IDENTIFICATION

PRODUCT CODE: MAINDEC-8E-D1IB-D

PRODUCT NAME: MI8-E BOOTSTRAP DIAGNOSTIC

DATE CREATED: JAN. 17, 1972

MAINTAINER: DIAGNOSTIC PROGRAMMING GROUP

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1. ABSTRACT

THE MI8-E BOOTSTRAP DIAGNOSTIC VERIFIES CORRECT OPERATION OF
THE MI8-E BOOTSTRAP LOADER OPTION IN ALL ITS STANDARD
CONFIGURATIONS. THE DIAGNOSTIC PRODUCES A VISUAL TYPE OUT
AND/OR A BINARY OBJECT TAPE OF THE BOOTSTRAP BLOCK OF DATA
INFORMATION LOADED INTO CORE BY THE MI8-E MODULE UNDER TEST.
THIS VISUAL TYPEOUT AND BINARY OBJECT TAPE CAN THEN BE SAVED
FOR THE TESTING OF MI8-E MODULES OF THE SAME CONFIGURATION.

THE DIAGNOSTIC IS AVAILABLE IN A LOW AND HIGH CORE VERSION.
THE VERSION TO BE USED TO TEST A MI8-E MODULE WILL DEPEND ON THE
MEMORY LOCATIONS UTILIZED BY THAT PARTICULAR MODULE. THE LOW
CORE VERSION OF THE DIAGNOSTIC OCCUPIES AND USES MEMORY
LOCATIONS 0200-1777 AND THE HIGH CORE VERSION OCCUPIES AND
USES MEMORY LOCATIONS 4200-5777. USE THE VERSION THAT DOES
NOT CONFLICT WITH THE MEMORY LOCATIONS OF THE BOOTSTRAP BLOCK
FOR THE MI8-E MODULE UNDER TEST.

2. REQUIREMENTS

PDP8/E COMPUTER
ASR-33 TELETYPE OR EQUIVALENT.
LOW OR HIGH SPEED PAPER TAPE READER.
LOW OR HIGH SPEED PAPER TAPE PUNCH.
MI8-E BOOTSTRAP DIAGNOSTIC.
MI8-E BOOTSTRAP LOADER OPTION.

3. STARTING ADDRESS

THE STARTING ADDRESS OF THE LOW CORE VERSION IS 0200.
THE STARTING ADDRESS OF THE HIGH CORE VERSION IS 4200.

4. PRELIMINARY PROGRAMS

ALL OTHER DIAGNOSTICS FOR THE COMPUTER AND PERIPHERALS SHOULD BE
RUN SUCCESSFULLY.

5. OPERATION SWITCH SETTINGS

SWR0=1 VERIFICATION BY BINARY OBJECT TAPE.
SWR0=0 VERIFICATION BY VISUAL TYPEOUT.
SWR1=1 PUNCH BINARY OBJECT TAPE.
SWR2=1 LOW SPEED PAPER TAPE PUNCH.
SWR2=0 HIGH SPEED PAPER TAPE PUNCH.
SWR6=8 MEMORY FIELD OF BINARY LOADER.
SWR9-11 AMOUNT OF EXTENDED MEMORY FIELDS.

6. OPERATOR AND PROGRAM ACTION

A. INSTALL THE MI8-E MODULE TO BE TESTED.

B. LOAD THE DIAGNOSTIC INTO THE SAME MEMORY FIELD AS UTILIZED
    BY THE MI8-E MODULE UNDER TEST USING THE STANDARD BINARY
    LOADER TECHNIQUE.

C. IF THE OPERATOR WISHES TO TEST THE MODULE USING ITS BINARY
    OBJECT TAPE, LOAD THE BINARY OBJECT TAPE INTO THE SAME
    MEMORY FIELD AS OCCUPIED BY THE DIAGNOSTIC USING THE

STANDARD BINARY LOADER TECHNIQUE.

D. DISABLE THE I/O DEVICE USED BY THE MODULE UNDER TEST. FOR
   EXAMPLE, PLACE NO TAPE IN READER, TURN OFF READER OR PUNCH,
   OR DISCONNECT THE M8350 TO THE DEVICE.

E. SET THE SWITCH REGISTER TO THE STARTING ADDRESS OF THE
   DIAGNOSTIC 0200/4200 AND PRESS ADDRESS LOAD.

F. SET THE SWITCH REGISTER TO THE INITIAL ADDRESS OF THE
   BOOTSTRAP DATA BLOCK OF INFORMATION OF THE PARTICULAR MODULE
   UNDER TEST AND PRESS CLEAR AND THEN CONTINUE. THE COMPUTER
   SHOULD HALT AT ADDRESS 0202/4202.

G. SET THE SWITCH REGISTER TO THE STARTUP ADDRESS OF THE
   MODULE UNDER TEST AND PRESS CLEAR AND THEN CONTINUE. THE
   COMPUTER SHOULD HALT AT ADDRESS 0205/4205.

H. IF THE OPERATOR HAS SELECTED TO TEST THE MODULE USING THE
   BINARY OBJECT TAPE, SET SWR0=1. IF VERIFICATION IS DESIRED
   BY VISUAL TYPEOUT, SET SWR0=0.

I. IF THE OPERATOR WISHES TO PUNCH A NEW BINARY OBJECT TAPE, SET
   SWR1=1 AND SWR2=1 FOR LOW SPEED PUNCH OR SWR2=0 FOR HIGH
   SPEED PUNCH.

J. SET SWR6-8 TO THE MEMORY FIELD OF THE BINARY LOADER AND
   SWR9-11 TO THE AMOUNT OF EXTENDED MEMORY FIELDS AND
   PRESS CLEAR AND THEN CONTINUE.

K. THE BINARY LOADER WILL BE RELOCATED FROM THE FIELD SPEC-
   IFIED IN SWR6-8 TO A BUFFER AREA WITHIN THE DIAGNOSTIC.
   THE SWITCH REGISTER SETTINGS FOR THE STARTUP ADDRESS AND
   THE INITIAL ADDRESS OF THE BOOTSTRAP INFORMATION WILL BE
   CHECKED TO MAKE SURE THEY DO NOT CONFLICT WITH
   THE DIAGNOSTIC.

L. THE DIAGNOSTIC WILL NOW LOAD A DATA PATTERN OF 2525 INTO
   ALL MEMORY LOCATIONS NOT OCCUPIED BY THE DIAGNOSTIC AND THEN
   SIGNAL THE OPERATOR WITH A BELL ON THE TTY TO TOGGLE THE
   BOOTSTRAP SWITCH AS THE DATA PATTERN IS BEING CHECKED. THIS
   WILL VERIFY THAT THE COMPUTER IS NOT EFFECTED BY THE MODULE
   WHILE THE COMPUTER IS IN THE RUN STATE. THE OPERATOR MUST
   TOGGLE THE BOOTSTRAP SWITCH AT LEAST 10 TIMES DURING THIS
   TEST AND THEN HIT A KEY ON THE TTY TO EXIT TO NEXT TEST.

M. THE DIAGNOSTIC WILL NOW LOAD A DATA PATTERN OF 5252 INTO ALL
   MEMORY LOCATIONS NOT OCCUPIED BY THE DIAGNOSTIC AND THEN
   SIGNAL THE OPERATOR WITH A BELL ON THE TTY TO TOGGLE THE
   BOOTSTRAP SWITCH AS THE DATA PATTERN IS BEING CHECKED.
   THIS WILL VERIFY THAT THE COMPUTER IS NOT EFFECTED BY THE
   MODULE WHILE THE COMPUTER IS IN THE RUN STATE. THE OPERATOR
   MUST TOGGLE THE BOOTSTRAP SWITCH AT LEAST 10 TIMES DURING
   AND THEN HIT A KEY ON THE TTY TO EXIT TO NEXT TEST.

N. THE DIAGNOSTIC WILL NOW LOAD A DATA PATTERN OF 2525 IN ALL
   MEMORY LOCATIONS NOT OCCUPIED BY THE DIAGNOSTIC, LOAD A
   HALT IN THE BOOTSTRAP BLOCK +1 JUST INCASE THE BOOTSTRAP
   DATA DOESN'T HANG, THEN HALT IN ADDRESS 1640/5640. THE
   RATOR MUST TOGGLE THE BOOTSTRAP SWITCH ONCE THEN ST

INCORRECT SWITCH SETTINGS FOR THE STARTUP ADDRESS OF THE
MODULE AND THE INITIAL ADDRESS OF THE BOOTSTRAP DATA BLOCK
OF INFORMATION WILL RESULT IN A HALT AT ADDRESS 0545/4545,
THE OPERATOR MAY RE-SET THE SWITCH REGISTER FOR THE INITIAL
ADDRESS OF THE DATA BLOCK OF INFORMATION AND HIT CONTINUE
TO RE-START THE SETUP PROCEDURE.

8.   RESTRICTIONS

THE OPERATOR MUST NOTE THAT ENCODED BOOTSTRAPS OF STANDARD
CONFIGURATIONS SHOULD HANG WHEN LOADED AND AUTOMATICALLY
STARTED-UP. UNENCODED BOOTSTRAPS SHOULD NOT HANG BUT SHOULD
RESULT IN A HALT AT THE BOOTSTRAP BLOCK -1.

THE I/O DEVICE THAT THE BOOTSTRAP USES MUST BE DISABLED.

THE INITIAL ADDRESS OF THE BOOTSTRAP BLOCK AND THE STARTUP
ADDRESS OF THE MODULE MUST NOT CONFLICT WITH THE DIAGNOSTIC.

THE STARTUP ADDRESS OF THE MODULE MUST BE WITHIN THE BOOTSTRAP
BLOCK OF INFORMATION.

THE BINARY OBJECT TAPE USED TO TEST A PARTICULAR MODULE MUST
BE USED WITH THE SAME (LOW OR HIGH) VERSION OF THE DIAGNOSTIC
FROM WHICH IT WAS PUNCHED.

THE DIAGNOSTIC AND BINARY OBJECT TAPE MUST BE LOADED INTO THE
SAME MEMORY FIELD AS UTILIZED BY THE MODULE UNDER TEST.

THE OPERATOR MUST NOTE THAT THE DOWNWARD MOTION OF THE BOOTSTRAP
SWITCH DOES NOT IN ANYWAY EFFECT THE COMPUTER. THE BOOTSTRAP
SHOULD ONLY LOAD ON THE UPWARD MOTION OF THE BOOTSTRAP SWITCH.

9.   GENERAL INFORMATION

THE FIRST TIME AN OPERATOR RUNS THIS DIAGNOSTIC TO TEST A
PARTICULAR TYPE OF MODULE HE MUST VERIFY THE MODULE BY THE
VISUAL TYPEOUT METHOD. IF THIS INFORMATION IS CORRECT, HE
SHOULD THEN PUNCH A BINARY OBJECT TAPE OF THE INFORMATION
LOADED BY THE MODULE. THE OPERATOR SHOULD THEN LABEL AND
SAVE THIS BINARY OBJECT TAPE AND VISUAL TYPEOUT FOR THE
TESTING OF MODULES OF THE SAME CONFIGURATION.

THE STARTUP ADDRESS OF THE MODULE REFERED TO IN THIS DOCU-
MENTATION IS THE ADDRESS AT WHICH THE BOOTSTRAP PROGRAM WILL
AUTOMATICALLY START AFTER BEING LOADED BY THE MODULE. THE
INITIAL ADDRESS OF THE DATA BLOCK OF INFORMATION IS THE FIRST
ADDRESS LOCATION INTO WHICH THE FIRST OF THE 32 DATA WORDS
WILL BE LOADED.

THE BOOTSTRAP SWITCH IS LOCATED TO THE LEFT OF THE SWITCH
REGISTER ON THE PDP8/E FRONT PANEL AND IS LABELED "SW".

THE 32 DECIMAL WORDS OF DATA INFORMATION LOADED BY THE
BOOTSTRAP MODULE IS DEPENDENT ON THE DIODES LABELED "WORD 1-32"
ON THE M18-E MODULE. CUT DIODES RESULT IN A DATA 1 AND UNCUT
DIODES RESULT IN A DATA 0.

ENCODED BOOTSTRAP MODULES ARE THOSE WHOSE "WORD DIODES"
ARE CUT FOR CERTAIN DATA PATTERNS AND INSTRUCTIONS.

AND/OR RE-START THE COMPUTER AT ADDRESS 0266/4266. THE
DIAGNOSTIC WILL CHECK ALL MEMORY LOCATIONS NOT OCCUPIED BY
THE DIAGNOSTIC AND THE BOOTSTRAP BLOCK FOR A CORRECT DATA
PATTERN AND THEN CHECK THE HALT LOADED INTO THE BOOTSTRAP
BLOCK +1. IF VISUAL TYPEOUT WAS PREVIOUSLY SELECTED THE
BOOTSTRAP BLOCK OF INFORMATION LOADED BY THE MODULE WILL BE
TYPED OUT ON THE TTY AND THE OPERATOR MUST VERIFY THAT
THIS IS CORRECT. IF VERIFICATION WAS PREVIOUSLY SELECTED BY
THE BINARY OBJECT TAPE THE DIAGNOSTIC WILL COMPARE THE
BOOTSTRAP INFORMATION LOADED BY THE MODULE TO THAT INFORMATION
LOADED BY THE BINARY OBJECT TAPE.

O. IF THE OPERATOR HAS SELECTED TO PUNCH A BINARY OBJECT TAPE
THE COMPUTER WILL HALT AT ADDRESS 0307/4307 TO ALLOW THE
OPERATOR TO PREPARE THE PUNCH. THE OPERATOR MUST THEN
HIT CONTINUE TO PUNCH THE BINARY OBJECT TAPE.

P. THE DIAGNOSTIC WILL NOW LOAD A DATA PATTERN OF 5252
INTO ALL MEMORY LOCATIONS NOT OCCUPIED BY THE DIAGNOSTIC
AND THEN HALT AT ADDRESS 1640/5640. THE OPERATOR MUST
TOGGLE THE BOOTSTRAP SWITCH ONCE THEN STOP AND/OR RESTART
THE DIAGNOSTIC AT ADDRESS 0323/4323. THE DIAGNOSTIC
WILL CHECK THE DATA PATTERN IN ALL MEMORY LOCATIONS
NOT OCCUPIED BY THE DIAGNOSTIC AND THE BOOTSTRAP BLOCK,
CHECK THE HALT IN THE BOOTSTRAP BLOCK +1, AND COMPARE
THE BOOTSTRAP BLOCK OF INFORMATION TO THAT FOUND IN
STEP N. THE COMPUTER SHOULD THEN HALT AT ADDRESS
0332/4332 INDICATING A SUCCESSFUL PASS COMPLETE. IF
THE OPERATOR HITS CONTINUE THE DIAGNOSTIC SHOULD ENTER
THE FIRST TEST SECTION L. IF THE OPERATOR WISHES TO TEST
A MODULE OF THE SAME CONFIGURATION, THE DIAGNOSTIC CAN
BE RESTARTED FROM ADDRESS 0333/4333, THUS ELIMINATING THE
INITIAL SETUP PROCEDURE.

7.   ERRORS

A NON-RECOVERABLE ERROR MAY OCCUR IF THE BOOTSTRAP BLOCK OF
INFORMATION DESTROYS THE DIAGNOSTIC IN CORE. IF THIS SHOULD
OCCUR, IT IS POSSIBLE TO SINGLE STEP THE ACTUAL LOAD OF THE
BOOTSTRAP MODULE.

IF A RECOVERABLE DATA ERROR DOES OCCUR THE COMPUTER SHOULD
HALT WITH THE DEFECTIVE ADDRESS IN THE MQ, THE DEFECTIVE DATA
IN THE AC, AND THE MEMORY FIELD WHERE THE VALUES WERE FOUND
IN THE DF INDICATORS. THE OPERATOR MAY HIT CONTINUE TO
DISPLAY THE VALUE EXPECTED IN THE AC.

THE FOLLOWING MEMORY ADDRESSES LISTED BELOW ARE RECOVERABLE
DATA ERROR HALTS AND FAILURES. FOR MORE INFORMATION REFERENCE
THE DIAGNOSTIC LISTING AND/OR SECTION 6 OF THE DOCUMENT.

0753/4753   DATA PATTERN OF 2525 OR 5252 LOADED INTO
                  CORE BY THE DIAGNOSTIC WAS INCORRECT.

1036/5036   HALT LOADED INTO THE BOOTSTRAP BLOCK +1 BY
                  THE DIAGNOSTIC WAS INCORRECT.

1072/5072   THE BOOTSTRAP INFORMATION LOADED INTO CORE
                  BY THE MODULE UNDER TEST WAS INCORRECT.

UNENCODED BOOTSTRAP MODULES ARE THOSE WHOSE "WORD DIODES"
ARE NOT CUT RESULTING IN AN ALL 0'S PATTERN.

THE MEMORY FIELD, STARTUP ADDRESS, AND THE INITIAL ADDRESS
OF THE BOOTSTRAP INFORMATION IS DEPENDENT ON THE SPLIT
LUG JUMPERS LOCATED ON THE MI8-E MODULE AND LABELED
F0-F2, S0-S11, AND I2-I11 RESPECTIVELY.

THE BINARY LOADER MAY BE REPLACED AFTER RUNNING THE DIAGNOSTIC
TO ITS ORIGINAL LOCATIONS IN MEMORY BY LOAD AND STARTING
ADDRESS 1200/5200.

AN EXAMPLE OF THE BOOTSTRAP DATA TYPEOUT IS SHOWN BELOW.

```
        MI8-E BOOTSTRAP DATA
        ADRS            DATA

        0023            6007
        0024            6751
        0025            6745
        0026            5025
        0027            7200
        0030            6733
        0031            5031
        0032            7777
        0033            7777
        0034            7777
        0035            7777
        0036            7777
        0037            7777
        0040            7777
        0041            7777
        0042            7777
        0043            7777
        0044            7777
        0045            7777
        0046            7777
        0047            7777
        0050            7777
        0051            7777
        0052            7777
        0053            7777
        0054            7777
        0055            7777
        0056            7777
        0057            7777
        0060            7777
        0061            7777
        0062            7777
```

10.   LISTING

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                        /
                        /MI8-E BOOTSTRAP DIAGNOSTIC
                        /
                        /COPYRIGHT 1972, DIGITAL EQUIPMENT CORPORATION
                        /
              6007      CAF=6007
              7421      MQL=7421
                        /
                        /THE LOW VERSION STARTING ADDRESS IS 0200,
                        /THE HIGH VERSION STARTING ADDRESS IS 4200;
                        /
                        /OPERATION SWITCH REGISTER FOR MI8-E DIAGNOSTIC
                        /
                        /SWR0=0 VERIFICATION BY OCTAL DUMP TYPE OUT
                        /SWR0=1 VERIFICATION BY BINARY OBJECT TAPE
                        /SWR1=1 PUNCH BINARY OBJECT TAPE
                        /SWR2=1 LOW SPEED PUNCH
                        /SWR2=0 HIGH SPEED PUNCH
                        /SWR6=0 FIELD OF BINARY LOADER
                        /SWR9=11 AMOUNT OF EXTENDED FIELDS
                        /
                        /ROUTINE TO SAVE THE INITIAL BLOCK ADDRESS
                        /AND THE STARTUP ADDRESS OF THE BOOTSTRAP,
                        /SAVE BINARY LOADER IN PROGRAM BUFFER AREA;
                        /CHECK TO MAKE SURE THAT ADDRESSES DO NOT INTERFER
                        /WITH THE LOCATIONS OF THE DIAGNOSTIC,
                        /ALSO SAVE OPERATION SWITCHES,
                        /
              0200      *0200
                        /
0200  7604      BEGIN,  LAS
0201  3335              DCA STRBLK              /SAVE START OF BOOTSTRAP BLOCK
0202  7402              HLT
0203  7604              LAS
0204  3336              DCA STRADD              /SAVE STARTUP ADDRESS OF BOOTSTRAP
0205  7402              HLT
0206  7604              LAS
0207  3337              DCA EXTSAV              /SAVE OPERATING SWITCHES
0210  6224              RIF
0211  1342              TAD KCDF                /MAKE PRESENT FIELD CDF
0212  3213              DCA PREFLD
0213  0000      PREFLD, 0
0214  1335              TAD STRBLK              /GET START OF BLOCK
0215  1340              TAD AMOUNT              /GET LENGTH OF BLOCK +1
0216  3341              DCA HLTLOC              /MAKE HALT LOCATION
0217  1344              TAD FIRPAS              /GET PASS FLAG
0220  7640              SZA CLA                 /IS IT FIRST PASS
0221  4777'             JMS MOVBIN              /YES, MOVE THE BINARY LOADER
0222  4776'             JMS CHKADD              /CHECK THAT SWITCHES DO NOT CONFLICT
                        /
                        /LOAD MEMORY WITH DATA PATTERN 2525 AND SIGNAL
                        /OPERATOR TO TOGGLE SWITCH AS MEMORY IS BEING CHECKED,
                        /SWITCH SHOULD BE TOGGLED AT LEAST 10 TIMES
                        /OPERATOR MUST HIT TTY KEY TO EXIT TO NEXT TEST,
                        /THIS WILL VERIFY THAT THE PROCESSOR AND THE MEMORY
```

```
                        /WILL NOT BE AFFECTED BY BOOTSTRAP WHEN THE COMPUTER
                        /IS RUNNING,
                        /
0223  6007      TEST1,  CAF                     /CLEAR THE WORLD
0224  3344              DCA FIRPAS
0225  1746              TAD I XLOD               /GET JMS FOR LOAD
0226  3775'             DCA LODCHK              /SETUP FOR LOAD
0227  4774'             JMS MEMGO               /LOAD MEMORY WITH DATA PATTERN
0230  2525              2525                    /DATA PATTERN TO BE USED
0231  4773'             JMS BELL                /SIGNAL OPERATOR
0232  1745              TAD I XCHK              /GET JMS FOR CHECK
0233  3775'             DCA LODCHK              /SETUP FOR CHECK MEMORY
0234  4774'             JMS MEMGO               /CHECK MEMORY
0235  2525              2525                    /COMPARE TO THIS PATTERN
0236  6031              KSF
0237  5234              JMP .-3                 /WAIT FOR OPERATOR TO CONTINUE
                        /
                        /LOAD MEMORY WITH DATA PATTERN 5252 AND SIGNAL
                        /OPERATOR TO TOGGLE SWITCH AS MEMORY IS BEING CHECKED;
                        /SWITCH SHOULD BE TOGGLED AT LEAST 10 TIMES
                        /OPERATOR MUST HIT TTY KEY TO EXIT THIS TEST
                        /THIS WILL VERIFY THAT THE PROCESSOR AND THE MEMORY
                        /WILL NOT BE AFFECTED BY BOOTSTRAP WHEN THE COMPUTER
                        /IS RUNNING,
                        /
0240  7300      TEST2,  CLA CLL
0241  1746              TAD I XLOD               /GET JMS FOR LOAD
0242  3775'             DCA LODCHK              /SETUP FOR LOAD MEMORY
0243  4774'             JMS MEMGO               /LOAD MEMORY WITH DATA PATTERN
0244  5252              5252                    /DATA PATTERN TO BE USED
0245  4773'             JMS BELL                /SIGNAL OPERATOR
0246  1745              TAD I XCHK
0247  3775'             DCA LODCHK              /SETUP FOR CHECK MEMORY
0250  4774'             JMS MEMGO               /CHECK MEMORY
0251  5252              5252                    /COMPARE TO THIS PATTERN
0252  6031              KSF
0253  5250              JMP .-3                 /WAIT FOR OPERATOR TO CONTINUE
                        /
                        /LOAD MEMORY WITH DATA PATTERN 2525,
                        /LOAD A HALT INTO BOOTSTRAP BUFFER +1 JUST
                        /INCASE THE BOOTSTRAP DOESN'T HANG,
                        /THEN GO HALT AND WAIT FOR THE OPERATOR TO
                        /TOGGLE THE BOOTSTRAP SWITCH ONCE,
                        /THE OPERATOR MUST THEN RESTART THE PROGRAM AT
                        /LOCATION 0266/4266,
                        /
0254  7300      TEST3,  CLA CLL
0255  1746              TAD I XLOD               /GET JMS FOR LOAD
0256  3775'             DCA LODCHK              /SETUP FOR LOAD
0257  4774'             JMS MEMGO               /LOAD MEMORY WITH DATA PATTERN
0260  2525              2525
0261  1343              TAD KHLT
0262  3734              DCA I WATHLT             /STORE WAIT HALT AT END OF DIAG,
0263  1343              TAD KHLT
0264  3741              DCA I HLTLOC             /STORE HLT IN BOOTSTRAP BLOCK +1
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/

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0265 5734            JMP I WATHLT            /GO HALT AND WAIT FOR OPERATOR TO
                                             /TOGGLE SWITCH AND RESTART PROGRAM
                     /
                     /CHECK MEMORY NOT OCCUPIED BY THE BOOTSTRAP
                     /FOR CORRECT PATTERN OF 2525, IF OPERATOR HAS
                     /INHIBITED VISUAL PRINT OUT ASSUME THAT THE
                     /BINARY OBJECT TAPE OF THE BOOTSTRAP INFORMATION
                     /HAS BEEN LOADED INTO CORE AND COMPARE THIS OBJECT
                     /TO THE INFORMATION BOOTSTRAPED INTO CORE,
                     /IF VISUAL CHECK PRINT OUT BOOTSTRAP BUFFER INFORMATION,
                     /IF OPERATOR HAS SELECTED TO PUNCH NEW OBJECT TAPE
                     /HALT AND WAIT FOR OPERATOR TO PREPARE THE
                     /PAPER TAPE PUNCH SELECTED,
                     /OPERATOR MUST HIT CONTINUE TO PUNCH TAPE,
                     /
0266 7300   RESTR3,  CLA CLL
0267 1337            TAD EXTSAV              /GET OPERATION SWITCHES
0270 7710            SPA CLA                 /SWR0=1 IS INHIBIT OCTAL DUMP
0271 5274            JMP INHDMP              /INHIBIT OCTAL DUMP OF BOOTSTRAP
0272 4772'           JMS MOVBUF              /MOVE BOOTSTRAP TO BUFFER AREA
0273 4771'           JMS TYPBUF              /TYPE OCTAL DUMP OF BOOTSTRAP
0274 1745   INHDMP,  TAD I XCHK              /GET JMS FOR CHECK
0275 3775'           DCA LODCHK              /SETUP FOR CHECK MEMORY
0276 7320            CLA CLL CML
0277 4774'           JMS MEMGO               /CHECK MEMORY OTHER THAN BOOTSTRAP
0300 2525            2525
0301 4770'           JMS CHKHLT              /CHECK HLT STORED IN BLOCK +1
0302 4767'           JMS COMPAR              /COMPARE BOOTSTRAP TO BUFFER AREA
0303 1337            TAD EXTSAV              /GET OPERATION SWITCHES
0304 7004            RAL
0305 7700            SMA CLA                 /SWR1=1 IS PUNCH NEW TAPE
0306 5311            JMP TEST4               /INHIBIT TAPE AND GO TO NEXT TEST
0307 7402            HLT                     /WAIT FOR OPERATOR TO PREPARE PUNCH
0310 4766'           JMS BPUN                /OPERATOR MUST HIT CONTINUE TO PUNCH
                     /
                     /LOAD MEMORY WITH DATA PATTERN 5252,
                     /LOAD A HALT INTO BOOTSTRAP BUFFER +1 JUST
                     /INCASE THE BOOTSTRAP DOESN'T HANG,
                     /THEN GO HALT AND WAIT FOR THE OPERATOR TO
                     /TOGGLE THE BOOTSTRAP SWITCH ONCE,
                     /THE OPERATOR MUST THEN RESTART THE PROGRAM AT
                     /LOCATION 0323/4323,
                     /
0311 7300   TEST4,   CLA CLL
0312 1746            TAD I XLOD              /GET JMS FOR LOAD
0313 3775'           DCA LODCHK              /SETUP FOR LOAD
0314 4774'           JMS MEMGO               /LOAD MEMORY WITH DATA PATTERN
0315 5252            5252
0316 1343            TAD KHLT
0317 3734            DCA I WATHLT            /STORE WAIT HALT AT END OF DIAG,
0320 1343            TAD KHLT
0321 3741            DCA I HLTLOC            /STORE A HLT IN BLOBK +1
0322 5734            JMP I WATHLT            /GO HALT AND WAIT FOR OPERATOR TO
                                             /TOGGLE SWITCH AND RESTART PROGRAM
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                     /
                     /CHECK MEMORY NOT OCCUPIED BY THE BOOTSTRAP
                     /FOR A CORRECT PATTERN OF 5252, THEN COMPARE
                     /THE BOOTSTRAP INFORMATION TO THAT FOUND IN
                     /TEST 3,
                     /
0323 7300   RESTR4,  CLA CLL
0324 1745            TAD I XCHK              /GET JMS FOR CHECK
0325 3775'           DCA LODCHK              /SETUP FOR CHECK MEMORY
0326 7320            CLA CLL CML
0327 4774'           JMS MEMGO               /CHECK MEMORY OTHER THAN BOOTSTRAP
0330 5252            5252
0331 4770'           JMS CHKHLT              /CHECK HLT IN BLOCK +1
0332 7402            HLT                     /END OF TEST
0333 5223            JMP TEST1               /LOOP ON PROGRAM
                     /
0334 1640   WATHLT,  INBUF +40
0335 0000   STRBLK,  0
0336 0000   STRADD,  0
0337 0000   EXTSAV,  0
0340 0040   AMOUNT,  0040
0341 0000   HLTLOC,  0
0342 6201   KCDF,    CDF
0343 7402   KHLT,    HLT
0344 7777   FIRPAS,  7777
0345 0760   XCHK,    KCHK
0346 0761   XLOD,    KLOD
                     /
0366 1223
0367 1043
0370 1023
0371 0421
0372 0400
0373 0514
0374 0600
0375 0743
0376 0520
0377 1000
            PAGE
                     /
                     /ROUTINE TO MOVE BOOTSTRAP INFORMATION FROM
                     /BOOTSTRAP AREA TO PROGRAM BUFFER AREA,
                     /
0400 0000   MOVBUF,  0
0401 1777'           TAD STRBLK
0402 3364            DCA BCNT6
0403 1776'           TAD AMOUNT
0404 7041            CIA
0405 3365            DCA BCNT7
0406 1362            TAD XINBUF
0407 3366            DCA BCNT8
0410 1764            TAD I BCNT6
0411 3766            DCA I BCNT8
0412 2364            ISZ BCNT6
0413 7000            NOP
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0414  2366              ISZ BCNT8
0415  7000              NOP
0416  2365              ISZ BCNT7
0417  5210              JMP MOVBUF +10
0420  5600              JMP I MOVBUF
                /
                /ROUTINE TO TYPE BOOTSTRAP DATA INFORMATION
                /
0421  0000      TYPBUF, 0
0422  1360              TAD TEXTMS
0423  3364              DCA BCNT6
0424  1361              TAD TEXTLG
0425  3365              DCA BCNT7
0426  1764              TAD I BCNT6
0427  4305              JMS TYPE
0430  2364              ISZ BCNT6
0431  7000              NOP
0432  2365              ISZ BCNT7
0433  5226              JMP TYPBUF +5
0434  1777'             TAD STRBLK
0435  3364              DCA BCNT6
0436  1776'             TAD AMOUNT
0437  7041              CIA
0440  3365              DCA BCNT7
0441  1364      STRTYP, TAD BCNT6
0442  4264              JMS OCTEL
0443  1347              TAD K7774
0444  3366              DCA BCNT8
0445  1354              TAD K0240
0446  4305              JMS TYPE              /MAKE A SPACE
0447  2366              ISZ BCNT8
0450  5245              JMP .-3
0451  1764              TAD I BCNT6
0452  4264              JMS OCTEL
0453  1350              TAD K0215
0454  4305              JMS TYPE
0455  1351              TAD K0212
0456  4305              JMS TYPE
0457  2364              ISZ BCNT6
0460  7000              NOP
0461  2365              ISZ BCNT7
0462  5241              JMP STRTYP
0463  5621              JMP I TYPBUF
                /
                /ROUTINE TO TYPE OCTAL INFORMATION,
                /
0464  0000      OCTEL,  0
0465  7106              RTL CLL
0466  7006              RTL
0467  3363              DCA ACSAV1
0470  1347              TAD K7774
0471  3367              DCA BCNT9
0472  1363              TAD ACSAV1
0473  0775'             AND K0007
0474  1353              TAD K0260
```

```
0475  4305              JMS TYPE
0476  1363              TAD ACSAV1
0477  7006              RTL
0500  7004              RAL
0501  3363              DCA ACSAV1
0502  2367              ISZ BCNT9
0503  5272              JMP .-11
0504  5664              JMP I OCTEL
                /
0505  0000      TYPE,   0
0506  6046              TLS
0507  6041              TSF
0510  5307              JMP .-1
0511  6042              TCF
0512  6032              KCC
0513  5705              JMP I TYPE
                /
0514  0000      BELL,   0
0515  1352              TAD K0207
0516  4305              JMS TYPE
0517  5714              JMP I BELL
                /
                /ROUTINE TO CHECK THAT ADDRESSES SUBMITTED BY OPERATOR
                /DO NOT CONFLICT WITH DIAGNOSTIC, IF SWITCH ERROR OCCURES
                /THE COMPUTER SHOULD HALT, RE-SET SWITCH FOR STARTING
                /ADDRESS OF BLOCK AND HIT CONTINUE TO TRY AGAIN,
                /
0520  0000      CHKADD, 0
0521  7300              CLA CLL
0522  1356              TAD SAFADD            /LAST LOCATION USED
0523  7040              CMA
0524  1777'             TAD STRBLK            /GET START OF BOOTSTRAP BLOCK
0525  7630              SZL CLA               /DOES BLOCK INTERFER WITH DIAG,
0526  5334              JMP STRTUP            /OK, CHECK STARTUP ADDRESS
0527  1357              TAD XBEGIN            /GET FIRST LOCATION USED
0530  7041              CIA
0531  1774'             TAD HLTLOC            /COMPARE TO THIS VALUE
0532  7630              SZL CLA               /DOES BLOCK INTERFER WITH DIAG,
0533  5345              JMP ADDHLT            /STARTING BLOCK ADDRESS ERROR
0534  1777'     STRTUP, TAD STRBLK            /GET START OF BLOCK
0535  7041              CIA
0536  1773'             TAD STRADD            /GET STARTUP ADDRESS
0537  7510              SPA                   /WAS ADDRESS OK
0540  5345              JMP ADDHLT            /NO, ERROR
0541  7161              CIA STL
0542  1355              TAD LENGTH            /LENGTH OF BLOCK
0543  7620              SNL CLA               /WAS STARTUP ADDRESS OK
0544  5720              JMP I CHKADD          /YES, START TEST
0545  7602      ADDHLT, HLT CLA               /SWITCH SETTING ERROR
0546  5772'             JMP BEGIN             /RESET SWITCH REGISTER TO START OF
                                              /BLOCK AND HIT CONTINUE TO TRY AGAIN
                /
0547  7774      K7774,  7774
0550  0215      K0215,  0215
0551  0212      K0212,  0212
```

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```
0552  0207    K0207,  0207
0553  0260    K0260,  0260
0554  0240    K0240,  0240
0555  0037    LENGTH, 0037
0556  1777    SAFADD, INBUF +177
0557  0177    XBEGIN, BEGIN -1
0560  1107    TEXTMS, BOTMES
0561  7732    TEXTLG, 7732
0562  1600    XINBUF, INBUF
0563  0000    ACSAV1, 0
0564  0000    BCNT6,  0
0565  0000    BCNT7,  0
0566  0000    BCNT8,  0
0567  0000    BCNT9,  0
                      /
0572  0200
0573  0336
0574  0341
0575  0765
0576  0340
0577  0335
      0600    PAGE
                      /
                      /ROUTINE TO DETERMINE FIELDS TO BE CHECKED
                      /
0600  0000    MEMGO,  0
0601  1777'           TAD PREFLD          /GET PRESENT FIELD CDF
0602  3346            DCA FLDGO
0603  7630            SZL CLA
0604  5325            JMP SPECHK          /CHECK FOR ALL BUT PROG. + BOOTSTRAP
0605  1776'           TAD XBEGIN          /GET STARTING ADDRESS OF CHECK
0606  3345            DCA TSTOP
0607  1362            TAD LASTLC          /GET ENDING ADDRESS OF CHECK
0610  3344            DCA TBEGIN
0611  4342            JMS FLDCHK          /ENTER ROUTINE TO LOAD OR CHECK
0612  7340            CLA CLL CMA
0613  3345            DCA TSTOP           /START AT 0
0614  3344            DCA TBEGIN          /END AT 0
0615  1775'   EXTCHK, TAD EXTSAV
0616  0365            AND K0007
0617  7450            SNA                 /IS IT TEST EXTENDED MEMORY
0620  5240            JMP EXIT            /NO DO NOT TEST EXTENDED MEMORY
0621  7040            CMA
0622  3363            DCA FLDAMN          /SETUP FOR FIELDS TO TEST
0623  3366    STRCHK, DCA BCNT3           /START WITH 0
0624  1366            TAD BCNT3
0625  1774'           TAD KCDF     ..
0626  3346            DCA FLDGO           /FIELD TO BE CHECKED
0627  6224            RIF
0630  7041            CIA
0631  1366            TAD BCNT3
0632  7640            SZA CLA             /ARE WE IN THIS FIELD
0633  4342            JMS FLDCHK          /NO, ENTER ROUTINE TO LOAD OR CHECK
0634  1366            TAD BCNT3
0635  1364            TAD K0010
```

```
0636  2363            ISZ FLDAMN
0637  5223            JMP STRCHK          /MORE TO GO
0640  7300    EXIT,   CLA CLL
0641  2200            ISZ MEMGO
0642  5600            JMP I MEMGO         /EXIT
                      /
                      /ROUTINE TO LOAD MEMORY WITH DATA PATTERN
                      /
0643  0000    LODMEM, 0
0644  1777'           TAD PREFLD          /SETUP FOR PRESENT FIELD
0645  3262            DCA THSFLD
0646  1643            TAD I LODMEM            /GET STARTING ADDRESS
0647  3367            DCA BCNT4
0650  2243            ISZ LODMEM
0651  1643            TAD I LODMEM        /GET ENDING ADDRESS
0652  3370            DCA BCNT5
0653  2243            ISZ LODMEM
0654  1643            TAD I LODMEM        /GET FIELD TO GO
0655  3260            DCA NEWFLD
0656  2243            ISZ LODMEM
0657  1600            TAD I MEMGO         /GET DATA PATTERN
0660  0000    NEWFLD, 0                   /MODIFIED BY TEST
0661  3767            DCA I BCNT4
0662  0000    THSFLD, 0                   /MODIFIED BY TEST
0663  4314            JMS ENDTST          /IS IT END OF TEST
0664  5257            JMP NEWFLD -1       /NO, CONTINUE
0665  5643            JMP I LODMEM        /YES, EXIT
                      /
                      /ROUTINE TO CHECK MEMORY FOR CORRECT DATA PATTERN.
                      /
0666  0000    CHKMEM, 0
0667  1777'           TAD PREFLD          /GET PRESENT FIELD
0670  3310            DCA CHKTHS
0671  1666            TAD I CHKMEM        /GET STARTING ADDRESS
0672  3367            DCA BCNT4
0673  2266            ISZ CHKMEM
0674  1666            TAD I CHKMEM        /GET ENDING ADDRESS
0675  3370            DCA BCNT5
0676  2266            ISZ CHKMEM
0677  1666            TAD I CHKMEM        /GET FIELD TO TEST
0700  3303            DCA FRMFLD
0701  2266            ISZ CHKMEM
0702  1600            TAD I MEMGO         /GET EXPECTED DATA
0703  0000    FRMFLD, 0
0704  7041            CIA
0705  1767            TAD I BCNT4         /GET DATA PATTERN
0706  7640            SZA CLA             /ARE THEY THE SAME
0707  5350            JMP ACERR1          /NO, INDICATE
0710  0000    CHKTHS, 0                   /MODIFIED BY TEST
0711  4314            JMS ENDTST          /IS IT END OF TEST
0712  5302            JMP FRMFLD -1       /NO, CONTINUE
0713  5666            JMP I CHKMEM        /YES EXIT
                      /
                      /ROUTINE TO CHECK FOR END OF TEST
                      /
```

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```
0714    0000    ENDTST, 0
0715    1367            TAD BCNT4           /GET ENDING ADDRESS
0716    7041            CIA
0717    1370            TAD BCNT5           /GET PRESENT ADDRESS
0720    7650            SNA CLA             /IS IT LAST ADDRESS TO TEST
0721    2314            ISZ ENDTST          /YES, EXIT
0722    2367            ISZ BCNT4
0723    5714            JMP I ENDTST        /EXIT
0724    5714            JMP I ENDTST        /EXIT
                /
                /ROUTINE TO TEST ALL BUT PROG. + BOOTSTRAP
                /
0725    1362    SPECHK, TAD LASTLC          /GET START OF CHECK
0726    3344            DCA TBEGIN
0727    7340            CLL CMA
0730    1773'           TAD STRBLK          /GET END OF CHECK
0731    3345            DCA TSTOP
0732    4342            JMS FLDCHK          /ENTER ROUTINE TO LOAD OR CHECK
0733    7301            CLA CLL IAC
0734    1772'           TAD HLTLOC
0735    3344            DCA TBEGIN
0736    1776'           TAD XBEGIN          /GET END OF CHECK
0737    3345            DCA TSTOP
0740    4342            JMS FLDCHK          /ENTER ROUTINE TO LOAD OR CHECK
0741    5215            JMP EXTCHK          /EXIT
                /
                /ROUTINE TO LOAD OR CHECK MEMORY
                /
0742    0000    FLDCHK, 0
0743    0000    LODCHK, 0                   /MODIFIED BY TEST
0744    0000    TBEGIN, 0                   /MODIFIED BY TEST
0745    0000    TSTOP,  0                   /MODIFIED BY TEST
0746    0000    FLDGO,  0                   /MODIFIED BY TEST
0747    5742            JMP I FLDCHK        /EXIT
                /
                /ROUTINE TO DISPLAY CORE PATTERN ERRORS,
                /IF AN ERROR OCCURES THE MACHINE WILL
                /HLT WITH BAD ADDRESS IN MQ AND BAD DATA IN AC,
                /HIT CONTINUE,
                /THE MACHINE WILL HLT WITH EXPECTED DATA IN AC,
                /
0750    1367    ACERR1, TAD BCNT4           /GET BAD ADDRESS
0751    7421            MQL                 /LOAD AC TO MQ
0752    1767            TAD I BCNT4         /GET BAD DATA PATTERN
0753    7402    ERHLT1, HLT                 /AC = DATA PATTERN FOUND
0754    7300            CLA CLL
0755    1600            TAD I MEMGO         /GET GOOD NUMBER
0756    7402            HLT                 /AC = EXPECTED DATA PATTERN
0757    5356            JMP .-1
                /
0760    4266    KCHK,   JMS CHKMEM
0761    4243    KLOD,   JMS LODMEM
0762    1641    LASTLC, INBUF +41
0763    0000    FLDAMN, 0
0764    0010    K0010,  0010
```

```
0765    0007    K0007,  0007
0766    0000    BCNT3,  0
0767    0000    BCNT4,  0
0770    0000    BCNT5,  0

0772    0341    /
0773    0335
0774    0342
0775    0337
0776    0557
0777    0213
        1000    PAGE
                /
                /ROUTINE TO MOVE THE BINARY LOADER
                /
1000    0000    MOVBIN, 0
1001    1306            TAD BUFBIN
1002    3277            DCA BCNT1           /SETUP BINARY LOADER BUFFER
1003    1777'           TAD PREFLD
1004    3215            DCA SETFLD
1005    1305            TAD K7600
1006    3300            DCA BCNT2           /SETUP FOR BINARY LOADER
1007    1776'           TAD EXTSAV
1010    0304            AND K0070           /MASK 6-8
1011    1775'           TAD KCDF
1012    3213            DCA BINFLD          /FIELD OF BINARY LOADER
1013    0000    BINFLD, 0                   /MODIFIED BY TEST
1014    1700            TAD I BCNT2         /GET BINARY WORD
1015    0000    SETFLD, 0                   /MODIFIED BY TEST
1016    3677            DCA I BCNT1         /STORE IN BUFFER AREA
1017    2277            ISZ BCNT1
1020    2300            ISZ BCNT2
1021    5213            JMP BINFLD          /MORE WORDS TO GO
1022    5600            JMP I MOVBIN        /EXIT
                /
                /ROUTINE TO CHECK HALT AFTER BOOTSTRAP
                /
1023    0000    CHKHLT, 0
1024    1774'           TAD HLTLOC          /GET HALT LOCATION
1025    3301            DCA BCNT10
1026    1701            TAD I BCNT10        /GET HALT
1027    7041            CIA
1030    1773'           TAD KHLT            /GET EXPECTED VALUE
1031    7650            SNA CLA             /HERE THEY THE SAME
1032    5623            JMP I CHKHLT        /YES EXIT
                /
                /ROUTINE TO DISPLAY ERROR FOR BAD HLT LOCATION
                /IF AN ERROR OCCURES THE MACHINE WILL
                /HLT WITH BAD ADDRESS IN MQ AND BAD DATA IN AC,
                /HIT CONTINUE,
                /THE MACHINE WILL HLT WITH EXPECTED DATA IN AC,
                /
1033    1301    ACERR2, TAD BCNT10          /GET BAD ADDRESS
1034    7421            MQL                 /LOAD M.Q.
1035    1701            TAD I BCNT10        /GET BAD DATA
```

```
1036  7402  ERHLT2, HLT                     /BAD DATA IN AC
1037  7300          CLA CLL
1040  1773'         TAD KHLT                /GET EXPECTED DATA
1041  7402          HLT                     /EXPECTED DATA IN AC
1042  5241          JMP .-1
            /
            /ROUTINE TO COMPARE BOOTSTRAP TO BUFFER
            /
1043  0000  COMPAR, 0
1044  1772'         TAD STRBUF              /GET START OF BUFFER AREA
1045  3301          DCA BCNT10
1046  1771'         TAD STRBLK              /GET START OF BOOTSTRAP AREA
1047  3302          DCA BCNT11
1050  1770'         TAD AMOUNT              /GET AMOUNT TO BE CHECKED
1051  7041          CIA
1052  3303          DCA BCNT12              /STORE IN COUNTER
1053  1701  COMSTR, TAD I BCNT10            /GET EXPECTED DATA
1054  7041          CIA
1055  1702          TAD I BCNT11            /GET UNKNOWN VALUE
1056  7640          SZA CLA
1057  5267          JMP ACERR3              /ERROR VALUES NOT THE SAME
1060  2301          ISZ BCNT10
1061  7000          NOP
1062  2302          ISZ BCNT11
1063  7000          NOP
1064  2303          ISZ BCNT12
1065  5253          JMP COMSTR              /CONTINUE CHECKING
1066  5643          JMP I COMPAR            /EXIT
            /
            /ROUTINE TO DISPLAY BOOTSTRAP DATA ERRORS
            /IF AN ERROR OCCURES THE MACHINE WILL
            /HLT WITH BAD ADDRESS IN MQ AND BAD DATA IN AC,
            /HIT CONTINUE,
            /THE MACHINE WILL HLT WITH EXPECTED DATA IN AC,
            /
1067  1302  ACERR3, TAD BCNT11
1070  7421          MQL                     /LOAD AC WITH BAD ADDRESS
1071  1702          TAD I BCNT11            /GET BAD DATA
1072  7402  ERHLT3, HLT                     /AC IS BAD DATA
1073  7300          CLA CLL
1074  1701          TAD I BCNT10            /GET EXPECTED DATA
1075  7402          HLT                     /AC IS EXPECTED DATA
1076  5275          JMP .-1
            /
1077  0000  BCNT1,  0
1100  0000  BCNT2,  0
1101  0000  BCNT10, 0
1102  0000  BCNT11, 0
1103  0000  BCNT12, 0
1104  0070  K0070,  0070
1105  7600  K7600,  7600
1106  1400  BUFBIN, SAVBIN
            /
            /TEXT FOR "MI8-E BOOTSTRAP DATA"
            /        "ADRS"   "DATA"
```

```
            /
1107  0215  BOTMES, 215
1110  0212          212
1111  0315          315
1112  0311          311
1113  0270          270
1114  0255          255
1115  0305          305
1116  0240          240
1117  0302          302
1120  0317          317
1121  0317          317
1122  0324          324
1123  0323          323
1124  0324          324
1125  0322          322
1126  0301          301
1127  0320          320
1130  0240          240
1131  0304          304
1132  0301          301
1133  0324          324
1134  0301          301
1135  0215          215
1136  0212          212
1137  0301          301
1140  0304          304
1141  0322          322
1142  0323          323
1143  0240          240
1144  0240          240
1145  0240          240
1146  0240          240
1147  0304          304
1150  0301          301
1151  0324          324
1152  0301          301
1153  0215          215
1154  0212          212
            /
1170  0340
1171  0335
1172  1350
1173  0343
1174  0341
1175  0342
1176  0337
1177  0213
      1200  PAGE
            /
            /ROUTINE TO REPLACE BINARY LOADER,
            /BINARY LOADER MAY BE REPLACED BY
            /LOAD AND STARTING ADDRESS "RPLBIN"
            /
1200  1777'  RPLBIN, TAD EXTSAV             /GET OPERATION SWITCHES
```

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```
1201  0776'          AND KB070           /MASK BITS 6-8
1202  1775'          TAD KCDF
1203  3213           DCA TOFLD           /MAKE BINARY FIELD CDF
1204  1774'          TAD PREFLD          /GET PRESENT FIELD CDF
1205  3215           DCA OPRFLD
1206  1773'          TAD K7600           /GET START OF BINARY LOADER
1207  3351           DCA BCNT13
1210  1772'          TAD BUFBIN          /GET START OF BUFFER AREA
1211  3352           DCA BCNT14
1212  1752           TAD I BCNT14        /GET INFORMATION
1213  0000  TOFLD,   0                   /MODIFIED BY TEST
1214  3751           DCA I BCNT13        /STORE BINARY WORD
1215  0000  OPRFLD,  0                   /MODIFIED BY TEST
1216  2392           ISZ BCNT14
1217  2351           ISZ BCNT13
1220  5212           JMP TOFLD -1        /MORE WORDS TO GO
1221  7402           HLT                 /BINARY LOADER DONE
1222  5221           JMP .-1
      /
      /ROUTINE TO PUNCH OBJECT TAPE FOR OPERATOR
      /
1223  0000  BPUN,    0
1224  7300           CLA CLL
1225  3336           DCA CKSM            /CLEAR CHECK SUM
1226  1777'          TAD EXTSAV          /GET OPERATION SWITCHES
1227  7006           RTL
1230  7700           SMA CLA             /SWR2=1 IS LOW SPEED PUNCH
1231  5262           JMP HIPUN           /HIGH SPEED PUNCH SELECTED
1232  6046           TLS                 /LOW SPEED PUNCH SELECTED
1233  4264  GOLEAD,  JMS PLOT            /GO PUNCH LEADER TRAILER
1234  1350           TAD STRBUF          /GET START OF BUFFER
1235  3337           DCA IA              /STORE INITIAL ADDRESS TO BE PUNCHED
1236  1350           TAD STRBUF
1237  1771'          TAD AMOUNT          /GET AMOUNT OF BOOTSTRAP LOCATIONS
1240  3340           DCA FA
1241  1337           TAD IA
1242  7120           STL                 /TO PUNCH IA AS ORIGIN
1243  4276  PUNL,    JMS BINP            /GO PUNCH WORD AS TWO LINES OF TAPE
1244  1337           TAD IA
1245  7041           CIA
1246  1340           TAD FA
1247  7650           SNA CLA             /WAS IT LAST WORD
1250  5255           JMP .+5             /IT WAS LAST WORD
1251  1737           TAD I IA            /GET WORD TO PUNCH
1252  7100           CLL
1253  2337           ISZ IA
1254  5243           JMP PUNL
1255  1336           TAD CKSM
1256  7100           CLL
1257  4276           JMS BINP
1260  4264           JMS PLOT            /GO PUNCH CHECK SUM
1261  5623           JMP I BPUN          /GO PUNCH LEADER TRAILER
      /                                  /EXIT AND DONE WITH TAPE
1262  6026  HIPUN,   PLS                 /HIGH SPEED PUNCH SELECTED
1263  5233           JMP GOLEAD          /GO PUNCH LEADER TRAILER
```

```
      /
1264  0000  PLOT,    0
1265  7300           CLA CLL
1266  1341           TAD M212            /TO PUNCH 212 OCTAL LEADER TRAILER
1267  3342           DCA CTR1
1270  1343           TAD C200            /LEADER TRAILER CODE
1271  4316           JMS PUN             /PUNCH
1272  2342           ISZ CTR1
1273  5271           JMP .-2
1274  7300           CLA CLL
1275  5664           JMP I PLOT          /EXIT
      /
1276  0000  BINP,    0
1277  3344           DCA TEM1
1300  1344           TAD TEM1
1301  7012           RTR
1302  7012           RTR
1303  7012           RTR
1304  0345           AND SL7             /FIRST TO OCTAL DIGITS IN AC 5-11
1305  4316           JMS PUN             /PUNCH
1306  1336           TAD CKSM
1307  3336           DCA CKSM
1310  1344           TAD TEM1
1311  0346           AND SL6             /LAST TWO OCTAL DIGITS IN AC 6-11
1312  4316           JMS PUN             /PUNCH
1313  1336           TAD CKSM
1314  3336           DCA CKSM
1315  5676           JMP I BINP          /EXIT
      /
1316  0000  PUN,     0
1317  3347           DCA ACSAV2          /SAVE CODE TO BE PUNCHED
1320  1777'          TAD EXTSAV          /GET OPERATION SWITCHES
1321  7006           RTL
1322  7700           SMA CLA             /SWR2=1 IS LOW SPEED PUNCH
1323  5331           JMP HISPED          /HIGH SPEED PUNCH SELECTED
1324  1347           TAD ACSAV2          /GET CODE TO BE PUNCHED
1325  6041           TSF
1326  5325           JMP .-1
1327  6046           TLS                 /PUNCH
1330  5716           JMP I PUN           /EXIT
1331  1347  HISPED,  TAD ACSAV2          /GET CODE TO BE PUNCHED
1332  6021           PSF
1333  5332           JMP .-1
1334  6026           PLS                 /PUNCH
1335  5716           JMP I PUN           /EXIT
      /
1336  0000  CKSM,    0
1337  0000  IA,      0
1340  0000  FA,      0
1341  7566  M212,    -212
1342  0000  CTR1,    0
1343  0200  C200,    200
1344  0000  TEM1,    0
1345  0177  SL7,     177
1346  0077  SL6,     77
```

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```
          1347  0000    ACSAV2, 0
          1350  1600    STRBUF, INBUF
          1351  0000    BCNT13, 0
          1352  0000    BCNT14, 0
                        /
          1371  0340
          1372  1106
          1373  1105
          1374  0213
          1375  0342
          1376  1104
          1377  0337
                1400    PAGE
                        /
                        /THE NEXT PAGE IS RESERVED FOR BINARY LOADER
                        /STORAGE AREA WHILE THE DIAGNOSTIC IS BEING RUN,
                        /
          1400  1400    SAVBIN, SAVBIN
                        /
                1600    PAGE
                        /
                        /THE NEXT 40 OCTAL LOCATIONS ARE RESERVED
                        /FOR THE BOOOTSTRAP BUFFER
                        /
          1600  1600    INBUF, INBUF
                        /
                          S
```

```
2000
0100

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111110  00000000  00000011  11111111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  00111111

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  10111111

1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  11111000  00000000  11111111

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11100000  00000000  01111111

1400  10000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
1500  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000

1600  10000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
1700  00000000  20000000  00000000  00000000  00000000  00000000  00000000  00000000

2000
2100

2200
2300

2400
2500

2600
2700

3000
3100

3200
3300

3400
3500

3600
3700
```

8

```
4000
4100

4200
4300

4400
4500

4600
4700


5000
5100

5200
5300

5400
5500

5600
5700


6000
6100

6200
6300

6400
6500

6600
6700


7000
7100

7200
7300

7400
7500

7600
7700
```

ACERR1	0750	HIPUN	1262	TEM1	1344
ACERR2	1033	HISPED	1331	TEST1	0223
ACERR3	1067	HLTLOC	0341	TEST2	0240
ACSAV1	0563	IA	1337	TEST3	0294
ACSAV2	1347	INBUF	1600	TEST4	0311
ADDHLT	0545	INHDMP	0274	TEXTLG	0561
AMOUNT	0340	K0007	0765	TEXTMS	0560
BCNT1	1077	K0010	0764	THSFLD	0662
BCNT10	1101	K0070	1104	TOFLD	1213
BCNT11	1102	K0207	0552	TSTOP	0745
BCNT12	1103	K0212	0551	TYPBUF	0421
BCNT13	1351	K0215	0550	TYPE	0505
BCNT14	1392	K0240	0554	WATHLT	0334
BCNT2	1100	K0260	0553	XBEGIN	0597
BCNT3	0766	K7600	1105	XCHK	0345
BCNT4	0767	K7774	0547	XINBUF	0562
BCNT5	0773	KCDF	0342	XLOD	0346
BCNT6	0564	KCHK	0760		
BCNT7	0565	KHLT	0343		
BCNT8	0566	KLOD	0761		
BCNT9	0567	LASTLC	0762		
BEGIN	0200	LENGTH	0555		
BELL	0514	LODCHK	0743		
BINFLD	1013	LODMEM	0643		
BINP	1276	M212	1341		
BOTMES	1107	MEMGO	0600		
BPUN	1223	MOVBIN	1000		
BUFBIN	1106	MOVBUF	0400		
C200	1343	MQL	7421		
CAF	6007	NEWFLD	0660		
CHKADD	0520	OCTEL	0464		
CHKHLT	1023	OPRFLD	1219		
CHKMEM	0666	PLOT	1264		
CHKTHS	0710	PREFLD	0213		
CKSM	1336	PUN	1316		
COMPAR	1043	PUNL	1243		
COMSTR	1053	RESTR3	0266		
CTR1	1342	RESTR4	0323		
ENDTST	0714	RPLBIN	1200		
ERHLT1	0753	SAFADD	0556		
ERHLT2	1036	SAVBIN	1400		
ERHLT3	1072	SETFLD	1013		
EXIT	0640	SL6	1346		
EXTCHK	0615	SL7	1345		
EXTSAV	0337	SPECHK	0725		
FA	1340	STRADD	0336		
FIRPAS	0344	STRBLK	0335		
FLDAMN	0763	STRBUF	1350		
FLDCHK	0742	STRCHK	0623		
FLDGO	0746	STRTUP	0534		
FRMFLD	0703	STRTYP	0441		
GOLEAD	1233	TBEGIN	0744		

ERRORS DETECTED: 0

LINKS GENERATED: 63

RUN-TIME: 7 SECONDS

2K CORE USED

```
                        /
                        /MI8-E BOOTSTRAP DIAGNOSTIC
                        /
                        /COPYRIGHT 1972, DIGITAL EQUIPMENT CORPORATION
                        /
             6007       CAF=6007
             7421       MQL=7421
                        /
                        /THE LOW VERSION STARTING ADDRESS IS 0200,
                        /THE HIGH VERSION STARTING ADDRESS IS 4200,
                        /
                        /OPERATION SWITCH REGISTER FOR MI8-E DIAGNOSTIC
                        /
                        /SWR0=0 VERIFICATION BY OCTAL DUMP TYPE OUT
                        /SWR0=1 VERIFICATION BY BINARY OBJECT TAPE
                        /SWR1=1 PUNCH BINARY OBJECT TAPE
                        /SWR2=1 LOW SPEED PUNCH
                        /SWR2=0 HIGH SPEED PUNCH
                        /SWR6=8 FIELD OF BINARY LOADER
                        /SWR9=11 AMOUNT OF EXTENDED FIELDS
                        /
                        /ROUTINE TO SAVE THE INITIAL BLOCK ADDRESS
                        /AND THE STARTUP ADDRESS OF THE BOOTSTRAP,
                        /SAVE BINARY LOADER IN PROGRAM BUFFER AREA,
                        /CHECK TO MAKE SURE THAT ADDRESSES DO NOT INTERFER
                        /WITH THE LOCATIONS OF THE DIAGNOSTIC,
                        /ALSO SAVE OPERATION SWITCHES,
                        /
             4200       *4200
                        /
   4200  7604    BEGIN,  LAS
   4201  3335            DCA  STRBLK          /SAVE START OF BOOTSTRAP BLOCK
   4202  7402            HLT
   4203  7604            LAS
   4204  3336            DCA  STRADD          /SAVE STARTUP ADDRESS OF BOOTSTRAP
   4205  7402            HLT
   4206  7604            LAS
   4207  3337            DCA  EXTSAV          /SAVE OPERATING SWITCHES
   4210  6224            RIF
   4211  1342            TAD  KCDF            /MAKE PRESENT FIELD CDF
   4212  3213            DCA  PREFLD
   4213  0000    PREFLD, 0
   4214  1335            TAD  STRBLK          /GET START OF BLOCK
   4215  1340            TAD  AMOUNT          /GET LENGTH OF BLOCK +1
   4216  3341            DCA  HLTLOC          /MAKE HALT LOCATION
   4217  1344            TAD  FIRPAS          /GET PASS FLAG
   4220  7640            SZA  CLA             /IS IT FIRST PASS
   4221  4777'           JMS  MOVBIN          /YES, MOVE THE BINARY LOADER
   4222  4776'           JMS  CHKADD          /CHECK THAT SWITCHES DO NOT CONFLICT
                        /
                        /LOAD MEMORY WITH DATA PATTERN 2525 AND  SIGNAL
                        /OPERATOR TO TOGGLE SWITCH AS MEMORY IS BEING CHECKED,
                        /SWITCH SHOULD BE TOGGLED AT LEAST 10 TIMES
                        /OPERATOR MUST HIT TTY KEY TO EXIT TO NEXT TEST,
                        /THIS WILL VERIFY THAT THE PROCESSOR AND THE MEMORY
```

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```
                    /WILL NOT BE AFFECTED BY BOOTSTRAP WHEN THE COMPUTER
                    /IS RUNNING,
                    /
4223  6007    TEST1,  CAF                     /CLEAR THE WORLD
4224  3344            DCA FIRPAS
4225  1746            TAD I XLOD              /GET JMS FOR LOAD
4226  3775'           DCA LODCHK             /SETUP FOR LOAD
4227  4774'           JMS MEMGO              /LOAD MEMORY WITH DATA PATTERN
4230  2525            2525                   /DATA PATTERN TO BE USED
4231  4773'           JMS BELL               /SIGNAL OPERATOR
4232  1745            TAD I XCHK             /GET JMS FOR CHECK
4233  3775'           DCA LODCHK             /SETUP FOR CHECK MEMORY
4234  4774'           JMS MEMGO              /CHECK MEMORY
4235  2525            2525                   /COMPARE TO THIS PATTERN
4236  6031            KSF
4237  5234            JMP .-3                /WAIT FOR OPERATOR TO CONTINUE
                    /
                    /LOAD MEMORY WITH DATA PATTERN 5252 AND SIGNAL
                    /OPERATOR TO TOGGLE SWITCH AS MEMORY IS BEING CHECKED,
                    /SWITCH SHOULD BE TOGGLED AT LEAST 10 TIMES
                    /OPERATOR MUST HIT TTY KEY TO EXIT THIS TEST
                    /THIS WILL VERIFY THAT THE PROCESSOR AND THE MEMORY
                    /WILL NOT BE AFFECTED BY BOOTSTRAP WHEN THE COMPUTER
                    /IS RUNNING,
                    /
4240  7300    TEST2,  CLA CLL
4241  1746            TAD I XLOD              /GET JMS FOR LOAD
4242  3775'           DCA LODCHK             /SETUP FOR LOAD MEMORY
4243  4774'           JMS MEMGO              /LOAD MEMORY WITH DATA PATTERN
4244  5252            5252                   /DATA PATTERN TO BE USED
4245  4773'           JMS BELL               /SIGNAL OPERATOR
4246  1745            TAD I XCHK
4247  3775'           DCA LODCHK             /SETUP FOR CHECK MEMORY
4250  4774'           JMS MEMGO              /CHECK MEMORY
4251  5252            5252                   /COMPARE TO THIS PATTERN
4252  6031            KSF
4253  5250            JMP .-3                /WAIT FOR OPERATOR TO CONTINUE
                    /
                    /LOAD MEMORY WITH DATA PATTERN 2525,
                    /LOAD A HALT INTO BOOTSTRAP BUFFER +1 JUST
                    /INCASE THE BOOTSTRAP DOESN'T HANG,
                    /THEN GO HALT AND WAIT FOR THE OPERATOR TO
                    /TOGGLE THE BOOTSTRAP SWITCH ONCE,
                    /THE OPERATOR MUST THEN RESTART THE PROGRAM AT
                    /LOCATION 0266/4266,
                    /
4254  7300    TEST3,  CLA CLL
4255  1746            TAD I XLOD              /GET JMS FOR LOAD
4256  3775'           DCA LODCHK             /SETUP FOR LOAD
4257  4774'           JMS MEMGO              /LOAD MEMORY WITH DATA PATTERN
4260  2525            2525
4261  1343            TAD KHLT
4262  3734            DCA I WATHLT            /STORE WAIT HALT AT END OF DIAG,
4263  1343            TAD KHLT
4264  3741            DCA I HLTLOC            /STORE HLT IN BOOTSTRAP BLOCK +1
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4265  5734            JMP I WATHLT            /GO HALT AND WAIT FOR OPERATOR TO
                                             /TOGGLE SWITCH AND RESTART PROGRAM
                    /
                    /CHECK MEMORY NOT OCCUPIED BY THE BOOTSTRAP
                    /FOR CORRECT PATTERN OF 2525, IF OPERATOR HAS
                    /INHIBITED VISUAL PRINT OUT ASSUME THAT THE
                    /BINARY OBJECT TAPE OF THE BOOTSTRAP INFORMATION
                    /HAS BEEN LOADED INTO CORE AND COMPARE THIS OBJECT
                    /TO THE INFORMATION BOOTSTRAPED INTO CORE,
                    /IF VISUAL CHECK PRINT OUT BOOTSTRAP BUFFER INFORMATION,
                    /IF OPERATOR HAS SELECTED TO PUNCH NEW OBJECT TAPE
                    /HALT AND WAIT FOR OPERATOR TO PREPARE THE
                    /PAPER TAPE PUNCH SELECTED,
                    /OPERATOR MUST HIT CONTINUE TO PUNCH TAPE,
                    /
4266  7300    RESTR3,  CLA CLL
4267  1337            TAD EXTSAV              /GET OPERATION SWITCHES
4270  7710            SPA CLA                 /SWR0=1 IS INHIBIT OCTAL DUMP
4271  5274            JMP INHDMP              /INHIBIT OCTAL DUMP OF BOOTSTRAP
4272  4772'           JMS MOVBUF              /MOVE BOOTSTRAP TO BUFFER AREA
4273  4771'           JMS TYPBUF              /TYPE OCTAL DUMP OF BOOTSTRAP
4274  1745    INHDMP,  TAD I XCHK             /GET JMS FOR CHECK
4275  3775'           DCA LODCHK             /SETUP FOR CHECK MEMORY
4276  7320            CLA CLL CML
4277  4774'           JMS MEMGO              /CHECK MEMORY OTHER THAN BOOTSTRAP
4300  2525            2525
4301  4770'           JMS CHKHLT             /CHECK HLT STORED IN BLOCK +1
4302  4767'           JMS COMPAR             /COMPARE BOOTSTRAP TO BUFFER AREA
4303  1337            TAD EXTSAV              /GET OPERATION SWITCHES
4304  7004            RAL
4305  7700            SMA CLA                 /SWR1=1 IS PUNCH NEW TAPE
4306  5311            JMP TEST4               /INHIBIT TAPE AND GO TO NEXT TEST
4307  7402            HLT                     /WAIT FOR OPERATOR TO PREPARE PUNCH
4310  4766'           JMS BPUN               /OPERATOR MUST HIT CONTINUE TO PUNCH
                    /
                    /LOAD MEMORY WITH DATA PATTERN 5252,
                    /LOAD A HALT INTO BOOTSTRAP BUFFER +1 JUST
                    /INCASE THE BOOTSTRAP DOESN'T HANG,
                    /THEN GO HALT AND WAIT FOR THE OPERATOR TO
                    /TOGGLE THE BOOTSTRAP SWITCH ONCE,
                    /THE OPERATOR MUST THEN RESTART THE PROGRAM AT
                    /LOCATION 0323/4323,
                    /
                    /
4311  7300    TEST4,  CLA CLL
4312  1746            TAD I XLOD              /GET JMS FOR LOAD
4313  3775'           DCA LODCHK             /SETUP FOR LOAD
4314  4774'           JMS MEMGO              /LOAD MEMORY WITH DATA PATTERN
4315  5252            5252
4316  1343            TAD KHLT
4317  3734            DCA I WATHLT            /STORE WAIT HALT AT END OF DIAG,
4320  1343            TAD KHLT
4321  3741            DCA I HLTLOC            /STORE A HLT IN BLOBK +1
4322  5734            JMP I WATHLT            /GO HALT AND WAIT FOR OPERATOR TO
                                             /TOGGLE SWITCH AND RESTART PROGRAM
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                    /
                    /CHECK MEMORY NOT OCCUPIED BY THE BOOTSTRAP
                    /FOR A CORRECT PATTERN OF 5252, THEN COMPARE
                    /THE BOOTSTRAP INFORMATION TO THAT FOUND IN
                    /TEST 3.
                    /
4323  7300    RESTR4, CLA CLL
4324  1745            TAD I XCHK              /GET JMS FOR CHECK
4325  3775'           DCA LODCHK              /SETUP FOR CHECK MEMORY
4326  7320            CLA CLL CML
4327  4774'           JMS MEMGO               /CHECK MEMORY OTHER THAN BOOTSTRAP
4330  5252            5252
4331  4770'           JMS CHKHLT              /CHECK HLT IN BLOCK +1
4332  7402            HLT                     /END OF TEST
4333  5223            JMP TEST1               /LOOP ON PROGRAM
                    /
4334  5640    WATHLT, INBUF +40
4335  0000    STRBLK, 0
4336  0000    STRADD, 0
4337  0000    EXTSAV, 0
4340  0040    AMOUNT, 0040
4341  0000    HLTLOC, 0
4342  6201    KCDF,   CDF
4343  7402    KHLT,   HLT
4344  7777    FIRPAS, 7777
4345  4760    XCHK,   KCHK
4346  4761    XLOD,   KLOD
                    /
4366  5223
4367  5043
4370  5023
4371  4421
4372  4400
4373  4514
4374  4600
4375  4743
4376  4520
4377  5000
      4400    PAGE
                    /
                    /ROUTINE TO MOVE BOOTSTRAP INFORMATION FROM
                    /BOOTSTRAP AREA TO PROGRAM BUFFER AREA.
                    /
4400  0000    MOVBUF, 0
4401  1777'           TAD STRBLK
4402  3364            DCA BCNT6
4403  1776'           TAD AMOUNT
4404  7041            CIA
4405  3365            DCA BCNT7
4406  1362            TAD XINBUF
4407  3366            DCA BCNT8
4410  1764            TAD I BCNT6
4411  3766            DCA I BCNT8
4412  2364            ISZ BCNT6
4413  7000            NOP
```

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4414  2366            ISZ BCNT8
4415  7000            NOP
4416  2365            ISZ BCNT7
4417  5210            JMP MOVBUF +10
4420  5600            JMP I MOVBUF
                    /
                    /ROUTINE TO TYPE BOOTSTRAP DATA INFORMATION
                    /
4421  0000    TYPBUF, 0
4422  1360            TAD TEXTMS
4423  3364            DCA BCNT6
4424  1361            TAD TEXTLG
4425  3365            DCA BCNT7
4426  1764            TAD I BCNT6
4427  4305            JMS TYPE
4430  2364            ISZ BCNT6
4431  7000            NOP
4432  2365            ISZ BCNT7
4433  5226            JMP TYPBUF +5
4434  1777'           TAD STRBLK
4435  3364            DCA BCNT6
4436  1776'           TAD AMOUNT
4437  7041            CIA
4440  3365            DCA BCNT7
4441  1364    STRTYP, TAD BCNT6
4442  4264            JMS OCTEL
4443  1347            TAD K7774
4444  3366            DCA BCNT8
4445  1354            TAD K0240
4446  4305            JMS TYPE                /MAKE A SPACE
4447  2366            ISZ BCNT8
4450  5245            JMP .-3
4451  1764            TAD I BCNT6
4452  4264            JMS OCTEL
4453  1350            TAD K0215
4454  4305            JMS TYPE
4455  1351            TAD K0212
4456  4305            JMS TYPE
4457  2364            ISZ BCNT6
4460  7000            NOP
4461  2365            ISZ BCNT7
4462  5241            JMP STRTYP
4463  5621            JMP I TYPBUF
                    /
                    /ROUTINE TO TYPE OCTAL INFORMATION.
                    /
4464  0000    OCTEL,  0
4465  7106            RTL CLL
4466  7006            RTL
4467  3363            DCA ACSAV1
4470  1347            TAD K7774
4471  3367            DCA BCNT9
4472  1363            TAD ACSAV1
4473  0775'           AND K0007
4474  1353            TAD K0260
```

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4475  4305              JMS TYPE
4476  1363              TAD ACSAV1
4477  7006              RTL
4500  7004              RAL
4501  3363              DCA ACSAV1
4502  2367              ISZ BCNT9
4503  5272              JMP .-11
4504  5664              JMP I OCTEL
                /
4505  0000    TYPE,   0
4506  6046              TLS
4507  6041              TSF
4510  5307              JMP .-1
4511  6042              TCF
4512  6032              KCC
4513  5705              JMP I TYPE
                /
4514  0000    BELL,   0
4515  1352              TAD K0207
4516  4305              JMS TYPE
4517  5714              JMP I BELL
                /
                /ROUTINE TO CHECK THAT ADDRESSES SUBMITTED BY OPERATOR
                /DO NOT CONFLICT WITH DIAGNOSTIC. IF SWITCH ERROR OCCURES
                /THE COMPUTER SHOULD HALT, RE-SET SWITCH FOR STARTING
                /ADDRESS OF BLOCK AND HIT CONTINUE TO TRY AGAIN,
                /
4520  0000    CHKADD,  0
4521  7300              CLA CLL
4522  1356              TAD SAFADD          /LAST LOCATION USED
4523  7040              CMA
4524  1777'             TAD STRBLK          /GET START OF BOOTSTRAP BLOCK
4525  7630              SZL CLA             /DOES BLOCK INTERFER WITH DIAG,
4526  5334              JMP STRTUP          /OK, CHECK STARTUP ADDRESS
4527  1357              TAD XBEGIN          /GET FIRST LOCATION USED
4530  7041              CIA
4531  1774'             TAD HLTLOC          /COMPARE TO THIS VALUE
4532  7630              SZL CLA             /DOES BLOCK INTERFER WITH DIAG,
4533  5345              JMP ADDHLT          /STARTING BLOCK ADDRESS ERROR
4534  1777'    STRTUP, TAD STRBLK          /GET START OF BLOCK
4535  7041              CIA
4536  1773'             TAD STRADD          /GET STARTUP ADDRESS
4537  7510              SPA                 /WAS ADDRESS OK
4540  5345              JMP ADDHLT          /NO, ERROR
4541  7161              CIA STL
4542  1355              TAD LENGTH          /LENGTH OF BLOCK
4543  7620              SNL CLA             /WAS STARTUP ADDRESS OK
4544  5720              JMP I CHKADD        /YES, START TEST
4545  7602    ADDHLT, HLT CLA              /SWITCH SETTING ERROR
4546  5772'             JMP BEGIN           /RESET SWITCH REGISTER TO START OF
                                            /BLOCK AND HIT CONTINUE TO TRY AGAIN
                /
4547  7774    K7774,  7774
4550  0215    K0215,  0215
4551  0212    K0212,  0212
```

```
4552  0207    K0207,  0207
4553  0260    K0260,  0260
4554  0240    K0240,  0240
4555  0037    LENGTH, 0037
4556  5777    SAFADD, INBUF +177
4557  4177    XBEGIN, BEGIN -1
4560  5107    TEXTMS, BOTMES
4561  7732    TEXTLG, 7732
4562  5600    XINBUF, INBUF
4563  0000    ACSAV1, 0
4564  0000    BCNT6,  0
4565  0000    BCNT7,  0
4566  0000    BCNT8,  0
4567  0000    BCNT9,  0
                /
4572  4200
4573  4336
4574  4341
4575  4765
4576  4340
4577  4335
      4600    PAGE
                /
                /ROUTINE TO DETERMINE FIELDS TO BE CHECKED
                /
4600  0000    MEMGO,  0
4601  1777'             TAD PREFLD          /GET PRESENT FIELD CDF
4602  3346              DCA FLDGO
4603  7630              SZL CLA
4604  5325              JMP SPECHK          /CHECK FOR ALL BUT PROG, + BOOTSTRAP
4605  1776'             TAD XBEGIN          /GET STARTING ADDRESS OF CHECK
4606  3345              DCA TSTOP
4607  1362              TAD LASTLC          /GET ENDING ADDRESS OF CHECK
4610  3344              DCA TBEGIN
4611  4342              JMS FLDCHK          /ENTER ROUTINE TO LOAD OR CHECK
4612  7340              CLA CLL CMA
4613  3345              DCA TSTOP           /START AT 0
4614  3344              DCA TBEGIN          /END AT 0
4615  1775'    EXTCHK, TAD EXTSAV
4616  0365              AND K0007
4617  7450              SNA                 /IS IT TEST EXTENDED MEMORY
4620  5240              JMP EXIT            /NO DO NOT TEST EXTENDED MEMORY
4621  7040              CMA
4622  3363              DCA FLDAMN          /SETUP FOR FIELDS TO TEST
4623  3366    STRCHK, DCA BCNT3            /START WITH 0
4624  1366              TAD BCNT3
4625  1774'             TAD KCDF
4626  3346              DCA FLDGO           /FIELD TO BE CHECKED
4627  6224              RIF
4630  7041              CIA
4631  1366              TAD BCNT3
4632  7640              SZA CLA             /ARE WE IN THIS FIELD
4633  4342              JMS FLDCHK          /NO, ENTER ROUTINE TO LOAD OR CHECK
4634  1366              TAD BCNT3
4635  1364              TAD K0010
```

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4636 2363          ISZ FLDAMN
4637 5223          JMP STRCHK   OCCUPIED BY THE BOOTSTRAP
4640 7300   EXIT,  CLA CLL      TERN OF 5252, THEN COMPARE
4641 2200          ISZ MEMGO    FORMATION TO THAT FOUND IN
4642 5600          JMP I MEMGO          /EXIT

            /ROUTINE TO LOAD MEMORY WITH DATA PATTERN
            /                            /GET JMS FOR CHECK
4643 0000   LODMEM, 0                    /SETUP FOR CHECK MEMORY
4644 1777          TAD PREFLD            /SETUP FOR PRESENT FIELD
4645 3262          DCA THSFLD            /CHECK MEMORY OTHER THAN BOOTSTRAP
4646 1643          TAD I LODMEM           /GET STARTING ADDRESS
4647 3367          DCA BCNT4            /CHECK HLT IN BLOCK +1
4650 2243          ISZ LODMEM            /END OF TEST
4651 1643          TAD I LODMEM         /LOOP ON PROGRA
4652 3370          DCA BCNT5
4653 2243          ISZ LODMEM
4654 1643          TAD I LODMEM          /GET FIELD TO GO
4655 3260          DCA NEWFLD
4656 2243          ISZ LODMEM
4657 1600          TAD I MEMGO           /GET DATA PATTERN
4660 0000   NEWFLD, 0                    /MODIFIED BY TEST
4661 3767          DCA I BCNT4
4662 0000   THSFLD, 0                    /MODIFIED BY TEST
4663 4314          JMS ENDTST            /IS IT END OF TEST
4664 5257          JMP NEWFLD -1         /NO, CONTINUE
4665 5643          JMP I LODMEM          /YES, EXIT
            /ROUTINE TO CHECK MEMORY FOR CORRECT DATA PATTERN,
            /
4666 0000   CHKMEM, 0
4667 1777'         TAD PREFLD            /GET PRESENT FIELD
4670 3310          DCA CHKTHS
4671 1666          TAD I CHKMEM          /GET STARTING ADDRESS
4672 3367          DCA BCNT4
4673 2266          ISZ CHKMEM
4674 1666          TAD I CHKMEM          /GET ENDING ADDRESS
4675 3370          DCA BCNT5
4676 2266          ISZ CHKMEM
4677 1666          TAD I CHKMEM          /GET FIELD TO TEST
4700 3303          DCA FRMFLD    STRAP INFORMATION FROM
4701 2266          ISZ CHKMEM    PROGRAM BUFFER AREA,
4702 1600          TAD I MEMGO           /GET EXPECTED DATA
4703 0000   FRMFLD, 0
4704 7041          CIA
4705 1767          TAD I BCNT4           /GET DATA PATTERN
4706 7640          SZA CLA               /ARE THEY THE SAME
4707 5350          JMP ACERR1            /NO, INDICATE
4710 0000   CHKTHS, 0                    /MODIFIED BY TEST
4711 4314          JMS ENDTST            /IS IT END OF TEST
4712 5302          JMP FRMFLD -1         /NO, CONTINUE
4713 5666          JMP I CHKMEM          /YES EXIT
            /ROUTINE TO CHECK FOR END OF TEST
            /
```

```
4714 0000   ENDTST, 0
4715 1367          TAD BCNT4             /GET ENDING ADDRESS
4716 7041          CIA
4717 1370          TAD BCNT5             /GET PRESENT ADDRESS
4720 7650          SNA CLA               /IS IT LAST ADDRESS TO TEST
4721 2314          ISZ ENDTST            /YES, EXIT
4722 2367          ISZ BCNT4     BOOTSTRAP DATA INFORMATION
4723 5714          JMP I ENDTST          /EXIT
4724 5714          JMP I ENDTST          /EXIT
            /ROUTINE TO TEST ALL BUT PROG, + BOOTSTRAP
            /
4725 1362   SPECHK, TAD LASTLC           /GET START OF CHECK
4726 3344          DCA TBEGIN
4727 7340          CLA CLL CMA
4730 1773'         TAD STRBLK            /GET END OF CHECK
4731 3345          DCA TSTOP
4732 4342          JMS FLDCHK            /ENTER ROUTINE TO LOAD OR CHECK
4733 7301          CLA CLL IAC
4734 1772'         TAD HLTLOC
4735 3344          DCA TBEGIN
4736 1776'         TAD XBEGIN            /GET END OF CHECK
4737 3345          DCA TSTOP
4740 4342          JMS FLDCHK            /ENTER ROUTINE TO LOAD OR CHECK
4741 5215          JMP EXTCHK            /EXIT
            /
            /ROUTINE TO LOAD OR CHECK MEMORY
            /
4742 0000   FLDCHK, 0
4743 0000   LODCHK, 0                    /MODIFIED BY TEST
4744 0000   TBEGIN, 0                    /MODIFIED BY TEST
4745 0000   TSTOP,  0                    /MODIFIED BY TEST
4746 0000   FLDGO,  0                    /MODIFIED BY TEST
4747 5742          JMP I FLDCHK          /EXIT
            /
            /ROUTINE TO DISPLAY CORE PATTERN ERRORS,
            /IF AN ERROR OCCURES THE MACHINE WILL
            /HLT WITH BAD ADDRESS IN MQ AND BAD DATA IN AC,
            /HIT CONTINUE,
            /THE MACHINE WILL HLT WITH EXPECTED DATA IN AC,
            /
4750 1367   ACERR1, TAD BCNT4            /GET BAD ADDRESS
4751 7421          MQL                   /LOAD AC TO MQ
4752 1767          TAD I BCNT4           /GET BAD DATA PATTERN
4753 7402   ERHLT1, HLT          FORMATION, BAD DATA PATTERN FOUND
4754 7300          CLA CLL
4755 1600          TAD I MEMGO           /GET GOOD NUMBER
4756 7402          HLT                   /AC = EXPECTED DATA PATTERN
4757 5356          JMP .-1

4760 4266   KCHK,   JMS CHKMEM
4761 4243   KLOD,   JMS LODMEM
4762 5641   LASTLC, INBUF +41
4763 0000   FLDAMN, 0
4764 0010   K0010,  0010
```

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```
4765  0007   K0007,  0007
4766  0000   BCNT3,  0
4767  0000   BCNT4,  0
4770  0000   BCNT5,  0
                     /
4772  4341
4773  4335
4774  4342
4775  4337
4776  4557
4777  4213
      5000   PAGE
                     /
                     /ROUTINE TO MOVE THE BINARY LOADER
                     /
5000  0000   MOVBIN, 0
5001  1306           TAD BUFBIN
5002  3277           DCA BCNT1              /SETUP BINARY LOADER BUFFER
5003  1777'          TAD PREFLD
5004  3215           DCA SETFLD
5005  1305           TAD K7600
5006  3300           DCA BCNT2              /SETUP FOR BINARY LOADER
5007  1776'          TAD EXTSAV
5010  0304           AND K0070              /MASK 6-8
5011  1775'          TAD KCDF
5012  3213           DCA BINFLD             /FIELD OF BINARY LOADER
5013  0000   BINFLD, 0                      /MODIFIED BY TEST
5014  1700           TAD I BCNT2            /GET BINARY WORD
5015  0000   SETFLD, 0                      /MODIFIED BY TEST
5016  3677           DCA I BCNT1            /STORE IN BUFFER AREA
5017  2277           ISZ BCNT1
5020  2300           ISZ BCNT2
5021  5213           JMP BINFLD             /MORE WORDS TO GO
5022  5600           JMP I MOVBIN           /EXIT
                     /
                     /ROUTINE TO CHECK HALT AFTER BOOTSTRAP
                     /
5023  0000   CHKHLT, 0
5024  1774'          TAD HLTLOC             /GET HALT LOCATION
5025  3301           DCA BCNT10
5026  1701           TAD I BCNT10           /GET HALT
5027  7041           CIA
5030  1773'          TAD KHLT               /GET EXPECTED VALUE
5031  7650           SNA CLA                /WERE THEY THE SAME
5032  5623           JMP I CHKHLT           /YES EXIT
                     /
                     /ROUTINE TO DISPLAY ERROR FOR BAD HLT LOCATION
                     /IF AN ERROR OCCURES THE MACHINE WILL
                     /HLT WITH BAD ADDRESS IN MQ AND BAD DATA IN AC,
                     /HIT CONTINUE,
                     /THE MACHINE WILL HLT WITH EXPECTED DATA IN AC,
                     /
5033  1301   ACERR2, TAD BCNT10             /GET BAD ADDRESS
5034  7421           MQL                    /LOAD M,Q,
5035  1701           TAD I BCNT10           /GET BAD DATA
```

```
5036  7402   ERHLT2, HLT                    /BAD DATA IN AC
5037  7300           CLA CLL
5040  1773'          TAD KHLT               /GET EXPECTED DATA
5041  7402           HLT                    /EXPECTED DATA IN AC
5042  5241           JMP .-1
                     /
                     /ROUTINE TO COMPARE BOOTSTRAP TO BUFFER
                     /
5043  0000   COMPAR, 0
5044  1772'          TAD STRBUF             /GET START OF BUFFER AREA
5045  3301           DCA BCNT10
5046  1771'          TAD STRBLK             /GET START OF BOOTSTRAP AREA
5047  3302           DCA BCNT11
5050  1770'          TAD AMOUNT             /GET AMOUNT TO BE CHECKED
5051  7041           CIA
5052  3303           DCA BCNT12             /STORE IN COUNTER
5053  1701   COMSTR, TAD I BCNT10           /GET EXPECTED DATA
5054  7041           CIA
5055  1702           TAD I BCNT11           /GET UNKNOWN VALUE
5056  7640           SZA CLA
5057  5267           JMP ACERR3             /ERROR VALUES NOT THE SAME
5060  2301           ISZ BCNT10
5061  7000           NOP
5062  2302           ISZ BCNT11
5063  7000           NOP
5064  2303           ISZ BCNT12
5065  5253           JMP COMSTR             /CONTINUE CHECKING
5066  5643           JMP I COMPAR           /EXIT
                     /
                     /ROUTINE TO DISPLAY BOOTSTRAP DATA ERRORS
                     /IF AN ERROR OCCURES THE MACHINE WILL
                     /HLT WITH BAD ADDRESS IN MQ AND BAD DATA IN AC,
                     /HIT CONTINUE,
                     /THE MACHINE WILL HLT WITH EXPECTED DATA IN AC,
                     /
5067  1302   ACERR3, TAD BCNT11
5070  7421           MQL                    /LOAD AC WITH BAD ADDRESS
5071  1702           TAD I-BCNT11           /GET BAD DATA
5072  7402   ERHLT3, HLT                    /AC IS BAD DATA
5073  7300           CLA CLL
5074  1701           TAD I BCNT10           /GET EXPECTED DATA
5075  7402           HLT                    /AC IS EXPECTED DATA
5076  5275           JMP .-1
                     /
5077  0000   BCNT1,  0
5100  0000   BCNT2,  0
5101  0000   BCNT10, 0
5102  0000   BCNT11, 0
5103  0000   BCNT12, 0
5104  0070   K0070,  0070
5105  7600   K7600,  7600
5106  5400   BUFBIN, SAVBIN
                     /
                     /TEXT FOR "MI8-E BOOTSTRAP DATA"
                     /        "ADRS"    "DATA"
```

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```
5107    0215    BOTMES, 215
5110    0212            212
5111    0315            315
5112    0311            311
5113    0270            270
5114    0255            255
5115    0305            305
5116    0240            240
5117    0302            302
5120    0317            317
5121    0317            317
5122    0324            324
5123    0323            323
5124    0324            324
5125    0322            322
5126    0301            301
5127    0320            320
5130    0240            240
5131    0304            304
5132    0301            301
5133    0324            324
5134    0301            301
5135    0215            215
5136    0212            212
5137    0301            301
5140    0304            304
5141    0322            322
5142    0323            323
5143    0240            240
5144    0240            240
5145    0240            240
5146    0240            240
5147    0304            304
5150    0301            301
5151    0324            324
5152    0301            301
5153    0215            215
5154    0212            212
                /
5170    4340
5171    4335
5172    5350
5173    4343
5174    4341
5175    4342
5176    4337
5177    4213
        5200    PAGE
                /
                /ROUTINE TO REPLACE BINARY LOADER,
                /BINARY LOADER MAY BE REPLACED BY
                /LOAD AND STARTING ADDRESS "RPLBIN"
                /
5200    1777'   RPLBIN, TAD EXTSAV          /GET OPERATION SWITCHES
```

```
5201    0776'           AND K0070           /MASK BITS 6-8
5202    1775'           TAD KCDF
5203    3213            DCA TOFLD           /MAKE BINARY FIELD CDF
5204    1774'           TAD PREFLD          /GET PRESENT FIELD CDF
5205    3215            DCA OPRFLD
5206    1773'           TAD K7600           /GET START OF BINARY LOADER
5207    3351            DCA BCNT13
5210    1772'           TAD BUFBIN          /GET START OF BUFFER AREA
5211    3352            DCA BCNT14
5212    1752            TAD I BCNT14        /GET INFORMATION
5213    0000    TOFLD,  0                   /MODIFIED BY TEST
5214    3751            DCA I BCNT13        /STORE BINARY WORD
5215    0000    OPRFLD, 0                   /MODIFIED BY TEST
5216    2352            ISZ BCNT14
5217    2351            ISZ BCNT13
5220    5212            JMP TOFLD -1        /MORE WORDS TO GO
5221    7402            HLT                 /BINARY LOADER DONE
5222    5221            JMP .-1
                /
                /ROUTINE TO PUNCH OBJECT TAPE FOR OPERATOR
                /
5223    0000    BPUN,   0
5224    7300            CLA CLL
5225    3336            DCA CKSM            /CLEAR CHECK SUM
5226    1777'           TAD EXTSAV          /GET OPERATION SWITCHES
5227    7006            RTL
5230    7700            SMA CLA             /SWR2=1 IS LOW SPEED PUNCH
5231    5262            JMP HIPUN           /HIGH SPEED PUNCH SELECTED
5232    6046            TLS                 /LOW SPEED PUNCH SELECTED
5233    4264    GOLEAD, JMS PLOT            /GO PUNCH LEADER TRAILER
5234    1350            TAD STRBUF          /GET START OF BUFFER
5235    3337            DCA IA              /STORE INITIAL ADDRESS TO BE PUNCHED
5236    1350            TAD STRBUF
5237    1771'           TAD AMOUNT          /GET AMOUNT OF BOOTSTRAP LOCATIONS
5240    3340            DCA FA
5241    1337            TAD IA
5242    7120            STL                 /TO PUNCH IA AS ORIGIN
5243    4276    PUNL,   JMS BINP            /GO PUNCH WORD AS TWO LINES OF TAPE
5244    1337            TAD IA
5245    7041            CIA
5246    1340            TAD FA
5247    7650            SNA CLA             /WAS IT LAST WORD
5250    5255            JMP .+5             /IT WAS LAST WORD
5251    1737            TAD I IA            /GET WORD TO PUNCH
5252    7100            CLL
5253    2337            ISZ IA
5254    5243            JMP PUNL
5255    1336            TAD CKSM
5256    7100            CLL
5257    4276            JMS BINP            /GO PUNCH CHECK SUM
5260    4264            JMS PLOT            /GO PUNCH LEADER TRAILER
5261    5623            JMP I BPUN          /EXIT AND DONE WITH TAPE
                /
5262    6026    HIPUN,  PLS                 /HIGH SPEED PUNCH SELECTED
5263    5233            JMP GOLEAD          /GO PUNCH LEADER TRAILER
```

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```
                    /
5264   0000  PLOT,  0
5265   7330         CLA CLL
5266   1341         TAD M212           /TO PUNCH 212 OCTAL LEADER TRAILER
5267   3342         DCA CTR1
5270   1343         TAD C200           /LEADER TRAILER CODE
5271   4316         JMS PUN            /PUNCH
5272   2342         ISZ CTR1
5273   5271         JMP .-2
5274   7320         CLA CLL
5275   5664         JMP I PLOT         /EXIT
                    /
5276   0000  BINP,  0
5277   3344         DCA TEM1
5300   1344         TAD TEM1
5301   7012         RTR
5302   7012         RTR
5303   7012         RTR
5304   0345         AND SL7            /FIRST TO OCTAL DIGITS IN AC 5-11
5305   4316         JMS PUN            /PUNCH
5306   1336         TAD CKSM
5307   3336         DCA CKSM
5310   1344         TAD TEM1
5311   0346         AND SL6            /LAST TWO OCTAL DIGITS IN AC 6-11
5312   4316         JMS PUN            /PUNCH
5313   1336         TAD CKSM
5314   3336         DCA CKSM
5315   5676         JMP I BINP         /EXIT
                    /
5316   0000  PUN,   0
5317   3347         DCA ACSAV2         /SAVE CODE TO BE PUNCHED
5320   1777'        TAD EXTSAV         /GET OPERATION SWITCHES
5321   7006         RTL
5322   7700         SMA CLA            /SWR2=1 IS LOW SPEED PUNCH
5323   5331         JMP HISPED         /HIGH SPEED PUNCH SELECTED
5324   1347         TAD ACSAV2         /GET CODE TO BE PUNCHED
5325   6041         TSF
5326   5325         JMP .-1
5327   6046         TLS                /PUNCH
5330   5716         JMP I PUN          /EXIT
5331   1347  HISPED, TAD ACSAV2        /GET CODE TO BE PUNCHED
5332   6021         PSF
5333   5332         JMP .-1
5334   6026         PLS                /PUNCH
5335   5716         JMP I PUN          /EXIT
                    /
5336   0000  CKSM,  0
5337   0000  IA,    0
5340   0000  FA,    0
5341   7566  M212,  -212
5342   0000  CTR1,  0
5343   0200  C200,  200
5344   0000  TEM1,  0
5345   0177  SL7,   177
5346   0077  SL6,   77
```

```
5347   0000  ACSAV2, 0
5350   5600  STRBUF, INBUF
5351   0000  BCNT13, 0
5352   0000  BCNT14, 0
                    /
5371   4340
5372   5106
5373   5105
5374   4213
5375   4342
5376   5104
5377   4337
       5400  PAGE
                    /
                    /THE NEXT PAGE IS RESERVED FOR BINARY LOADER
                    /STORAGE AREA WHILE THE DIAGNOSTIC IS BEING RUN.
                    /
5400   5400  SAVBIN, SAVBIN
                    /
       5600  PAGE
                    /
                    /THE NEXT 40 OCTAL LOCATIONS ARE RESERVED
                    /FOR THE BOOOTSTRAP BUFFER
                    /
5600   5600  INBUF, INBUF
                    /
                       $
```

```
0000
0100

0200
0300

0400
0500

0600
0700

1000
1100

1200
1300

1400
1500

1600
1700

2000
2100

2200
2300

2400
2500

2600
2700

3000
3100

3200
3300

3400
3500

3600
3700
```

```
4000
4100

4200  11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4300  11111111 11111111 11111111 11111111 11111110 00000000 00000011 11111111

4400  11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4500  11111111 11111111 11111111 11111111 11111111 11111111 11111111 00111111

4600  11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4700  11111111 11111111 11111111 11111111 11111111 11111111 11111111 10111111

5000  11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
5100  11111111 11111111 11111111 11111111 11111111 11111000 00000000 11111111

5200  11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
5300  11111111 11111111 11111111 11111111 11111111 11100000 00000000 01111111

5400  10000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
5500  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

5600  10000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
5700  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

6000
6100

6200
6300

6400
6500

6600
6700

7000
7100

7200
7300

7400
7500

7600
7700
```

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```
ACERR1   4750      HIPUN    5262      TEM1    5364
ACERR2   5033      HISPED   5331      TEST1   4203
ACERR3   5067      HLTLOC   4341      TEST2   4240
ACSAV1   4563      IA       5337      TEST3   4294
ACSAV2   5347      INBUF    5600      TEST4   4351
ADDHLT   4545      INHDMP   4274      TEXTLG  4561
AMOUNT   4340      K0007    4765      TEXTMS  4560
BCNT1    5077      K0010    4764      THSFLD  4662
BCNT10   5101      K0070    5104      TOPLD   5013
BCNT11   5102      K0207    4552      TSTOP   4745
BCNT12   5103      K0212    4551      TYPBUF  4421
BCNT13   5351      K0215    4550      TYPE    4505
BCNT14   5352      K0240    4554      WATHLT  4334
BCNT2    5100      K0260    4553      XBEGIN  4997
BCNT3    4766      K7600    5105      XCHK    4345
BCNT4    4767      K7774    4547      XINBUF  4562
BCNT5    4770      KCDF     4342      XLOD    4346
BCNT6    4564      KCHK     4760
BCNT7    4565      KHLT     4343
BCNT8    4566      KLOD     4761
BCNT9    4567      LASTLC   4762
BEGIN    4200      LENGTH   4555
BELL     4514      LODCHK   4743
BINFLD   5013      LODMEM   4643
BINP     5276      M212     5341
BOTMES   5107      MEMGO    4600
BPUN     5223      MOVBIN   5000
BUFBIN   5106      MOVBUF   4400
C200     5343      MQL      7421
CAF      6007      NEWFLD   4660
CHKADD   4520      OCTEL    4464
CHKHLT   5023      OPRFLD   5215
CHKMEM   4666      PLOT     5264
CHKTHS   4710      PREFLD   4213
CKSM     5336      PUN      5316
COMPAR   5043      PUNL     5243
COMSTR   5053      RESTR3   4266
CTR1     5342      RESTR4   4323
ENDTST   4714      RPLBIN   5200
ERHLT1   4753      SAFADD   4556
ERHLT2   5036      SAVBIN   5400
ERHLT3   5072      SETFLD   5015
EXIT     4640      SL6      5346
EXTCHK   4615      SL7      5345
EXTSAV   4337      SPECHK   4725
FA       5340      STRADD   4336
FIRPAS   4344      STRBLK   4335
FLDAMN   4763      STRBUF   5350
FLDCHK   4742      STRCHK   4623
FLDGO    4746      STRTUP   4534
FRMFLD   4703      STRTYP   4441
GOLEAD   5233      TBEGIN   4744
```

ERRORS DETECTED: 0

LINKS GENERATED: 63

RUN-TIME: 7 SECONDS

2K CORE USED