RH11-RS03

DATA RELIABILITY

MD-11-DZRSC-E

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IDENTIFICATION

PRODUCT CODE:

MAINDEC-11-DZRSC-E-D

PRODUCT NAME:

RH11-RS03-RS03/LA-RS04 DATA RELIABILITY

DIAGNOSTIC

PROGRAM DATE:

AUG 1976

MAINTAINER;

DIAGNOSTIC GROUP

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MAINDEC-11-DZRSC-E RH11-RSD3/LA-RSD4 DATA RELIABILITY DIAG PAGE 3 DESCRIPTION

1. ABSTRACT

THIS DIAGNOSTIC WAS DESIGNED TO TEST RSD3, RSD3/LA AND RSD4 DRIVES.

THE DZRSC DISK DATA TEST IS A SERIES OF ADDRESS AND DATA RELIABILITY ROUTINES WHICH VERIFY TO THE USER THAT THE CONTROLLER (RH11) AND THE DISKS (RSD3/LA OR RSD4) ARE OPERATING CORRECTLY. THIS TEST SHOULD BE USED IN CONJUNCTION WITH THE DZRSB DIAGNOSTIC. IF THERE IS A POWER FAIL WHILE THE DIAGNOSTIC IS RUNNING, THE PROGRAM WILL WAIT FOR AFFROXIMATELY 5 MINUTES, TO GIVE ALL THE DRIVES TIME TO COME BACK UP TO SPEED, BEFORE RESTARTING THE TEST SEQUENCE.

NOTE

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

- 2. REQUIREMENTS
- 2.1 EQUIPMENT

PDP11 STANDARD COMPUTER WITH A MINIMUM OF 8K OF MEMORY, AND AN RH11 CONTROLLER WITH AN RSD3, RSD3/LA OR AN RSD4 DISK.

2.2 PRELIMINARY PROGRAMS

DZRSB

3. LOADING PROCEDURE

USE STANDARD PROCEDURE FOR ABS TAPES.

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- 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.

- STARTING ADDRESS 200.
 - A. SET SWITCHES (SEE SEC 5.). ALL DOWN FOR WORST CASE (IF SWITCH-LESS CPV SIMPLY PRESS START)
 - 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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MAINDEC-11-DZRSC-E RH11-RSD3/LA-RSD4 DATA RELIABILITY DIAG PAGE 5 DESCRIPTION

5. OPERATIONAL SWITCH SETTINGS

THIS PROGRAM HAS BEEN MODIFILD 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 D-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 tG (CNTL 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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日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本日本の日本日本の日本日本の日本の	219 220 221 222 223		SW(15) = 1 HA SW(14) = 1 LO SW(13) = 1 IN SW(12) = 1 IN WI	ALT ON ERROR DOP ON FUNCTION WHIBIT PRINTOUT WHIBIT COMPARISON THE THIS SWITCH SET, THE ROGRAM WILL NOT COMPARE THE
medicing senting thinks 47c . Her divintality builting ABN 150 apprint	213421212122122222222222222222222222222		SW(11) = 1 HA SW(10) = 1 EN SW(09) = 1 LO SW(08) = 1 DA SW(07) = 1 WA PRI	WHIBIT COMPARISON ITH THIS SWITCH SET, THE ROGRAM WILL NOT COMPARE THE RIA IT READ FROM THE DISK WITH HE KNOWN GOOD DATA. HIT ON COMPLETION OF TRANSFER HITER CONVERSATION MODE ROP ON ERROR RIA RELIABILITY TEST MODE ROGRAM RUNS IN A BACKGROUND TEST HILL WAITING FOR INTERRUPT, WITH HISET PROGRAM WAITS IN A WAIT HISTRUCTION. PILONAL TYPEOUT OF RETRY ERRORS HIBIT PASS COUNT LOWS 8 ERROR TYPEOUTS IN THE HIPMARE ROUTINE BEFORE EXECUTING NEXT READ HIMMAND. WHEN SWITCH IS 0, ONLY 1 ERROR HIPPEOUT IS RECORDED. HIPPEOUT & OF ERRORS HIBIT MEMORY MANAGEMENT
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MAINDEC-11-DZRSC-E RH11-RSD3/LA-RSD4 DATA RELIABILITY DIAG PAGE 7 DESCRIPTION

5.1 DATA RELIABILITY TEST MODE

WITH SWB 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 SWB IS CHANGED, WHILE THE PROGRAM IS FUNNING, 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.

MAINDEC-11-DZRSC-E RH11-RSD3/LA-RSD4 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 000000	TYPE	TO START AT
	020000	51	400000 420000
74-15-4	060000 100000 120000 140000	53	440000 460000 500000
7	20000 200000 200000	26	520000 540000 560000 600000
13	240000	35	620000
123456701234567	360000 320000 340000 360000	201024222222222222222222222222222222222	660000 700000 720000 740000
11	380000	30	7 40000

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- FORT DATA BUFFER. THE SIZE OF THE DATA BUFFER CAN NOT EXCEED 24K AND MUST BE IN "OCTAL".

37567890-1234567890-1234567890-1234567890-1234567890-1234

MAINDEC-11-DZRSC-E RH11-RSD3/LA-RSD4 DATA RELIABILITY DIAG PAGE 9
DESCRIPTION

4. 1ST 4K BANK #

NOTE

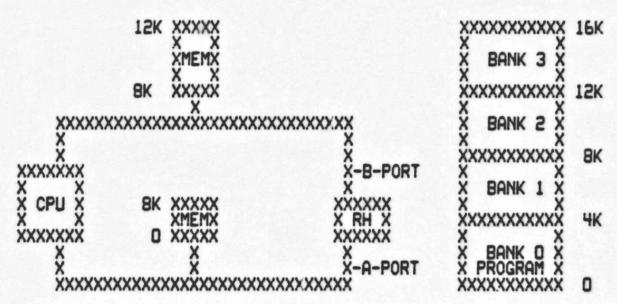
THIS DIAGNOSTIC WILL ONLY TEST -B- PORT IF THE PROCESSOR HAS ACCESS TO THAT MEMORY ON -B- PORT. THIS MEMORY MUST HAVE THE SAME ADDRESS ON ALL PORTS.

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:

55678990-123755678990-123755678990-123755678990-123755678990-123755678990-123755678990-123755678990-1237556789

MAINDEC-11-DZRSC-E RH11-RSD3/LA-RSD4 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 FEPORTED 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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337777775676901037556789010375678901037567890103756 337777777778988885555555555555556789010375678901037556

MAINDEC-11-DZRSC-E RH11-RSO3/LA-RSO4 DATA RELIABILITY DIAG DESCRIPTION

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.

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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-DZRSC-E RH11-RSD3/LA-RSD4 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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- 6. ERRORS
- **6.1 ERROR PRINTOUT**

THE FORMAT IS AS FOLLOWS:

CS1 = ---- CS2 = ---- ER = ----

WHERE:

CS1,CS2,ER ETC. GOOD BAD

= RS11 DISK REGISTERS. = EXPECTED DATA. = DATA RECEIVED.

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

IF SWO 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 O" 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.

- B. 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.

B.2 STACK POINTER

STACK IS INITIALLY SET TO 500

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MAINDEC-11-DZRSC-E RH11-RS03/LA-RS04 DATA RELIABILITY DIAG 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.

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IDENTIFICATION

PRODUCT CODE:

MAINDEC-11-DZRSC-E-D

PRODUCT NAME:

RH11-RS03-RS03/LA-RS04 DATA RELIABILITY

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DIAGNOSTIC

PROGRAM DATE:

AUG 1976

MAINTAINER:

DIAGNOSTIC GROUP

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MAINDEC-11-DZRSC-E RH11-RS03/LA-RS04 DATA RELIABILITY DIAG PAGE 3 DESCRIPTION

1. ABSTRACT

THIS DIAGNOSTIC WAS DESIGNED TO TEST RSD3, RSD3/LA AND RSD4 DRIVES.

THE DZRSC DISK DATA TEST IS A SERIES OF ADDRESS AND DATA RELIABILITY ROUTINES WHICH VERIFY TO THE USER THAT THE CONTROLLER (RH11) AND THE DISKS (RSD3/LA OR RSD4) ARE OPERATING CORRECTLY. THIS TEST SHOULD BE USED IN CONJUNCTION WITH THE DZRSB DIAGNOSTIC. IF THERE IS A POWER FAIL WHILE THE DIAGNOSTIC IS RUNNING, THE PROGRAM WILL WAIT FOR APPROXIMATELY 5 MINUTES, TO GIVE ALL THE DRIVES TIME TO COME BACK UP TO SPEED, BEFORE RESTARTING THE TEST SEQUENCE.

NOTE

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

- 2. REQUIREMENTS
- 2.1 EQUIPMENT

PDP11 STANDARD COMPUTER WITH A MINIMUM OF 8K OF MEMORY, AND AN RH11 CONTROLLER WITH AN RSD3, RSD3/LA OR AN RSD4 DISK.

2.2 PRELIMINARY PROGRAMS

DZRSB

3. LOADING PROCEDURE

USE STANDARD PROCEDURE FOR ABS TAPES.

MAINDEC-11-DZRSC-E RH11-RS03/LA-RS04 DATA RELIABILITY DIAG PAGE 4 DESCRIPTION

- 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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MAINDEC-11-DZRSC-E RH11-RSD3/LA-RSD4 DATA RELIABILITY DIAG PAGE 5 DESCRIPTION

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 D-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 (CNTL 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.

H05

.MAIN. MACY11 27(732) DZRSCE.P11	03-NOV-76	09:20 PAGE 21	
815 816 817		MAINDEC-11-DZRSC-E DESCRIPTION	RH11-RS03/LA-RS04 DATA RELIABILITY DIAG PAGE 6
818 819		SWITCH SETTINGS ARE	
821 822 823 824 825 825 826 827		SW(15) = SW(14) = SW(13) = SW(12) =	1 HALT ON ERROR 1 LOOP ON FUNCTION 1 INHIBIT PRINTOUT 1 INHIBIT COMPARISON WITH THIS SWITCH SET, THE PROGRAM WILL NOT COMPARE THE DATA IT READ FROM THE DISK WITH
815 8117 82123 82223 82223 8223 8233 8233 8333 83		SW(11) = SW(10) = SW(09) = SW(08) = SW(07) =	PROGRAM WILL NOT COMPARE THE DATA IT READ FROM THE DISK WITH THE KNOWN GOOD DATA. 1 HALT ON COMPLETION OF TRANSFER 1 ENTER CONVERSATION MODE 1 DATA RELIABILITY TEST MODE 1 DATA RELIABILITY TEST MODE PROGRAM RUNS IN A BACKGROUND TEST WHILE WAITING FOR INTERRUPT, WITH SW SET PROGRAM WAITS IN A WAIT INSTRUCTION.
837 838 839 840 841 842		SW(06) = SW(05) = SW(04) =	INSTRUCTION. OPTIONAL TYPEOUT OF RETRY ERRORS INHIBIT PASS COUNT ALLOWS B ERROR TYPEOUTS IN THE COMPARE ROUTINE BEFORE EXECUTING NEXT READ COMMAND. WHEN SWITCH IS 0, ONLY 1 ERROR
844 845 846 847		SW(03) = SW(02) = SW(01) = SW(00) =	I OPTIONAL TYPEOUT OF RETRY ERRORS I INHIBIT PASS COUNT I ALLOWS 8 ERROR TYPEOUTS IN THE COMPARE ROUTINE BEFORE EXECUTING NEXT READ COMMAND. WHEN SWITCH IS 0, ONLY 1 ERROR TYPEOUT IS RECORDED. I TYPEOUT * OF ERRORS I INHIBIT MEMORY MANAGEMENT DATA TEST ONLY DROPS DRIVE AFTER 20 ERRORS

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849 850 851 MAINDEC-11-DZRSC-E RH11-RS03/LA-RS04 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.

888553455678901234567890123456789012 88855578901234567890123456789012

MAINDEC-11-DZRSC-E RH11-RS03/LA-RS04 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 000000	TYPE	TO	START	AT
2001年の07	020000 040000 060000 100000	50 51 50		4500 4400 4000 4000	
5 7 10 11	220000 220000 200000 140000			5000 5200 5400 5600 6000	
10 112 13 14 15 16 17	260000 300000 320000 340000 360000	32 33 35 35 36		6200 6400 6600 7000 7200 7400	100

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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MAINDEC-11-DZRSC-E RH11-RSD3/LA-RSD4 DATA RELIABILITY DIAG PAGE 9
DESCRIPTION

4. 1ST 4K BANK #

NOTE

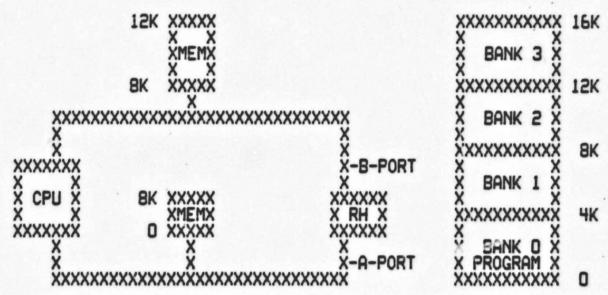
THIS DIAGNOSTIC WILL ONLY TEST -B- PORT IF THE PROCESSOR HAS ACCESS TO THAT MEMORY ON -B- PORT. THIS MEMORY MUST HAVE THE SAME ADDRESS ON ALL PORTS.

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:

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MAINDEC-11-DZRSC-E RH11-RSD3/LA-RSD4 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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MAINDEC-11-DZRSC-E RH11-RSD3/LA-RSD4 DATA RELIABILITY DIAG PAGE 11 DESCRIPTION

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

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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MAINDEC-11-DZRSC-E RH11-RS03/LA-RS04 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 D - 776 TO CATCH ANY UNEXPECTED TRAPS. THUS ANY UNEXPECTED TRAPS OR INTERRUPTS WILL HALT AT THE VECTOR + 2.

MAINDEC-11-DZRSC-E RH11-RS03/LA-RS04 DATA RELIABILITY DIAG PAGE 13 DESCRIPTION

6. ERRORS

6.1 ERROR PRINTOUT

THE FORMAT IS AS FOLLOWS:

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

WHERE:

CS1,CS2,ER ETC. GOOD BAD

= RS11 DISK REGISTERS. = EXPECTED DATA. = DATA RECEIVED.

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

IF SWO 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 O" 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.

B. 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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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.

SSSKIP EQUAT HEADE KT11 SETUP SARHI SARTH SARTH

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DZRSCE.P11 CROSS REFERENCE TABLE -- MACRO NAMES

.STUPR 1:
.STYPB 1:
.STYPD 1:
.STYPD 1:
.STYPO 1:
.
```

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