030
TSF      700401
TWO       02457
TYPE      01166
TYPOUT    01207
UNIT      02461
WAC       02401
WC       000030
WTMT      02377
YYY       02462
```

```
WC      200030
CA      200231
BEGIN    00100
TMESS3   00122
TMESS4   00136
TMESS5   00151
TMESS6   00160
TMESS7   00167
TMESS8   00177
STAND    00223
NEXT     00230
FIRST    00263
SECOND   00312
THIRD    00403
TMES11   00430
FOURTH   00452
HERE1    00565
FIFTH    00632
HERE2    00644
SIXTH    00734
HERE3    00743
LAST     01007
TMES23   01030
ERROR1   01044
ERROR2   01106
ERROR3   01112
CALQL8   01115
LOOP     01127
MESAGE   01144
TYPE     01166
CRLF     01174
GET      01202
TYPOUT   01207
DBCV     01227
TEST     01232
MP10     01244
DONE     01267
OVER     01272
MESS1    01276
MESS2    01326
MESS3    01342
MESS4    01407
MESS5    01420
MESS6    01433
MESS7    01462
MESS8    01504
MESS9    01521
MESS10   01654
MESS11   01757
MESS12   02032
MESS13   02065
MESS14   02077
MESS15   02110
MESS16   02120
MESS17   02130
```

```
MESS18   02147
MESS19   02172
MESS20   02210
MESS21   02221
MESS22   02232
MESS23   02243
MESS24   02306
MESS25   02332
REVEND   02362
EXPAND   02363
MARK     02364
REVGRD   02365
LOCK     02366
DATAM    02367
PREFIN   02370
GUARD    02371
REVMRK   02372
END      02373
REDNOM   02374
FWDWAC   02375
RESERC   02376
WTMT     02377
STOPGO   02400
WAC      02401
NORCON   02402
SERNOM   02403
AA       02404
ANSWER   02405
ASKII    02406
BLOCKS   02407
CPOINT   02410
CONST1   02411
CONST2   02412
CNTR     02413
CNTR1    02414
CNTR2    02415
DATAS    02416
EXPECT   02417
M9       02420
M12      02421
M260     02422
MASK1    02423
MASK2    02424
MASK3    02425
MASK4    02426
MASK5    02427
MINUS4   02430
NNN      02431
NUMBER   02432
OBVERS   02433
ONE      02434
PNTR     02435
PNTR1    02436
PNTR2    02437
POINT    02440
```

```
RUBOUT   02446
SAVE     02447
SAVE1    02450
SAVE2    02451
SAVE3    02452
TALLY    02453
TEMP     02454
TEM1     02455
TEN      02456
TWO      02457
THREE    02460
UNIT     02461
YYY      02462
MAGCON   02463
BUFFER   02466
A        015265
CLSF     700001
CLOF     700004
CLON     700044
RSF      700101
RCF      700102
RSA      700104
RRB      700112
RSB      700144
PSF      700201
PCF      700202
PSA      700204
PSB      700244
KSF      700301
KRB      700312
TSF      700401
TCF      700402
TLS      700406
EEM      707702
LEM      707704
```