IDENTIFICATION

PRODUCT CODE: MAINDEC-11-D1BA

PRODUCT NAME: BASIC ADDRESS TEST (DOWN)

DATE CREATED: MARCH 30, 1970

MAINTAINER: DIAGNOSTIC GROUP

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1.   ABSTRACT

THIS TEST DEMONSTRATES THAT THE SELECTED MEMORY TEST
AREA IS CAPABLE OF BASIC READ AND WRITE OPERATION WHEN
ADDRESS PROPAGATION IS DOWNWARD THROUGH MEMORY, THIS
TEST IS A COMPANION TEST TO THE BASIC ADDRESS TEST (UP).

2.   REQUIREMENTS

2.1   EQUIPMENT

PDP-11/20

2.2   STORAGE

2.2.1   PROGRAM STORAGE - THE ROUTINE OCCUPIES MEMORY
FROM 17300 TO 17412

3.   LOADING PROCEDURE

3.1   METHOD

PROCEDURE FOR NORMAL BINARY TAPES SHOULD BE FOLLOWED.

1.   ABSOLUTE LOADER MUST BE IN MEMORY,
2.   PLACE BINARY TAPE IN READER,
3.   LOAD ADDRESS 17500,
4.   PRESS "START" (PROGRAM WILL LOAD).

4.   STARTING PROCEDURE

4.1   CONTROL SWITCH SETTING

N/A

4.2   STARTING ADDRESS OR ADDRESSES

17300

4.3   PROGRAM AND/OR OPERATOR ACTION

LOAD PROGRAM INTO MEMORY,
SET SWITCH REGISTER TO STARTING ADDRESS,
LOAD ADDRESS,
PRESS START,
THE PROGRAM WILL TEST SELECTED MEMORY AREA
AND LOOP,

5.   OPERATING PROCEDURE

5.1   OPERATIONAL SWITCH SETTINGS

        N/A

5.2   SUBROUTINE ABSTRACTS

        N/A

5.3   PROGRAM AND/OR OPERATOR ACTION

5.3.1   AFTER THE PROGRAM IS LOADED THE TEST LIMIT BOUNDARIES MAY
        BE MODIFIED AS FOLLOWS:

        A. LOAD LOCATION 17410 (TAGGED AS STADD) WITH THE
            HIGH TEST LIMIT BOUNDARY.

        B. LOAD LOCATION 17412 (TAGGED AS LODOWN) WITH THE LOW LIMIT
            BOUNDARY ADDRESS OF THE TEST. (SEE 7.2 FOR OPERATIONAL
            RESTRICTION)

        C. LOAD AND START AT 17300. IF AN ERROR OCCURS THE PROGRAM
            WILL MOVE THE ERROR ADDRESS TO THE REGISTER 0 AND HALT,
            AT THIS TIME THE ERROR ADDRESS MAY BE DETERMINED BY EXAM-
            INING 177700 (R0).

6.   ERRORS

6.1   ERROR RECOVERY

        DEPRESS CONTINUE TO RESTART SECTION

7.   RESTRICTIONS

7.1   STARTING RESTRICTION

        NONE

7.2   OPERATIONAL RESTRICTION

        DO NOT EXTEND THE LOWER LIMIT OF THIS TEST BELOW 100 AS THE
        LOCATIONS IN THIS AREA ARE RESERVED AS TRAP & VECTOR LOCATIONS.

8.   MISCELLANEOUS

8.1   EXECUTION TIME

        N/A

9.   PROGRAM DESCRIPTION

THE BASIC ADDRESS TEST (DOWN) IS A COMPANION TEST TO THE BASIC
ADDRESS TEST (UP), AND VERIFIES THAT THE MEMORY AREA TESTED IS
CAPABLE OF BASIC READ-WRITE OPERATIONS WHEN ADDRESSING IS DOWN-
WARD THROUGH MEMORY. THE TEST RESIDES IN THE UPPER END OF THE
BASIC 4K (WORD) CONFIGURATION AND WRITES THE ADDRESS OF EACH
LOCATION INTO ITSELF, DOWNWARD THROUGH MEMORY. DO NOT EXTEND
THE LOWER LIMIT OF THE TEST BELOW 100 AS THE LOCATIONS BELOW
100 ARE RESERVED AS TRAP AND VECTOR LOCATIONS. AFTER WRITING
DOWN THE PROGRAM READ-CHECKS BACK UP THROUGH THE MEMORY TEST
AREA. IF AN ERROR OCCURS, THE PROGRAM WILL HALT WITH THE ERROR
ADDRESS DISPLAYED IN THE CONSOLE SWITCH REGISTER. A CONTINUE
FROM THE ERROR HALT WILL ALLOW THE PROGRAM TO RESUME TESTING.

10.   LISTING

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                                        ;BASIC ADDRESS TEST (DOWN)
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            000240                       NOP=000240

            017300                       .=17300

017300   026727  000102  017300  STCK:  CMP     STADD,#STCK
017306   103402                          BLO     .+6
017310   000000                          HALT
017312   000772                          BR      STCK
017314   026767  000070  000064          CMP     LODOWN,STADD           ;LODOWN MUST BEL STARTING ADDRESS
017322   103402                          BLO     BEGTST                 ;OK
017324   000000                          HALT                           ;HALT, WAIT FOR FIX
017326   000764                          BR      STCK                   ;LOOP TO START CHECK
017330   016703  000052          BEGTST: MOV     STADD,X3               ;GET START ADDRESS
017334   000401                          BR      .+4                    ;SKIP DECREMENTER
017336   005743                  DWNTST: TST     -(3)                   ;DECREMENTING, THATS ALL
017340   010313                          MOV     X3,@X3                 ;WRITING
017342   005703                          TST     X3                     ;TEST R3 FOR LOC 0
017344   001403                          BEQ     READUP                 ;START READ IF R3=0
017346   020367  000036                  CMP     X3,LODOWN              ;CKN (3) R3 AGAINST LOW ADDRESS
017352   101371                          BHI     DWNTST                 ;LOOP
017354   000240                  READUP: NOP
017356   020313                          CMP     X3,@X3                 ;READING
017360   001007                          BNE     ERROR
017362   020367  000020          CTINUE: CMP     X3,STADD               ;R3 BACK TO START ADDRESS YET?
017366   103402                          BLO     INCRM                  ;NO, GO INCREMENT  R3
017370   000240                          NOP                            ;TEST COMPLETE
017372   000742                          BR      STCK                   ;REPEAT TEST
017374   005723                  INCRM:  TST     (3)+                   ;JUST INCRMTING
017376   000766                          BR      READUP                 ;LOOP
017400   010300                  ERROR:  MOV     X3,X0                  ;COPY IN R0 FOR HALT DISPLAY
017402   000000                          HALT
017404   000766                          BR      CTINUE                 ;CONTINUE FROM ERROR HALT
017406   017276                  STADD:  STCK-2
017410   000200                  LODOWN: 200
         000001                          .END
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BEGTST   017330
CTINUE   017362
DWNTST   017336
ERROR    017400
INCRM    017374
LODOWN   017410
NOP      000240
READUP   017354
STADD    017406
STCK     017300
```

ERRORS DETECTED: 0

RUN-TIME: 0 SECONDS

4K CORE USED