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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZRSC-E-D
 PRODUCT NAME: RH11-R503-R503/LA-R504 DATA RELIABILITY
 DIAGNOSTIC
 PROGRAM DATE: AUG 1976
 MAINTAINER: DIAGNOSTIC GROUP

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03-NOV-76 09:20 PAGE 2

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SEE 5. (ALL DOWN FOR WORST CASE TESTING)

4.2 STARTING ADDRESS

PROGRAM AND/OR OPERATOR ACTION

LOAD PROGRAM INTO MEMORY USING ABS LOADER.

1. STARTING ADDRESS 200.

A. SET SWITCHES (SEE SEC 5.). ALL DOWN FOR WORST CASE (IF SWITCH-LESS CPV SIMPLY PRESS START)

B. THE DISPLAY ON THE 11/45 WILL SHOW THE ITERATION COUNT IN THE LEFT BYTE AND TEST NUMBER IN THE RIGHT. TO USE, SET THE DATA DISPLAY SWITCH TO THE DISPLAY POSITION.

C. PRESS START.

THE PROGRAM WILL NOW MAP THE DATA BUFFERS IN 4K SEGMENTS ON -A- AND -B- PORTS UP TO 28K. IT WILL THEN TYPE OUT THE PARAMETERS OF THE DATA BUFFERS. THE PROGRAM WILL ONLY DO THIS THE FIRST TIME IT IS STARTED, FOR IT STORES THESE ADDRESSES AND CONTINUES USING THEM. TO HAVE THE PROGRAM REMAP THE SYSTEM, THE PROGRAM MUST BE RELOADED. IF YOU WISH TO GET ABOVE 28K, YOU CAN ENTER CONVERSATION MODE AND PUT THE DATA BUFFERS WHERE YOU WISH. THE SIZE OF THE DATA BUFFERS CAN NOT EXCEED 24K.

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5. OPERATIONAL SWITCH SETTINGS

THIS PROGRAM HAS BEEN MODIFIED TO RUN ON A PROCESSOR WITH OR WITHOUT A HARDWARE SWITCH REGISTER. WHEN FIRST EXECUTED THE PROGRAM TESTS THE EXISTENCE OF A HARDWARE SWITCH REGISTER. IF NOT FOUND A SOFTWARE SWITCH REGISTER LOCATION (SWREG=LOC.176) IS DEFAULTED TO. IF THIS IS THE CASE, UPON EXECUTION THE CONTENTS OF THE SWREG ARE DUMPED IN OCTAL ON THE CONSOLE TTY AND ANY CHANGES ARE REQUESTED.

(I.E) SWR=XXXXXX NEW=

POSSIBLE RESPONSES ARE:

- 1. <CR> IF NO CHANGES ARE TO BE MADE.
- 2. 6 DIGITS 0-7 TO REPRESENT IN OCTAL THE NEW SWITCH REGISTER VALUE: LAST DIGIT FOLLOWED BY <CR>.
- 3. ↑U TO ALLOW REENTERING VALUE IF ERROR IS COMMITTED KEYING IN SWREG VALUE.

BUILT INTO THE PROGRAM IS THE ABILITY TO DYNAMICALLY CHANGE THE CONTENTS OF SWREG DURING PROGRAM EXECUTION. BY STRIKING ↑G (CNTRL G) ON CONSOLE TTY THE OPERATOR SETS A REQUEST FLAG TO CHANGE THE CONTENTS OF SWREG, WHICH IS PROCESSED IN KEY AREAS OF THE PROGRAM CODE (I.E.) ERROR ROUTINES, AFTER HALTS END OF PASS, AND OTHER APPLICABLE AREAS.

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DZRSCE.P11

MAINDEC-11-DZRSCE-E RH11-R503/LA-R504 DATA RELIABILITY DIAG PAGE 6
DESCRIPTION

SWITCH SETTINGS ARE:

SW<15> = 1 HALT ON ERROR
SW<14> = 1 LOOP ON FUNCTION
SW<13> = 1 INHIBIT PRINTOUT
SW<12> = 1 INHIBIT COMPARISON
WITH THIS SWITCH SET, THE
PROGRAM WILL NOT COMPARE THE
DATA IT READ FROM THE DISK WITH
THE KNOWN GOOD DATA.
SW<11> = 1 HALT ON COMPLETION OF TRANSFER
SW<10> = 1 ENTER CONVERSATION MODE
SW<09> = 1 LOOP ON ERROR
SW<08> = 1 DATA RELIABILITY TEST MODE
SW<07> = 1 WAIT IN WAIT MODE
PROGRAM RUNS IN A BACKGROUND TEST
WHILE WAITING FOR INTERRUPT, WITH
SW SET PROGRAM WAITS IN A WAIT
INSTRUCTION.
SW<06> = 1 OPTIONAL TYPEOUT OF RETRY ERRORS
SW<05> = 1 INHIBIT PASS COUNT
SW<04> = 1 ALLOWS 8 ERROR TYPEOUTS IN THE
COMPARE ROUTINE BEFORE EXECUTING NEXT READ
COMMAND. WHEN SWITCH IS 0, ONLY 1 ERROR
TYPEOUT IS RECORDED.
SW<03> = 1 TYPEOUT # OF ERRORS
SW<02> = 1 INHIBIT MEMORY MANAGEMENT
SW<01> = 1 DATA TEST ONLY
SW<00> = 1 DROPS DRIVE AFTER 20 ERRORS

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5.1 DATA RELIABILITY TEST MODE

WITH SW8 SET, THE PROGRAM WILL SET THE "B31" BIT IN RHCS2 AND TRANSFER 64K OF DATA AT A TIME FOR ALL PATTERNS EXCEPT RANDOM. RANDOM WILL BE EXECUTED AS USUAL WITH STANDARD BUFFERS. NO COMPARES ARE DONE IN THIS MODE OF OPERATION EXCEPT ON RANDOM PATTERNS. THIS OPTION SHOULD ONLY BE USED IN DATA TEST OR CONVERSATION MODE. WHEN USED IN CONVERSATION MODE IT OVER RIDES THE NON STANDARD WORD COUNT. YOU SHOULD NOT SELECT A DESIRED DISK ADDRESS IN CONVERSATION MODE FOR IT CAN PRODUCE A DISK ADDRESS OVERFLOW ERROR FOR THIS DATA RELIABILITY TEST MODE ONLY DOES 64K WORD TRANSFERS. IF SW8 IS CHANGED, WHILE THE PROGRAM IS RUNNING, THE PROGRAM WILL FINISH ITS PASS BEFORE EXECUTING THE SWITCH CHANGE.

5.2 CONVERSATION MODE FOR PROGRAM PARAMETERS FOR DATA TEST ONLY

IN CONVERSATION MODE THE OPERATOR CAN SPECIFY ANY ONE OR ALL OF THE PROGRAM PARAMETERS.

NOTE

ONCE IN CONVERSATION MODE, THE ONLY WAY TO REMAP THE SYSTEM IS TO RELOAD THE PROGRAM. TO RESTART THE PROGRAM IN CONVERSATION MODE WITHOUT HAVING TO REANSWER THE QUESTIONS, THE STARTING ADDRESS IS 210. RESET SWITCH 10. TO RESTART THE PROGRAM WITHOUT HAVING TO REANSWER THE PORT SIZING QUESTIONS, RESTART AT 220. RESET SWITCH 10.

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MAINDEC-11-DZRSCE-E RH11-R503/LA-R504 DATA RELIABILITY DIAG PAGE 8
DESCRIPTION

THE PROGRAM WILL NOW ASK SEVERAL QUESTIONS, THE TABLE BELOW WILL HELP YOU ANSWER THE QUESTIONS.

| TYPE TO START AT | | TYPE TO START AT | |
|------------------|--------|------------------|--------|
| 0 | 000000 | | |
| 1 | 020000 | 20 | 400000 |
| 2 | 040000 | 21 | 420000 |
| 3 | 060000 | 22 | 440000 |
| 4 | 100000 | 23 | 460000 |
| 5 | 120000 | 24 | 500000 |
| 6 | 140000 | 25 | 520000 |
| 7 | 160000 | 26 | 540000 |
| 10 | 200000 | 27 | 560000 |
| 11 | 220000 | 30 | 600000 |
| 12 | 240000 | 31 | 620000 |
| 13 | 260000 | 32 | 640000 |
| 14 | 300000 | 33 | 660000 |
| 15 | 320000 | 34 | 700000 |
| 16 | 340000 | 35 | 720000 |
| 17 | 360000 | 36 | 740000 |

NOTE: TYPE ONLY NUMBERS SHOWN!!!

1. -A- PORT? (Y OR N)

THIS GIVES YOU THE OPTION TO TEST -A- OR -B- PORT USING THE DATA TEST.

IF THE ANSWER TO THIS QUESTION IS YES, THE FOLLOWING QUESTIONS WILL BE ASKED. IF THE ANSWER IS NO, -B- PORT WILL BE TESTED AND QUESTIONS 4 AND 5 WILL BE ASKED.

2. 1ST 4K BANK #

THIS NUMBER THAT IS TYPED WILL DETERMINE WHERE THE BUFFER AREA WILL START ON -A- PORT. USE TABLE ABOVE

NOTE:

PROGRAM IS LOCATED IN 1ST 4K BANK. THEREFORE, THIS BANK CAN NOT BE USED AS A BUFFER.

3. # OF 4K BANKS ?

THIS WILL DETERMINE THE SIZE OF THE -A- PORT DATA BUFFER. THE SIZE OF THE DATA BUFFER CAN NOT EXCEED 24K AND MUST BE IN "OCTAL".

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PROGRAM CONVERSATION

MULTI DRIVE MODE? (YES-NO)

MULTI DISK MODE IS A MODE IN THE PROGRAM WHICH ALLOWS THE OPERATOR TO EXERCISE ALL THE DISKS ON THE SYSTEM WITHOUT RE-STARTING THE PROGRAM. THE PROGRAM, AFTER EXERCISING ONE DISK WILL REPORT A MESSAGE TELLING THE OPERATOR WHICH DISK WILL BE SELECTED NEXT, AND THEN THE PROGRAM WILL EXERCISE THAT DISK. WHEN A COMPLETE PASS IS ACCOMPLISHED, A PASS COMPLETE WILL BE REPORTED AND THE TEST WILL RECYCLE.

IF THE ANSWER TO THE MULTI DRIVE MODE WAS "NO", THE FOLLOWING QUESTION IS ASKED.

UNIT #

THE OPERATOR CAN NOW SELECT THE UNIT HE WISHES TO TEST BY TYPING THE UNIT NUMBER.

OPTIONAL WORD COUNT (YES-NO)

IF THE OPERATOR ANSWERS "NO" TO THIS QUESTION THE NEXT QUESTION WILL BE DELETED FROM THE CONVERSATION.

WD CT

THE OPERATOR CAN SPECIFY ANY LENGTH TRANSFER FROM 1(8) TO 6000(8) WORDS. THE NORMAL TRANSFER LENGTH IS N(8) WORDS WHERE N IS THE MAXIMUM BUFFER SIZE FOR THE AVAILABLE CORE. IN EITHER CASE, BUFFER WILL NOT EXCEED 24 K.

THIS PROGRAM MAPS THE SYSTEM IN 4K SEGMENTS. IF THERE IS A 1K BLOCK OF MEMORY ON THE SYSTEM THAT YOU WOULD LIKE TO REACH, YOU CAN TYPE IN THAT 4K BANK # AND THEN SPECIFY A WC OF 2000.

IF THE WORD COUNT NUMBER TYPED, IS LARGER THAN THE CORE SIZE GIVEN IN THE SETUP ROUTINE, THE QUESTION WILL BE REPEATED.

OPTIONAL DSK ADDR (YES-NO)

IF THE ANSWER TO THIS QUESTION IS NO, THE WHOLE DISK WILL BE WRITTEN AND THE NEXT QUESTION IS NOT ASKED.

DSK ADDR

THE OPERATOR CAN NOW SPECIFY THE STARTING SECTOR

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PATTERN NO.?

THIS GIVES THE OPERATOR THE OPTION OF SELECTING ALL THE DATA PATTERNS (#22) OR ANY ONE DATA PATTERN, SIMPLY BY TYPING THE DATA PATTERN NUMBER DESIRED.

- PATTERN 0 = 000000
- " 1 = 177777
- " 2 = 031463
- " 3 = 066666
- " 4 = 100001
- " 5 = 107070
- " 6 = 070707
- " 7 = 052525
- " 10 = 125252
- " 11 = 177737
- " 12 = 146314
- " 13 = 136363
- " 14 = 063636
- " 15 = 000001
- " 16 = 100005
- " 17 = 155555
- " 20 = 133333
- " 21 = RANDOM DATA
- " 22 = RUN ALL DATA PATTERNS UNDER PROGRAM CONTROL

IN THIS SECTION OF THE PROGRAM PARAMETER CONVERSATION MODE, THE OPERATOR CAN SELECT ANY ONE OR ALL THREE OF THE CONTROL FUNCTIONS TO BE EXECUTED. THE NORMAL SEQUENCE OF DISK FUNCTIONS UNDER PROGRAM CONTROL ARE WRITE, WRITE CHECK, AND THEN READ. BY ENTERING THE CONVERSATION MODE THE OPERATOR HAS GAINED COMPLETE CONTROL OVER THE DISK FUNCTIONS. HE MUST SPECIFY YES OR NO TO ALL OF THE FOLLOWING QUESTIONS.

- WRITE? (YES - NO)
- READ? (YES - NO)
- WRITE CHECK? (YES - NO)

TO PERFORM A WRITE CHECK ONLY, THE OPERATOR MUST FIRST WRITE SOME KNOWN DATA ON THE DISK. THIS COURSE OF ACTION ALSO PREVAILS FOR A READ ONLY OPERATION.

* IF AN ERROR OCCURS IN THE LINE THE OPERATOR IS TYPING, DEPRESS THE RUB-OUT KEY AND RETYPE ANSWER.
ALL ANSWERS SHOULD BE FOLLOWED BY A CARRIAGE-RETURN

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487 MAINDEC-11-DZRSCE-E RH11-R503/LA-R504 DATA RELIABILITY DIAG PAGE 12
488 DESCRIPTION
489
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491

492 5.3 ROUTINE ABSTRACTS
493
494

495 ADDRESS TEST
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497

498 THIS TEST WRITES EACH SECTOR WITH ITS OWN ADDRESS THEN READS IT BACK
499 AND COMPARES IT FOR THE CORRECT DATA.
500

501 RANEX - RANDOM DATA, ADDRESS AND WORD COUNT TEST
502
503

504 THIS ROUTINE TESTS THE ABILITY OF THE SYSTEM TO ACCESS RANDOM
505 ADDRESSES WITH RANDOM DATA. ONE SECTOR OF RANDOM DATA IS WRITTEN AT A
506 STARTING RANDOM ADDRESS ON THE DISK. IT IS THEN WRITE CHECKED AND
507 READ. ALL ERRORS ARE REPORTED. THIS IS REPEATED 1000 TIMES.
508

509 DATA RELIABILITY - DATA PATTERN TEST
510
511

512 IN THIS PORTION OF THE TEST, THE RELIABILITY OF THE DISK SURFACE IS
513 TESTED BY WRITE, WRITE CHECK, AND READ FUNCTIONS. THE ROUTINE FIRST
514 WRITES THE COMPLETE SURFACE WITH A SET DATA PATTERN, THEN A WRITE
515 CHECK OF THE COMPLETE SURFACE IS ACCOMPLISHED, THUS REPORTING ALL
516 ERRORS BETWEEN THE DATA WRITTEN AND THE DATA IN MEMORY. THE DISK IS
517 THEN READ. THE DATA READ FROM THE DISK IS COMPARED AGAINST THE KNOWN
518 DATA PATTERN. THIS COMPARE IS TAKING PLACE THE SAME TIME THE DISK IS
519 BEING READ. THE BUFFER IS CLEARED AS IT IS BEING COMPARED. IF THERE
520 ARE DATA BUFFERS ON -A- AND -B- PORTS, THE DATA TEST WILL TRANSFER
521 DATA OVER -A- PORT ON ODD PASSES AND OVER -B- PORT ON EVEN PASSES.
522

523 5.4 SUBROUTINE ABSTRACTS
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525

526 5.4.1 SCOPE
527
528

529 THIS SUBROUTINE CALL IS PLACED BETWEEN EACH SUBTEST IN THE INSTRUCTION
530 SECTION. IT RECORDS THE STARTING ADDRESS OF EACH SUBTEST AS IT IS
531 BEING ENTERED IN LOCATION "LAD". IF A SCOPE LOOP IS REQUESTED, THE
532 CURRENT SUBTEST WILL BE LOOPED UPON. THE CONTENTS OF LAD MAY BE USED
533 TO DETERMINE THE LAST SUBTEST SUCCESSFULLY COMPLETED.
534

535 5.4.2 HLT
536
537

538 THIS ROUTINE PRINTS OUT AN ERROR MESSAGE (SEE 6.1). TO INHIBIT
539 TYPEOUTS, PUT SW<13> ON A 1.
540

541 5.4.3 TRAPCATCHER
542
543

544 A ".+2" - "HALT" SEQUENCE IS REPEATED FROM 0 - 776 TO CATCH ANY
545 UNEXPECTED TRAPS. THUS ANY UNEXPECTED TRAPS OR INTERRUPTS WILL HALT
546 AT THE VECTOR + 2.
547

MAINDEC-11-DZRSCE-E RH11-R503/LA-R504 DATA RELIABILITY DIAG PAGE 13
DESCRIPTION

6. ERRORS

6.1 ERROR PRINTOUT

THE FORMAT IS AS FOLLOWS:

ADR CS1 = ----- CS2 = ----- ER = -----
GOOD = ----- BAD = -----

WHERE:

CS1, CS2, ER ETC. = RS11 DISK REGISTERS.
GOOD = EXPECTED DATA.
BAD = DATA RECEIVED.

TO FIND THE FAILING TEST, LOOK AT THE LISTING ABOVE THE ADDRESS TYPED.

IF SWD IS SET, A DRIVE WILL BE DROPPED FROM THE TEST SEQUENCE AFTER 20
ERRORS. THE PROGRAM WILL STATE WHICH DRIVE WAS DROPPED AND ON WHICH
PASS IT WAS DROPPED. IF ALL THE DRIVES HAVE BEEN DROPPED, THE PROGRAM
WILL TYPE "TESTING UNIT 0" AND HALT". INDICATING THAT IT COULD NOT
FIND ANY MORE DRIVES ON THE SYSTEM TO TEST.

7. RESTRICTIONS

THIS DIAGNOSTIC WILL TEST -B- PORT, ONLY IF THE CPU CAN ACCESS THAT
MEMORY ON -B- PORT.

8. MISCELLANEOUS

8.1 EXECUTION TIME

PASS COMPLETE WILL BE TYPED OUT AT END OF PASS. IT WILL TAKE 10 TO 20
MINUTES TO COMPLETE A PASS DEPENDING ON THE TYPE OF DRIVE BEING TESTED
AND THE SIZE OF THE SYSTEM.

8.2 STACK POINTER

STACK IS INITIALLY SET TO 500

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MAINDEC-11-DZRSCE-E RH11-R503/LA-R504 DATA RELIABILITY DIAG PAGE 14
DESCRIPTION

8.3 POWER FAIL

THE STARTING ADDRESS FOR THE WRITE POWER FAIL TEST IS 244. WHEN ASKED, ENTER UNIT #. THE PROGRAM WILL TELL THE OPERATOR WHEN TO POWER DOWN. WHEN THE SYSTEM IS POWERED UP, ONLY ONE ERROR IS ALLOWED. THE STARTING ADDRESS FOR THE WRITECHECK POWER FAIL TEST IS 250. HERE AS IN THE WRITE POWER FAIL TEST, THE PROGRAM WILL TELL THE OPERATOR WHEN TO POWER DOWN. WHEN THE POWER COMES BACK, NO ERRORS SHOULD OCCUR.

.REM %
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CONTENTS

- 1. ABSTRACT
- 2. REQUIREMENTS
 - 2.1 EQUIPMENT
 - 2.2 PRELIMINARY PROGRAMS
- 3. LOADING PROCEDURE
- 4. STARTING PROCEDURE
 - 4.1 CONTROL SWITCH SETTINGS
 - 4.2 STARTING ADDRESS
- 5. OPERATIONAL SWITCH SETTINGS
 - 5.1 DATA RELIABILITY TEST MODE
 - 5.2 CONVERSATION MODE
 - 5.3 ROUTINE ABSTRACTS
 - 5.4 SUBROUTINE ABSTRACTS
- 6. ERRORS
- 7. RESTRICTIONS
- 8. MISCELLANEOUS
 - 8.1 EXECUTION TIME
 - 8.2 STACK POINTER
 - 8.3 POWER FAIL

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701 MAINDEC-11-DZRSC-E RH11-R503/LA-R504 DATA RELIABILITY DIAG PAGE 3
702 DESCRIPTION
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705 1. ABSTRACT
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707 THIS DIAGNOSTIC WAS DESIGNED TO TEST R503, R503/LA AND R504 DRIVES.
708

709 THE DZRSC DISK DATA TEST IS A SERIES OF ADDRESS AND DATA RELIABILITY
710 ROUTINES WHICH VERIFY TO THE USER THAT THE CONTROLLER (RH11) AND THE
711 DISKS (R503/LA OR R504) ARE OPERATING CORRECTLY. THIS TEST SHOULD BE
712 USED IN CONJUNCTION WITH THE DZRSEB DIAGNOSTIC. IF THERE IS A POWER
713 FAIL WHILE THE DIAGNOSTIC IS RUNNING, THE PROGRAM WILL WAIT FOR
714 APPROXIMATELY 5 MINUTES, TO GIVE ALL THE DRIVES TIME TO COME BACK UP
715 TO SPEED, BEFORE RESTARTING THE TEST SEQUENCE.
716

717 NOTE
718

719 THIS PROGRAM WILL DESTROY ALL DATA ON
720 THE DISKS. TURN OFF ALL DRIVES THAT YOU
721 DO NOT WANT TO TEST.
722

723 2. REQUIREMENTS
724

725 2.1 EQUIPMENT
726

727 PDP11 STANDARD COMPUTER WITH A MINIMUM OF 8K OF MEMORY, AND AN RH11
728 CONTROLLER WITH AN R503, R503/LA OR AN R504 DISK.
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730 2.2 PRELIMINARY PROGRAMS
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732 DZRSEB
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734 3. LOADING PROCEDURE
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736 USE STANDARD PROCEDURE FOR ABS TAPES.
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4.1 CONTROL SWITCH SETTINGS

SEE 5. (ALL DOWN FOR WORST CASE TESTING)

4.2 STARTING ADDRESS

PROGRAM AND/OR OPERATOR ACTION

LOAD PROGRAM INTO MEMORY USING ABS LOADER.

1. STARTING ADDRESS 200.

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B. THE DISPLAY ON THE 11/45 WILL SHOW THE ITERATION COUNT IN THE LEFT BYTE AND TEST NUMBER IN THE RIGHT. TO USE, SET THE DATA DISPLAY SWITCH TO THE DISPLAY POSITION.

C. PRESS START.

THE PROGRAM WILL NOW MAP THE DATA BUFFERS IN 4K SEGMENTS ON -A- AND -B- PORTS UP TO 28K. IT WILL THEN TYPE OUT THE PARAMETERS OF THE DATA BUFFERS. THE PROGRAM WILL ONLY DO THIS THE FIRST TIME IT IS STARTED, FOR IT STORES THESE ADDRESSES AND CONTINUES USING THEM. TO HAVE THE PROGRAM REMAP THE SYSTEM, THE PROGRAM MUST BE RELOADED. IF YOU WISH TO GET ABOVE 28K, YOU CAN ENTER CONVERSATION MODE AND PUT THE DATA BUFFERS WHERE YOU WISH. THE SIZE OF THE DATA BUFFERS CAN NOT EXCEED 24K.

MAINDEC-11-DZRSCE-E RH11-RS03/LA-RS04 DATA RELIABILITY DIAG PAGE 5
DESCRIPTION

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(I.E) SWR=XXXXXX NEW=

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1. <CR> IF NO CHANGES ARE TO BE MADE.
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MAINDEC-11-DZRSCE-E RH11-R503/LA-R504 DATA RELIABILITY DIAG PAGE 6
DESCRIPTION

SWITCH SETTINGS ARE:

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 SW<14> = 1 LOOP ON FUNCTION
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 SW<12> = 1 INHIBIT COMPARISON
 WITH THIS SWITCH SET, THE
 PROGRAM WILL NOT COMPARE THE
 DATA IT READ FROM THE DISK WITH
 THE KNOWN GOOD DATA.
 SW<11> = 1 HALT ON COMPLETION OF TRANSFER
 SW<10> = 1 ENTER CONVERSATION MODE
 SW<09> = 1 LOOP ON ERROR
 SW<08> = 1 DATA RELIABILITY TEST MODE
 SW<07> = 1 WAIT IN WAIT MODE
 PROGRAM RUNS IN A BACKGROUND TEST
 WHILE WAITING FOR INTERRUPT, WITH
 SW SET PROGRAM WAITS IN A WAIT
 INSTRUCTION.
 SW<06> = 1 OPTIONAL TYPEOUT OF RETRY ERRORS
 SW<05> = 1 INHIBIT PASS COUNT
 SW<04> = 1 ALLOWS 8 ERROR TYPEOUTS IN THE
 COMPARE ROUTINE BEFORE EXECUTING NEXT READ
 COMMAND. WHEN SWITCH IS 0, ONLY 1 ERROR
 TYPEOUT IS RECORDED.
 SW<03> = 1 TYPEOUT # OF ERRORS
 SW<02> = 1 INHIBIT MEMORY MANAGEMENT
 SW<01> = 1 DATA TEST ONLY
 SW<00> = 1 DROPS DRIVE AFTER 20 ERRORS

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MAINDEC-11-DZRSCE-E RH11-R503/LA-R504 DATA RELIABILITY DIAG PAGE 7
DESCRIPTION

5.1 DATA RELIABILITY TEST MODE

WITH SW8 SET, THE PROGRAM WILL SET THE "BAI" BIT IN RHCS2 AND TRANSFER 64K OF DATA AT A TIME FOR ALL PATTERNS EXCEPT RANDOM. RANDOM WILL BE EXECUTED AS USUAL WITH STANDARD BUFFERS. NO COMPARES ARE DONE IN THIS MODE OF OPERATION EXCEPT ON RANDOM PATTERNS. THIS OPTION SHOULD ONLY BE USED IN DATA TEST OR CONVERSATION MODE. WHEN USED IN CONVERSATION MODE IT OVER RIDES THE NON STANDARD WORD COUNT. YOU SHOULD NOT SELECT A DESIRED DISK ADDRESS IN CONVERSATION MODE FOR IT CAN PRODUCE A DISK ADDRESS OVERFLOW ERROR FOR THIS DATA RELIABILITY TEST MODE ONLY DOES 64K WORD TRANSFERS. IF SW8 IS CHANGED, WHILE THE PROGRAM IS RUNNING, THE PROGRAM WILL FINISH ITS PASS BEFORE EXECUTING THE SWITCH CHANGE.

5.2 CONVERSATION MODE FOR PROGRAM PARAMETERS FOR DATA TEST ONLY

IN CONVERSATION MODE THE OPERATOR CAN SPECIFY ANY ONE OR ALL OF THE PROGRAM PARAMETERS.

NOTE

ONCE IN CONVERSATION MODE, THE ONLY WAY TO REMAP THE SYSTEM IS TO RELOAD THE PROGRAM. TO RESTART THE PROGRAM IN CONVERSATION MODE WITHOUT HAVING TO REANSWER THE QUESTIONS, THE STARTING ADDRESS IS 210. RESET SWITCH 10. TO RESTART THE PROGRAM WITHOUT HAVING TO REANSWER THE PORT SIZING QUESTIONS, RESTART AT 220. RESET SWITCH 10.

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THE PROGRAM WILL NOW ASK SEVERAL QUESTIONS, THE TABLE BELOW WILL HELP YOU ANSWER THE QUESTIONS.

| TYPE TO START AT | | TYPE TO START AT | |
|------------------|--------|------------------|--------|
| 0 | 000000 | | |
| 1 | 020000 | 20 | 400000 |
| 2 | 040000 | 21 | 420000 |
| 3 | 060000 | 22 | 440000 |
| 4 | 100000 | 23 | 460000 |
| 5 | 120000 | 24 | 500000 |
| 6 | 140000 | 25 | 520000 |
| 7 | 160000 | 26 | 540000 |
| 10 | 200000 | 27 | 560000 |
| 11 | 220000 | 30 | 600000 |
| 12 | 240000 | 31 | 620000 |
| 13 | 260000 | 32 | 640000 |
| 14 | 300000 | 33 | 660000 |
| 15 | 320000 | 34 | 700000 |
| 16 | 340000 | 35 | 720000 |
| 17 | 360000 | 36 | 740000 |

NOTE: TYPE ONLY NUMBERS SHOWN!!!

1. -A- PORT? (Y OR N)

THIS GIVES YOU THE OPTION TO TEST -A- OR -B- PORT USING THE DATA TEST.

IF THE ANSWER TO THIS QUESTION IS YES, THE FOLLOWING QUESTIONS WILL BE ASKED. IF THE ANSWER IS NO, -B- PORT WILL BE TESTED AND QUESTIONS 4 AND 5 WILL BE ASKED.

2. 1ST 4K BANK #

THIS NUMBER THAT IS TYPED WILL DETERMINE WHERE THE BUFFER AREA WILL START ON -A- PORT. USE TABLE ABOVE

NOTE:

PROGRAM IS LOCATED IN 1ST 4K BANK. THEREFORE, THIS BANK CAN NOT BE USED AS A BUFFER.

3. # OF 4K BANKS ?

THIS WILL DETERMINE THE SIZE OF THE -A- PORT DATA BUFFER. THE SIZE OF THE DATA BUFFER CAN NOT EXCEED 24K AND MUST BE IN "OCTAL".

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4. 1ST 4K BANK #

NOTE

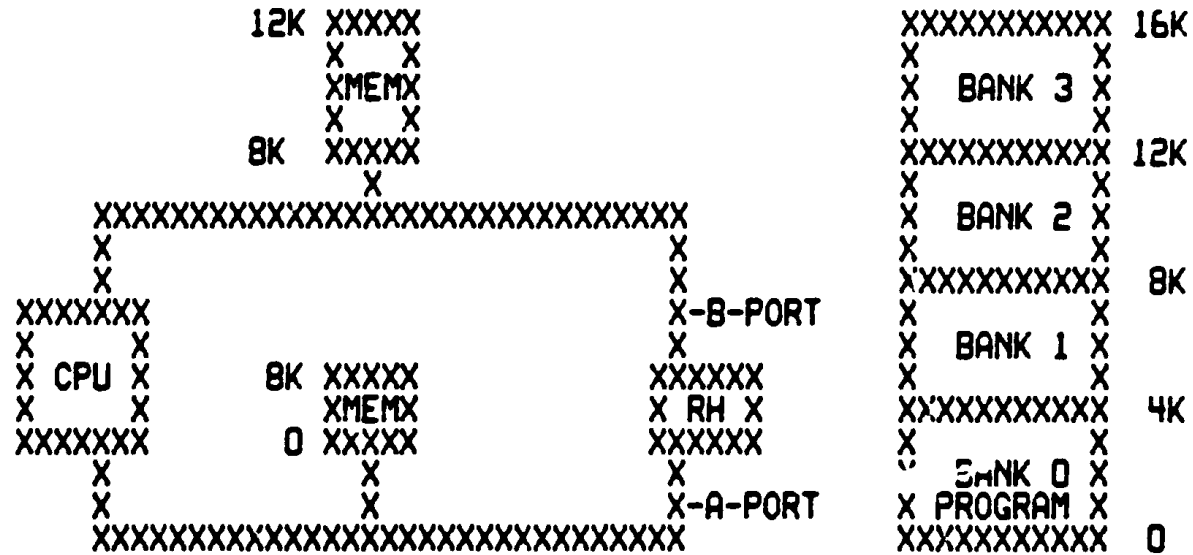
THIS DIAGNOSTIC WILL ONLY TEST -B- PORT
IF THE PROCESSOR HAS ACCESS TO THAT
MEMORY ON -B- PORT. THIS MEMORY MUST
HAVE THE SAME ADDRESS ON ALL PORTS.

THIS NUMBER WILL DETERMINE WHERE THE DATA BUFFER AREA WILL
START ON -B- PORT.

5. # OF 4K BANKS?

THIS NUMBER WILL DETERMINE THE SIZE OF THE -B- PORT DATA
BUFFER. THE SIZE OF THE DATA BUFFER CAN NOT EXCEED 24K AND
MUST BE IN "OCTAL".

EXAMPLE:



THESE ANSWERS GIVEN BELOW WILL TEST THE CONFIGURATION IN THE
GIVEN EXAMPLE. ANSWERS:

- | | | |
|---------|----------|----------|
| TO TEST | -A- PORT | -B- PORT |
| | 1) Y | 1) N |
| | 2) 1 | 4) 2 |
| | 3) 1 | 5) 1 |

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MAINDEC-11-DZRSCE-E RH11-RS03/LA-RS04 DATA RELIABILITY DIAG PAGE 10
DESCRIPTION

PROGRAM CONVERSATION

MULTI DRIVE MODE? (YES-NO)

MULTI DISK MODE IS A MODE IN THE PROGRAM WHICH ALLOWS THE OPERATOR TO EXERCISE ALL THE DISKS ON THE SYSTEM WITHOUT RE-STARTING THE PROGRAM. THE PROGRAM, AFTER EXERCISING ONE DISK WILL REPORT A MESSAGE TELLING THE OPERATOR WHICH DISK WILL BE SELECTED NEXT, AND THEN THE PROGRAM WILL EXERCISE THAT DISK. WHEN A COMPLETE PASS IS ACCOMPLISHED, A PASS COMPLETE WILL BE REPORTED AND THE TEST WILL RECYCLE.

IF THE ANSWER TO THE MULTI DRIVE MODE WAS "NO", THE FOLLOWING QUESTION IS ASKED.

UNIT

THE OPERATOR CAN NOW SELECT THE UNIT HE WISHES TO TEST BY TYPING THE UNIT NUMBER.

OPTIONAL WORD COUNT (YES-NO)

IF THE OPERATOR ANSWERS "NO" TO THIS QUESTION THE NEXT QUESTION WILL BE DELETED FROM THE CONVERSATION.

WD CT

THE OPERATOR CAN SPECIFY ANY LENGTH TRANSFER FROM 1(8) TO 60000(8) WORDS. THE NORMAL TRANSFER LENGTH IS N(8) WORDS WHERE N IS THE MAXIMUM BUFFER SIZE FOR THE AVAILABLE CORE. IN EITHER CASE, BUFFER WILL NOT EXCEED 24 K.

THIS PROGRAM MAPS THE SYSTEM IN 4K SEGMENTS. IF THERE IS A 1K BLOCK OF MEMORY ON THE SYSTEM THAT YOU WOULD LIKE TO REACH, YOU CAN TYPE IN THAT 4K BANK # AND THEN SPECIFY A WC OF 2000.

IF THE WORD COUNT NUMBER TYPED, IS LARGER THAN THE CORE SIZE GIVEN IN THE SETUP ROUTINE, THE QUESTION WILL BE REPEATED.

OPTIONAL DSK ADDR (YES-NO)

IF THE ANSWER TO THIS QUESTION IS NO, THE WHOLE DISK WILL BE WRITTEN AND THE NEXT QUESTION IS NOT ASKED.

DSK ADDR

THE OPERATOR CAN NOW SPECIFY THE STARTING SECTOR

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PATTERN NO. ?

THIS GIVES THE OPERATOR THE OPTION OF SELECTING ALL THE DATA PATTERNS (22) OR ANY ONE DATA PATTERN, SIMPLY BY TYPING THE DATA PATTERN NUMBER DESIRED.

| | |
|---------|--|
| PATTERN | 0 = 000000 |
| " | 1 = 177777 |
| " | 2 = 031463 |
| " | 3 = 066666 |
| " | 4 = 100001 |
| " | 5 = 107070 |
| " | 6 = 070707 |
| " | 7 = 052525 |
| " | 10 = 125252 |
| " | 11 = 177737 |
| " | 12 = 146314 |
| " | 13 = 136363 |
| " | 14 = 063636 |
| " | 15 = 000001 |
| " | 16 = 100005 |
| " | 17 = 155555 |
| " | 20 = 133333 |
| " | 21 = RANDOM DATA |
| " | 22 = RUN ALL DATA PATTERNS UNDER PROGRAM CONTROL |

IN THIS SECTION OF THE PROGRAM PARAMETER CONVERSATION MODE, THE OPERATOR CAN SELECT ANY ONE OR ALL THREE OF THE CONTROL FUNCTIONS TO BE EXECUTED. THE NORMAL SEQUENCE OF DISK FUNCTIONS UNDER PROGRAM CONTROL ARE WRITE, WRITE CHECK, AND THEN READ. BY ENTERING THE CONVERSATION MODE THE OPERATOR HAS GAINED COMPLETE CONTROL OVER THE DISK FUNCTIONS. HE MUST SPECIFY YES OR NO TO ALL OF THE FOLLOWING QUESTIONS.

WRITE? (YES - NO)
READ? (YES - NO)
WRITE CHECK? (YES - NO)

TO PERFORM A WRITE CHECK ONLY, THE OPERATOR MUST FIRST WRITE SOME KNOWN DATA ON THE DISK. THIS COURSE OF ACTION ALSO PREVAILS FOR A READ ONLY OPERATION.

* IF AN ERROR OCCURS IN THE LINE THE OPERATOR IS TYPING, DEPRESS THE RUB-OUT KEY AND RETYPE ANSWER.
ALL ANSWERS SHOULD BE FOLLOWED BY A CARRIAGE-RETURN

MAINDEC-11-DZRSCE-E RH11-R503/LA-R504 DATA RELIABILITY DIAG PAGE 12
DESCRIPTION

5.3 ROUTINE ABSTRACTS

ADDRESS TEST

THIS TEST WRITES EACH SECTOR WITH ITS OWN ADDRESS THEN READS IT BACK AND COMPARES IT FOR THE CORRECT DATA.

RANEX - RANDOM DATA, ADDRESS AND WORD COUNT TEST

THIS ROUTINE TESTS THE ABILITY OF THE SYSTEM TO ACCESS RANDOM ADDRESSES WITH RANDOM DATA. ONE SECTOR OF RANDOM DATA IS WRITTEN AT A STARTING RANDOM ADDRESS ON THE DISK. IT IS THEN WRITE CHECKED AND READ. ALL ERRORS ARE REPORTED. THIS IS REPEATED 1000 TIMES

DATA RELIABILITY - DATA PATTERN TEST

IN THIS PORTION OF THE TEST, THE RELIABILITY OF THE DISK SURFACE IS TESTED BY WRITE, WRITE CHECK, AND READ FUNCTIONS. THE ROUTINE FIRST WRITES THE COMPLETE SURFACE WITH A SET DATA PATTERN, THEN A WRITE CHECK OF THE COMPLETE SURFACE IS ACCOMPLISHED, THUS REPORTING ALL ERRORS BETWEEN THE DATA WRITTEN AND THE DATA IN MEMORY. THE DISK IS THEN READ. THE DATA READ FROM THE DISK IS COMPARED AGAINST THE KNOWN DATA PATTERN. THIS COMPARE IS TAKING PLACE THE SAME TIME THE DISK IS BEING READ. THE BUFFER IS CLEARED AS IT IS BEING COMPARED. IF THERE ARE DATA BUFFERS ON -A- AND -B- PORTS, THE DATA TEST WILL TRANSFER DATA OVER -A- PORT ON ODD PASSES AND OVER -B- PORT ON EVEN PASSES.

5.4 SUBROUTINE ABSTRACTS

5.4.1 SCOPE

THIS SUBROUTINE CALL IS PLACED BETWEEN EACH SUBTEST IN THE INSTRUCTION SECTION. IT RECORDS THE STARTING ADDRESS OF EACH SUBTEST AS IT IS BEING ENTERED IN LOCATION "LAD". IF A SCOPE LOOP IS REQUESTED, THE CURRENT SUBTEST WILL BE LOOPED UPON. THE CONTENTS OF LAD MAY BE USED TO DETERMINE THE LAST SUBTEST SUCCESSFULLY COMPLETED.

5.4.2 HLT

THIS ROUTINE PRINTS OUT AN ERROR MESSAGE (SEE 6.1). TO INHIBIT TYPEOUTS, PUT SW(13) ON A 1.

5.4.3 TRAPCATCHER

A ".+2" - "HALT" SEQUENCE IS REPEATED FROM 0 - 776 TO CATCH ANY UNEXPECTED TRAPS. THUS ANY UNEXPECTED TRAPS OR INTERRUPTS WILL HALT AT THE VECTOR + 2.

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MAINDEC-11-DZRSC-E RH11-R503/LA-R504 DATA RELIABILITY DIAG PAGE 14
DESCRIPTION

8.3 POWER FAIL

THE STARTING ADDRESS FOR THE WRITE POWER FAIL TEST IS 244. WHEN
ASKED, ENTER UNIT #. THE PROGRAM WILL TELL THE OPEFATOR WHEN TO POWER
DOWN. WHEN THE SYSTEM IS POWERED UP, ONLY ONE ERROR IS ALLOWED. THE
STARTING ADDRESS FOR THE WRITECHECK POWER FAIL TEST IS 250. HERE AS
IN THE WRITE POWER FAIL TEST, THE PROGRAM WILL TELL THE OPERATOR WHEN
TO POWER DOWN. WHEN THE POWER COMES BACK, NO ERRORS SHOULD OCCUR.
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| COMMEN | 18 |
| ENDCOM | 18 |
| ESCAPE | 18 |
| GETPRI | 18 |
| GETSMR | 18 |
| MULT | 18 |
| NEWST | 18 |
| POP | 18 |
| PUSH | 18 |
| REPORT | 18 |
| SETPRI | 18 |
| SETUP | 18 |
| SKIP | 18 |
| SLASH | 18 |
| STARS | 18 |
| SUSU | 18 |
| TYPBIN | 18 |
| TYPDEC | 18 |
| TYPNAM | 18 |
| TYPNUM | 18 |
| TYPQCS | 18 |
| TYPQCT | 18 |
| TYPTXT | 18 |
| SSESCA | 18 |
| SSNEWT | 18 |
| SSSKIP | 18 |
| .EQUAT | 18 |
| .HEADE | 18 |
| .K11 | 18 |
| .SETUP | 18 |
| .SURI | 18 |
| .SACTI | 18 |
| .SAPT8 | 18 |
| .SAPTH | 18 |
| .SAPTY | 18 |
| .SASTA | 18 |
| .SCATC | 18 |
| .SCHTA | 18 |
| .SOB20 | 18 |
| .SOB20 | 18 |
| .SOIV | 18 |
| .SEOP | 18 |
| .SERRO | 18 |
| .SERRT | 18 |
| .SMULT | 18 |
| .SPONE | 18 |
| .SRAND | 18 |
| .SRODE | 18 |
| .SRDOC | 18 |
| .SRERO | 18 |
| .SR2AZ | 18 |
| .SSAVE | 18 |
| .SOB20 | 18 |
| .SOB20 | 18 |
| .SECOP | 18 |
| .SEIZE | 18 |

.MAIN. MACY11 27.7321 03-NOV-76 09:20 PAGE 32
DIRSCE.P11 CROSS REFERENCE TABLE -- MACRO NAMES

| | |
|--------|----|
| .SSUPR | 10 |
| .STRAP | 10 |
| .STYPB | 10 |
| .STYPO | 10 |
| .STYPE | 10 |
| .STYPO | 10 |
| .S40CA | 10 |
| .1170 | 10 |

.MAIN. MACY11 27(732) 03-NOV-76 09:20 PAGE 34
DZRSCE.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

| | | |
|--------|---|-----|
| .ENABL | 1 | |
| .LIST | 1 | |
| .MACRO | 1 | |
| .NLIST | 1 | |
| .REM | 1 | 604 |

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

*.DZRSCE.SEQ/SOL/CRF/PAGNUM/NL:TOC=SYSMAC.CO,DZRSCE.P11
RUN-TIME: 22 25 .2 SECONDS
RUN-TIME RATIO: 104/48=2.1
CORE USED: 32K (63 PAGES)

