

IDENTIFICATION

PRODUCT CODE: MAINDEC-08-DHRKC-C-0  
PRODUCT NAME: RK8E DATA RELIABILITY PROGRAM  
DATE CREATED: JULY 16, 1973  
MAINTAINER: DIAGNOSTIC GROUP  
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1. ABSTRACT  
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THE RK8E DATA RELIABILITY PROGRAM IS DESIGNED PRIMARILY AS AN ACCEPTANCE TEST TO VERIFY DISK DATA TRANSFERS WITHIN THE DISK SYSTEM.

THE "ACCEPT MODE" OF OPERATION VERIFIES THE CAPABILITY OF TRANSFERRING A TOTAL 3 X 1019) BITS OF DATA TO AND FROM EACH INDIVIDUAL DISK DRIVE ON THE DISK SYSTEM.

THE "MANUAL INTERVENTION MODE" IS AVAILABLE AS A HARDWARE DEBUGGING AID TO ALLOW THE OPERATOR TO SELECT DATA PATTERNS, TRANSFER LENGTHS, AND ADDRESSING.

2. REQUIREMENTS  
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2.1 HARDWARE  
\*\*\*\*\*

A. PDP-01E, 8/P, OR 8/M COMPUTER OR OTHER FAMILY OF 8 COMPATIBLE COMPUTER WITH NECESSARY DW8E BUS ADAPTER.

B. AT LEAST 4K OF READ/WRITE MEMORY

C. ASR-33 TELETYPE OR EQUIVALENT

D. RK8E DISK CONTROL

E. RK05 DISK DRIVE(S)

2.2 PROGRAM STORAGE  
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THE PROGRAM OCCUPIES OR UTILIZES LOCATION 0000 TO LOCATION 7577 OF FIELD 0. ALL EXTENDED MEMORY LOCATIONS, IF AVAILABLE, ARE UTILIZED FOR TESTING.

2.3 PRELIMINARY PROGRAMS  
\*\*\*\*\*

THIS PROGRAM REQUIRES A FORMATTED CARTRIDGE ON ALL DRIVES TO BE TESTED.

ALL BASIC AND EXTENDED MEMORY DIAGNOSTICS, THE RK8E DISKLESS CONTROL TEST, THE RK8E DRIVE CONTROL TEST, AND THE RK8E DISK FORMATTER PROGRAM SHOULD BE RUN IF THIS TEST FAILS TO OPERATE CORRECTLY.

2.4 EXECUTION TIME  
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THE PROGRAM EXECUTION TIME (I.E., PASSING 3 X 10(9) BITS OF DATA ON A DISK DRIVE), IS APPROX. 3 HOURS PER DISK DRIVE ON A 4K MEMORY SYSTEM OR APPROX. 2.5 HOURS PER DISK DRIVE ON SYSTEMS WITH EXTENDED MEMORY.

3. SWITCH REGISTER SETTINGS  
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- SWR0#1 LOOP ON WRITE SEQUENCE,
- SWR1#1 LOOP ON READ SEQUENCE,
- SWR2#1 INHIBIT ALL ERROR TYPEOUTS
- SWR3#1 TYPE "STATUS=COMPLETE" REPORT,
- SWR4#1 PROGRAM STOP OR HALT,
- SWR5#1 DRIVE DISCONNECT AFTER PASS COMPLETION,
- SWR6#1 PERFORM ONLY "OVERLAP SEEKS", DO NOT EXECUTE DATA BREAKS.

4. OPERATOR AND/OR PROGRAM ACTION  
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4.1 STANDARD TEST PROCEDURE  
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- A. START AS SPECIFIED THROUGH OUT THIS DOCUMENTATION IS KEY CLEAR AND THEN KEY CONTINUE ON POP8/E, POP8/M, AND POP8/F COMPUTERS.
- B. LOAD THE PROGRAM INTO MEMORY FIELD 2 USING THE STANDARD BINARY LOADER TECHNIQUE,
- C. IF IT IS DESIRED TO CHANGE THE IOT CODES WITHIN THE PROGRAM, FOLLOW THE PROCEDURE IN SECTION 4.5,
- D. RUN THE ACCEPTANCE MODE OF DATA RELIABILITY WITH ALL DRIVES AND MEMORY AVAILABLE BY FOLLOWING THE PROCEDURE IN SECTION 4.3,
- E. THE MANUAL INTERVENTION MODE, SECTION 4.4, MAY BE USED FOR TROUBLE SHOOTING, IF DESIRED,
- F. IF POSSIBLE SWR4#1 SHOULD ALWAYS BE USED TO STOP THE PROGRAM.

G. IF THE PROGRAM HAS BEEN STOPPED DUE TO SWR421, THE PROGRAM CAN BE RESTARTED, AND THE INITIAL STARTUP QUESTIONS BYPASSED, BY USING 0202 AS THE RESTART ADDRESS.

H. FOR THE ABSOLUTE LOCATIONS OF ALL KNOWN HALTS IN THIS PROGRAM, ACCESS PAGE 1 OF THE PROGRAM LISTING.

4.2 RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE  
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THE FOLLOWING IS THE CORRECT CARTRIDGE MOUNTING PROCEDURE FOR THE RK05 DISK DRIVE. ANY DEVIATION ENCOUNTERED DURING THIS PROCEDURE WILL BE CONSIDERED AN ERROR CONDITION.

- A. SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION.
- B. TURN AC POWER TO DISK DRIVE ON.
- C. VERIFY THAT THE LIGHT LABELED "PWR" IS ON.
- D. WAIT FOR THE LIGHT LABELED "LOAD" TO COME ON.
- E. VERIFY THAT THE LIGHTS LABELED "RDY", "ON CYL", "FAULT", "WT", AND "RD" ARE OFF.
- F. OPEN ACCESS DOOR.
- G. INSERT CARTRIDGE.
- H. CLOSE ACCESS DOOR.
- I. SET SWITCH LABELED "RUN/LOAD" TO THE "RUN" POSITION.
- J. WAIT FOR THE LIGHTS LABELED "RDY" AND "ON CYL" TO COME ON.
- K. TOGGLE SWITCH LABELED "WT PROT" AND VERIFY THAT THE LIGHT LABELED "WT PROT" GOES ON AND OFF.
- L. TOGGLE SWITCH LABELED "WT PROT" UNTIL THE LIGHT LABELED "WT PROT" IS OFF.
- M. VERIFY THAT LIGHTS LABELED "FAULT", "WT", "RD", AND "LOAD" ARE OFF.

4.3

RK8E DATA RELIABILITY (ACCEPT MODE)  
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- A. MAKE READY ALL DRIVES TO BE TESTED USING THE RK25 DRIVE CARTRIDGE MOUNTING PROCEDURE SECTION 4.2.
- B. SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION ON ALL DRIVES NOT BEING TESTED.
- C. VERIFY THAT AC POWER IS ON, ON ALL DRIVES NOT BEING TESTED.
- D. SET THE SWITCH REGISTER TO 2200 AND PRESS LOAD ADDRESS.
- E. SET THE SWITCH REGISTER TO 0000 AND PRESS START.
- F. THE OPERATOR MAY SET SWR5=1 IF IT IS DESIRED TO HAVE THE PROGRAM AUTOMATICALLY DISCONNECT EACH DISK DRIVE AS EACH MAKE THEIR PASS COMPLETION. (NOTE! IF SWR5=2, ALL DISK DRIVES WILL CONTINUE TO RUN AFTER THEIR PASS COMPLETION)
- G. THE TTY WILL PRINT THE FOLLOWING PROGRAM NAME AND QUESTION.

RK8E DATA RELIABILITY  
AMOUNT OF EXTENDED R/W MEMORY (0-7)?

THE OPERATOR SHOULD THEN TYPE THE AMOUNT OF EXTENDED READ/ WRITE MEMORY BANKS NUMBERED SEQUENTIALLY FROM BANK 1, AS INDICATED BY THE TTY QUESTION.

- H. THE TTY WILL PRINT THE FOLLOWING QUESTION(S), ASKING THE DESIRED DISK DRIVE(S) TO BE USED IN TESTING.

EXERCISE DISK0? DISK1? DISK2? DISK3?

FOR THE QUESTION(S) ABOVE, TYPE Y FOR YES, IF IT IS DESIRED TO TEST THE DISK DRIVE IN QUESTION; OTHERWISE, TYPE N FOR NO.

- I. THE TTY WILL PRINT THE FOLLOWING QUESTION.

ACCEPT MODE?

THE OPERATOR SHOULD THEN TYPE Y FOR YES TO RUN THE ACCEPTANCE MODE OF OPERATION.

- J. THE TTY WILL PRINT THE FOLLOWING QUESTION.

ARE YOU SURE?

IF THE OPERATOR IS CERTAIN OF THE AMOUNT OF MEMORY, THE DISK DRIVE(S) SELECTED, AND THE MODE OF OPERATION, TYPE Y FOR YES. TYPING N FOR NO WILL RESULT IN A REPEAT OF ALL MESSAGES AND QUESTIONS ENCOUNTERED THUS FAR.

- K. THE PROGRAM SHOULD START TESTING THE DISK DRIVE(S) AND MEMORY SELECTED.
- L. THE "STATUS=COMPLETE" TIMEOUT SHOULD OCCUR UPON PASS COMPLETION OF EACH DISK DRIVE. ALL OTHER TIMEOUTS OR HALTS WILL BE CONSIDERED AS AN ERROR CONDITION. SEE SECTION 5.5 FOR "STATUS=COMPLETE" TIMEOUT.
- M. A SUCCESSFUL PASS COMPLETE ON A DISK DRIVE WILL BE CONSIDERED AS NO "HARD" ERRORS AND NO MORE THAN ONE (1) "SOFT" ERROR PER PASS COMPLETE.
- N. IF ANY ERRORS DO OCCUR, THE OPERATOR SHOULD ACCESS SECTION 5 IN THIS DOCUMENTATION.

4.4 RK8E DATA RELIABILITY (MANUAL INTERVENTION MODE)  
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THE MANUAL INTERVENTION MODE IS AVAILABLE AS A TROUBLE SHOOTING AID AND SHOULD ONLY BE USED FOR SUCH PURPOSES, IF DESIRED.

- A. MAKE READY ALL DISK DRIVES TO BE TESTED USING THE RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE SECTION 4.2.
- B. SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION ON ALL DRIVES NOT BEING TESTED.
- C. VERIFY THAT AC POWER IS ON. ON ALL DRIVES NOT BEING TESTED.
- D. SET THE SWITCH REGISTER TO 0200 AND PRESS LOAD ADDRESS.
- E. SET THE SWITCH REGISTER TO 0000 AND PRESS START.
- F. THE TTY WILL PRINT THE FOLLOWING PROGRAM NAME AND QUESTION.  
  
RK8E DATA RELIABILITY  
AMOUNT OF EXTENDED R/W MEMORY (0-7)?  
  
THE OPERATOR SHOULD THEN TYPE THE AMOUNT OF EXTENDED READ/WRITE MEMORY BANKS NUMBERED SEQUENTIALLY FROM BANK 0, AS INDICATED BY THE TTY QUESTION.

- G. THE TTY WILL PRINT THE FOLLOWING QUESTION(S), ASKING THE DESIRED DISK DRIVE(S) TO BE USED IN TESTING.

EXERCISE DISK0? DISK1? DISK2? DISK3?

FOR THE QUESTION(S) ABOVE, TYPE Y FOR YES, IF IT IS DESIRED TO TEST THE DISK DRIVE IN QUESTION; OTHERWISE, TYPE N FOR NO.

H. THE TTY WILL PRINT THE FOLLOWING QUESTION,

ACCEPT MODE?

THE OPERATOR SHOULD THEN TYPE N FOR NO TO RUN THE MANUAL INTERVENTION MODE OF OPERATION.

I. THE TTY WILL THEN PRINT THE FOLLOWING QUESTION, ASKING IF THE OPERATOR DESIRES TO SELECT A CONSTANT MEMORY FIELD, RATHER THAN THE NORMAL RANDOM FIELD SELECTION.

FIELD?

IF THE OPERATOR DESIRES TO SELECT A CONSTANT FIELD, TYPE Y FOR YES, OTHERWISE, TYPE N FOR NO. IF Y WAS TYPED THE TTY WILL SPACE OUT ONCE AND WAIT FOR THE OPERATOR TO TYPE THE DESIRED FIELD IN OCTAL (0-7).

J. THE TTY WILL PRINT THE FOLLOWING QUESTION, ASKING IF THE OPERATOR DESIRES TO SELECT A CONSTANT TRACK, RATHER THAN THE NORMAL RANDOM TRACK SELECTION.

TRACK?

IF THE OPERATOR DESIRES TO SELECT A CONSTANT TRACK, TYPE Y FOR YES, OTHERWISE, N FOR NO. IF Y WAS TYPED, THE TTY WILL SPACE OUT ONCE AND WAIT FOR THE OPERATOR TO INPUT THE DESIRED TRACK ADDRESS (0000-14537).

K. THE TTY WILL PRINT THE FOLLOWING QUESTION, ASKING IF THE OPERATOR DESIRES TO SELECT HALF BLOCK OR FULL BLOCK TRANSFERS, RATHER THAN THE NORMAL RANDOM SELECTION.

BLOCK LENGTH?

IF THE OPERATOR DESIRES TO CHANGE THE BLOCK LENGTH, TYPE Y FOR YES, OTHERWISE, N FOR NO. IF Y WAS TYPED THE TTY WILL SPACE OUT ONCE AND WAIT FOR THE OPERATOR TO TYPE THE BLOCK LENGTH DESIRED (0=256 WORD BLOCK OR 1=128 WORD BLOCK).

L. THE TTY WILL PRINT THE FOLLOWING QUESTION, ASKING IF THE OPERATOR DESIRES TO SELECT A CONSTANT NUMBER OF SECTORS TO BE TRANSFERRED, RATHER THAN THE NORMAL RANDOM SECTOR SELECTION.

EXTRA SECTORS?

IF THE OPERATOR DESIRES TO SELECT A CONSTANT AMOUNT OF SECTORS, TYPE Y FOR YES, OTHERWISE, N FOR NO. IF Y WAS TYPED THE TTY WILL SPACE OUT ONCE, AND WAIT FOR THE OPERATOR TO TYPE IN THE EXTRA SECTORS DESIRED (0-17). (NOTE: IF THE FIELD OF THE BLOCK LENGTH PREVIOUSLY SELECTED WAS 0, THE AMOUNT OF EXTRA SECTORS WILL BE LIMITED TO 07, OTHERWISE THE MAXIMUM AMOUNT IS LIMITED TO 17.)

M. IF A CONSTANT TRACK WAS NOT SELECTED, AS MENTIONED ABOVE, THE TTY WILL PRINT THE FOLLOWING QUESTION, ASKING IF THE OPERATOR DESIRES TO SELECT AN INCREMENT SEEK SEQUENCE, RATHER THAN THE NORMAL RANDOM SEQUENCE.

SEQUENCE?

IF THE OPERATOR DESIRES TO SELECT SEQUENTIAL SEEK SEQUENCE, TYPE Y FOR YES, OTHERWISE, N FOR NO.

N. THE TTY WILL PRINT THE FOLLOWING QUESTION, ASKING IF THE OPERATOR DESIRES TO SELECT A DATA PATTERN, RATHER THAN NORMAL RANDOM DATA SELECTION.

DATA?

IF THE OPERATOR DESIRES TO SELECT A DATA PATTERN, TYPE Y FOR YES, OTHERWISE, N FOR NO. IF Y WAS TYPED, THE TTY WILL DO A "CRLF" AND WAIT FOR THE OPERATOR TO TYPE IN 12 OCTAL DATA WORDS TO BE USED IN TESTING.

P. THE TTY WILL PRINT THE FOLLOWING QUESTION.

ARE YOU SURE?

IF THE OPERATOR IS CERTAIN OF THE INFORMATION SELECTED, TYPE Y FOR YES. TYPING N FOR NO WILL RESULT IN A REPEAT OF ALL MESSAGES AND QUESTIONS ENCOUNTERED THUS FAR.

R. THE PROGRAM SHOULD START EXECUTING THE OPERATIONS SELECTED.

S. IF ERRORS ARE ENCOUNTERED, ACCESS SECTION 5 IN THIS DOCUMENTATION.

4.5 CHANGE PROGRAM DEVICE IOT CODES  
\*\*\*\*\*

THE PROGRAM NORMALLY RECOGNIZES DEVICE IOT CODE X74X. TO CHANGE THE DEVICE IOT CODES WITHIN THE PROGRAM:

A. SET THE SWITCH REGISTER TO 0201 AND PRESS LOAD ADDRESS.

B. SET THE SWITCH REGISTER TO 2000, SET SWITCH REGISTER BITS 3-8 TO THE DESIRED DEVICE IOT CODE, AND PRESS START.

C. THE PROGRAM WILL CHANGE THE DEVICE IOT CODES WITHIN THE PROGRAM AND THEN HALT.

D. THE REGULAR TESTS CAN THEN BE RUN (SEE SECTIONS 4.3 OR 4.4)

5. ERRORS  
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5.1. USEFUL INFORMATION  
\*\*\*\*\*

ALL STATUS ERRORS WILL BE REPORTED AS STATUS ERRORS. ALL DATA ERRORS WILL BE REPORTED AS DISK DATA ERRORS.

WHEN DATA IS BEING READ OFF THE DISK AND A CRC ERROR OCCURS THE PROGRAM WILL REPORT THE ERROR AS A READ STATUS ERROR. THE PROGRAM WILL THEN CHECK THE DATA READ FOR DATA ERRORS. IF DATA ERRORS EXIST THEY WILL BE REPORTED AS DISK DATA ERRORS.

5.2. ERROR HALTS  
\*\*\*\*\*

ERROR HALTS FOR WHICH THERE ARE NO ERROR TYPEOUTS ARE LISTED AND DEFINED AS FOLLOWS.

- INTER1 NO DISK INTERRUPT
- INTER2 UNDEFINED INTERRUPT
- ERHLT2 SKIP TRAP FOR IOT "DCLR"
- ERHLT3 SKIP TRAP FOR IOT "DLAG"
- ERHLT4 SKIP TRAP FOR IOT "DLCA"
- ERHLT5 SKIP TRAP FOR IOT "DRST"
- ERHLT6 SKIP TRAP FOR IOT "ELCC"
- ERHLT7 SKIP TRAP FOR IOT "DMAN"
- SADHLT CHECKSUM FAILED BUT WORD\*BY\*WORD COMPARE WORKED
- NOODSKS NO DISKS AVAILABLE TO RUN.
- KHLT PROGRAM WILL ONLY RUN IN FIELD 2

FOR THE ABSOLUTE LOCATIONS OF THE HALTS LISTED ABOVE, ACCESS PAGE 1 OF THE PROGRAM LISTING.

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ERROR TYPEOUTS.  
\*\*\*\*\*

WHEN AN ERROR OCCURS THE PROGRAM WILL PRINT AN "ERROR HEADER" WHICH WILL SPECIFY THE PARTICULAR TYPE OF ERROR FOUND AT THE TIME OF THE FAILURE.

POSSIBLE "ERROR HEADERS" ARE AS FOLLOWS.

- SEEK STATUS ERROR
- WRITE STATUS ERROR
- READ STATUS ERROR
- DISK DATA ERROR
- RECALIBRATE STATUS ERROR

AFTER THE "ERROR HEADER" MENTIONED ABOVE IS TYPED, THE PROGRAM WILL PRINT THE FOLLOWING ERROR INFORMATION FOUND AT THE TIME OF THE FAILURE, PERTAINING TO THE FAILURE. POSSIBLE TYPEOUTS ARE AS FOLLOWS.

- PCF PROGRAM LOCATION OF THE ACTUAL FAILURE.
- STI CONTENTS OF THE STATUS REGISTER.
- CHI SOFTWARE COMMAND REGISTER.
- NMI ACTUAL CONTENTS OF THE COMMAND REGISTER READ IN MAINTENANCE MODE.
- IAI INITIAL SOFTWARE DISK ADDRESS REGISTER OR THE CYLINDER, SURFACE, AND SECTOR BITS.
- DAI FINAL SOFTWARE DISK ADDRESS REGISTER OR THE CYLINDER, SURFACE, AND SECTOR BITS.
- SSI ACTUAL CONTENTS OF THE SURFACE AND SECTOR REGISTER READ IN MAINTENANCE MODE.
- CAI SOFTWARE INITIAL CURRENT ADDRESS
- WCI SOFTWARE INITIAL WORD COUNT
- FWI SOFTWARE FINAL WORD COUNT
- ASI SECTOR IN ERROR ON THE PARTICULAR CYLINDER AND SURFACE IN QUESTION.
- WAI WORD ADDRESS WITHIN THE SECTOR IN ERROR
- ADI BREAK ADDRESS OF DATA BREAK IN COMPUTER.
- DG: EXPECTED DATA
- DBI DATA FOUND DURING DATA BREAK.

5.4 ERROR RECOVERY AND ERROR DISCONNECT  
 \*\*\*\*\*

WHEN A READ, WRITE, OR DISK DATA ERROR OCCURS (SEE SECTION 5.3), THE PROGRAM WILL TRY TO REPEAT THE FAILING SEQUENCE THREE (3) TIMES. IF THE ERROR HAS OCCURRED FOUR (4) TIMES SIMULTANEOUSLY, THE ERROR WILL BE CONSIDERED AS A NON-RECOVERABLE ERROR; THE "ERROR HEADER" WILL BE CHANGED TO INDICATE "NON-RECOVERABLE" ERROR; ANOTHER DISK ADDRESS WILL BE SELECTED FOR TESTING; AND THE CURRENT DRIVE WILL BE SENT ON A "SEEK" TO THE ADDRESS SELECTED. IF A SOFT ERROR SHOULD OCCUR ON A TRACK, THE PROGRAM WILL RETRY THE READ SEQUENCE (64) TIMES BEFORE SELECTING ANOTHER TRACK FOR TESTING.

POSSIBLE NON-RECOVERABLE ERROR HEADERS ARE AS FOLLOWS:

- NON-RECOVERABLE READ STATUS ERROR
- NON-RECOVERABLE WRITE STATUS ERROR
- NON-RECOVERABLE DISK DATA ERROR

IF A "SEEK" ERROR SHOULD OCCUR TO THE NEW ADDRESS, THE DISK IN QUESTION WILL THEN BE RECALIBRATED (RESTORED TO CYLINDER 0). IF THE RECALIBRATE SEQUENCE FAILS, THE DISK DRIVE IN ERROR WILL BE DISCONNECTED BY THE PROGRAM AND NO LONGER BE TESTED.

THE FOLLOWING "DISCONNECT" AND "STATUS-COMplete" TYPEOUTS SHOULD OCCUR.

```

RECALIBRATE ERROR DISCONNECT
DISK X DISCONNECTED!
OSK PARO SOFT COMP
X 2239 0212 0021
X 2242 5672 0021
  
```

IF ALL DISKS ON THE SYSTEM HAVE BEEN DISCONNECTED DO TO RECALIBRATE ERRORS THE FOLLOWING TYPEOUT WILL OCCUR AND THE PROGRAM WILL HALT.

```

DISK SYSTEM SHUT DOWN, NO DISKS TO RUN!
  
```

5.5 STATUS-COMplete TYPEOUT AND PASS COMPLETE DISCONNECT  
 \*\*\*\*\*

ALL ERRORS AND PASS COMPLETES ARE TALLIED BY THE PROGRAM PER DISK DRIVE.

THE FOLLOWING IS AN EXAMPLE OF THE "STATUS-COMplete" TYPEOUT THAT WILL OCCUR WHEN SKR3=1 INDICATING TYPE THIS REPORT; A PASS COMPLETE OCCURES ON A DRIVE UNDER TEST, OR A DRIVE IS DISCONNECTED DO TO A RECALIBRATE ERROR.

DSK HARD SOFT COMP  
X XXXX XXXX XXXX  
X XXXX XXXX XXXX  
X XXXX XXXX XXXX  
X XXXX XXXX XXXX

THE TYPEOUT AS MENTIONED ABOVE IS DESCRIBED AS FOLLOWS,

DSK DISK DRIVE IN QUESTION,

HARD ALL ERRORS OTHER THAN THAT DEFINED AS A SOFT ERROR,

SOFT A CRC STATUS ERROR WITH ONE (1) BAD DATA WORD PER READ TRANSFER,

COMP PASS COMPLETES. <3 X 10(9) BITS>

IF SWRS#1 INDICATING "DISCONNECT ON PASS COMPLETION", AND A DISK DRIVE UNDER TEST MAKES A PASS COMPLETION, THE FOLLOWING TYPEOUT WILL OCCUR AND THE DRIVE WILL BE DISCONNECTED.

DISK X PASS COMPLETE!  
DISK X DISCONNECTED!  
DSK HARD SOFT CC-P  
X XXXX XXXX XX\*  
X XXXX XXXX XXXX

IF SWRS#0 INDICATING DON'T "DISCONNECT ON PASS COMPLETION", AND A DISK DRIVE UNDER TEST MAKES A PASS COMPLETION, THE FOLLOWING TYPEOUT WILL OCCUR AND THE DRIVE WILL CONTINUE TO RUN.

DISK X PASS COMPLETE!  
DSK HARD SOFT COMP  
X XXXX XXXX XXXX  
X XXXX XXXX XXXX

IF SWRS#1 AND ALL DRIVES HAVE MADE THEIR PASS COMPLETION AND HAVE BEEN DISCONNECTED, THE FOLLOWING TYPEOUT WILL OCCUR AND THE COMPUTER WILL HALT.

DISK SYSTEM SHUT DOWN, NO DISKS TO RUN!

5.6 TYPICAL ERROR TYPEOUTS  
\*\*\*\*\*

THE FOLLOWING IS AN EXAMPLE OF AN "ERROR HEADER" AND  
ERROR TYPEOUT THAT COULD HAVE OCCURRED ON A WRITE STATUS  
ERROR. (NOTE CRC IN THE STATUS INDICATOR "STI")

WRITE STATUS ERROR  
PC12371 ST14010 CM14000 MM14000 IA10001 DA10002  
SS10002 CA13600 WC17000 FW10000

THE FOLLOWING IS AN EXAMPLE OF AN ERROR TYPEOUT THAT COULD  
HAVE OCCURRED IF THE STATUS REGISTER FAILED ON A SEEK  
ONLY FUNCTION.

SEEK STATUS ERROR  
PC12076 ST14002 CM13000 MM13000 DA14007 SS10007

THE FOLLOWING IS A TYPICAL EXAMPLE OF AN "ERROR HEADER"  
AND ERROR TYPEOUT THAT COULD HAVE OCCURRED ON A DISK  
DATA ERROR. (NOTE! ADDITION DATA ERRORS IN BUFFER)

DISK DATA ERROR  
PC11674 ST14010 CM11432 MM11432 IA11035 DA11001  
SS10001 CA10001 WC15000 FW17400  
AS10015 WA10007 AD10010 DG10037 DB10036  
AS10015 WA10077 AD10100 DG17777 DB17776  
AS10016 WA10002 AD10403 DG16167 DB16166

6. RESTRICTIONS  
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ALL DISK DRIVES SHOULD BE SET TO THE LOAD POSITION  
THAT ARE NOT BEING TESTED.

7. TROUBLE SHOOTING INFORMATION  
\*\*\*\*\*

101  
---  
FUNCTION  
\*\*\*\*\*

6741 DSXP "SKIP" SKIP IF TRANSFER DONE FLAG  
OR ERROR FLAG IS SET.

6742 DCLE "CLEAR" FUNCTION IS REGULATED BY  
AC BITS 10 AND 11. THE AC IS THEN  
CLEARED.

AC10 AC11  
=====

0 0 CLEAR THE AC AND STATUS REGISTER.

2 1 CLEAR THE AC, CONTROL, AND MAJOR REGISTERS. THIS INSTRUCTION WILL STOP THE CONTROL EVEN IF IT IS WRITING A HEADER. THIS IS THE ONLY INSTRUCTION THAT CLEARS MAINTENANCE MODE.

1 0 CLEAR AC, RECALIBRATE DISK DRIVE, AND CLEAR STATUS REGISTER.

6743 DLAS "LOAD DISK ADDRESS AND GO" LOAD THE DISK CYLINDER, SURFACE, AND SECTOR FROM THE AC, CLEAR THE AC, AND DO THE COMMAND IN THE COMMAND REGISTER.

AC  
==  
2\*6 CYLINDER

7 SURFACE (1=UPPER) (0=LOWER)  
8\*11 SECTOR

6744 DLCA "LOAD CURRENT ADDRESS" LOAD THE CURRENT ADDRESS FROM AC, THE AC IS THEN CLEARED.

AC  
==  
2\*11 CURRENT ADDRESS

6745 DRST "READ STATUS" CLEAR THE AC AND READ THE CONTENTS OF THE STATUS REGISTER INTO THE AC.

AC  
\*\*

0 TRANSFER DONE  
1 READY TO SEEK, READ, OR WRITE,  
2 NOT USED  
3 SEEK FAIL  
4 DISK FILE READY  
5 CONTROL BUSY ERROR  
6 TIME OUT ERROR  
7 WRITE LOCK ERROR  
8 CRC ERROR  
9 DATA RATE ERROR  
10 DRIVE STATUS ERROR  
11 CYLINDER ADDRESS ERROR

6746 DLDC

"LOAD COMMAND" LOAD THE COMMAND  
REGISTER FROM AC, CLEAR THE AC,  
AND CLEAR THE STATUS REGISTER.

AC  
\*\*

2\*2=0 READ DATA  
3\*2=1 READ ALL  
2\*2=2 WRITE LOCK  
2\*2=3 SEEK ONLY  
0\*2=4 WRITE DATA  
0\*2=5 WRITE ALL  
2\*2=6 NOT USED  
2\*2=7 NOT USED  
2 ENABLE INTERRUPT  
4 ENABLE SET TRANSFER DONE ON SEEK DONE  
5 HALF BLOCK 128 WORDS  
6 EXTENDED MEMORY ADDRESS  
7 EXTENDED MEMORY ADDRESS  
8 EXTENDED MEMORY ADDRESS  
9 UNIT SELECT  
10 UNIT SELECT  
11 EXTENDED CYLINDER ADDRESS

6747 DMAN

"MAINTENANCE IOT" LOAD THE  
MAINTENANCE REGISTER FROM THE AC, THE  
FUNCTION IS REGULATED BY THE AC BITS.  
MAINTENANCE MODE CAN ONLY BE CLEARED  
BY DCLR "CLEAR CONTROL".

AC  
--

- 0 ENTER MAINTENANCE MODE
- 1 ENABLE SHIFT TO LOWER BUFFER
- 2 AC BIT 10, CRC REGISTER, AND THE LOWER DATA BUFFER ARE CONNECTED AS A SHIFT REGISTER. AC BIT 10 DATA SHIFTS TO THE CRC, THE CRC SHIFTS TO THE LOWER DATA BUFFER.
- 3 SHIFT COMMAND REGISTER TO THE LOWER DATA BUFFER.
- 4 SHIFT THE SURFACE AND SECTOR REGISTER TO THE LOWER DATA BUFFER.
- 5 SHIFT AC 10 DATA TO THE UPPER DATA BUFFER. THE UPPER BUFFER SHOULD SINK IN THE SILO WHEN FULL.
- 6 ONE SINGLE CYCLE BREAK REQUEST, DIRECTION IS REGULATED BY FUNCTION IN THE COMMAND REGISTER.
- 7 CLEAR AC THEN READ THE LOWER DATA BUFFER TO THE AC.
- 8 NOT USED.
- 9 NOT USED.
- 10 USED AS DATA WITH OTHER BITS IN THE MAINTENANCE MODE.
- 11 NOT USED

8. PROGRAM DESCRIPTION (ACCEPT MODE)  
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THE FOLLOWING IS BRIEF DESCRIPTION OF THE STEPS TAKEN BY THE PROGRAM WHEN RUNNING THE ACCEPT MODE.

- A. ALL DISKS SELECTED ARE FIRST RECALIBRATED, THEN SENT ON AN OVERLAP SEEK TO A RANDOM TRACK. THE TRACKS SELECTED ARE SAVED BY THE PROGRAM FOR FUTURE USE.
- B. A RANDOM FIELD IS GENERATED. IF FIELD GENERATED IS A NON-EXISTING FIELD, THE MAXIMUM FIELD AVAILABLE WILL BE USED.
- C. A RANDOM BLOCK LENGTH IS GENERATED (128 OR 256 WORD SECTORS).
- D. A RANDOM AMOUNT OF SEQUENTIAL SECTORS TO TRANSFER IS GENERATED. IF THE FIELD PREVIOUSLY SELECTED WAS AN EXTENDED FIELD OR IF HALF BLOCK TRANSFERS WERE SELECTED (128 WORD SECTORS), THE AMOUNT OF SECTORS WILL BE LIMITED TO 17(8). IF THE FIELD SELECTED WAS FIELD 0 AND IF FULL BLOCK TRANSFERS WERE SELECTED (256 WORD SECTORS), THE AMOUNT OF SECTORS WILL BE LIMITED TO 7(8).

E. A RANDOM STARTING SECTOR WILL BE GENERATED, THE RANDOM AMOUNT OF EXTRA SECTORS PREVIOUSLY GENERATED WILL BE ADDED TO THIS STARTING SECTOR, DETERMINING THE ACTUAL LENGTH OF THE DATA TRANSFER, IF THE STARTING SECTOR WAS 14 AND THE AMOUNT OF EXTRA SECTORS WAS 6, SECTORS 14, 15, 16, 17, 00, 01, AND 02 WILL BE USED FOR TRANSFERING DATA.

F. AN INITIAL SOFTWARE WORD COUNT WILL BE CALCULATED.

G. AN INITIAL RANDOM CURRENT ADDRESS WILL BE GENERATED, IF THE FIELD PREVIOUSLY GENERATED HAS FIELD 0, THE CURRENT ADDRESS WILL BE LIMITED WITHIN THE END OF THE PROGRAM ADDRESS LOCATIONS.

H. THE BUFFER SELECTED WILL BE FILLED WITH RANDOM DATA, CHECKSUMMED, AND THE CHECKSUM SAVED. (NOTE: BUFFER IS DEPENDENT ON FIELD, WORD COUNT, BLOCK LENGTH, AND CURRENT ADDRESS PREVIOUSLY SELECTED.)

I. THE PROGRAM WILL THEN POLE THE DISK DRIVES PREVIOUSLY SENT ON OVERLAP SEEK OPERATIONS.

J. DATA WILL BE WRITTEN ON THE FIRST DISK DRIVE TO COMPLETE THE SEEK OPERATION USING THE RANDOM PARAMETERS GENERATED ABOVE. AS DATA IS WRITTEN, A BACK GROUND PROGRAM WILL CLEAR THE BUFFER AREA ALREADY WRITTEN ON THE DISK.

K. WHEN THE WRITE AND CLEAR IS COMPLETE, DATA WILL BE READ OFF THE CURRENT DRIVE INTO THE BUFFER AREA, AS DATA IS READ, A BACK GROUND PROGRAM WILL CHECKSUM THE BUFFER INFORMATION ALREADY READ OFF THE DISK.

L. WHEN THE READ AND CHECKSUM IS COMPLETE, THE CHECKSUM FOUND WILL BE COMPARED TO THE CHECKSUM SAVED PREVIOUS TO THE WRITE OPERATION. IF CHECKSUMS DO NOT COMPARE OR IF A CRC ERROR HAS OCCURRED, A WORD BY WORD COMPARE WILL BE MADE TO DETERMINE AND TYPE OUT THE BAD DATA FOUND.

M. THE CURRENT DRIVE WILL BE SENT OUT ON AN OVERLAP SEEK OPERATION AND THE TRACK SAVED.

N. STEPS B-H WILL BE REPEATED AND THE DRIVE POLE WILL BE STARTED AT THE CURRENT DRIVE +1.

O. FOR ALL POSSIBLE ERRORS, SEE SECTION 5 IN THIS DOCUMENT.

9. PROGRAM LISTING  
\*\*\*\*\*



```

/
/RKBE DATA RELIABILITY PROGRAM
/
/COPYRIGHT (C) 1972-1973, DIGITAL EQUIP. CORP., MAYNARD, MASS.
/
/ALL KNOWN HALTS
/

```

```

0200 1403 ERHLT2 /SKIP TRAP DCLR
0201 2563 ERHLT3 /SKIP TRAP DLAG
0202 2555 ERHLT4 /SKIP TRAP DLCA
0203 2546 ERHLT5 /SKIP TRAP DRST
0204 2732 ERHLT6 /SKIP TRAP DLDC
0205 1407 ERHLT7 /SKIP TRAP DMAN
0206 3127 INTER1 /NO DISK INTERRUPT
0207 2307 INTER2 /UNDEFINED INTERRUPT
0210 2205 KHLT /PROGRAM WILL ONLY RUN IN FIELD 8
0211 2671 HODSKS /NO DISKS AVAILABLE TO RUN
0212 2206 STPHLT /PROGRAM STOP FROM SWR4#1
0213 2753 CHNHLT /I/O CHANGE HALT
0214 1712 BADHLT /COMPUTER MUST BE DOWN, CHECKSUM FAILED
/

```

```

6741 DSKP=6741 /SKIP ON TRANSFER DONE OR ERROR
6742 DCLR=6742 /CLEAR DISK CONTROL LOGIC
6743 DLAG=6743 /LOAD ADDRESS AND GO
6744 DLCA=6744 /LOAD CURRENT ADDRESS
6745 DRST=6745 /READ STATUS REGISTER
6746 DLDC=6746 /LOAD COMMAND REGISTER
6747 DMAN=6747 /LOAD MAINTENANCE
/

```

```

4421 RANDAT=JMS I XRNWRD
4422 DISCON=JMS I XDUMP
4423 SPACE=JMS I XSPAC
4424 ONEIN=JMS I XOCT1
4425 FORIN=JMS I XOCT4
4426 SETGEN=JMS I XSTGEN
4427 SETFLD=JMS I XSTFLD
4431 YESNO=JMS I XCHKYN
4432 SELCHK=JMS I XCKPOT
4433 SEEK=JMS I XSKOUT
4435 RANDEN=JMS I XRNODM
4435 RESRAN=JMS I XRSRAN
4434 DISKGD=JMS I XDSKGD
4436 RECAL=JMS I XRESTR
4437 RECEIVE=JMS I XWAIT
4441 ERROR=JMS I XERRD
4442 RDSYAT=JMS I XRDST
4446 LDADD=JMS I XLDAD
4443 DSKSKP=JMS I XDSKSP
4444 LDCHD=JMS I XLDCM
4445 LDCUR=JMS I XLDCA
4450 CLRALL=JMS I XCLDR
4447 LDMAN=JMS I XLDWN
4451 PRNTER=JMS I XPRN
/

```

```

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```

```

4452 OCTEL=JMS I XPROCT
4440 TYPE=JMS I XPRINT
4453 CRLP=JMS I XCRLF
4420 GENDAT=JMS I XGNDAT
/

```

```

0000 *0
/

```

```

0000 0000 0
0001 0001 0001
0002 0002 0002
0003 0003 0003
0004 0004 0004
0005 0005 0005
/

```

```

/INTERRUPT SERVICE RETURN
/DCA SAVAC SAVE AC AT INT.
/RAL SHIFT LINK AT TIME OF INT.
/DCA SVLWK SAVE LINK AT TIME OF INT.
/JMP I 2 RETURN TO INT. SERVICE
/RETURN POINTER
/

```

```

0010 *10
/

```

```

0010 0000 AUTO10, 0
/

```

```

0011 0000 AUTO11, 0
/

```

```

0012 0000 AUTO12, 0
/

```

```

0013 0000 K0020, 0020
0014 0040 K0042, 0040
0015 0100 K0100, 0100
0016 0200 K0200, 0200
/

```

```

0020 *20
/

```

```

0020 1744 XGNDAT, GNDAT
0021 2600 XRNWRD, RNWRD
0022 2627 XDUMP, DUMP
0023 1554 XSPAC, SPAC
0024 2400 XOCT1, OCT1
0025 2400 XOCT4, OCT4
0026 1755 XSTGEN, STGEN
0027 2673 XSTFLD, STFLD
0030 2150 XCKPOT, CKPOT
0031 2127 XCHKYN, CKYN
0032 2000 XSKOUT, SKOUT
0033 1717 XRNODM, RNODM
0034 2200 XDSKGD, DSKGD
0035 1763 XRSRAN, RSRAN
0036 3147 XRESTR, RESTR
0037 2117 XWAIT, WAIT
0040 2620 XPRINT, PRINT
0041 1200 XERRD, ERRO
0042 2043 XRDST, RDST
0043 2700 XDSKSP, DSKP
0044 2725 XLDCM, LDCM
0045 2552 XLDCA, LDCA
0046 2556 XLDAD, LDAD
0047 1404 XLDWN, LDWN
0050 1400 XCLDR, CLDR
/

```

```

0051 1516 XPRN, PRN
0052 1474 XPROCT, FROCT
0053 1462 XCRLF, UPONE
0054 2193 XGETAC, GETAC
0055 0000 AMOUNT, 0
0056 0003 K0003, 0003
0057 0004 K0004, 0004
0060 0006 K0006, 0006
0061 0007 K0007, 0007
0062 0010 K0010, 0010
0063 0017 K0017, 0017
0064 0070 K0070, 0070
0065 0260 K0260, 0260
0066 0240 K0240, 0240
0067 0316 K0316, 0316
0070 0331 K0331, 0331
0071 0277 K0277, 0277
0072 0400 K0400, 0400
0073 4000 K4000, 4000
0074 1000 K1000, 1000
0075 1777 K1777, 1777
0076 2000 K2000, 2000
0077 3000 K3000, 3000
0100 6000 K6000, 6000
0101 7700 K7700, 7700
0102 7760 K7760, 7760
0103 7761 K7761, 7761
0104 0077 K0077, 0077
0105 6201 KCDF, CDF
0106 7400 K7400, 7400
/
DECIMAL
/
0107 7764 H12, =12
/
OCTAL
/
0110 7774 H4, =4
0111 7773 H5, =5
/
0112 0000 TRASH1, 0
0113 0000 TRASH2, 0
0114 0000 TRASH3, 0
0115 0000 UPDATE, 0
0116 0000 POLDSK, 0
0117 0000 OPTAL, 0
0120 0000 BUFTAL, 0
0121 0000 PCREG, 0
0122 0000 STREG, 0
0123 0000 CMREG, 0
0124 0000 MHREG, 0
0125 0000 INTDA, 0
0126 0000 DAREG, 0
0127 0000 SSREG, 0
0130 0000 CAREG, 0

```

```

0131 0000 WCREG, 0
0132 0000 FWREG, 0
0133 0000 ASREG, 0
0134 0000 WAREG, 0
0135 0000 ADREG, 0
0136 0000 DCREG, 0
0137 0000 DBREG, 0
0140 0000 INTCH, 0
0141 0000 STATRY, 0
0142 0000 DATTRY, 0
0143 0000 CHKSAY, 0
0144 0000 FNDSUM, 0
0145 0000 MAXFLD, 0
0146 7607 MAXTIM, 7607
0147 3240 MAXTRK, 3240
0150 3600 BGNRUF, STRBUF
0151 0000 CONSEC, 0
/
0152 3563 DATPOT, DAT1
0153 3522 TIMPOT, DBTM1
0154 3527 STAPOT, CSHRD =3
0155 3553 DSKPOT, DSKBA
0156 3557 RUNPOT, DSKBB
/
0157 0000 CRCPLD, 0
0160 0000 DATFLG, 0
0161 0000 SPFLG, 0
0162 0000 SPTRK1, 0
0163 0000 SPTRK2, 0
0164 0000 SPSEC, 0
0165 0000 SPBLK, 0
0166 0000 ERFLG, 0
0167 0000 SEKSH, 0
0170 0000 SAVAC, 0
0171 0000 SVLNK, 0
0172 0000 RELOAD, 0
0173 0000 FIRTIM, 0
0174 0000 CLRBAK, 0
/
0200 =200
/
0270 5203 BGN, JHP 1-3
0271 5777 JHP CHANG
0272 5776 JHP STRSTP
0203 6224 RIF
0274 7400 SEA
0205 7402 KHLT, KLT
0206 1105 TAD KCDF
0277 3210 DCA =5
0210 7402 HLT
0211 1363 TAD ACDCA
0212 3001 DCA 1
0213 1246 TAD KRDT
0214 3002 DCA 2
0215 1364 TAD LNKDCA

```

```

/NO REGULAR TEST
/CHANGE IOT ROUTINE
/RESTART
/FIELD 0????
/WILL ONLY RUN IN FIELD 3????
/MAKE DF=IF
/SETUP AC DCA
/SETUP ROTATE LINK

```

```

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0216 3003 DCA 3 /SETUP SAVE LINK
0217 1363 TAD K5405
0220 3004 DCA 4 /SETUP JMP RETURN
0221 1366 TAD BRKRET
0222 3005 DCA 5 /RETURN POINTER
0223 1101 STRTEX, TAD K7700
0224 3112 DCA TRASH1 /CLEAR COUNTER
0225 1775 TAD RANJMS
0226 3774 DCA SWDAT /SET INSTRUCTION SWITCH
0227 7340 CLA CLL CMA
0230 1153 TAD TAMPOT
0231 3210 DCA AUTO10 /LOCATION POINTER
0232 3410 DCA I AUTO10 /CLEAR
0233 2112 ISZ TRASH1
0234 5232 JMP ,=2 /MORE TO CLEAR
0235 3160 DCA DATFLG
0236 4453 /
0237 4451 CRLF
0240 3310 PRNTER /PRINT "RK06 DATA RELIABILITY"
0241 4451 HES1
0242 3344 PRNTER /PRINT "AMOUNT OF MEMORY"
0243 4424 HES3
0244 0070 ONEIN /RECEIVE ONE OCTAL
0245 5241 JHP 0070 /LIMITS
0246 7004 KROT, RAL ,=4 /INPUT ERROR
0247 7006 RTL
0250 7040 CMA /COMPLETE
0251 3145 DCA MAXFLD /MAXIMUM FIELD POINTER
0252 4451 ALLAGN, PRNTER /PRINT "EXERCISE"
0253 3323 HES2
0254 3112 DCA TRASH1
0255 1110 TAD *4
0256 3113 DCA TRASH2
0257 3055 DCA AMOUNT /A FEW POINTERS
0260 1112 NEXT, TAD TRASH1
0261 1156 TAD RUNPOT
0262 3114 DCA TRASH3 /SAVE RUN POINTER
0263 7340 CLA CLL CMA
0264 4451 PRNTER /PRINT " DISK"
0265 3332 HES3
0266 1065 TAD K0267
0267 1112 TAD TRASH1 /ADD IN DISK NUMBER
0270 4447 TYPE /TYPE DISK NUMBER
0271 1071 TAD K0277
0272 4443 TYPE /TYPE 7
0273 4437 RECEIV /RECEIVE KEY INPUT
0274 4431 YESNO /WAS IT YES OR NO
0275 5252 JMP ALLAGN /NEITHER
0276 5321 JMP ,=3 /WAS A NO
0277 2055 ISZ AMOUNT /AMOUNT OF DISK FOUND
0301 7340 CLA CLL CMA /AC TO 7777 FOR EXISTING DISK
0302 2112 DCA I TRASH3 /SETUP RUN POINTER
0302 2112 ISZ TRASH1

```

```

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0303 2113 ISZ TRASH2
0304 5200 JMP NEXT /ASK ABOUT NEXT DISK
0305 1055 TAD AMOUNT /GET AMOUNT FOUND
0306 7650 GNA CLA /WERE ANY FOUND
0307 5023 JMP STRTEX /OPERATOR ERROR NO DISK INPUT
0310 4451 PRNTER /PRINT "ACCEPT MODE?"
0311 3360 HES6
0312 4437 RECEIV /RECEIVE INPUT
0313 4431 YESNO /YES OR NO????
0314 5010 JMP ,=4 /NEITHER ALL AGAIN
0315 7610 SKP CLA /MANUAL TEST
0316 5773 JMP ASKSUR /ASK "ARE YOU SURE"
0317 4451 MANUAL, PRNTER /PRINT "FIELD?"
0320 3407 HES8
0321 4437 RECEIV /RECEIVE Y OR N
0322 4431 YESNO /CHECK FOR Y OR N
0323 5317 JMP MANUAL /NEITHER Y OR N
0324 5342 JMP ASKNX1 /WAS A N, ASK ABOUT NEXT
0325 4423 SPACE /SPACE OUT ONE
0326 4424 ONEIN /GET 1 OCTAL
0327 0070 0070 /LIMITS
0330 5317 JMP MANUAL /INPUT ERROR ASK AGAIN
0331 7104 CLL RAL
0332 7006 RYL
0333 3161 DCA SPFLD /SAVE INPUT
0334 1161 TAD SPFLD
0335 1145 TAD MAXFLD /COMPARE TO MAXIMUM
0336 7700 SHA CLA /O.K.?
0337 5317 JMP MANUAL /INPUT ERROR
0340 7340 CLA CLL CMA
0341 3772 DCA FLDPLG /SETUP FIELD FLAG
0342 4451 ASKNX1, PRNTER /PRINT "TRACK?"
0343 3413 HES9
0344 4437 RECEIV /RECEIVE Y OR N
0345 4431 YESNO /CHECK FOR Y OR N
0346 5342 JMP ASKNX1 /ERROR, ASK AGAIN
0347 5773 JMP ASKNX2 /N, ASK ABOUT NEXT
0350 4423 SPACE
0351 4424 ONEIN /RECEIVE 1 IN OCTAL
0352 0010 0010 /LIMITS
0353 9342 JMP ASKNX1 /ERROR, ASK AGAIN
0354 3162 DCA SPTRK1 /SAVE EXTENDED TRACK BIT
0355 4425 FORIN /RECEIVE FOUR IN OCTAL
0356 9342 JMP ASKNX1 /ERROR, ASK AGAIN
0357 3163 DCA SPTRK2 /SAVE CYL, SURFACE, AND SECTOR
0360 7340 CLA CLL CMA
0361 3773 DCA TRKPLG /SETUP TRACK FLAG
0362 5773 JMP ASKNX2 /ASK ABOUT NEXT
0363 5405 /
0364 3171 K5405, 5475 LNKDCA, DCA SVLNK
0365 3170 ACDC, DCA SAVAC

```

```

2366 2320 BRKRET, RETURN
/
0370 3547
0371 2400
0372 3546
0373 0920
0374 2601
0375 0554
0376 2003
0377 2733
0400 0400
PAGE
/
0420 4451 ASKNX2, PRNTER /PRINT "BLOCK LENGTH?"
0421 3427 MES11 /RECEIVE INPUT
0422 4437 RECEIV /CHECK FOR Y OR N
0423 4431 YESNO /ERROR, ASK AGAIN
0424 5200 JMP ASKNX2 /N, ASK ABOUT NEXT
0425 5217 JMP ASKNX3 /Y, SPACE OUT 1
0426 4423 SPACE /RECEIVE 1 IN OCTAL
0427 4424 ONEIN /LIMITS
0428 0010 0010 /ERROR, ASK AGAIN
0429 5200 JMP ASKNX2 /SET HALF BLOCK?
0430 7640 SZA CLA /YES
0431 7340 CLA CLL CMA /SETUP BLOCK NUMBER
0432 3185 DCA SPBLK /YES
0433 7340 CLA CLL CMA /SETUP BLOCK FLAG
0434 3777 DCA HLPFLG
/
0417 4451 ASKNX3, PRNTER /PRINT "EXTRA SECTORS?"
0420 3417 MES10 /RECEIVE INPUT
0421 4437 RECEIV /CHECK FOR Y OR N
0422 4431 YESNO /INPUT ERROR
0423 5217 JMP ASKNX3 /N, ASK ABOUT NEXT
0424 5256 JMP ASKNX4 /SPACE OUT 1
0425 4423 SPACE /RECEIVE 1 IN OCTAL
0426 4424 ONEIN /LIMITS
0427 0010 0010 /ERROR, ASK AGAIN
0428 5217 JMP ASKNX3
0429 7104 CLL RAL
0430 7006 RTL
0431 3164 DCA SPSEC /SAVE 1Y
0432 4424 ONEIN /RECEIVE 1 IN OCTAL
0433 0070 0070 /LIMITS
0434 5217 JMP ASKNX3 /INPUT ERROR, ASK AGAIN
0435 1164 TAD SPSEC /ADD IN LAST
0436 3164 DCA SPSEC /SAVE ALL
0437 1164 TAD SPBLK
0438 7640 SZA CLA /BLOCK LENGTH 0????
0439 5246 JMP 1,3 /NO LIMIT IS 17.
0440 1164 TAD SPFLD
0441 7640 SZA CLA /FIELD 0????
0442 1062 TAD K0010 /LIMIT IS 17.
0443 1061 TAD K0007
0444 7140 CLL CMA
0445 1164 TAD SPSEC /COMPARE SECTOR INPUT

```

```

0452 7630 SZA CLA /IN LIMITS???
0453 5217 JMP ASKNX3 /NO, INPUT ERROR
0454 7340 CLA CLL CMA /SETUP SECTOR FLAG
0455 3776 DCA SECFLG
/
0456 2775 ASKNX4, TAD TRKFLG /SET TRACK FLAG
0457 7647 SZA CLA /NO, IT IS Y
0458 5271 JMP ASKNX5 /NO, INPUT ERROR SEQUENCE
0459 4451 PRNTER /PRINT "SEQUENCE"
0460 3436 MES12
0461 4437 RECEIV /RECEIVE INPUT
0462 4431 YESNO /Y OR N
0463 5256 JMP ASKNX4 /ERROR, ASK AGAIN
0464 5271 JMP ASKNX5 /N, ASK ABOUT NEXT
0465 7340 CLA CLL CMA
0466 3774 DCA SECFLG /SETUP SEQUENCE FLAG
/
0471 4451 ASKNX5, PRNTER /PRINT "DATA?"
0472 3443 MES13
0473 1354 TAD RANJMS
0474 3773 DCA SWDAT /SET INSTRUCTION SWITCH
0475 4437 RECEIV /RECEIVE INPUT
0476 4431 YESNO /Y OR N
0477 5271 JMP ASKNX5 /ERROR, ASK AGAIN
0478 5320 JMP ASKSUR /ASK "ARE YOU SURE"
0479 1340 TAD KSKIP
0480 3773 DCA SWDAT /SET INSTRUCTION SWITCH
0481 1107 TAD W02
0482 0112 DCA TRASH1 /SETUP WORD COUNTER
0483 7340 CLA CLL CMA
0484 1152 TAD DATPOT /GET POT POINTER
0485 3310 DCA AUTO10
0486 4453 ORLT
0487 4425 FORIN
0488 5271 JMP ASKNX5 /RECEIVE 4 IN OCTAL
0489 3410 DCA I AUTO10 /INPUT ERROR, ASK AGAIN
0490 2112 ISZ TRASH1 /SAVE DATA
0491 5310 JMP 1,5 /UPDATE COUNTER
0492 7340 CLA CLL CMA /GET NEXT
0493 3164 DCA DATFLG /SETUP DATA FLAG
0494 4451 ASKSUR, PRNTER /PRINT "ARE YOU SURE?"
0495 3446 MES14
0496 4437 RECEIV /RECEIVE INPUT
0497 4431 YESNO /Y OR N
0498 5320 JMP ASKSUR /INPUT ERROR
0499 5772 JMP STRTEX /ASK AGAIN
/
/SEND EXISTING DRIVES TO A RANDOM TRACK
/AND SAVE THE TRACK ADDRESS
/
0526 3112 STRSEK, DCA TRASH1
0527 1755 TAD AMOUNT
0528 7241 DCA
0529 3113 DCA TRASH2 /SOME POINTERS

```

```

0572 1112  NXTSEK, TAD TRASH1
0573 4427  JELCHK
0574 5352  JMP NYSEK
RESET, TAD TRASH1
0536 7104  CLL RAL
0537 4436  RECAL
0540 7610  KSKP, SKP CLA
0541 5347  JMP NYSEK *3
0542 1112  TAD TRASH1
0543 7104  CLL RAL
0544 4432  SEEK
0545 7610  SKP CLA
0546 5335  JMP RESET
0547 2113  ISZ TRASH2
0550 7610  SKP CLA
0551 5771/  JMP RUN
0552 2112  NYSEK, ISZ TRASH1
0553 5332  JMP NXTSEK
/
0554 4420  RANJHS, GENDAT
/
0571 0600
0572 0223
0573 2601
0574 3852
0575 3847
0576 3852
0577 3551
0600

```

PAGE  
/ RUNNER FOR RANDOM DATA

```

0600 3166  RUN, DCA ERFLG
0601 7604  LAS
0602 0014  AND K0040
0603 3167  DCA SEKSW
0604 1167  YAD SEKSW
0605 7640  SZA CLA
0606 5777/  JMP POLNEX
0607 1776/  YAD FLDPLG
0610 7650  SNA CLA
0611 5214  JMP *3
0612 1161  TAD SPFLD
0613 5233  JMP RNFLD
0614 7301  CLA CLL IAC
0615 1145  TAD MAXFLD
0616 7652  SNA CLA
0617 5233  JMP RNFLD
0620 4433  RANGEN
0621 7064  AND K0072
0622 7452  SNA
0623 5233  JMP RNFLD
0624 3140  DCA INTCH
0625 1140  YAD INTCH
0626 1145  TAD MAXFLO
/
/ CLEAR ERROR POINTER
/ MASK SWITCH & LATCH
/ SEEK ONLY SET????
/ YES, SEEK ONLY
/ GET FIELD FLAG
/ WAS IT SET?
/ NO, USE RANDOM FIELD
/ YES, GET OPERATOR FIELD
/ GO
/ GET MAXIMUM FIELD POINTER
/ ANY FIELDS THERE
/ NO EXTENDED FIELDS TO USE
/ YES, GET A RANDOM FIELD
/ MASK
/ COULD BE 0
/ WAS DON'T HAVE TO CHECK LIMITS
/ SAVE FIELD FOUND
/ ADD IN MAXIMUM FIELD POINTER

```

```

0627 7710  SPA CLA
0628 5234  JMP RNFLD *1
0631 1145  YAD MAXFLD
0632 7040  CHA
RNFLD, DCA INTCH
0633 3140  TAD HLFPLG
0634 1775/  SNA CLA
0635 7652  RANGEN
0636 4433  TAD
0637 1165  TAD SPBLK
0640 0010  AND K0100
0641 1140  TAD INTCH
0642 3140  DCA INTCH
0643 1140  YAD INTCH
0644 0015  AND K0100
0645 7640  SZA CLA
0646 1016  TAD K0200
0647 1176  TAD K7402
0648 3113  DCA TRASH2
0651 1113  TAD TRASH2
0652 7041  CIA
0653 3115  DCA UPDATE
0654 1140  TAD INTCH
0655 0360  AND A0170
0656 7640  SZA CLA
0657 1002  TAD K0310
0660 1001  TAD K0027
0661 3112  DCA TRASH1
0662 1774/  YAD SECPLG
0663 7652  SNA CLA
0664 4433  RANGEN
0665 1164  TAD
0666 0112  AND SPSEC
0667 3151  DCA TRASH1
0670 1151  TAD CONSEC
0671 7040  CHA
0672 3112  DCA TRASH1
0673 1773/  TAD TRKFLG
0674 7652  SNA CLA
0675 4433  RANGEN
0676 1163  TAD SPTRK2
0677 0003  AND K0017
0701 1113  DCA TRASH3
0702 2112  TAD TRASH2
0703 5301  ISZ TRASH1
0704 3131  JMP *2
0705 4433  DCA WOREG
0706 3130  RANGEN
0707 1140  DCA CAREG
0710 0064  AND K0070
0711 7640  SZA CLA
0712 5330  JMP FILLER
0713 1150  YAD BGNBUF
0714 7140  CHA CLL
0715 1130  YAD CAREG
/
/ IN LIMITS????
/ YES, USE IT
/ NO, USE MAXIMUM IN THE MACHINE
/ GET BLOCK FLAG
/ WAS IT SET????
/ NO, USE RANDOM
/ MASK
/ INITIAL HALF BLOCK BIT ****
/ MASK
/ HALF BLOCK SET????
/ YES, SETUP WC POINTER
/ WC BUILDER
/ UPDATER FOR FWREG
/ MASK FIELD BITS
/ WERE THERE ANY
/ YES
/ MAKE MAXIMUM SECTOR POINTER
/ SAVE IT
/ GET SECTOR FLAG
/ WAS IT SET????
/ USE RANDOM
/ GET OPERATOR INPUT
/ MASK OUT
/ SAVE
/ CONSECUTIVE TO DO
/ GET TRACK FLAG
/ WAS IT SET????
/ USE RANDOM
/ GET INPUT
/ MASK
/ STARTING SECTOR
/ COMPUTE INITIAL WC
/ UPDATE BY BUILDER
/ INITIAL WORD COUNT ****
/ GENERATE RANDOM CA
/ SAVE IT
/ MASK FIELD BITS
/ EXTENDED FIELD????
/ INITIAL CA O.K.****

```

5

```

0724 7400   SZL CLA
0725 7400   JMP
0726 7400   CONCUR, TAD FILLER
0727 7400   DCA CAREG
/
/ROUTINE TO FILL AND CHECK SUM BUFFER
/
0730 4426   FILLER, SETGEN
0731 1118   TAD M4
0732 3141   DCA STAYRY
0733 4427   REFILL, SETFLD
0734 3338   DCA I+1
0735 7402   HLT
0736 3143   DCA CHKSAV
0737 4421   NEWRD, RANDAY
0738 3112   DCA TRASH1
0739 1112   TAD TRASH1
0740 3411   DCA I AUTO11
0741 7108   CLL
0742 1112   TAD TRASH1
0743 1143   TAD CHKSAV
0744 7438   SZL
0745 7001   IAC
0746 3143   DCA CHKSAV
0747 2128   ISZ BUFTAL
0748 5337   JMP NEWRD
0749 6201   CDF
0750 1166   TAD ERFLG
0751 7650   SNA CLA
0752 5777   JMP POLNEX
0753 5772   JMP REWRY
/
0760 0170   A0170, 0170
/
PAGE
/ROUTINE TO POLE DRIVES
/
1070 2116   POLNEX, ISZ POLDSK
1071 7200   NOP
1072 1116   SAHPOL, TAD POLDSK
1073 4432   SELCHK
1074 5200   JMP POLNEX
/GET POINTER
/MASK
/SETUP AND SAVE GENERATOR
/SETUP TRY COUNTER
/FIELD = BUFTAL + AUTO 11 + 12
/FIELD TO BUFFER IN AC
/COF TO PUFFER
/START WITH 0
/INITIAL DATA
/SAVE OUTPUT WORD
/GET BACK WORD
/STORE IN BUFFER
/GET BACK WORD
/ADD IN LAST
/LINK SENT
/ADD IT
/SAVE FOR NEXT
/UPDATE BUFFER TALLY
/MORE WORDS TO GO
/ERROR FLAG SET????
/POLE DRIVES
/YES, MUST BE A WRITE ERROR
/UPDATE POLE POINTER
/GET POINTER
/CHECK RUN POINTER
/TRY NEXT DRIVE

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1075 1116   TAD POLDSK
1076 7200   AND K0003
1077 7104   CLL RAL
1078 4444   BCOND
1079 4442   BOSTAT
1080 1100   TAD K0200
1081 7450   SNA
1082 5200   JMP POLNEX
1083 1076   TAD K2000
1084 7650   SNA CLA
1085 5236   JMP GOTIT
1086 3157   DCA CRCFLG
1087 4441   ERRDR
1088 0303   0003
1089 7340   7540
1090 1116   BDREC, TAD POLDSK
1091 7104   CLL RAL
1092 4436   RECAL
1093 7510   SKP CLA
1094 5200   JMP POLNEX
1095 1116   TAD POLDSK
1096 7104   CLL RAL
1097 4432   SEEK
1098 5277   JMP POLNEX
1099 5274   JMP BDREC
/
1100 1116   GOTIT, TAD POLDSK
1101 0250   AND K0003
1102 1155   TAD DSKPOT
1103 3112   DCA TRASH1
1104 1512   TAD I TRASH1
1105 0061   AND K0007
1106 1148   TAD INTCH
1107 3140   DCA INTCH
1108 1167   TAD SEKSW
1109 7640   SZA CLA
1110 5350   JMP RESEEK
1111 1512   TAD I TRASH1
1112 1102   AND K7767
1113 1114   TAD TRASH3
1114 3125   DCA INTDA
1115 3157   DCA CRCFLG
1116 4434   DISK00
1117 4400   4400
1118 0272   JMP GOREAD
1119 7340   CLA CLL CHA
1120 0166   DCA ERFLG
1121 4435   REGRAN
1122 2141   ISZ STAYRY
1123 5777   JMP REFILL
1124 7654   LAS
1125 7720   TRYIN, SNA CLA
1126 0350   JMP RESEEK
1127 5776   JMP REFILL
1128 7604   GOREAD, LAS
/GET SWITCH 0
/READ STATUS REGISTER
/AS DRIVE BUSY
/YES, TRY NEXT DRIVE
/NO, THEN IT MUST BE DONE
/AS IT DONE?
/YES, DONE
/CLEAR CRC ERROR POINTER
/ERROR ON DRIVE POLE
/HEADER POINTER
/MESSAGE POINTER
/LAST DRIVE USED
/RECALIBRATE DISK
/RECALIBRATE O.K.
/DUMPED, BUT MORE AVAILABLE
/GET DISK NO.
/SEEK A RANDOM TRACK
/ENTER POLY RISKS
/ENTER, RECALIBRATE
/GET POINTER
/MASK
/GET DISK ADDRESS POINTER
/GET DISK ADDRESS
/MASK DRIVE * EXTENDED BIT
/ADD IN COMMAND
/DRIVE NUMBER * EXTENDED BIT ***
/GET SEEK SWITCH LATCH
/LOOP ON SEEK ONLYS????
/YES!!!!
/GET DISK ADDRESS
/MASK OFF TRACK
/ADD IN STARTING SECTOR
/INITIAL DISK ADDRESS ****
/CLEAR CRC FLAG
/GO WRITE
/WRITE DATA POINTER
/WRITE O.K.
/SET WRITE ERROR FLAG
/RESET GENERATOR
/UPDATE WRITE RE*TRY
/TRY AGAIN
/GET SWITCH 0
/LOOP ON WRITE????
/NO, TRY TO SEEK IT
/TRY WRITE AGAIN

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1073 7007          SNA CLA          /LOOP SWITCH SET????
1074 7011          JMP REREAD          /NO
1075 7040          CLA CLL CMA          /SET ERROR FLAG
1076 3166          DCA ERFLG          /RESET DATA GENERATOR
1077 4435          RESRAN
1100 5776          JMP REFILL *2
1101 1267          REREAD, TAD TRYTIM
1102 3366          DCA TRYCNT          /SETUP FOR 64 RETRY FROM RETRY
1103 3166          DCA ERFLG          /CLEAR ERROR FLAG
1104 1110          TAD M4
1105 3141          DCA STATRY          /SETUP TRY COUNTER
1106 1110          TAD M4
1107 3142          DCA DATTRY          /SETUP TRY COUNTER
1108 3157          RDTRY, DCA CRCFLG          /CLEAR CRC FLAG
1111 4634          DISKGD          /READ DATA
1112 0400          0400          /READ DATA POINTER
1113 7610          SKP CLA          /DATA READ O.K.
1114 5322          JMP RDSTA          /STATUS ERROR
1115 4775          JMS DTCHK          /CHECK DATA
1116 5336          JMP SEKGO          /DATA O.K.
1117 2142          ISZ DATTRY          /UPDATE READ RE*TRY
1118 5312          JMP RDTRY          /TRY AGAIN
1119 5335          JMP SEKGO *1          /TRY TO SEEK IT
1120 1102          RDSTA, TAD STREG          /GET STATUS READ
1121 0002          AND K0010          /MASK CRC
1122 7450          SNA          /CRC ERROR????
1123 5332          JMP UPTRY *1          /NO, TRY READ AGAIN
1124 3157          DCA CRCFLG          /CLEAR CRC FLAG
1125 4775          JMS DTCHK          /CHECK DATA
1126 7617          SKP CLA          /IS A HARD ERROR?
1127 7047          CLA CLL CMA          /SETUP FOR 64 RETRYS
1128 3166          DCA ERFLG          /UPDATE TRY POINTER
1129 2141          UPTRY, ISZ STATRY          /TRY AGAIN
1130 5313          JMP RDTRY          /IS A HARD ERROR
1131 3166          DCA ERFLG          /CHECK TIME POINTERS
1132 4774          SEKGO, JMS CKTIM
1133 1166          TAD ERFLG
1134 7650          SNA CLA          /IS IT 64 RETRYS FOR SOFT ERROR?
1135 5344          JMP *+3          /NO DON'T BOTHER
1136 2366          ISZ TRYCNT          /YES, UPDATE RETRY COUNTER
1137 5304          JMP REREAD *3          /TRY AGAIN
1138 7604          LAS          /GET SWITCH 1
1139 7004          CLL RAL
1140 7710          SPA CLA          /LOOP????
1141 5301          JMP REREAD          /YES, LOOP
1142 3166          RESECK, DCA ERFLG          /CLEAR ERROR FLAG
1143 7604          LAS
1144 2072          AND K0400          /MASK
1145 7650          SNA CLA          /TYPE STATUS REPORT????
1146 5337          JMP *+3          /NO
1147 4453          DRLF
1148 4773          JMS TPSTA          /YES
1149 1123          TAD CMREG          /GET DRIVE NUMBER
1150 4432          SEEK          /SEEK A RANDOM TRACK
1151 5772          JMP RUN          /DO NEXT DRIVE

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1162 1123          TAD CMREG
1163 4436          RECAL          /RECALIBRATE DRIVE
1164 5357          JMP *+5          /TRY, SEEK AGAIN
1165 5772          JMP RUN          /DUMPED, BUT MORE AVAILABLE
1166 0000          TRYCNT, 0
1172 0000
1173 3000
1174 2450
1175 1600
1176 0731
1177 0733
1200          PAGE
          /SUBROUTINE FOR ERROR TYPEOUTS,
ERR0, 0
1200 0000          IAC          /UPDATE AC FLAG
1201 7001          DCA          /SAVE AC FLAG
1202 3364          DCA PCNTR2
1203 1356          TAD K7775
1204 3365          DCA PCNTR3          /LINE COUNTER
1205 1123          TAD CMREG          /GET LAST COMMAND
1206 2000          AND K0006          /MASK DRIVE NUMBER
1207 7170          CLL CML CMA RAR
1208 3363          DCA PCNTR1          /SETUP COUNTER
1209 1056          TAD K0003
1210 2363          ISZ PCNTR1
1211 5011          JMP *+2          /COMPUTE WAY TO BUFFER
1212 1156          TAD STAPD
1213 3363          DCA PCNTR1          /POINTER TO BUFFER
1214 1157          TAD CRCFLG          /GET CRC FLAG
1215 7650          SNA CLA          /CRC ERROR????
1216 5032          JMP NONCRC          /NO WAY
1217 3157          DCA CRCFLG          /CLEAR CRC ERROR POINTER
1218 7001          IAC
1219 1141          TAD STATRY
1220 7450          SNA CLA          /LAST TIME CRC????
1221 5036          JMP NONCRC          /YES!!!!
1222 7340          CLA CLL CMA
1223 1763          TAD I PCNTR1          /REDUCE HARD ERROR COUNT
1224 3763          DCA I PCNTR1
1225 2363          ISZ PCNTR1          /YES, UPDATE POINTER
1226 7342          NONCRC, CLA CLL CMA
1227 2763          ISZ I PCNTR1          /UPDATE ERROR COUNT
1228 7610          SKP CLA
1229 3763          DCA I PCNTR1          /HOLD AT 7777
1230 7604          NONCRC, LAS
1231 7106          CLL RTL
1232 7710          SPA CLA          /INHIBIT ERRORS????
1233 5342          JMP ERRGX          /YES
1234 5342          TAD I ERR0          /GET TEXT POINTER
1235 7340          SZA CLA          /DATA ERROR?
1236 5247          JMP *+3          /NO WAY
1237 4760          JMS I PRNDAT          /PRINT ONLY DATA

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PAL11  V142  16-JUL-73  17147  PAGE 1414
1246 5342 JMP ERROEX /EXIT
1247 4777 JMS RCHSS /READ COMMAND AND SURFACE
1250 4453 CRLF
1251 4453 CRLF
1252 1364 YAD PCNTR2
1253 7648 SZA CLA /GET NON-RECOV. FLAG
1254 5260 JMS I,+4 /WAS IT SET
1255 7540 CLA CLL CMA /NO DON'T TYPE IT
1256 4451 PRNTR /PRINT "NON-RECOVERABLE "
1257 3333 MES4
1260 1600 TAD I ERRO
1261 3776 DCA SDKP
1262 1776 TAD SDKP
1263 1364 YAD HEDTAD /MAKE ERROR HEADER YAD
1264 1264 LCA,+1
1265 7642 HLT /MODIFIED HEADER TAD
1266 3271 DCA,+3
1267 7340 CLA CLL CMA
1268 4451 PRNTR /PRINT HEADER
1271 7402 HLT
1272 7340 CLA CLL CMA
1273 4451 PRNTR /PRINT "ERROR"
1274 1776 MES4
1275 4453 CRLF
1276 1200 TAD ERRO
1277 3121 DCA PCREG /SAVE PC
1280 2200 ISZ ERRO
1321 1600 TAD I ERRO
1322 3355 DCA ESAVE
1323 2200 ISZ ERRO /UPDATE %I RETURN
1324 1361 TAD YTEXT
1325 3364 DCA PCNTR2
1326 1362 YAD XREG
1327 3010 DCA AUTO10
1310 1357 TAD K7764
1311 3363 DCA PCNTR1
1312 1355 STRAUT, TAD ESAVE /COUNTER FOR # OF HEADS
1313 7500 SMA /GET TEXT POINTER
1314 5347 JMP NOTEX /NOT THIS ONE
1315 7124 CLL RAL
1316 3355 DCA ESAVE
1317 2365 ISZ PCNTR3 /UPDATE LINE FILL COUNTER
1320 7617 SKP CLA /NO CRLF
1321 4453 CRLF
1322 1364 TAD PCNTR2 /GET TEXT MESSAGE POINTER
1323 1364 ISZ PCNTR2
1324 1364 ISZ PCNTR2
1325 3332 DCA,+3
1326 7340 CLA CLL CMA /STORE FOR PRNTR
1327 4451 PRNTR /PRINT XXI
1330 7402 HLT /MODIFIED TEXT POINTER
1331 1410 TAD I AUTO10
1332 4492 DCTEL /PRINT FOUR OCTAL
1333 2363 AGAIN, ISZ PCNTR1
1334 5312 JMP STRAUT /CHECK FOR NEXT XXI

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PAL12  V142  16-JUL-73  17142  PAGE 1415
1335 1776 TAD SDKP
1336 1111 TAD M5
1337 7550 SNA CLA /FIRST DATA ERROR
1340 4760 JMS I PRNDAT /YES, PRINT DATA
1341 5344 JMS I,+3
1342 2200 ERROEX, ISZ ERRO
1343 2200 ISZ ERRO /UPDATE FOR RETURN
1344 7301 CLA CLL IAC /ENABLE CLEAR CONTROL
1345 4450 CLRALL /CLEAR CONTROL
1346 5600 JMP I ERRO /EXIT
1347 7104 NOTEX, CLL RAL
1350 3355 DCA ESAVE
1351 2364 ISZ PCNTR2
1352 2364 ISZ PCNTR2
1353 2010 ISZ AUTO10
1354 5333 JMP AGAIN
/
1355 7077 ESAVE, 0
1356 7771 K7771, 7771
1357 7764 K7764, 7764
1360 3133 PRNDAT, TYPDAT
1361 3204 XTEXT, TEXPC
1362 2120 XREG, PCREG =1
1363 8000 PCNTR1, 0
1364 8000 PCNTR2, 0
1365 8000 PCNTR3, 0
1366 1366 HEDTAD, TAD HEDTAD
1377 1042 IRTX1
1378 1050 IRTX2
1371 3257 IRTX3
1372 3265 IRTX4
1373 3277 IRTX5
/
1376 2720 PAGE
1377 1410 /SUBROUTINE TO ISSUE "CLR" CLEAR IOT
1400 8000 /
1401 6742 CLDR, 0
1402 5600 IOT2, DCLR /DCLR "CLEAR IOT"
1403 7402 JMP I CLDR /EXIT
ERHLT2, HLT /SKIP TRAP
/
1404 2000 /ROUTINE TO LOAD MAINTENANCE REGISTER
1405 6747 LDNM, 0
1406 5604 IOT7, DMAN /MAINTENANCE IOT
1407 7402 JMP I LDNM /EXIT
ERHLT7, HLT /SKIP TRAP
/
/ROUTINE TO CLEAR THE BUFFERS OUT, THEN
/READ THE COMMAND REGISTER AND THE SURFACE
/AND SECTOR REGISTER.
/

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1410 0000 RCHSS, B
1411 1110 TAD M4
1412 3274 DCA FROCT
1413 4440 /SETUP FOUR READ COUNTER
1414 7070 CLA CLL CML RAR /LOAD CURRENT ADDRESS
1415 1110 LDMAN /ENABLE SET MAINTENANCE
1416 7032 CLA CLL CML RTR /LOAD MAINTENANCE
1417 4447 LDMAN
1420 7032 CLA CLL CML RTR /BREAK IF LAST BREAK WAS READ
1421 4447 LDMAN
1422 7300 CLA CLL /LOAD MAINTENANCE
1423 1013 TAD K0020
1424 4447 LDMAN /ENABLE READ BUFFER
1425 2274 ISE FROCT /READ AND CLEAR BUFFER
1426 5207 JMP /,*6 /UPDATE COUNTER
1427 7070 CLA CLL
1430 1107 TAD M12
1431 3274 DCA FROCT
1432 7032 CLA CLL CML RTR /SETUP BIT COUNTER
1433 4447 LDMAN /ENABLE SET DB4#1
1434 7012 RTR /LOAD MAINTENANCE
1435 4447 LDMAN /ENABLE SHIFT COMMAND
1436 2274 ISE FROCT /LOAD MAINTENANCE
1437 5205 JMP /,*2 /UPDATE BIT COUNTER
1440 7032 CLA CLL /MORE BITS TO SHIFT
1441 1013 TAD K0020
1442 4447 LDMAN /ENABLE READ LOWER BUFFER
1443 3124 TCA MHREG /LOAD MAINTENANCE
1444 1107 TAD M12 /SAVE COMMAND READ
1445 3274 DCA FROCT
1446 7032 CLA CLL CML RTR /SETUP COUNTER
1447 4447 LDMAN /ENABLE SET DB4#1
1448 7032 CLA CLL /LOAD MAINTENANCE
1451 1016 TAD K0200
1452 4447 LDMAN /ENABLE SHIFT SURFACE AND SECTOR
1453 2274 ISE FROCT /LOAD MAINTENANCE
1454 5252 JMP /,*2 /UPDATE BIT COUNTER
1455 7030 CLA CLL /MORE BITS TO GO
1456 1013 TAD K0020
1457 4447 LDMAN /ENABLE READ LOWER BUFFER
1458 3127 DCA SSREG /LOAD MAINTENANCE
1461 5610 JMP I RCHSS /SAVE SURFACE AND SECTOR
/EXIT
/ROUTINE TO DO CRLF
/
UPONE, 2
1462 0000 CLA CLL
1463 7300 TAD K0215
1464 1272 TYPE
1465 4440 TYPE K0212
1466 1273 TAD K0212
1467 4440 TYPE
1470 4440 TYPE
1471 5662 JMP I UPONE
/
1472 0215 K0215, 0215

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1473 0212 K0212, 0212
/ROUTINE TO PRINT FOUR OCTAL
/
FROCT, 5
1474 0000 RTL
1475 7006 RTL
1476 7006 DCA UPONE
1477 7006 TAD M4
1480 3262 DCA PRN
1481 3310 TAD UPONE
1482 1262 AND K0007
1483 0061 TAD K0200
1484 1045 TYPE
1485 4440 TYPE UPONE
1486 1262 TAD UPONE
1487 7006 RTL
1490 7004 RAL
1491 3262 DCA UPONE
1492 2316 ISE PRN
1493 5302 JMP /,*11
1494 4423 SPACE
1495 5674 JMP I FROCT
/
/SUBROUTINE TO PRINT TEXT
/
PRN, 8
1516 0000 SNA CLA /TYPE CRLF
1517 7050 CRLF /YES!!!!
1521 1716 TAD I PRN /GET POINTER
/
1522 2016 ISE PRN
1523 3274 DCA FROCT
1524 7300 MRPRN, CLA CLL
1525 1674 TAD I FROCT
1526 0101 AND K7700
1527 7450 SNA
1530 5052 JMP EXIT
1531 7002 SMA
1532 7002 CML
1533 7004 IAC
1534 7012 RTR
1535 7012 RTR
1536 7012 RTR
1537 4440 TYPE
1540 1674 TAD I FROCT
1541 0104 AND K0077
1542 7450 SNA
1543 5052 JMP EXIT
1544 1361 TAD K3740
1545 7502 SMA
1546 1360 TAD K4100
1547 4423 SPACE /SPACE OUT I
1550 2274 ISE FROCT
1551 5024 JMP MRPRN /MORE TO PRINT
1552 7300 EXIT, CLA CLL

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1553 5716          JMP I PRN
/
/ROUTINE TO SPACE OUT 1
/
1554 0000 SPAC, 0
1555 1066 TAD K0240
1556 4440 TYPE
1557 5754 JMP I SPAC
/
1560 4100 K4100, 4100
1561 3740 K3740, 3740
/
1600 PAGE
/
/ROUTINE TO CHECK DATA READ
/
1600 0000 DTCHK, 0
1601 1157 TAD CRCFLG
1602 7642 SEA CLA
1603 9212 JMP WRDCHK
1604 1144 TAD FNDSUM
1605 7041 CIA
1606 1143 TAD CHKSAV
1607 7650 SNA CLA
1608 5000 JMP I DTCHK
1609 7340 CLA CLL CMA
1610 3441 WRDCHK, DCA I XERR0
1611 1123 TAD CHREG
1612 0015 AND K0100
1613 7640 SEA CLA
1614 1016 TAD K0200
1615 1100 TAD K7400
1616 3113 DCA TRASH2
1617 1113 TAD TRASH2
1618 7040 CMA
1619 3316 DCA HSKER
1620 7340 CLA CLL CMA
1621 3144 DCA FNDSUM
1622 4435 RESRAN
1623 1132 TAD FWREG
1624 4427 SETFLD
1625 3246 DCA GOCDF
1626 1113 TAD TRASH2
1627 3363 DCA HSRAN
1628 1129 TAD INTDA
1629 3359 DCA STGEN
1630 1363 DTRI, TAD HSRAN
1631 0316 AND HSKER
1632 3134 DCA WAREG
1633 1355 TAD STGEN
1634 0063 AND K0017
1635 3133 DCA ASREG
1636 4421 RANDAY
1637 3136 DCA DGREG
1638 7422 GOCDF, HLT/CDF
/GET CRC ERROR FLAG
/CRC ERROR SET????
/YES, THEN WORD BY WORD CHECK
/GET CHECK SUM FOUND
/COMPARE TO GOOD VALUE SAVED
/WERE THEY THE SAME
/YES, DATA D,K.
/SETUP CHECKSUM ERROR FLAG
/HALF BLOCK SET??
/YES!
/SET FIRST TIME FLAG
/NO, SETUP RANDOM GENERATOR
/GET FINAL WC
/GET AUTO11 + BUFTAL + FIELD
/SAVE FIELD CDF
/GENERATE DATA
/SAVE GOOD DATA POINTER
/CDF TO BUFFER FIELD

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1647 1411 TAD I AUTO11
1648 6201 CDF 0
1649 3137 DCA DBREG
1650 1011 TAD AUTO11
1651 3135 DCA ADREG
1652 1137 TAD DBREG
1653 7041 CIA
1654 1136 TAD DGREG
1655 7650 SNA CLA
1656 5276 JMP NOERR
1657 2144 ISZ FNDSUM
1658 5312 JMP NTRKRS
1659 1157 TAD CRCFLG
1660 7640 SEA CLA
1661 5272 JMP I+5
1662 1142 TAD DAYTRY
1663 7001 IAC
1664 7650 SNA CLA
1665 7340 CLA CLL CMA
1666 2200 ISZ DTCHK
1667 4441 ERROR
1668 0005 0005
1669 7774 7774
1670 2363 NOERR, ISZ HSRAN
1671 5304 JMP I+5
1672 2355 ISZ STGEN
1673 7001 NOP
1674 1113 TAD TRASH2
1675 3363 DCA HSRAN
1676 2122 ISZ BUFTAL
1677 5236 JMP DTRI
1678 2441 ISZ I XERR0
1679 5000 JMP I DTCHK
1680 7402 BADHLT, HLT
1681 5312 JMP I+1
1682 4441 NTRKRS, ERROR
1683 0000 0000
1684 0000 0000
1685 5276 JMP NOERR
/CHECK REST OF BUFFER
/
1716 0000 HSKER, 0
/
/ROUTINE TO GENERATE RANDOM NUMBERS
/
1717 0000 RANDOM, 0
1718 7301 CLA CLL IAC
1719 1375 TAD RAD1
1720 1376 TAD RAD2
1721 1377 TAD RAD3
1722 3375 DCA RAD1
1723 7004 RAL
1724 1375 TAD RAD1
1725 1376 TAD RAD2
1726 1377 TAD RAD3
1727 3376 DCA RAD2

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1732 7084          RAL          -
1733 1375          TAD          RAD1
1734 1376          TAD          RAD2
1735 1377          TAD          RAD3
1736 3377          DCA          RAD3
1737 1377          TAD          RAD3
1740 5717          JMP I         RANDOM
/
/GENERATOR FOR RANDOM DATA
/
1741 0000          GNDAY, 0
1742 7301          CLA CLL IAC
1743 1371          TAD          RAN1
1744 1372          TAD          RAN2
1745 7106          CLL RYL
1746 3371          DCA          RAN1
1747 1372          TAD          RAN2
1750 7812          RTR
1751 1371          TAD          RAN1
1752 3372          DCA          RAN2
1753 1372          TAD          RAN2
1754 5741          JMP I         GNDAT
/
/ROUTINE TO SAVE RANDOM GENERATOR
/
1755 0000          STGEN, 0
1756 1371          TAD          RAN1
1757 3373          DCA          SAV1
1760 1372          TAD          RAN2
1761 3374          DCA          SAV2
1762 5755          JMP I         STGEN
/
/ROUTINE TO RESET RANDOM GENERATOR
/
1763 0000          PSRAN, 0
1764 1373          TAD          SAV1
1765 3371          DCA          RAN1
1766 1374          TAD          SAV2
1767 3372          DCA          RAN2
1770 5763          JMP I         PSRAN
/
1771 1234          RAN1, 1234
1772 5670          RAN2, 5670
/
1773 0000          SAV1, 0
1774 2000          SAV2, 0
1775 1234          RAD1, 1234
1776 5670          RAD2, 5670
1777 4321          RAD3, 4321
/
/
2000          PAGE
/ROUTINE TO SEND A DRIVE TO A RANDOM TRACK
/AND SAVE THE TRACK

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2000 0000          /SEKOUT, 0
2001 0000          AND          K0000          /MASK DRIVE NUMBER
2002 3310          DCA          WAIT          /SAVE POINTER
2003 7084          STRESTP, LAS
2004 0000          AND          K0200          /MASK
2005 7040          SEA CLA          /PROGRAM STOP????
2006 7402          STPHLT, HLT          /PROGRAM STOP ON SWITCH 4
2007 3157          DCA          CRCFLG          /CLEAR CRC ERROR POINTER
2008 1310          RESEK, TAD          WAIT
2009 7110          CLL RAR
2010 1155          TAD          DSKPOT          /GET ADDRESS SAVE POINTER
2011 3327          DCA          CHKYN          /SAVE MADE POINTER
2012 1777          TAD          TRKFLG          /GET TRACK FLAG
2013 7650          SNA CLA          /WAS IT SEY??
2014 5223          JMP          +5          /NO, USE OTHER
2015 1163          TAD          SPTRK2          /GET OPERATOR TRACK
2016 0102          AND          K7760          /MASK
2017 1160          TAD          SPTRK1          /GET OPERATOR TRACK
2018 5254          JMP          DSKOUT =2          /DO IT
2019 1776          TAD          SEQPLG          /GET SEQUENCE FLAG
2020 7650          SNA CLA          /WAS IT SEY??
2021 5233          JMP          +6          /NO, USE RANDOM
2022 1727          TAD I         CHKYN          /GET LAST USED
2023 1013          TAD          K0020          /UPDATE
2024 7430          BZL          /LINK SEY?
2025 7001          IAC          /YES, SET EXTENDED BIT
2026 7410          SKP          /UPDATE AND CHECK BOUNDARIES
2027 4433          RANGEN          /GENERATE RANDOM ADDRESS
2028 0100          AND          K7761          /MASK OFF
2029 1310          TAD          WAIT          /ADD IN DRIVE NUMBER
2030 3727          DCA I         CHKYN          /SAVE MADE ADDRESS
2031 1727          TAD I         CHKYN
2032 7110          CLL RAR
2033 7620          BNL CLA
2034 9256          JMP          DSKOUT          /WAS IT SEY
2035 1147          TAD          MAXTRK          /NO, DON'T CHECK LIMITS
2036 1727          TAD I         CHKYN          /ADD IN FUDGE FACTOR
2037 7630          BSL CLA          /GET ADDRESS FOUND
2038 9256          JMP          DSKOUT          /IN LIMITS?
2039 1774          TAD          SEQPLG          /YES, O.K.
2040 7640          SEA CLA          /GET SEQUENCE FLAG
2041 5254          JMP          DSKOUT =2          /WAS IT SEY????
2042 1727          TAD I         CHKYN          /DO
2043 0102          AND          K7760          /NO
2044 1313          TAD          WAIT          /MASK
2045 3727          DCA I         CHKYN          /ADD IN DRIVE NUMBER
2046 1727          TAD I         CHKYN          /SAVE IT NOW
2047 0361          AND          K0007          /GET ADDRESS
2048 1077          TAD          K0000          /MASK DRIVE NUMBER + EXTENDED
2049 4444          LDCHD          /FUNCTION SEEK ONLY
2050 1727          TAD I         CHKYN          /LOAD COMMAND
2051 0102          AND          K7760          /GET ADDRESS
2052 4446          LDADD          /LOAD DISK ADDRESS + GO
2053 4443          DSKSKP          /WAIT FOR DONE FLAG

```

```

2266 5265      JMP      ,=1
2267 4442      ROSTAT
2270 7588      SMA
2271 5275      JMP      SEKER
2272 8075      AND      K1777
2273 7658      SNA CLA
2274 5381      JMP      SEKEX
2275 4441      SEKER,  ERROR
2276 8083      8083
2277 7548      7548
2188 2288      SEKER,  IS2      SEKOUT
2181 4452      SEKEX, CLRALL
2182 5688      JMP I   SEKOUT
    
```

```

/READ STATUS
/DOONE FLAG SET???
/SEEK ERROR, NO DONE FLAG
/MASK OTHER ERROR BITS
/ANY SET???
/NO, EXIT
/PRINT ERROR
/HEADER POINTER
/MESSAGE POINTER
/UPDATE FOR RETURN
/CLEAR STATUS
    
```

/ROUTINE TO GET AC

```

2123 8888      GETAC,  8
2124 1171      TAD      SVLNK
2125 7118      CLL RAR
2126 1178      TAD
2127 5783      JMP I   GETAC
    
```

/ROUTINE TO WAIT FOR KEY FROM OPERATOR

```

2118 8888      WAIT,  8
2111 7388      CLA CLL
2112 6832      KCC
2113 6831      KSP
2114 9313      JMP ,=1
2115 6836      KRB
2116 7325      AND      K177
2117 1326      TAD      K288
2120 6846      YLS
2121 6841      YSP
2122 5321      JMP ,=1
2123 6842      TCF
2124 5718      JMP I   WAIT
    
```

/EXIT

```

2125 8177      K177,  8177
2126 8288      K288,  8288
    
```

/ROUTINE TO CHECK FOR YES OR NO

```

2127 8888      CHKYN,  8
2138 3318      DCA      WAIT
2131 1327      TAD      CHKYN
2132 3358      DCA      CHKPD?
2133 1318      TAD      WAIT
2134 2327      ISZ      CHKYN
2135 7841      CIA
2136 1867      TAD      K8316
2137 7658      SNA CLA
2148 5727      JMP I   CHKYN
2141 1318      TAD      WAIT
2142 3327      ISZ      CHKYN
    
```

```

/SAVE POINTER
/GET PC STORED
/SAVE IT
    
```

```

/NO IT A NO
/YES
    
```

```

2143 7841      CIA
2144 1878      TAD      K8331
2145 7658      SNA CLA
2146 5727      JMP I   CHKYN
2147 5758      JMP I   CHKPD?
    
```

```

/NO IT A YES
/YES
/NO NEITHER
    
```

/ROUTINE TO CHECK DISK RUN POINTERS

```

2158 8888      CHKPD?, 8
2151 8886      AND      K8883
2152 1196      TAD      RUNPD?
2153 3318      DCA      WAIT
2154 1718      TAD I   WAIT
2155 7648      SZA CLA
2156 2358      ISZ      CHKPD?
2157 5758      JMP I   CHKPD?
    
```

```

/GET RUN POINTER
/RUN THIS DRIVE
/NO
/EXIT
    
```

```

2176 3552
2177 3347
2178 2288
    
```

PAGE

/ROUTINE TO WRITE OR READ SECTORS SELECTED

```

2278 8888      DSKGO,  8
2271 7348      CLA CLL CHA
2272 3172      DCA      RELOAD
2273 7348      CLA CLL CHA
2274 3173      DCA      FIRTIM
2275 1138      TAD      CAREG
2276 4445      LDCUR
2277 1131      TAD      WCREG
2278 3132      DCA      FWREG
2279 1125      TAD      INTDA
2280 3112      DCA      TRASH1
2281 1125      TAD      INTDA
2282 8182      AND      K7768
2283 3113      DCA      TRASH2
2284 1148      TAD      INTCH
2285 1888      TAD I   DSKGO
2286 4444      LDCHD
2287 1112      TAD      TRASH1
2288 8863      AND      K8817
2289 1113      TAD      TRASH2
2290 4446      LDADD
2291 6881      ION
    
```

```

/SETUP FIRST TIME POINTER
/SETUP FIRST TIME POINTER
/GET INITIAL CURRENT ADDRESS
/LOAD CURRENT ADDRESS
/SETUP FINAL WC
/GET INITIAL STARTING SECTOR
/SAVE
/GET DISK ADDRESS
/MASK
/SAVE
/GET INITIAL COMMAND
/GET READ OR WRITE
/LOAD COMMAND
/SECTOR TO DO
/MASK
/ADD TO TRACK
/LOAD AND GO
/TURN INTERRUPT ON
    
```

```

2226 3777      GOBAK, DCA      TIMER2
2227 3144      DCA      FNDSUM
2228 4427      SETFLD
2229 3252      DCA      CHNCFD
2230 1173      TAD      FIRTIM
2231 7658      SNA CLA
2232 5237      JMP      STRWRK
    
```

```

/CLEAR LONG TIMER
/CLEAR SUM CHECK
/GET FIELD TO BUFFER
/SAVE CDF
/NO IT A NO
/YES!!!!
    
```

```

2235 4776/ JMS TIME /WAIT FOR FIRST INTERRUPT
2236 5232 JMP .+4 /NOT HERE YET
2237 1127 STRHRK, TAD BUFTAL
2240 7041 CIA
2241 1132 TAD FWREG
2242 7450 SNA
2243 5292 JMP WRKDON /COMPARE TO SOFTWARE FINAL
2244 7041 CIA /WAIT FOR DISK????
2245 3174 DCA CLRBAK /YES!!!!
2246 1174 TAD CLRBAK /SAVE DIFFERENCE
2247 7041 CIA
2250 1120 TAD BUFTAL
2251 3120 DCA BUFTAL
2252 7432 CHNCDF, HLT /UPDATE BUFFER TALLY
2253 1123 TAD CHREG /CDF TO BUFFER FIELD
2254 7700 SNA CLA
2255 5262 JMP /READ OR WRITE
2256 3411 GOCLR, DCA I AUTO11 /WAS A READ!!
2257 2174 ISZ CLRBAK /WAS A WRITE, CLEAR BUFFER
2260 5256 JMP GOCLR /UPDATE TALLY
2261 5272 JMP WRKDON /MORE TO CLEAR
2262 1144 WASRD, TAD FNDSUM /DONE WITH SOME
2263 7100 GOCHK, CLL
2264 1411 TAD I AUTO11
2265 7430 SZL /GET WORD
2266 7001 IAC
2267 2174 ISZ CLRBAK
2270 5263 JMP GOCHK /UPDATE CLEAR POINTER
2271 3144 DCA FNDSUM /MORE TO CHECKSUM
2272 6201 WRKDON, CDF R /SAVE IT
2273 1120 TAD BUFTAL
2274 7650 SNA CLA
2275 5374 JMP DSKEK /LAST WORD DONE????
2276 4776/ JMS TIME /EXIT
2277 5237 JMP STRHRK /TIME AND WAIT
/ /WAIT FOR INT. OR DONE!!!!

/ INTERRUPT SERVICE
/
2320 6741 /RETURN, DSKP
2321 7610 SKP CLA /DISK SKIP 10Y
2322 5316 JMP DSKRET /NOT THE DISK
2323 6031 KSF /GO DISK
2324 7610 SKP CLA /CHECK READER FLAG
2325 5312 JMP KEYRET /NOT READER
2326 6041 TSP /WAS THE READER
2327 7422 INTER2, HLT /CHECK PUNCH FLAG
2328 6042 TCF /UNDEFINED INTERRUPT
2329 5353 JMP REYRN /WAS PUNCH, CLEAR FLAG
2330 6034 KEYRET, KRS REYRN /RETURN
2331 6046 TLS /GET INPUT
2332 6032 KCC /PRINT IT
2333 6046 JMP RETRN /WAS CLEAR READER FLAG
2334 6032 DSKRET, DCA RETRN /RETURN TO DISK
2335 5353 JMP FIRYIM /CLEAR TIME POINTER
2336 3173 ISZ TRASH1 /UPDATE SECTOR
2337 2112 NOP

```

```

2321 1115 TAD UPDATE
2322 1132 TAD FWREG
2323 3132 DCA FWREG /UPDATE WORD COUNT
2324 6745 STATUS, DCA FWREG
2325 3132 DCA STREG /READ STATUS
2326 1102 TAD STREG /SAVE READ FOR PRINTER
2327 1073 TAD R4000
2330 7640 SZA CLA
2331 5357 JMP STATER /ONLY DONE FLAG
2332 6742 CLRSTA, DCLR /STATUS ERROR
2333 1132 TAD FWREG /CLEAR STATUS
2334 7640 SZA CLA
2335 5341 JMP GOAGN /LAST TRANSFER
2336 4454 JMS I XGETAC /MORE TO TRANSFER
2337 6244 RNF /GET AC AND LINK
2340 5400 JMP I 0 /RESTORE FIELDS
2341 2172 GOAGN, ISZ RELOAD /RETURN
2342 5347 JMP NEXSEC /CLEAR FIRST TIME POINTER
2343 1074 TAD K1000 /NOT FIRST TIME
2344 1000 TAD I OSKGO /GET ALL FLAG
2345 1140 TAD INTOM /GET READ OR WRITE
2346 4444 LDCHD /ADD IN INITIAL
2347 1112 NEXSEC, TAD TRASH1 /RELOAD COMMAND REGISTER
2348 0043 AND K001Y /GET SECTOR TO DO
2349 1113 TAD TRASH2 /MASK OFF
2352 4446 LDADD /ADD IN TRACK
2353 4454 RETRN, JMS I XGETAC /LOAD AND GO TO DISK
2354 6244 RNF /GET AC AND LINK
2355 6001 ION /RESTORE FIELDS
2356 5400 JMP I 0 /TURN INTERRUPT ON
2357 1123 STATER, TAD CHREG /EXIT
2358 7710 SPA CLA /GET LAST COMMAND
2361 7101 IAC /WRITE OR READ
2362 7001 IAC /WRITE
2363 3375 DCA I 0
2364 7301 CLA CLL IAC /MODIFY HEADER POINTER
2365 1141 TAD STATRY /AC TO I
2366 7653 SNA CLA /GET TRY POINTER
2367 7340 CLA CLL CHA /TIME TO SET IT????
2370 4441 ERROR, R000 /YES, SET NON-RECOVERABLE FLAG
2371 0000 R000 /PRINT MESSAGE
2372 7774 R774 /MODIFIED HEADER POINTER
2373 2000 ISZ DSKGD /MESSAGE POINTER
2374 2000 DSKEK, ISZ DSKGD /UPDATE FOR ERROR
2375 0000 JMP I DSKGD /EXIT

/
2376 3122 PAGE
2377 3132 /ROUTINE TO GET ONE IN OCTAL
2400 2400 /
2470 0000 OCT1, 0
2471 4437 RECEIV
2472 3365 DCA ISAVES /RECEIVE
/SAVE IT

```

```

2403 1600      YAD I  OCT1      /GET LIMITS
2404 0061      AND      K0007      /MASK
2405 1065      YAD      K0260
2406 7141      CLL CIA
2407 1365      YAD      ISAVE1      /GET INPUT
2410 7620      SNL CLA      /IN LIMITS????
2411 5226      JMP      INERR      /NO, ERROR EXIT
2412 1600      YAD I  OCT1      /GET LIMITS
2413 0064      AND      K0070      /MASK
2414 7110      CLL RAR
2415 7012      RTR
2416 1065      YAD      K0260
2417 7045      CHA
2420 1365      YAD      ISAVE1      /GET INPUT
2421 7630      SZL CLA      /IN LIMITS????
2422 5226      JMP      INERR      /NO, ERROR
2423 1365      YAD      ISAVE1      /GET INPUT
2424 0061      AND      K0007      /MASK
2425 2200      ISZ      OCT1
2426 2200      INERR, ISZ      OCT1
2427 5600      JMP I  OCT1      /GOOD EXIT

```

/ROUTINE TO RECEIVE FOUR OCTAL

```

2430 0000      /
2431 1110      OCT4, 0
2432 3366      YAD      M4
2433 3367      DCA      ISAVE2      /SETUP COUNTER
2434 4424      DCA      ISAVE3      /START WITH 0
2435 0070      ONEIN      /RECEIVE ONE OCTAL
2436 5630      D070      /LIMITS
2437 1367      JMP I  OCT4      /ERROR EXIT
2440 2366      YAD      ISAVE3      /GET LAST
2441 7410      ISZ      ISAVE2      /UPDATE COUNTER
2442 5246      SKP
2443 7004      JMP      ,+4      /EXIT
2444 7006      RAL
2445 5233      RYL
2446 2230      JMP      OCT4 *3
2447 5630      ISZ      OCT4
2448 5630      JMP I  OCT4      /EXIT OCTAL IN AC

```

/ROUTINE TO UPDATE AND CHECK FOR PASS COMPLETE

```

2450 0000      /
2451 1123      CKTIM, 0
2452 0060      YAD      CHREG      /GET CURRENT DRIVE NUMBER
2453 7110      AND      K0006      /MASK
2454 3366      CLL RAR
2455 1366      DCA      ISAVE2      /POINTER
2456 1365      YAD      ISAVE2
2457 3305      YAD      YIMPT      /GET TIME POINTER
2458 7301      DCA      ISAVE1      /SAVE IT
2459 1131      CLA CLL IAC      /ONE FOR 0
2460 1765      YAD      CONSEC      /GET AMOUNT DONE
2461 1765      YAD I  ISAVE1      /ADD IN AMOUNT COMPLETED SO FAR
2462 1765      DCA I  ISAVE1      /SAVE IT
2463 3765

```

```

2464 7620      SNL CLA      /LINK UP????
2465 5650      JMP I  CKTIM      /NO, EXIT
2466 4433      RANGEN      /GET RANDOM NUMBER
2467 3777      DCA      RAN1      /RE=PRIME GENERATOR
2470 4433      RANGEN      /GET RANDOM NUMBER
2471 3776      DCA      RAN2      /RE=PRIME GENERATOR
2472 7100      CLL
2473 1365      YAD      ISAVE1
2474 1057      YAD      K0004
2475 3365      DCA      ISAVE1      /SECOND TIME POINTER
2476 2765      ISZ I  ISAVE1      /UPDATE IT
2477 1765      YAD I  ISAVE1      /GET COUNT
2500 1146      YAD      MAXTIM      /ADD IN FUDGE FACTOR
2501 7620      SNL CLA      /PASS COMPLETE????
2502 5050      JMP I  CKTIM      /NO, EXIT
2503 3765      DCA I  ISAVE1      /ZERO SECOND COUNTER
2504 1366      YAD      ISAVE2
2505 7040      CHA
2506 3366      DCA      ISAVE2      /SETUP COUNTER
2507 1364      YAD      CHPTOT      /ADD IN POINTER
2510 1356      YAD      K0003
2511 2366      ISZ      ISAVE2      /COMPUTE BUFFER
2512 5310      JMP      ,+2
2513 3366      DCA      ISAVE2      /SAVE ADDRESS POINTER
2514 7340      CLA CLL CHA
2515 2766      ISZ I  ISAVE2      /UPDATE PASS COMPLETE POINTER
2516 7610      SKP CLA
2517 3766      DCA I  ISAVE2      /HOLD AT 7777
2520 4453      CRLF
2521 4451      PRNTER      /PRINT "DISK"
2522 3507      MES17
2523 1123      YAD      CHREG      /GET LAST COMMAND
2524 0060      AND      K0006      /MASK
2525 7110      CLL RAR
2526 1265      YAD      K0260
2527 4440      TYPE
2530 7340      CLA CLL CHA      /TYPE DISK NO.
2531 4451      PRNTER      /PRINT "PASS COMPLETE"
2532 3512      MES16
2533 7604      LAS
2534 0015      AND      K0100      /MASK
2535 7650      SNA CLA      /PASS COMPLETE DISCONNECT????
2536 5341      JMP      ,+3      /NO WAY!!!!
2537 4422      DISCON      /DUMP DRIVE
2540 5775      JMP      RUN      /MORE TO TEST!!!!
2541 4774      JMS      YPSYA      /STATUS=COMPLETE TYPEOUT
2542 5650      JMP I  CKTIM      /EXIT

```

/SUBROUTINE TO READ STATUS REGISTER

```

2543 0000      ROST, 0
2544 6745      IOTS, DRST      /READ STATUS IOT
2545 7410      SKP
2546 7422      ERHLT5, HLT      /SKIP TRAP
2547 3122      DCA      STREG      /SAVE RESULTS

```

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```

2550 1122      TAD      STREG
2551 5743      JMP I   ROST                /EXIT
/
/SUBROUTINE TO LOAD CURRENT ADDRESS REGISTER
/
2552 0000      LDCA,  0
2553 6744      IOT4,  DLCA                /LOAD CURRENT ADDRESS IOT
2554 5732      JMP I   LDCA                /EXIT

2555 7402      ERHLT4, HLT                /SKIP TRAP
/
/SUBROUTINE TO LOAD TRACK ADDRESS REGISTER
/
2556 0000      LDAD,  0
2557 3126      DCA      DAREG
2560 1126      TAD      DAREG
2561 6743      IOT3,  DLAC                /LOAD DISK ADDRESS REGISTER
2562 5736      JMP I   LDAD                /EXIT
2563 7402      ERHLT3, HLT                /SKIP TRAP
/
2564 3531      CHPPOT, D0CHP =3
2565 0000      ISAVE1, 0
2566 0000      ISAVE2, 0
2567 0000      ISAVE3, 0
/

2574 0000
2575 0000
2576 1772
2577 1771
2600 2600      PAGE
/
/ROUTINE TO GET RANDOM OR OPERAYOR DATA
/
2600 0000      RNWRD, 0
2601 7402      SHDAT, 0
2602 5600      JMP I   RNWRD                /MODIFIED SWITCH
2603 6201      CDF      0                /EXIT
2604 1412      TAD I   AUTO12            /HOME CDF
2605 7402      RECDP, HLT                /GET DATA
2606 2117      ISE     OPRTAL            /BUFFER CDF
2607 5000      JMP I   RNWRD            /UPDATE TALLY
2610 3200      DCA      PRINT            /EXIT
2611 1187      TAD      #12              /SAVE WORD
2612 3117      DCA     OPRTAL            /REPLACE TALLY
2613 7340      CLA     CLL  CMA
2614 1152      TAD     DATPOT
2615 3012      DCA     AUTO12            /REPLACE AUTO INDEX
2616 1200      TAD     PRINT            /GET SAVED WORD
2617 5000      JMP I   RNWRD            /EXIT
/
/ROUTINE TO TYPE
/
2620 0000      PRINT, 0
2621 6046      TLR

```

```

2622 0041      TSP
2623 5222      JMP      1=1
2624 6042      TCF
2625 7200      CLA
2626 5620      JMP I   PRINT

/
/ROUTINE TO DUMP AND REPORT DISK STATUS
/
2627 0000      DUMP, 0
2630 4651      PRNTER                /PRINT "DISK "
2631 3507      MES17
2632 1123      TAD      CHREG                /GET LAST COMMAND
2633 0000      AND      #0006
2634 7110      CLL     RAR
2635 3200      DCA     RNWRD                /SAVE
2636 1200      TAD     RNWRD                /GET DISK NUMBER
2637 1005      TAD     #2200
2640 4440      TYPE                /TYPE DISK NUMBER
2641 7340      CLA     CLL  CMA
2642 4051      PRNTER                /PRINT "DISCONNECTED!"
2643 3450      MES13
2644 4777      JMS     TPSTA                /TYPE STATUS REPORT
2645 1200      TAD     RNWRD
2646 1156      TAD     FUNPOT
2647 3200      DCA     RNWRD                /SAVE POINTER ADDRESS
2650 3600      DCA I   RNWRD                /CLEAR RUN POINTER
2651 3200      DCA     RNWRD
2652 1110      TAD     #4
2653 3220      DCA     PRINT                /CHECK FOR MORE POINTER
2654 1200      TAD     RNWRD
2655 4430      SELCHK                /CHECK SELECT POINTERS
2656 7610      SKP     CLA                /DISK NOT HERE
2657 5627      JMP I   DUMP                /MORE AVAILABLE
2660 3200      ISE     RNWRD
2661 7220      ISP     PRINT                /UPDATE POINTERS
2662 2254      JMP     1=0
2663 4453      ORLF
2664 4451      PRNTER                /PRINT "DISK"
2665 3507      MES17
2666 7342      CLA     CLL  CMA
2667 4451      PRNTER                /PRINT "SYSTEM DOWN"
2670 1465      MES16
2671 7402      NODSKS, HLT                /ERROR, NO DISK AVAILABLE
2672 5271      JMP     1=1

/
/ROUTINE TO SETUP FIELD TO BUFFER * AUTO11 * BUFFER TALLY
/
2673 0000      STPLD, 0
2674 7041      DCA      WEREG
2675 1431      TAD      WEREG
2676 3120      DCA     BUFTAL
2677 7340      CLA     CLL  CMA
2678 1130      TAD     CAREG                /GET INITIAL CA
2679 3011      DCA     AUTO11            /SAVE
2672 1100      TAD     DATPLG            /GET DATA FLAG

```

```

2723 7652 SNA CLA /WAS IT SET????
2724 5312 JMP ,+6 /NO, USE REGULAR
2725 1187 TAD H12
2726 3117 DCA CPRTAL /SETUP SPECIAL YALLY
2727 7340 CLA CLL CNA
2728 1152 TAD DATPOT
2729 3812 DCA AUTO12 /SETUP SPECIAL AUTO INDEX
2730 1148 TAD INTCH /GET LAST COMMAND
2731 0864 AND K0870 /MASK FIELD BITS
2732 1105 TAD KCOF /MAKE BUFFER CDF
2733 3225 DCA RECDF /SETUP SPECIAL CDF
2734 1285 TAD RECDF /GET BACK CDF
2735 5673 JMP I STFLD /EXIT, FIELD IN AC

```

/SUBROUTINE TO ISSUE "DSKP" DISK SKIP IOT

```

2720 0000 SDKP, 0
2721 6741 IOT1, DSKP /DISK SKIP IOT
2722 7412 SKP /DID NOT SKIP
2723 2320 ISZ SDKP
2724 5722 JMP I SDKP /EXIT

```

/SUBROUTINE TO LOAD COMMAND REGISTER

```

2725 0000 LDCH, 0
2726 3123 DCA CHREG
2727 1123 TAD CHREG
2728 6746 IOT6, DLDC /LOAD COMMAND REGISTER
2729 5725 JMP I LDCH /EXIT
2730 7402 ERHLT6, HLT /SKIP TRAP

```

/ROUTINE TO CHANGE DEVICE IOT CODES

```

2733 7604 CHANG, LAS /GET SWITCHES
2734 0355 AND A0770 /MASK 3=8
2735 3225 DCA LDCH /SAVE DESIRED CODE
2736 1360 TAD CHNPOT /POINTER
2737 3112 DCA TRASH1 /ADDRESS POINTER
2738 1357 TAD CCNTR1 /AMOUNT TO DO
2739 3113 DCA TRASH2 /SETUP COUNTER
2740 1512 CHANG, TAD I TRASH1 /GET ADDRESS POINTER
2741 3114 DCA TRASH3 /SAVE ADDRESS
2742 1514 TAD I TRASH3 /GET OLD CODE
2743 0356 AND A7007 /MASK OFF OLD CODE
2744 1325 TAD LDCH /ADD IN DESIRED CODE
2745 3514 DCA I TRASH3 /RESTORE
2746 2112 ISZ TRASH1 /UPDATE POINTER
2747 2113 ISZ TRASH2 /UPDATE CHANGE COUNTER
2748 5342 JMP CHANG /MORE TO CHANGE
2749 7402 CHNHLT, HLT /ALL DEVICE IOT CODES CHANGED
2750 5353 JMP ,+1
2751 0770 A0770, 0770
2752 7007 A7007, 7007
2753 7766 CCNTR1, 7766

```

```

2760 2761 CHNPOT, CHNPOT +1
2761 2303 RETURN
2762 2324 STATUS
2763 2332 CLRSTA
2764 2721 IOT1
2765 1401 IOT2
2766 2561 IOT3
2767 2553 IOT4
2770 2544 IOT5
2771 2730 IOT6
2772 1405 IOT7

```

/PAGE  
/ROUTINE TO TYPE STATUS REPORT

```

3000 0000 TPSTA, 0
3001 4451 PRNTR /PRINT "DSK HARD SOFT COMP"
3002 3375 MES7
3003 1110 TAD M4
3004 3242 DCA TSAVE1 /MAXIMUM TO DO
3005 3243 DCA TSAVE2
3006 3244 DCA TSAVE3 /CLEAR SOME COUNTERS
3007 1243 CHKRES, TAD TSAVE2
3008 1096 TAD K0003
3009 3243 DCA TSAVE2
3010 1243 TAD TSAVE2
3011 1154 TAD STAPOT
3012 3244 DCA TSAVE5 /LOCATION OF DISK STATUS
3013 1244 TAD TSAVE3
3014 4430 SELCHK /CHECK RUN POINTER
3015 5236 JMP NOTSTA /DISK NOT RUNNING
3016 4453 ORLF
3017 4423 SPACE /SPACE OUT ONE
3018 1244 TAD TSAVE3 /GET DISK NO.
3019 1265 TAD K0260
3020 4442 TYPE
3021 4423 SPACE /SPACE OUT ONE
3022 4423 SPACE /SPACE OUT ONE
3023 7346 CLA CLL CHA RTL
3024 3245 DCA TSAVE4 /COUNTER FOR FOUR WORDS
3025 1646 TAD I TSAVE5 /GET STATUS
3026 4432 DCTEL /TYPE IT
3027 2246 ISZ TSAVE5
3028 2245 ISZ TSAVE4
3029 5231 JMP ,+4
3030 2244 NOTSTA, ISZ TSAVE3 /UPDATE DRIVE NUMBER
3031 2242 ISZ TSAVE1
3032 5207 JMP CHKRES /MORE TO REPORT
3033 5602 JMP I TPSTA /EXIT
3042 0000 TSAVE1, 0
3043 0000 TSAVE2, 0

```

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```

3044 0000 TSAVE3, 0
3045 0000 TSAVE4, 0
3046 0000 TSAVE5, 0
/
/ROUTINE TO RECALIBRATE SELECTED DRIVE
/
3047 0000 RESTOR, 0
3050 0000 AND K0006
3051 3200 DCA TPSTA /SAVE DRIVE NUMBER
3052 1101 TAD K7700
3053 3332 DCA TIMER0 /SETUP COUNTER
3054 2331 ISZ TIMER1
3055 5254 JMP L=3
3056 2332 ISZ TIMER2 /WAIT FOR DISK TO COOL OFF!
3057 5254 JMP L=3
3060 3157 DCA CRCFLG /CLEAR CRC ERROR POINTER
3061 1200 TAD TPSTA /CURRENT DRIVE
3062 4444 LDCHD /LOAD COMMAND
3063 7326 CLA CLL CML RTL /ENABLE RECALIBRATE BIT
3064 4450 CLRALL /"RECALIBRATE"
3065 4443 DSKSKP /DISK SKIP IOY
3066 5265 JMP L=1 /WAIT FOR FIRST DONE FLAG
3067 4442 RDSYAT /READ STATUS
3070 7500 SNA /DONE FLAG SET???
3071 5307 JMP RESERR /NO, ERROR
3072 0075 AND K1777 /MASK OTHER ERROR BITS
3073 7640 SZA CLA /ANY SET???
3074 5307 JMP RESERR /YES, ERROR
3075 4450 RESTA, CLRALL /CLEAR STATUS
3076 1010 TAD K0200 /ENABLE BIT SECOND DONE FLAG
3077 1200 TAD TPSTA /ORIGINAL COMMAND
3078 4444 LDCHD /LOAD COMMAND
3079 4443 DSKSKP /DISK SKIP IOY
3082 5301 JMP L=1 /WAIT FOR SECOND DONE
3083 4442 RDSYAT /READ STATUS
3084 1070 TAD K4000 /
3085 7650 SNA CLA /WAS IT ONLY DONE FLAG
3086 5647 JMP I RESTOR /YES, RETURN
3087 7020 RESERR, CLA CLL /ERROR
3088 4441 ERROR
3089 2004 R004
3090 7540 T040
3091 4453 CRLF
3092 4453 CRLF
3093 4451 PRNTER /PRINT"RECALIBRATE ERROR DISCONNECT"
3094 3165 HES19
3095 4422 DISCON /DISCONNECT DISK
3096 2247 ISZ RESTOR
3097 5647 JMP I RESTOR /MORE DISK AVAILABLE
/
/ROUTINE TO TIME AND WAIT
/
3122 0000 TIME, 0
3123 2331 ISZ TIMER1
3124 5722 JMP I TIME /EXIT

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3125 2332 ISZ TIMER2
3126 5722 JMP I TIME /EXIT
3127 7402 INTER1, HLT /AND INTERRUPT OCCURRED, I GUESS!
3128 5327 JMP L=1
/
3131 0000 TIMER1, 0
3132 0000 TIMER2, 0
/
/ROUTINE TO TYPE OUT DATA INFORMATION
/
3133 0000 TYPDAT, 0
3134 4451 PRNTER /PRINT "ASIN"
3135 3230 TEXAS
3136 1133 TAD ASREG
3137 4452 OCTEL
3140 7340 CLA CLL CNA
3141 4451 PRNTER /PRINT "WAI"
3142 3232 TEXWA
3143 1134 TAD WAREG
3144 4452 OCTEL
3145 7340 CLA CLL CNA
3146 4451 PRNTER /PRINT "WAI"
3147 3234 TEXAD
3150 1135 TAD ADREG
3151 4452 OCTEL
3152 7340 CLA CLL CNA
3153 4451 PRNTER /PRINT "DCI"
3154 3236 TEXDG
3155 1136 TAD DGREG
3156 4452 OCTEL
3157 7340 CLA CLL CNA
3160 4451 PRNTER /PRINT "DBI"
3161 3240 TEXDB
3162 1137 TAD DBREG
3163 4452 OCTEL
3164 5733 JMP I TYPDAT
/
3165 2205 HES19, TEXT "RECALIBRATE ERROR DISCONNECT!"
3166 7101
3167 1411
3170 0222
3171 0124
3172 0540
3173 0522
3174 2217
3175 0240
3176 0411
3177 2383
3200 1716
3201 1305
3202 2124
3203 4100
/
3204 2303 TEXPC, TEXT "PCI"
3205 7200

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17

3206	2324	TEXT,	TEXT	"STI"
3207	7200			
3210	0315	TEXCH,	TEXT	"CHI"
3211	7200			
3212	1515	TEXHM,	TEXT	"HHI"
3213	7200			
3214	1101	TEXJA,	TEXT	"JAI"
3215	7200			
3216	0401	TEXDA,	TEXT	"DAI"
3217	7200			
3220	2323	TEXSS,	TEXT	"SSI"
3221	7200			
3222	0301	TEXCA,	TEXT	"CAI"
3223	7200			
3224	2703	TEXWC,	TEXT	"WCI"
3225	7200			
3226	0627	TEXFW,	TEXT	"FWI"
3227	7200			
3230	0123	TEXAS,	TEXT	"ASI"
3231	7200			
3232	2701	TEXWA,	TEXT	"WAI"
3233	7200			
3234	0104	TEXAD,	TEXT	"ADI"
3235	7200			
3236	0407	TEXDG,	TEXT	"DGI"
3237	7200			
3240	0402	TEXDB,	TEXT	"DBI"
3241	7200			
3242	2205	ERTX1,	TEXT	"READ STATUS"
3243	0104			
3244	4023			
3245	2401			
3246	2425			
3247	2300			
3250	2722	ERTX2,	TEXT	"WRITE STATUS"
3251	1124			
3252	0540			
3253	2324			
3254	0124			
3255	2523			
3256	0202			
3257	2305	ERTX3,	TEXT	"SEEK STATUS"
3258	0513			
3261	4023			
3262	2401			
3263	2425			
3264	2300			
3265	2205	ERTX4,	TEXT	"RECALIBRATE STATUS"
3266	0301			
3267	1411			
3270	0222			
3271	0124			
3272	0540			
3273	2324			

3274	0124			
3275	2523			
3276	0300			
3277	0411	ERTX5,	TEXT	"DISK DATA"
3300	2313			
3301	4004			
3302	0124			
3303	0100			
3304	4005	MES0,	TEXT	" ERROR"
3305	2222			
3306	1722			
3307	0000			
3310	2213	MES1,	TEXT	"RKB DATA RELIABILITY"
3311	7005			
3312	4004			
3313	0124			
3314	0140			
3315	2205			
3316	1411			
3317	0102			
3320	1114			
3321	1124			
3322	3100			
3323	0532	MES2,	TEXT	"EXERCISE"
3324	0522			
3325	0311			
3326	2305			
3327	0000			
3330	4004	MES3,	TEXT	" DISK"
3331	1123			
3332	1300			
3333	1457	MES4,	TEXT	"NON-RECOVERABLE "
3334	1455			
3335	2205			
3336	7317			
3337	2605			
3340	2201			
3341	2214			
3342	2940			
3343	0300			
3344	0115	MES5,	TEXT	"AMOUNT OF EXTENDED R/W MEMORY(0=7)?"
3345	1725			
3346	1624			
3347	4017			
3350	0640			
3351	0530			
3352	2405			
3353	1604			
3354	0504			
3355	4022			
3356	5727			
3357	4215			
3360	0515			
3361	1722			

3362	3150		
3363	6055		
3364	6751		
3365	7700		
3366	7103	MES6, TEXT	"ACCEPT MODE?"
3367	7305		
3370	2024		
3371	4015		
3372	1706		
3373	8577		
3374	0800		
3375	0423	MES7, TEXT	"DSK HARD SOFT COMP"
3376	1340		
3377	1801		
3400	2204		
3401	4023		
3402	1706		
3403	2440		
3404	0317		
3405	1520		
3406	0200		
3407	7611	MES8, TEXT	"FIELD?"
3410	0514		
3411	2477		
3412	2200		
3413	2422	MES9, TEXT	"TRACK?"
3414	0103		
3415	1377		
3416	0000		
3417	0533	MES10, TEXT	"EXTRA SECTORS?"
3420	2422		
3421	0140		
3422	2305		
3423	0324		
3424	1722		
3425	2377		
3426	2000		
3427	2214	MES11, TEXT	"BLOCK LENGTH?"
3430	1703		
3431	1340		
3432	1405		
3433	1607		
3434	2410		
3435	7700		
3436	2305	MES12, TEXT	"SEQUENCE?"
3437	2125		
3440	0516		
3441	0305		
3442	7700		
3443	0401	MES13, TEXT	"DATA?"
3444	2401		
3445	7700		
3446	0122	MES14, TEXT	"ARE YOU SURE?"
3447	0542		
3450	3117		

3451	2540		
3452	2325		
3453	2205		
3454	7700		
3455	4000	MES15, TEXT	"DISCONNECTED!"
3456	1123		
3457	0317		
3460	1610		
3461	0000		
3462	2405		
3463	0441		
3464	0000		
3465	2331	MES16, TEXT	"SYSTEM SHUT DOWN, NO DISKS TO RUN!"
3466	2324		
3467	0515		
3470	4023		
3471	1025		
3472	2440		
3473	2417		
3474	2710		
3475	5442		
3476	1617		
3477	4374		
3510	1123		
3501	1323		
3502	4024		
3503	1742		
3504	2225		
3505	1641		
3506	0000		
3507	0411	MES17, TEXT	"DISK "
3510	2313		
3511	4000		
3512	4320	MES18, TEXT	"PASS COMPLETE!"
3513	0123		
3514	2342		
3515	0317		
3516	1522		
3517	1405		
3520	2405		
3521	4202		
3522	0000	/	
3523	0000	D07H1, 0	
3524	0000	D17H1, 0	
3525	0000	D27H1, 0	
3526	0000	D37H1, 0	
3527	0000	D07H2, 0	
3528	0000	D17H2, 0	
3529	0000	D27H2, 0	
3531	0000	D37H2, 0	
3532	0000	/	
3533	0000	D0HR0, 0	
3534	0000	D0SOF, 0	
3535	0000	D0CMP, 0	
3536	0000	D1HR0, 0	

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3536 0000 01SCF, 0
3537 0000 01SCL, 0
3540 0000 02SOF, 0
3541 0000 02SOF, 0
3542 0000 02SOF, 0
3543 0000 03HRD, 0
3544 0000 03SOF, 0
3545 0000 03CHP, 0
/
3546 0000 FLDPLG, 0
3547 0000 TRKPLG, 0
3550 0000 SECPLG, 0
3551 0000 HLFPLG, 0
3552 0000 SECPLG, 0
/
3553 0000 DSK0A, 0
3554 0000 DSK1A, 0
3555 0000 DSK2A, 0
3556 0000 DSK3A, 0
/
3557 0000 DSK0B, 0
3560 0000 DSK1B, 0
3561 0000 DSK2B, 0
3562 0000 DSK3B, 0
/
/PLACE FOR DATA IN MANUAL MODE
/
3563 0000 DAY1, 0000
3564 0000 DAY2, 0000
3565 0000 DAY3, 0000
3566 0000 DAY4, 0000
3567 0000 DAY5, 0000
3570 0000 DAY6, 0000
3571 0000 DAY7, 0000
3572 0000 DAY8, 0000
3573 0000 DAY9, 0000
3574 0000 DAY10, 0000
3575 0000 DAY11, 0000
3576 0000 DAY12, 0000
/
3600 #3600
/
3600 STYBUF#,
/
      $$$$

```

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0000 11111100 11111110 11111111 11111111 11111111 11111111 11111111 11111111
0100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111100

0200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
0300 11111111 11111111 11111111 11111111 11111111 11111111 11111110 11111111

0400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
0500 11111111 11111111 11111111 11111111 11111111 11111000 00000000 01111111

0600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
0700 11111111 11111111 11111111 11111111 11111111 11111111 11111111 10000000 00111111

1000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111110 00111111

1200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1300 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11110011

1400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1500 11111111 11111111 11111111 11111111 11111111 11111111 11200000 00000000

1600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1700 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

2000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
2100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 00000000 00000011

2200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
2300 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

2400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
2500 11111111 11111111 11111111 11111111 11111111 11111111 11111111 00001111

2600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
2700 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11100001

3000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
3100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

3200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
3300 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

3400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
3500 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111110

3600
3700

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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

A2170 2760	D1HRD 3935	OSKPK 6741	10T5 2544
A2770 2755	D1SDP 3536	OSKPD7 2155	10T6 2732
A7707 2756	D1TH1 3523	OSKRET 2316	10T7 1405
ACDDA 2365	D1TH2 3527	OSKSKP 4443	ISAVE1 2565
ADREG 0135	D2CAF 3542	OTCHK 1670	ISAVE2 2566
AGAIN 1333	D2HRD 3540	OTR1 1676	ISAVE3 2567
ALLAGN 2252	D2SOF 3941	OUHP 2027	K0203 2056
AMOUNT 0035	D2TH1 3924	ORFLG 0166	K0204 2057
ASKNX1 2342	D2TH2 3530	ERHLT2 1403	K0206 0060
ASKNX2 0400	D3CMP 3540	ERHLT3 2563	K0207 0061
ASKNX3 0417	D3HRD 3543	ERHLT4 2555	K0210 0062
ASKNX4 0456	D3SOF 3944	ERHLT5 2546	K0217 0063
ASKNX5 0471	D3TH1 3925	ERHLT6 2732	K0220 0013
ASKSUR 0520	D3TH2 3531	ERHLT7 1407	K0242 0014
ASREG 3133	DAREG 0126	ERR0 1200	K0277 0104
AUTO10 0210	DAT1 3963	ERRDER 1342	K0277 0104
AUTO11 0011	DAT10 3574	ERRDP 4441	K0280 0016
AUTO12 0012	DAT11 3575	ERTX1 3240	K0212 1473
BADHLT 1710	DAT12 3576	ERTX2 3237	K0215 1472
BDRFC 1024	DAT2 3564	ERTX3 3237	K0240 0066
RON 2200	DAT3 3565	ERTX4 3265	K0260 0065
RONBUF 0150	DAT4 3566	ERTX5 3277	K0277 0071
RRKRET 0366	DAT5 3567	ESAVE 1355	K0316 2067
RUFTAL 0120	DAT6 3570	EXIT 1552	K0331 0070
CAREG 0130	DAT7 3571	FILLER 2730	K0400 0072
CONTR1 2737	DAT8 3572	FIRTM 0173	K1200 0074
CHANG 2733	DAT9 3573	FLOFLG 3546	K177 2125
CHANGR 2742	DATFLG 0160	FNDSP 0144	K1777 0075
CHKPOT 2150	DATPOT 0152	FORD 4425	K200 2126
CHKRES 3007	DATTRY 2142	FRODY 1474	K2000 0076
CHKSAV 0143	DBREG 0137	FWRCD 0532	K3700 0077
CHKYN 2127	DCLE 0742	GENDAY 4420	K3740 1561
CHNCDF 2252	DGREG 0136	GETAC 2100	K4000 0073
CHKNLT 2753	DISEGN 4422	GNDAT 1741	K4100 1560
CHKPOT 2760	DISKGD 4434	GSAG 2341	K5400 0363
CKTIM 2450	DLAG 0743	GSBK 2226	K6200 0100
CLDR 1400	DLCA 0744	GSDDP 1646	K7400 2126
CLRALL 4450	DLDC 0746	GSCHP 2283	K7700 0101
CLRBK 2174	DMAN 0747	GSCLR 2286	K7760 0102
CLRSTA 2332	DOHEAD 1242	GSREAD 1072	K7761 2153
CHPOT 2364	DRST 0745	GDIT 1206	K7764 1357
CHREG 2123	DSKRA 3553	HCOTAD 1366	K7771 1356
CONCUR 0726	OSKOB 3557	HLFFLG 3551	K7771 1356
CONSEC 0151	OSK1A 3554	INERR 2426	KCDF 2125
CRCLG 2157	OSK1B 3560	INT0 0140	KEYRET 2312
CRFL 4453	OSK2A 3558	INT0A 0125	KHLT 2205
DCOMP 3534	OSK2B 3561	INTER1 3127	KROT 0246
DBHRD 3532	OSK3A 3556	INTER2 2327	RSKP 0540
DBSOF 3533	OSK3B 3562	10T1 2721	LOAD 2556
DTH1 3522	OSKEX 2374	10T2 1421	LOADD 4446
DTH2 3526	OSKGD 2200	10T3 2861	LDCA 2552
D1CMP 3537	OSKOUT 2056	10T4 2553	LDCM 2725

PAL10	V142	16-JUL-73	17142	PAGE 1042			
LDCMD	4444	PCNTR1	1363	SEKER	2275	TPSTA	3088
LDCUR	4449	PCNTR2	1364	SEKEX	2101	TRASH1	2112
LOMAN	4447	PCNTR3	1365	SEKGO	1136	TRASH2	2113
LOMN	1404	PCREG	2121	SEKOUT	2000	TRASH3	2114
LNKDCO	3364	POLDSK	2116	SEKSW	2167	TRKFLG	3547
M12	0107	POLNEK	1020	SELCHK	4430	TRYCNT	1166
M4	0110	PRINT	2620	SECFLG	3552	TRYTIM	1067
M5	0111	PRN	1516	SETFLD	4427	YSAVE1	3042
MANUAL	0517	PRNDAY	1360	SETGEN	4426	YSAVE2	3043
MAXFLD	0145	PRNTER	4451	SPAC	1554	YSAVE3	3044
MAXFLM	0146	RA01	1775	SPACE	4423	YSAVE4	3045
MAXYRK	0147	RA02	1776	SPBLK	2165	YSAVE5	3046
MES0	3304	RA03	1777	SPFLD	2161	YYPDAT	3133
MES1	3310	RAN1	1771	SPSEC	2164	TYPE	4440
MES10	3417	RAN2	1772	SPTRK1	2162	UPDATE	0115
MES11	3427	RANDAT	4421	SPTRK2	2163	UPONE	1402
MES12	3436	RANDOM	1717	SSREG	2127	UPTRY	1133
MES13	3443	RANGES	4433	STADPT	3154	WAIT	2110
MES14	3446	RANJMS	0554	STAYER	2357	WAREG	0134
MES15	3455	RMSS	1410	STAYRY	2141	WASRD	2262
MES16	3465	ROST	2543	STATUS	2324	WCREG	0131
MES17	3507	ROSTA	1122	STFLD	2673	WRDGHK	1612
MES18	3512	ROSTAT	4442	STGEN	1755	WRKDON	2272
MES19	3105	ROTRY	1110	STPHLY	2006	XCHKYN	0031
MES2	3323	RECAL	4436	STFAUT	1312	XCKPDT	0030
MES3	3330	RECDP	2605	STFBUF	3000	XCLDR	0050
MES4	3333	RECEIV	4437	STREG	2122	XCRLF	0053
MES5	3344	REFILL	0733	STSEK	2526	XDSKGO	0054
MES6	3366	RELOAD	0172	STSTP	2003	XJUMP	0022
MES7	3375	REFEAD	1101	STSTEX	2223	XERRD	0041
MES8	3407	RESEK	1150	STRWIK	2237	XFRDCT	0052
MES9	3413	RESEK	2010	SVLNK	2171	XGETAC	0054
MRRG	0124	RESERR	3107	SWDPT	2601	XGNDAT	0020
MRRRN	1524	RESEY	0535	TEXAD	1234	XLDAD	0046
MSEFR	1716	RESRAN	4435	TEXAS	3230	XLOCA	0045
MWRD	0737	RESTA	3075	TEXCA	3222	XLOCH	0044
MEXSEC	2347	RESTR	3047	TEXCH	3210	XLOMN	0047
NEXT	0260	RETRN	2353	TEXDA	3216	YDCT1	0024
NOCR	1232	RETURN	2300	TEXDB	3240	YDCT4	0025
NOCSKS	2671	REWRT	1055	TEXDG	3236	XPRINT	0040
NOERR	1676	RNFLD	0633	TEXFW	3226	XPRN	0051
NONCRC	1236	RNRD	2600	TEXJA	3214	XRDST	0042
NOTEX	1347	RSRAN	1763	TEXMP	3212	XREG	1302
NOTSTA	3036	RUN	0600	TEXPC	3204	XRESTR	0036
NTSEK	0552	RUNPDT	0156	TEXSS	3220	XRNOM	0033
NTWRKS	1712	SAHPOL	1002	TEXST	3206	XRNWRD	0021
NYTSEK	0532	SAV1	1773	TEXWA	3232	XSRAN	0035
OCT1	2400	SAV2	1774	TEXWC	3224	XSDMP	0043
OCT4	2430	SAVAC	0170	TIME	3122	XSKOUT	0032
OCTEL	4452	SDKP	2720	TIMER1	3131	XSPAC	0023
ONEIN	4424	SECFLG	3550	TIMER2	3132	XSTFLD	0027
OPRTAL	0217	SEEK	4432	TIMPDT	2153	XSTGEN	0026

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XTEXT	1361			
XWAIT	2037			
YESNO	4431			

ERRORS DETECTED: 0  
 LINKS GENERATED: 48  
 RUN-TIME: 12 SECONDS  
 3K CORE USED



