

IDENTIFICATION

PRODUCT CODE:	MAINDEC-08-DHRKC-C-0
PRODUCT NAME:	RK8E DATA RELIABILITY PROGRAM
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MAINTAINER:	DIAGNOSTIC GROUP
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1. ABSTRACT

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 10(9) 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

2.1 HARDWARE

A. PDP-8/E, 8/F, OR 8/M COMPUTER OR OTHER FAMILY OF 8 COMPATIBLE COMPUTER WITH NECESSARY DMBE 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

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

THE PROGRAM EXECUTION TIME (I.E. PASSING 3 X 10¹⁹ 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

- 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

4.1 STANDARD TEST PROCEDURE

- 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 JOY 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

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)

- 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 0200 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 2, 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" TYPEOUT SHOULD OCCUR UPON PASS COMPLETION OF EACH DISK DRIVE. ALL OTHER TYPEOUTS OR HALTS WILL BE CONSIDERED AS AN ERROR CONDITION. SEE SECTION 5.5 FOR "STATUS=COMPLETE" TYPEOUT.
- 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 (2*7)?

THE OPERATOR SHOULD THEN TYPE THE AMOUNT OF EXTENDED READY WRITE MEMORY RANKS 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 (00000-14537).

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 (00-17). (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

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 "DLAC"
ERHLT4	SKIP TRAP FOR IOT "DLCA"
ERHLT5	SKIP TRAP FOR IOT "DRST"
ERHLT6	SKIP TRAP FOR IOT "DLOC"
ERHLT7	SKIP TRAP FOR IOT "DMAH"
GDHLT	CHECKSUM FAILED BUT WORD-BY-WORD COMPARE WORKED
NODSKS	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.

ERROR TYPEOUTS *****

WHEN AN ERROR OCCURES 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.

PCI PROGRAM LOCATION OF THE ACTUAL FAILURE.

ST: 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.

DGI 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 2). 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!
DSK HARD SOFT COMP
X 0030 0010 0001
X 0240 5670 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 OCCURS 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 COMP
X XXXX XXXX XXXX
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 "ST1")

```
WRITE STATUS ERROR
PC12371 ST14010 CM14000 NM14002 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 NM13000 DA14227 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 ST14210 CM11432 NM11432 IA11035 DA11021
SS10021 CA10001 WC15000 FW17400
AS10015 WA10007 AD10212 DG10537 D010536
AS10215 WA10077 AD10100 DG17777 D017776
AS10216 WA10002 AD10403 DG16167 D016166
```

6.

RESTRICTIONS

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

7.

TROUBLE SHOOTING INFORMATION

101 FUNCTION

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

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

AC10 AC11
=====

0 0
2 1

CLEAR THE AC AND STATUS REGISTER.

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 DLCA

"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
=====

0=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
00

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 DLOC

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

AC
00

2=2=2
3=2=1
2=2=2
2=2=3
2=2=4
0=2=5
2=2=6
2=2=7

READ DATA
READ ALL
WRITE LOCK
SEEK ONLY
WRITE DATA
WRITE ALL
NOT USED
NOT USED
ENABLE INTERRUPT
ENABLE SET TRANSFER DONE ON SEEK DONE
HALF BLOCK 128 WORDS
EXTENDED MEMORY ADDRESS
EXTENDED MEMORY ADDRESS
EXTENDED MEMORY ADDRESS
UNIT SELECT
UNIT SELECT
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)
=====

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, 20, 21, AND 22 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 WAS FIELD 0, THE CURRENT ADDRESS WILL BE LIMITED WITHIN THE END OF THE PROGRAM +4000 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.

PROGRAM LISTING

```

/
/RKBE DATA RELIABILITY PROGRAM
/
/COPYRIGHT (C) 1972-1973, DIGITAL EQUIP. CORP., MAYNARD, MASS.
/
/ALL KNOWN HALTS
/
0220 1403 ERHLT2 /SKIP TRAP DCLR
0221 2503 ERHLT3 /SKIP TRAP DLAG
0222 2505 ERHLT4 /SKIP TRAP DLCA
0223 2546 ERHLT5 /SKIP TRAP DRST
0224 2732 ERHLT6 /SKIP TRAP DLDC
0225 1407 ERHLT7 /SKIP TRAP DMAN
0226 3127 INTER1 /NO DISK INTERRUPT
0227 2307 INTER2 /UNDEFINED INTERRUPT
0228 2225 KHLT /PROGRAM WILL ONLY RUN IN FIELD 8
0229 2671 NODSKS /NO DISKS AVAILABLE TO RUN
0230 2206 STPHLT /PROGRAM STOP FROM SWR4=1
0231 2753 CHNHLT /NOT CHANGE HALT
0232 2753 CHNHLT /COMPUTER MUST BE DOWN, CHECKSUM FAILED
0233 1712 BADHLT /BUT WORD-BY-WORD COMPARE WORKED.
/
0741 DSKP=6741 /SKIP ON TRANSFER DONE OR ERROR
0742 DCLR=6742 /CLEAR DISK CONTROL LOGIC
0743 DLAG=6743 /LOAD ADDRESS AND GO
0744 DLCA=6744 /LOAD CURRENT ADDRESS
0745 DRST=6745 /READ STATUS REGISTER
0746 DLDC=6746 /LOAD COMMAND REGISTER
0747 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
4432 SEEK=JMS I XSKOUT
4433 RANDEN=JMS I XRNDOM
4435 RESRAN=JMS I XRSRAN
4434 DISKGO=JMS I XOSKGO
4436 RECAL=JMS I XRESTR
4437 RECEIVE=JMS I XWAIT
4441 ERRDR=JMS I XERRD
4442 ROSTAT=JMS I XROST
4446 LDADD=JMS I XLDD
4443 DSKSP=JMS I XSDKP
4444 LDCM=JMS I XLDCM
4445 LDCUR=JMS I XLCCA
4450 CLRALL=JMS I XCLDR
4447 LDMAN=JMS I XLDMN
4451 PRNTR=JMS I XPRN

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```

4452 OCTEL=JMS I XPROCT
4440 TYPE=JMS I XPRINT
4453 CRLF=JMS I XCRLF
4420 GENDAT=JMS I XGNDAT
/
0000 /
/
0000 /
/
0001 0001 0001 /INTERRUPT SERVICE RETURN
0002 0002 0002 /DCA SAVAC SAVE AC AT INT.
0003 0003 0003 /RAL SHIFT LINK AT TIME OF INT.
0004 0004 0004 /DCA SVLWK SAVE LINK AT TIME OF INT.
0005 0005 0005 /JMP I 0 RETURN TO INT. SERVICE
/RETURN POINTER
/
0010 *10
/
0010 0000 AUTO10, 0
/
0011 0000 AUTO11, 0
/
0012 0000 AUTO12, 0
/
/
0013 0000 K0020, 0000
0014 0000 K0040, 0040
0015 0100 K0100, 0100
0016 0200 K0200, 0200
/
0020 *20
/
0020 1741 XGNDAT, GNDAT
0021 2600 XRNWRD, RNWRD
0022 2627 XDUMP, DUMP
0023 1554 XSPAC, SPAC
0024 2400 XOCT1, OCT1
0025 2430 XOCT4, OCT4
0026 1755 XSTGEN, STGEN
0027 2673 XSTFLD, STFLD
0030 2150 XCKPOT, CKKPT
0031 2127 XCHKYN, CHKYN
0032 2307 XSKOUT, SKOUT
0033 1717 XRNDOM, RNDOM
0034 2283 XOSKGO, OSKGO
0035 1763 XRSRAN, RSRAN
0036 3147 XRESTR, RSTR
0037 2117 XWAIT, WAIT
0040 2620 XPRINT, PRINT
0041 1200 XERRD, ERRO
0042 2543 XROST, ROST
0043 2720 XSDKP, SDKP
0044 2725 XLDCM, LDCM
0045 2552 XLCCA, LCCA
0046 2556 XLDD, LDD
0047 1404 XLDMN, LDHN
0050 1402 XCLDR, CLDR

```


/	PAL10	V142	16-JUL-73	17142	PAGE 1-4
	0216	3003	DCA	3	/SETUP SAVE LINK
	0217	1363	TAD	K5405	
	0220	3004	DCA	4	/SETUP JMP RETURN
	0221	1366	TAD	RRKRET	
	0222	3005	DCA	5	/RETURN POINTER
	0223	1101	/		
	0224	3112	STRTX, TAD	K7700	
	0225	1775	DCA	TRASH1	/CLEAR COUNTER
	0226	3774	TAD	RANJHS	
	0227	7340	DCA	SWDAT	/SET INSTRUCTION SWITCH
	0230	1353	CLA CLL	CHM	
	0231	3010	TAD	TIMPOT	
	0232	3410	DCA	AUTO10	/LOCATION POINTER
	0233	2112	DCA I	AUTO10	/CLEAR
	0234	5032	ISZ	TRASH1	
	0235	3160	JMP	,=2	/MORE TO CLEAR
			DCA	DATFLG	
	0236	4453	/		
	0237	4451	CRLF		
	0240	3310	PRINTER		/PRINT "RKBE DATA RELIABILITY"
	0241	4451	HES1		
	0242	3344	PRINTER		/PRINT "AMOUNT OF MEMORY"
	0243	4424	HES3		
	0244	0070	ONEIN		/RECEIVE ONE OCTAL
	0245	5241	0070		/LIMITS
	0246	7004	JMP	,=4	/INPUT ERROR
	0247	7006	KROT, RAL		
	0250	7040	RTL		
	0251	3145	CHM		/COMPARE
	0252	4451	DCA	MAXFLD	/MAXIMUM FIELD POINTER
	0253	3323	ALLAGN, PRINTER		/PRINT "EXERCISE"
	0254	3112	HES2		
	0255	1110	DCA	TRASH1	
	0256	3113	TAD	M4	
	0257	3055	DCA	TRASH2	
	0260	1112	DCA	AMOUNT	/A FEW POINTERS
	0261	1156	NEXT, TAD	TRASH1	
	0262	3114	TAD	RUNPOT	
	0263	7340	DCA	TRASH3	/SAVE RUN POINTER
	0264	4451	CLA CLL	CHM	
	0265	3332	PRINTER		/PRINT "DISK"
	0266	1065	HES3		
	0267	1112	TAD	K0260	
	0270	4440	TAD	TRASH1	/ADD IN DISK NUMBER
	0271	1071	TYPE		/TYPE DISK NUMBER
	0272	4440	TAD	K0277	
	0273	4437	TYPE		/TYPE ?
	0274	4431	RECEIV		/RECEIVE KEY INPUT
	0275	5252	YESNO		/WAS IT YES OR NO
	0276	5301	JMP		/NEITHER
	0277	2055	JMP	,=3	/WAS A NO
	0300	7340	ISZ	AMOUNT	/AMOUNT OF DISK FOUND
	0301	3014	CLA CLL	CHM	/AC TO 7777 FOR EXISTING DISK
	0302	2112	DCA I	TRASH3	/SETUP RUN POINTER
			ISZ	TRASH1	

/	PAL10	V142	16-JUL-73	17142	PAGE 1-5
	0303	2113	ISZ	TRASH2	
	0304	5262	JMP	NEXT	/ASK ABOUT NEXT DISK
	0305	1055	/		
	0316	7050	TAD	AMOUNT	/GET AMOUNT FOUND
	0317	5023	SMA CLA		/WERE ANY FOUND
	0318	4451	JMP	STRTX	/OPERATOR ERROR NO DISK INPUT
	0319	3360	PRINTER		/PRINT "ACCEPT MODE?"
	0320	4437	HES6		
	0321	4431	RECEIV		/RECEIVE INPUT
	0322	4431	YESNO		/YES OR NO???
	0323	5317	JMP		/NEITHER ALL AGAIN
	0324	5310	JMP	,=4	/MANUAL TEST
	0325	7010	SKP CLA		/ASK "ARE YOU SURE"
	0326	5773	JMP	ASKSUR	
	0327	4451	/		
	0328	3407	HANUAL, PRINTER		/PRINT "FIELD?"
	0329	4437	HES8		
	0330	4431	RECEIV		/RECEIVE Y OR N
	0331	5317	YESNO		/CHECK FOR Y OR N
	0332	5342	JMP	HANUAL	/NEITHER Y OR N
	0333	5342	JMP	ASKNX1	/WAS A Y, ASK ABOUT NEXT
	0334	4423	SPACE		/SPACE OUT ONE
	0335	4424	ONEIN		/GET 1 OCTAL
	0336	0070	0070		/LIMITS
	0337	5317	JMP	HANUAL	/INPUT ERROR ASK AGAIN
	0338	7204	CLA CLL	RAL	
	0339	7006	RTL		
	0340	3161	DCA	SPFLD	/SAVE INPUT
	0341	1161	TAD	SPFLD	
	0342	1245	TAD	MAXFLD	/COMPARE TO MAXIMUM
	0343	7700	SMA CLA		/O.K.?
	0344	5317	JMP	HANUAL	/INPUT ERROR
	0345	7340	CLA CLL	CHM	
	0346	3772	DCA	FLOFLG	/SETUP FIELD FLAG
	0347	4451	/		
	0348	3413	ASKNX1, PRINTER		/PRINT "TRACK?"
	0349	4437	HES9		
	0350	4431	RECEIV		/RECEIVE Y OR N
	0351	5342	YESNO		/CHECK FOR Y OR N
	0352	5773	JMP	ASKNX1	/ERROR, ASK AGAIN
	0353	4423	JMP	ASKNX2	/N, ASK ABOUT NEXT
	0354	4424	SPACE		
	0355	7010	ONEIN		/RECEIVE 1 IN OCTAL
	0356	9342	0070		/LIMITS
	0357	9342	JMP	ASKNX1	/ERROR, ASK AGAIN
	0358	9342	DCA	SPTRK1	/SAVE EXTENDED TRACK BIT
	0359	9342	FORIN		/RECEIVE FOUR IN OCTAL
	0360	9342	JMP	ASKNX1	/ERROR, ASK AGAIN
	0361	9342	DCA	SPTRK2	/SAVE CYL, SURFACE, AND SECTOR
	0362	3773	CLA CLL	CHM	
	0363	5773	DCA	TRKFLG	/SETUP TRACK FLAG
	0364	5773	JMP	ASKNX2	/ASK ABOUT NEXT
	0365	5405	/		
	0366	1171	K5405, DCA	SVLNK	
	0367	3170	LNKDC, DCA	SAVAC	

0366 2320 BRKRET, RETURN
/
0370 3547
0371 2400
0372 3546
0373 3520
0374 2601
0375 0554
0376 2003
0377 2733
0400

PAGE

0420 4451 ASKNX2, PRNTER
0421 3427 MES11
0422 4437 RECEIV
0423 4431 YESNO
0424 5200 JMP ASKNX2
0425 5217 JMP ASKNX3
0426 4423 SPACE
0427 4424 ONEIN
0428 0010
0429 5200 JMP ASKNX2
0430 7640 SZA CLA
0431 7340 CLA CLL CMA
0432 3165 DCA SPBLK
0433 7340 CLA CLL CMA
0434 3777 DCA KLFPLG

/PRINT "BLOCK LENGTH?"
/RECEIVE INPUT
/CHECK FOR Y OR N
/ERROR, ASK AGAIN
/N, ASK ABOUT NEXT
/Y, SPACE OUT 1
/RECEIVE 1 IN OCTAL
/LIMITS
/ERROR, ASK AGAIN
/SET HALF BLOCK?
/YES
/SETUP BLOCK NUMBER
/SETUP BLOCK FLAG

0417 4451 ASKNX3, PRNTER
0420 3417 MES10
0421 4437 RECEIV
0422 4431 YESNO
0423 5217 JMP ASKNX3
0424 5206 JMP ASKNX4
0425 4423 SPACE
0426 4424 ONEIN
0427 0010
0428 5217 JMP ASKNX3
0429 7104 CLL RAL
0430 7006 RTL
0431 3164 DCA SPSEC
0432 4424 ONEIN
0433 0070
0434 5217 JMP ASKNX3
0435 1164 TAD SPSEC
0436 3164 DCA SPSEC
0437 1165 TAD SPBLK
0438 7640 SZA CLA
0439 5246 JMP 143
0440 1161 TAD SPFLD
0441 7640 SZA CLA
0442 1062 TAD K0010
0443 1061 TAD K0007
0444 7140 CLL CMA
0445 1164 TAD SPSEC

/PRINT "SECTOR SECTORS?"
/RECEIVE INPUT
/CHECK FOR Y OR N
/INPUT ERROR
/N, ASK ABOUT NEXT
/SPACE OUT 1
/RECEIVE 1 IN OCTAL
/LIMITS
/ERROR, ASK AGAIN
/SAVE 1Y
/RECEIVE 1 IN OCTAL
/LIMITS
/INPUT ERROR, ASK AGAIN
/ADD IN LAST
/SAVE ALL
/BLOCK LENGTH 0777?
/NO LIMIT IS 17.
/FIELD 0777?
/LIMIT IS 17.
/COMPARE SECTOR INPUT

0452 7630 SZA CLA
0453 5217 JMP ASKNX3
0454 7340 CLA CLL CMA
0455 3776 DCA SECFLG
/
0456 3776 ASKNX4, TAD TRKFLG
0457 7640 SZA CLA
0458 5271 JMP ASKNX5
0459 4451 PRNTER
0460 3436 MES12
0461 4437 RECEIV
0462 4431 YESNO
0463 5256 JMP ASKNX4
0464 5271 JMP ASKNX5
0465 7340 CLA CLL CMA
0466 3774 DCA SECFLG

/IN LIMITS???
/NO, INPUT ERROR
/SETUP SECTOR FLAG
/SET TRACK FLAG
/NO LIMIT??
/NO, INPUT ERROR
/PRINT "SEQUENCE"
/RECEIVE INPUT
/Y OR N
/ERROR, ASK AGAIN
/N, ASK ABOUT NEXT
/SETUP SEQUENCE FLAG

0471 4451 ASKNX5, PRNTER
0472 3443 MES13
0473 1354 TAD RANJMS
0474 3773 DCA SWDAT
0475 4437 RECEIV
0476 4431 YESNO
0477 5271 JMP ASKNX5
0478 5320 JMP ASKSUR
0479 1340 TAD KSKP
0480 3773 DCA SWDAT
0481 1117 TAD 112
0482 3112 DCA TRASH1
0483 7340 CLA CLL CMA
0484 1152 TAD DATPOT
0485 3010 DCA AUTO10
0486 4453 ORLT
0487 4425 FORIN
0488 5271 JMP ASKNX5
0489 3410 DCA I AUTO10
0490 2112 ISZ TRASH1
0491 5310 JMP 145
0492 7340 CLA CLL CMA
0493 3160 DCA DATFLG
0494 4451 ASKSUR, PRNTER
0495 3446 MES14
0496 4437 RECEIV
0497 4431 YESNO
0498 5320 JMP ASKSUR
0499 5772 JMP STRTEX

/PRINT "DATA?"
/SET INSTRUCTION SWITCH
/RECEIVE INPUT
/Y OR N
/ERROR, ASK AGAIN
/ASK "ARE YOU SURE"
/SET INSTRUCTION SWITCH
/SETUP WORD COUNTER
/GET POT POINTER
/RECEIVE 4 IN OCTAL
/INPUT ERROR, ASK AGAIN
/SAVE DATA
/UPDATE COUNTER
/GET NEXT
/SETUP DATA FLAG
/PRINT "ARE YOU SURE?"
/GET INPUT
/Y OR N
/INPUT ERROR
/ASK AGAIN

/SEND EXISTING DRIVES TO A RANDOM TRACK
/AND SAVE THE TRACK ADDRESS

0526 3112 STRSEK, DCA TRASH1
0527 1755 TAD AMOUNT
0528 7041 CIA
0529 3113 DCA TRASH2

/SOME POINTERS

```

0572 1112 XTSEK, TAD TRASH1
0573 1113 JUMP SECHK
0574 0352 JUMP XTSEK
0575 1112 RESET, TAD TRASH1
0576 7104 CLL RAL
0577 4432 RECAL
0578 7610 SKP CLA
0579 0347 JMP NTSEK *3
0580 1112 TAD TRASH1
0581 7104 CLL RAL
0582 4432 SEEK
0583 7610 SKP CLA
0584 0335 JMP
0585 2113 RESET
0586 7610 ISZ TRASH2
0587 0347 SKP CLA
0588 0347 JMP RUN
0589 2112 NTSEK, ISZ TRASH1
0590 0332 JMP NXTSEK
0591 4420 /
0592 4420 /
0593 4420 /
0594 4420 /
0595 4420 /
0596 4420 /
0597 4420 /
0598 4420 /
0599 4420 /
0600 4420 /
0601 4420 /
0602 4420 /
0603 4420 /
0604 4420 /
0605 4420 /
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PAGE

/

/RUNNER FOR RANDOM DATA

/

```

0620 3168 RUN, DCA ERFLG
0621 7604 LAS
0622 0014 AND K0240
0623 3167 DCA SEKSW
0624 1167 TAD SEKSW
0625 7640 SEA CLA
0626 0377 JMP POLNEX
0627 1776 TAD FLOFLG
0628 7650 SNA CLA
0629 0314 JMP *3
0630 1161 TAD SPFLD
0631 0333 JMP RNFLD
0632 7301 CLA CLL
0633 1145 TAD MAXFLD
0634 7650 SNA CLA
0635 0333 JMP RNFLD
0636 4433 RANGEN
0637 7064 AND K0277
0638 7450 SNA
0639 0333 JMP RNFLD
0640 3140 DCA INTCH
0641 1140 TAD INTCH
0642 1140 TAD MAXFLD
0643 3168 /
0644 7604 /
0645 0014 /
0646 3167 /
0647 1167 /
0648 7640 /
0649 0377 /
0650 1776 /
0651 7650 /
0652 0314 /
0653 1161 /
0654 0333 /
0655 7301 /
0656 1145 /
0657 7650 /
0658 0333 /
0659 4433 /
0660 7064 /
0661 7450 /
0662 0333 /
0663 3140 /
0664 1140 /
0665 1140 /
0666 1140 /
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0713 1140 /
0714 1140 /
0715 1140 /

```

/CLEAR ERROR POINTER

/MASK SWITCH 6

/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 0234 JHP RNFLD *3
0629 1145 TAD MAXFLD
0630 7040 CMA
0631 3140 RNFLD, DCA INTCH
0632 1775 TAD HLFPLG
0633 7650 SNA CLA
0634 4433 RANGEN
0635 1165 TAD SPBLK
0636 0015 AND K0100
0637 1140 TAD INTCH
0638 3140 DCA INTCH
0639 1140 TAD INTCH
0640 0015 AND K0100
0641 7640 SEA CLA
0642 1016 TAD K0200
0643 1176 TAD K7400
0644 3113 DCA TRASH2
0645 1123 TAD TRASH2
0646 7041 CIA
0647 0345 UPDATE
0648 3145 DCA INTCH
0649 1140 TAD INTCH
0650 0360 AND A0177
0651 7640 SEA CLA
0652 1062 TAD K0210
0653 1061 TAD K0007
0654 3112 DCA TRASH1
0655 1774 TAD SECFLG
0656 7650 SNA CLA
0657 4433 RANGEN
0658 1164 TAD SPSEC
0659 0112 AND TRASH1
0660 3151 DCA CONSEC
0661 1151 TAD CONSEC
0662 7040 CMA
0663 3112 DCA TRASH1
0664 1773 TAD TRXFLG
0665 7650 SNA CLA
0666 4433 RANGEN
0667 1163 TAD SPTRK2
0668 0060 AND K0217
0669 3114 DCA TRASH3
0670 1113 TAD TRASH2
0671 2112 ISZ TRASH1
0672 0301 JMP *2
0673 3131 DCA WREG
0674 4433 RANGEN
0675 3130 DCA CAREG
0676 1140 TAD INTCH
0677 0064 AND K0070
0678 7640 SEA CLA
0679 0330 JHP FILLER
0680 1150 TAD GENBUF
0681 7140 CMA CLL
0682 1130 TAD 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

/ARE 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 00

/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 0,K,****

5


```

/ PAL12 V142 16-JUL-73 17142 PAGE 1-12

1173 7727 DMA CLA /LOOP SWITCH SET???
1174 7727 JMP REREAD /NO
1175 7747 CLA CLL CMA /SET ERROR FLAG
1176 3166 DCA ERFLG /RESET DATA GENERATOR
1177 4435 RESRAN
1178 8776 JMP REFILL *2
1179 1267 REREAD, TAD TRYTIM
1172 3366 DCA TRYCNT /SETUP FOR 64 RETRY FROM RETRY
1173 3166 DCA ERFLG /CLEAR ERROR FLAG
1174 1110 TAD M4
1175 3141 DCA STATRY /SETUP TRY COUNTER
1176 1110 TAD M4
1177 3142 DCA DATTRY /SETUP TRY COUNTER
1178 3157 RDTRY, DCA CRCFLG /CLEAR CRC FLAG
1179 4434 DISKGO /READ DATA
1180 8400 8400 /READ DATA POINTER
1181 7610 SKP CLA /DATA READ O.K.
1182 5322 JMP ROSTA /STATUS ERROR
1183 4775 JMS DTCHK /CHECK DATA
1184 5336 JMS SEKGO /DATA O.K.
1185 2142 ISZ DATTRY /UPDATE READ RE*TRY
1186 5336 JMP RDTRY /TRY AGAIN
1187 5336 JMS SEKGO *1 /TRY TO SEEK IT
1188 1122 ROSTA, TAD STREG /GET STATUS READ
1189 8852 AND K0010 /MASK CRC
1190 7458 SNA /CRC ERROR???
1191 5332 JMS UPTRY *1 /NO, TRY READ AGAIN
1192 3157 DCA CRCFLG /CLEAR CRC FLAG
1193 4775 JMS DTCHK /CHECK DATA
1194 7617 SKP CLA /IS A HARD ERROR?
1195 7347 CLA CLL CMA /SETUP FOR 64 RETRY
1196 3166 DCA ERFLG /UPDATE TRY POINTER
1197 2141 UPTRY, ISZ STATRY /TRY AGAIN
1198 5310 JMS RDTRY /IS A HARD ERROR
1199 3166 DCA ERFLG /CHECK TIME POINTERS
1200 4774 SEKGO, JMS CKTIM
1201 1166 TAD ERFLG
1202 7650 SNA CLA /IS IT 64 RETRY FOR SOFT ERROR?
1203 5344 JMS *3 /NO, DON'T BOTHER
1204 2366 ISZ TRYCNT /YES, UPDATE RETRY COUNTER
1205 5304 JMS REREAD *3 /TRY AGAIN
1206 7604 LAS /GET SWITCH 1
1207 7104 CLL RAL
1208 7710 SPA CLA /LOOP???
1209 5301 JMS REREAD /YES, LOOP
1210 3166 RESECK, DCA ERFLG /CLEAR ERROR FLAG
1211 7604 LAS
1212 2872 AND K0400 /MASK
1213 7650 SNA CLA /TYPE STATUS REPORT???
1214 5357 JMS *3 /NO
1215 4453 CRLF /YES
1216 4773 JMS TPSTA /GET DRIVE NUMBER
1217 1123 TAD CMREG /SEEK A RANDOM TRACK
1218 4432 SEEK /DO NEXT DRIVE
1219 5772 JMS RUN

```

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/ PAL12 V142 16-JUL-73 17142 PAGE 1-13

1162 1123 TAD CMREG
1163 4436 RECAL
1164 5357 JMS *3
1165 5772 JMS RUN /PRECALIBRATE DRIVE
/TRY, SEEK AGAIN
/LOADED, BUT MORE AVAILABLE

1166 8800 /TRYCNT, 0
/

1172 8600
1173 3000
1174 2450
1175 1600
1176 8731
1177 8733
1178 1200 PAGE
/
/SUBROUTINE FOR ERROR TYPEOUTS.
/

1200 8800 ERRO, 0
1201 7001 JAC
1202 3164 DCA PCNTR2 /UPDATE AC FLAG
1203 1356 TAD K7771 /SAVE AC FLAG
1204 3366 DCA PCNTR3 /LINE COUNTER
1205 1123 TAD CMREG /GET LAST COMMAND
1206 8800 AND K0006 /MASK DRIVE NUMBER
1207 7170 CLL CHL CMA RAR /SETUP COUNTER
1208 3363 DCA PCNTR1
1209 1856 TAD K0003
1210 2363 ISZ PCNTR1
1211 5211 JMS *2 /COMPUTE WAY TO BUFFER
1212 1154 TAD STAPOT /POINTER TO BUFFER
1213 3363 DCA PCNTR1 /GET CRC FLAG
1214 1157 TAD CRCFLG /CRC ERROR???
1215 7652 SNA CLA /NO WAY
1216 5232 JMS NOCRC /CLEAR CRC ERROR POINTER
1217 3157 DCA CRCFLG
1218 7001 JAC
1219 1141 TAD STATRY /LAST TIME CRC???
1220 7400 SNA CLA /YES!!!!
1221 5236 JMS NONCRC
1222 7340 CLA CLL CMA /REDUCE HARD ERROR COUNT
1223 1763 TAD PCNTR1
1224 3763 DCA PCNTR1 /YES, UPDATE POINTER
1225 2363 ISZ PCNTR1
1226 7342 NOCRC, CLA CLL CMA /UPDATE ERROR COUNT
1227 2763 ISZ PCNTR1
1228 7410 SKP CLA /HOLD AT 7777
1229 3763 DCA PCNTR1
1230 7504 NONCRC, LAS
1231 7106 CLL RTL
1232 7710 SPA CLA /INHIBIT ERRORS???
1233 5342 JMS ERREG /YES
1234 2620 DOWEAD, TAD ERRO /GET NEXT POINTER
1235 7540 SZA CLA /DATA ERROR?
1236 5247 JMS *3 /NO WAY
1237 4760 JMS PRNDAT /PRINT ONLY DATA

```

```

1246 5342      JMP      ERROEX      /EXIT
1247 4777      JMS      RCMSS      /READ COMMAND AND SURFACE
1250 4453      CRLF
1251 4453      CRLF
1252 1364      TAD      PCNTR2      /GET NON-RECOV. FLAG
1253 7648      SZA      CLA      /WAS IT SET?
1254 5260      JMP      1,+4      /NO DON'T TYPE IT
1255 7340      CLA      CLL      CMA
1256 4451      PRNTER      /PRINT "NON-RECOVERABLE "
1257 3333      MES4
1260 1600      TAD      I      ERRO
1261 3776      DCA      SDKP
1262 1776      TAD      SDKP
1263 1364      TAD      HEDTAD      /MAKE ERROR HEADER TAD
1264 1265      DCA      1,+1
1265 7472      HLT
1266 3271      DCA      1,+3      /MODIFIED HEADER TAD
1267 7340      CLA      CLL      CMA
1270 4451      PRNTER      /PRINT HEADER
1271 7402      HLT
1272 7340      CLA      CLL      CMA
1273 4451      PRNTER      /PRINT "ERROR"
1274 1274      MES0
1275 4453      CRLF
1276 1200      TAD      ERRO
1277 3121      DCA      PCREG      /SAVE PC
1280 2200      ISZ      ERRO
1281 1600      TAD      I      ERRO
1282 3355      DCA      ESARE
1283 2200      ISZ      ERRO      /UPDATE PC RETURN
1284 1361      TAD      XTEXT
1285 3364      DCA      PCNTR2
1286 1362      TAD      XREG
1287 3810      DCA      AUTO10
1288 1357      TAD      K7764
1289 3343      DCA      PCNTR1      /COUNTER FOR # OF HEADS
1290 1355      TAD      ESARE      /GET TEXT POINTER
1291 7500      SWA
1292 5347      JMP      NOTEX      /NOT THIS ONE
1293 7104      CLL      RAL
1294 3355      DCA      ESARE
1295 2345      ISZ      PCNTR3      /UPDATE LINE FILL COUNTER
1296 7610      SKP      CLA      /NO CRLF
1297 4453      CRLF
1298 1364      TAD      PCNTR2      /GET TEXT MESSAGE POINTER
1299 2364      ISZ      PCNTR2
1300 2364      ISZ      PCNTR2
1301 3330      DCA      1,+3      /STORE FOR PRINTER
1302 7340      CLA      CLL      CMA
1303 4451      PRNTER      /PRINT XXI
1304 7402      HLT
1305 1410      TAD      I      AUTO10      /MODIFIED TEXT POINTER
1306 4452      OCTEL      /PRINT FOUR OCTAL
1307 2363      ISZ      PCNTR1      /CHECK FOR NEXT XXI
1308 5312      JMP      STRAUT

```

```

1335 1776      TAD      SDKP
1336 1111      TAD      M5
1337 7650      SNA      CLA      /FIRST DATA ERROR?
1338 4760      JMS      PRNDAT      /YES, PRINT DATA
1339 5344      JMP      1,+3
1340 2277      ERROEX, ISZ      ERRO
1341 2277      ISZ      ERRO
1342 7331      CLA      CLL      IAC
1343 4450      CLRAL
1344 5600      JMP      I      ERRO
1345 7104      NOTEX, CLL      RAL
1346 3355      DCA      ESARE
1347 2364      ISZ      PCNTR2
1348 2364      ISZ      PCNTR2
1349 2810      ISZ      AUTO10
1350 5333      JMP      AGAIN
/
1355 2277      ESARE, 0
1356 7771      <7771, 7771
1357 7764      K7764, 7764
1358 3133      PRNDAT, TYPDAT
1359 3204      XTEXT, TEXPC
1360 2120      XREG, PCREG =1
1361 2000      PCNTR1, 0
1362 2000      PCNTR2, 0
1363 2000      PCNTR3, 0
1364 1366      HEDTAD, TAD      HEDTAD
1365 1366      ERTX1
1366 1366      ERTX2
1367 3257      ERTX3
1368 3257      ERTX4
1369 3277      ERTX5
/
1376 2720      PAGE
1377 1410      /SUBROUTINE TO ISSUE "DCLR" CLEAR IOT
1378 1422      /
1379 0000      CLDR, 0
1380 6742      IOT2, DCLR      /DCLR "CLEAR IOT"
1381 5600      JMP      I      CLDR      /EXIT
1382 7402      ERHLT2, HLT      /SKIP TRAP
/
1383 7000      /ROUTINE TO LOAD MAINTENANCE REGISTER
1384 6747      LDHN, 0
1385 6747      IOT7, DMAN
1386 5604      JMP      I      LDHN      /MAINTENANCE IOT
1387 7402      ERHLT7, HLT      /EXIT
/
1388 7402      /ROUTINE TO CLEAR THE BUFFERS OUT, THEN
1389 7402      /READ THE COMMAND REGISTER AND THE SURFACE
1390 7402      /AND SECTOR REGISTER.
/

```

```

1410 2000 RCMSS, B
1411 1513 TAD M4
1412 3274 DCA FROCT /SETUP FOUR READ COUNTER
1413 4448 LDCUR /LOAD CURRENT ADDRESS
1414 7032 CLA CLL CHL RAR /ENABLE SET MAINTENANCE
1415 1447 LDMAN /LOAD MAINTENANCE
1416 7032 CLA CLL CHL RTR
1417 4447 LDMAN /BREAK IF LAST BREAK WAS READ
1420 7032 CLA CLL CHL RTR
1421 4447 LDMAN /LOAD MAINTENANCE
1422 7000 CLA CLL
1423 1013 TAD K0020 /ENABLE READ BUFFER
1424 4447 LDMAN /READ AND CLEAR BUFFER
1425 2274 ISZ FROCT /UPDATE COUNTER
1426 5200 JMP .+6
1427 7000 CLA CLL
1430 1507 TAD M12 /SETUP BIT COUNTER
1431 3274 DCA FROCT /ENABLE SET DB4=1
1432 7032 CLA CLL CHL RTR /LOAD MAINTENANCE
1433 4447 LDMAN /ENABLE SHIFT COMMAND
1434 7012 RTR /LOAD MAINTENANCE
1435 4447 LDMAN /UPDATE BIT COUNTER
1436 2274 ISZ FROCT /MORE BITS TO SHIFT
1437 5235 JMP .+2
1440 7000 CLA CLL
1441 1013 TAD K0023 /ENABLE READ LOWER BUFFER
1442 4447 LDMAN /LOAD MAINTENANCE
1443 3124 DCA MHREG /SAVE COMMAND READ
1444 1507 TAD M12
1445 3274 DCA FROCT /SETUP COUNTER
1446 7032 CLA CLL CHL RTR /ENABLE SET DB4=1
1447 4447 LDMAN /LOAD MAINTENANCE
1448 7000 CLA CLL
1451 1516 TAD K0020 /ENABLE SHIFT SURFACE AND SECTOR
1452 4447 LDMAN /LOAD MAINTENANCE
1453 2274 ISZ FROCT /UPDATE BIT COUNTER
1454 5252 JMP .+2 /MORE BITS TO GO
1455 7000 CLA CLL
1456 1013 TAD K0020 /ENABLE READ LOWER BUFFER
1457 4447 LDMAN /LOAD MAINTENANCE
1458 3127 DCA SSREG /SAVE SURFACE AND SECTOR
1461 5610 JMP I RCMSS /EXIT

/ROUTINE TO DO CRLF
/
1462 2000 UPONE, 2
1463 7000 CLA CLL
1464 1272 TAD K0215
1465 4448 TYPE K0212
1466 1273 TAD K0212
1467 4448 TYPE
1470 4448 TYPE
1471 5662 JMP I UPONE

1472 0215 K0215, 0215

```

```

1473 2212 K0212, 2212
/ROUTINE TO PRINT FOUR OCTAL
/
1474 2000 FROCT, B
1475 7000 RTL
1476 7000 RTL
1477 3262 DCA UPONE
1500 1510 TAD M4
1501 3316 DCA PRN
1502 1262 TAD UPONE
1503 0061 AND K0007
1504 1065 TAD K0260
1505 4448 TYPE
1506 1262 TAD UPONE
1507 7000 RTL
1510 7000 RAL
1511 3262 DCA UPONE
1512 2516 ISZ PRN
1513 5002 JMP .+11
1514 4423 SPACE
1515 5674 JMP I FROCT

/SUBROUTINE TO PRINT TEXT
/
1516 2000 PRN, B
1517 7000 SNA CLA /TYPE CRLF
1520 4453 CRLF /YES!!!!
1521 1716 TAD I PRN /GET POINTER

1522 2016 ISZ PRN
1523 3274 DCA FROCT
1524 7000 CLA CLL
1525 1674 TAD I FROCT
1526 7101 AND K7700
1527 7458 SNA
1530 5052 JMP EXIT
1531 7500 SNA
1532 7020 CHL
1533 7001 IAC
1534 7012 RTR
1535 7012 RTR
1536 7012 RTR
1537 4448 TYPE
1540 1674 TAD I FROCT
1541 0184 AND K0077
1542 7458 SNA
1543 5352 JMP EXIT
1544 1361 TAD K0740
1545 7502 SNA
1546 1360 TAD K4100
1547 4423 SPACE /SPACE OUT 1
1550 2274 ISZ FROCT
1551 5024 JMP MRPRN /MORE TO PRINT
1552 7000 EXIT, CLA CLL

```

```

1553 5716      JMP I PRN
/
/ROUTINE TO SPACE OUT 1
/
1554 0000      SPAC, 0
1555 1000      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 7640      SPA CLA
1603 5212      JMP WRDCHK
1604 1144      TAD FNDSUM
1605 7041      CIA
1606 1143      TAD CHKSAV
1607 7650      SNA CLA
1608 5600      JMP I DTCHK
1609 7340      CLA CLL CMA
1610 3441      WRDCHK, DCA I XERRO
1611 1123      TAD CHREG
1612 0015      AND K0100
1613 7640      SZA CLA
1614 1016      TAD K0200
1615 1106      TAD K7400
1616 3113      DCA TRASH2
1617 1113      TAD TRASH2
1618 7040      CMA
1619 3316      DCA MSKER
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 RSRAN
1628 1129      TAD INTDA
1629 3355      DCA STGEN
1630 1363      DT1, TAD RSRAN
1631 0316      AND MSKER
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/GDF

```

```

/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 O.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
/GDF TO BUFFER FIELD

```

```

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 NTRKS
1659 1157      TAD CRCFLG
1660 7640      SZA CLA
1661 5272      JMP 1=5
1662 1142      TAD DATTRY
1663 7001      IAC
1664 7650      SNA CLA
1665 7340      CLA CLL CMA
1666 2200      ISZ DTCHK
1667 4441      ERROR
1668 0005      B005
1669 7774      7774
1670 2363      NOERR, ISZ RSRAN
1671 5304      JMP 1=5
1672 2355      ISZ STGEN
1673 7002      NOP
1674 1113      TAD TRASH2
1675 3363      DCA RSRAN
1676 2122      ISZ BUFTAL
1677 5236      JMP DT1
1678 2641      ISZ I XERRO
1679 5600      JMP I DTCHK
1680 7402      BADHLT, HLT
1681 5312      JMP 1=1
1682 4441      NTRKS, ERROR
1683 0002      B002
1684 0002      B002
1685 5276      JMP NOERR

```

```

/GET BAD DATA WORD
/NO, OK
/SAVE BAD WORD
/GET ADDRESS
/SAVE FOR POINTER
/GET DATA READ
/COMPARE TO GOOD VALUE
/WERE THEY THE SAME
/YES, NO ERROR
/FIRST TIME PRINT???
/NO, JUST ADDRESS AND DATA

```

```

/CRC ERROR???
/YES, YOU GOT IT
/NO
/UPDATE
/TIME TO SET NON-RECOVERABLE
/YES, SET IT
/UPDATE FOR ERROR RETURN
/ERROR DATA
/POINTER
/POINTER

```

```

/UPDATE BUFFER TALLY
/NO, WORDS TO CHECK
/CHECK FOR COMPUTER ERROR?
/ALL O.K.
/COMPUTER MUST BE DOWN, CHECKSUM
/FAILED WORD-BY-WORD COMPARE WORKED,
/OTHER ERRORS IN BUFFER

```

```

/CHECK REST OF BUFFER

```

```

1716 0000      / MSKER, 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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/ PAL10 V142 16-JUL-73 17142 PAGE 1-20

1732 7004 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 /EXIT, RANDOM NUMBER IN AC

/
/GENERATOR FOR RANDOM DATA
/
1741 0000 GNDAT, 0
1742 7501 CLA CLL IAC
1743 1371 TAD RAN1
1744 1372 TAD RAN2
1745 7506 CLL RTL
1746 3371 DCA RAN1
1747 1372 TAD RAN2
1750 7012 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 RSRAN, 0
1764 1373 TAD SAV1
1765 3371 DCA RAN1
1766 1374 TAD SAV2
1767 3372 DCA RAN2
1770 5763 JMP I RSRAN

/
1771 1234 RAN1, 1234
1772 5670 RAN2, 5670
/
1773 0000 SAV1, 0
1774 0000 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

```

```

/ PAL12 V142 16-JUL-73 17142 PAGE 1-21

2000 0000 /
2001 0000 /SEKOUT, 0
2002 5310 AND K0000 /MASK DRIVE NUMBER
2003 7004 STSTP, LAS /SAVE POINTER
2004 0010 AND K0200 /MASK
2005 7040 SZA CLA /PROGRAM STOP????
2006 7402 HLT /PROGRAM STOP ON SWITCH 4
2007 3397 DCA CROFLG /CLEAR CRC ERROR POINTER
2010 1310 RESEK, TAD WAIT
2011 7110 CLL RAR
2012 1100 TAD DSKPOT /GET ADDRESS SAVE POINTER
2013 3320 DCA CHKYN /SAVE MADE POINTER
2014 1777 TAD TRKFLG /GET TRACK FLAG
2015 7000 SNA CLA /WAS IT SET??
2016 5223 JMP 1,0 /NO, USE OTHER
2017 1103 TAD SPTRK2 /GET OPERATOR TRACK
2020 0402 AND K7760 /MASK
2021 1162 TAD SPTRK1 /GET OPERATOR TRACK
2022 5204 JMP DSKOUT =2 /DO IT
2023 1776 TAD SEQFLG /GET SEQUENCE FLAG
2024 7000 SNA CLA /WAS IT SET??
2025 5233 JMP 1,0 /NO, USE RANDOM
2026 1727 TAD I CHKYN /GET LAST USED
2027 1013 TAD K0020 /UPDATE
2028 7430 S2L /LINK SET?
2031 7001 JAC /YES, SET EXTENDED BIT
2032 7410 SKP /UPDATE AND CHECK BOUNDARIES
2033 4433 RANGEN /GENERATE RANDOM ADDRESS
2034 0000 AND K7761 /MASK OFF
2035 1310 TAD WAIT /ADD IN DRIVE NUMBER
2036 3727 DCA I CHKYN /SAVE MADE ADDRESS
2037 1727 TAD I CHKYN
2040 7110 CLL RAR
2041 7000 SNA CLA /WAS IT SET
2042 5200 JMP DSKOUT /NO, DON'T CHECK LIMITS
2043 1147 TAD MAXTRK /ADD IN FUDGE FACTOR
2044 1727 TAD I CHKYN /GET ADDRESS FOUND
2045 7000 S2L CLA /IN LIMITS?
2046 5200 JMP DSKOUT /YES, O.K.
2047 1776 TAD SEQFLG /GET SEQUENCE FLAG
2050 7040 SZA CLA /WAS IT SET????
2051 5204 JMP DSKOUT =2 /DO
2052 1727 TAD I CHKYN /NO
2053 0102 AND K7760 /MASK
2054 1310 TAD WAIT /ADD IN DRIVE NUMBER
2055 3727 DCA I CHKYN /SAVE IT NOW
2056 1727 TAD I CHKYN /GET ADDRESS
2057 0000 AND K0000 /MASK DRIVE NUMBER + EXTENDED
2060 1377 TAD K3002 /FUNCTION SEEK ONLY
2061 4444 LDCHD /LOAD COMMAND
2062 1727 TAD I CHKYN /GET ADDRESS
2063 0102 AND K7760
2064 4444 LOADD /LOAD DISK ADDRESS + GO
2065 4443 DSKSKP /WAIT FOR DONE FLAG

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2266 5265 JNP ,=1
2267 4442 RDSTAT
2270 7530 SMA
2271 5275 JNP SEKER
2272 2075 AND K1777
2273 7650 SNA CLA
2274 5301 JNP SEKEX
2275 4441 SEKER, ERROR
2276 2033 R033
2277 7542 7540
2280 2280 ISZ SEKOUT
2281 4452 SEKEX, CLRALL
2282 5600 JNP I SEKOUT

/ROUTINE TO GET AC
/
2103 0000 GETAC, B
2104 1171 TAD SVLNK
2105 7110 CLL RAR
2106 1170 TAD SAVAC
2107 5783 JNP I GETAC

/ROUTINE TO WAIT FOR KEY FROM OPERATOR
/
2110 0000 WAIT, B
2111 7380 CLA CLL
2112 6332 RCC
2113 6031 KSF
2114 5313 JNP ,=1
2115 6036 KRS
2116 7325 AND K177
2117 1326 TAD K200
2120 6046 TFS
2121 6041 TSF
2122 5321 JNP ,=1
2123 6042 TCF
2124 5710 JNP I WAIT /EXIT

/
2125 0177 K177, 0177
2126 2200 K200, 0200

/ROUTINE TO CHECK FOR YES OR NO
/
2127 0000 CHKYN, B
2130 3310 DCA WAIT /SAVE POINTER
2131 1327 TAD CHKYN /GET PC STORED
2132 3350 DCA CHKPOY /SAVE IT
2133 1310 TAD WAIT
2134 2327 ISZ CHKYN
2135 7041 CIA
2136 1207 TAD K0316
2137 7650 SNA CLA /WAS IT A NO
2140 5727 JNP I CHKYN /YES
2141 1310 TAD WAIT
2142 2327 ISZ CHKYN

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2143 7041 CIA
2144 1070 TAD K0331
2145 7650 SNA CLA /WAS IT A YES
2146 5727 JNP I CHKYN /YES
2147 5750 JNP I CHKPOY /WAS NEITHER

/ROUTINE TO CHECK DISK RUN POINTERS
/
2150 0000 CHKPOY, B
2151 0056 AND K0003
2152 1156 TAD RUNPOY
2153 3310 DCA WAIT
2154 1710 TAD I WAIT /GET RUN POINTER
2155 7640 SZA CLA /RUN THIS DRIVE
2156 2350 ISZ CHKPOY /NO
2157 5750 JNP I CHKPOY /EXIT

/
2176 3552 PAGE
2177 3547 /
2200 /ROUTINE TO WRITE OR READ SECTORS SELECTED
/
2208 0000 OSKGO, B
2211 7340 CLA CLL CMA
2212 3172 DCA RELQAD /SETUP FIRST TIME POINTER
2213 7140 CLA CLL CMA
2214 3173 DCA FINTIM /SETUP FIRST TIME POINTER
2215 1130 TAD CAREG /GET INITIAL CURRENT ADDRESS
2216 4445 LDCUR /LOAD CURRENT ADDRESS
2217 1131 TAD WOREG
2218 3132 DCA FWREG /SETUP FINAL WC
2219 1125 TAD INTDA /GET INITIAL STARTING SECTOR
2220 3512 DCA TRASH1 /SAVE
2221 1125 TAD INTDA /GET DISK ADDRESS
2222 0102 AND K7760 /HASK
2223 3113 DCA TRASH2 /SAVE
2224 1140 TAD INTCH /GET INITIAL COMMAND
2225 1600 TAD I OSKGO /GET READ OR WRITE
2226 4444 LDCMD /LOAD COMMAND
2227 1112 TAD TRASH1 /SECTOR TO DO
2228 0063 AND K0017 /HASK
2229 1113 TAD TRASH2 /ADD TO TRACK
2230 4446 LDADD /LOAD AND GO
2231 6001 IGN /TURN INTERRUPT ON

/ROUTINE TO CLEAR OR CHECK SUM BUFFER IN BACK GROUND
/
2226 3777 GOBAK, DCA TIMER2 /CLEAR LONG TIMER
2227 3144 DCA FNDSUM /CLEAR SUM CHECK
2228 4427 SETFLD /GET FIELD TO BUFFER
2229 3252 DCA CHNCOF /SAVE COF
2230 1175 TAD FINTIM
2231 7650 SNA CLA /TIME TO GO
2232 5237 JNP STRWRK /YES!!!!

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PAL10	V142	16-JUL-73	17:42	PAGE 1-24
2235	4776	JMS	TIME	/WAIT FOR FIRST INTERRUPT
2236	5232	JMP	1=4	/NOT HERE YET
2237	1127	STRWRK, TAD	BUFTAL	
2240	7041	CIA		
2241	1132	TAD	FWREG	/COMPARE TO SOFTWARE FINAL
2242	7450	SNA		/WAIT FOR DISK????
2243	5272	JMP	WRKDON	/YES!!!!
2244	7041	CIA		
2245	3174	DCA	CLRBK	/SAVE DIFFERENCE
2246	1174	TAD	CLRBK	
2247	7041	CIA		
2250	1120	TAD	BUFTAL	
2251	3120	DCA	BUFTAL	/UPDATE BUFFER TALLY
2252	7422	CHNGDF, HLT		/CDF TO BUFFER FIELD
2253	1123	TAD	CHREG	
2254	7700	SHA CLA		/READ OR WRITE
2255	5262	JMP	WASRD	/WAS A READ??
2256	3411	DCA I	AUTO11	/WAS A WRITE, CLEAR BUFFER
2257	2174	ISZ	CLRBK	/UPDATE TALLY
2260	5256	JMP	GOCLR	/MORE TO CLEAR
2261	5272	JMP	WRKDON	/DONE WITH SOME
2262	1144	WASRD, TAD	FNDOSUM	
2263	7130	GOCHK, CLL		
2264	1411	TAD I	AUTO11	/GET WORD
2265	7430	SZL		
2266	7001	IAC		
2267	2174	ISZ	CLRBK	/UPDATE CLEAR POINTER
2270	5263	JMP	GOCHK	/MORE TO CHECKSUM
2271	3144	DCA	FNDOSUM	/SAVE IT
2272	6231	WRKDON, CDF		
2273	1120	TAD	BUFTAL	
2274	7650	SNA CLA		/LAST WORD DONE????
2275	5374	JMP	DSKEY	/EXIT
2276	4776	JMS	TIME	/TIME AND WAIT
2277	5237	JMP	STRWRK	/WAIT FOR INT. OR DONE!!!!
/				
/ INTERRUPT SERVICE				
/				
2320	6741	RETURN, DSKP		/DISK SKIP 107
2321	7610	SKP CLA		/NOT THE DISK
2322	5316	JMP	DSKRET	/GO DISK
2323	6031	KSF		/CHECK READER FLAG
2324	7610	SKP CLA		/NOT READER
2325	5312	JMP	KEYRET	/WAS THE READER
2326	6041	YSF		/CHECK PUNCH FLAG
2327	7422	INTER2, HLT		/UNDEFINED INTERRUPT
2328	6042	TCF		/WAS PUNCH, CLEAR FLAG
2329	5353	JMP	RETRN	/RETURN
2330	6034	KEYRET, KRS		/GET INPUT
2331	6046	TLS		/PRINT IT
2332	6032	KCC		/WAS CLEAR READER FLAG
2333	5353	JMP	RETRN	/RETURN TO DISK
2334	5173	DSKRET, DCA	FIRTIM	/CLEAR TIME POINTER
2335	2112	ISZ	TRASH1	/UPDATE SECTOR
2336	7000	NQP		

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2321	1115	TAD	UPDATE	
2322	1132	TAD	FWREG	/UPDATE WORD COUNT
2323	3132	DCA	FWREG	
2324	6745	STATUS, DRST		/READ STATUS
2325	3122	DCA	STREG	/SAVE READ FOR PRINTER
2326	1122	TAD	STREG	
2327	1073	TAD	K4000	
2328	7640	SZA CLA		/ONLY DONE FLAG
2329	5357	JMP	STATR	/STATUS ERROR
2330	6742	CLRSTA, DCLR	FWREG	/CLEAR STATUS
2331	1132	TAD		
2332	7640	SZA CLA		/LAST TRANSFER
2333	5341	JMP	GOAGN	/MORE TO TRANSFER
2334	4454	JMS I	XGETAC	/GET AC AND LINK
2335	8244	RMP		/RESTORE FIELDS
2336	5400	JMP I		/RETURN
2341	2172	GOAGN, ISZ	RELOAD	/CLEAR FIRST TIME POINTER
2342	5347	JMP	NEXSEC	/NOT FIRST TIME
2343	1074	TAD	K1000	/GET ALL FLAG
2344	1000	TAD I	OSKGO	/GET READ OR WRITE
2345	1140	TAD	INTCN	/ADD IN INITIAL
2346	4444	LDCHD		/RELOAD COMMAND REGISTER
2347	1112	NEXSEC, TAD	TRASH1	/GET SECTOR TO DO
2348	8003	AND	K0217	/MASK OFF
2349	1113	TAD	TRASH2	/ADD IN TRACK
2350	4446	LDADD		/LOAD AND GO TO DISK
2351	4454	RETRN, JMS I	XGETAC	/GET AC AND LINK
2352	8244	RMP		/RESTORE FIELDS
2353	6001	ION		/TURN INTERRUPT ON
2354	5400	JMP I		/EXIT
2355	1123	STATR, TAD	CHREG	/GET LAST COMMAND
2356	7710	SPA CLA		/WRITE OR READ
2357	7001	IAC		/WRITE
2358	7001	IAC		
2359	3370	DCA	1=0	/MODIFY HEADER POINTER
2360	7300	CLA CLL IAC		/AC TO 1
2361	1141	TAD	STATRY	/GET TRY POINTER
2362	7650	SNA CLA		/TIME TO SET IT????
2363	7040	CLA CLL DCA		/YES, SET NON-RECOVERABLE FLAG
2364	4441	ERROR		/PRINT MESSAGE
2365	2000	2000		/MODIFIED HEADER POINTER
2366	7774	7774		/MESSAGE POINTER
2367	2200	ISZ	DSKGO	/UPDATE FOR ERROR
2368	2200	ISZ	DSKGO	
2369	5600	JMP I	DSKGO	/EXIT
/				
2376	3122			
2377	3132			
2378	2400			
PAGE				
/ROUTINE TO GET ONE IN OCTAL				
/				
2420	0000			
2421	4437	RECEIV		/RECEIVE
2422	3365	DCA	ISAVES	/SAVE IT

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2403 1600 TAD I OCT1 /GET LIMITS
2404 0001 AND K0007 /MASK
2405 1005 TAD K0200
2406 7141 CLL CIA
2407 1305 TAD ISAVE1 /GET INPUT
2410 7620 SNL CLA /IN LIMITS???
2411 5226 JMP INERR /NO, ERROR EXIT
2412 1600 TAD I OCT1 /GET LIMITS
2413 0004 AND K0070 /MASK
2414 7110 CLL RAR
2415 7812 RTR
2416 1005 TAD K0200
2417 7000 CHA
2420 1305 TAD ISAVE1 /GET INPUT
2421 7630 SEL CLA /IN LIMITS???
2422 5226 JMP INERR /NO, ERROR
2423 1305 TAD ISAVE1 /GET INPUT
2424 0001 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 OCT4, 0
2431 1110 TAD M4
2432 3366 DCA ISAVE2 /SETUP COUNTER
2433 3367 DCA ISAVE3 /START WITH 0
2434 4424 ONEIN /RECEIVE ONE OCTAL
2435 0070 0070 /LIMITS
2436 5630 JMP I OCT4 /ERROR EXIT
2437 1367 TAD ISAVE3 /GET LAST
2440 2366 ISZ ISAVE2 /UPDATE COUNTER
2441 7410 SKP
2442 5246 JMP ,+4 /EXIT
2443 7804 RAL
2444 7000 RTL
2445 5233 JMP OCT4 +3
2446 2230 ISZ OCT4
2447 5630 JMP I OCT4 /EXIT OCTAL IN AC

/ROUTINE TO UPDATE AND CHECK FOR PASS COMPLETE
/
2450 0000 CKTIM, 0
2451 1123 TAD CHREG /GET CURRENT DRIVE NUMBER
2452 0000 AND K0000 /MASK
2453 7110 CLL RAR
2454 3366 DCA ISAVE2 /POINTER
2455 1366 TAD ISAVE2
2456 1193 TAD TIMPT /GET TIME POINTER
2457 3365 DCA ISAVE1 /SAVE IT
2458 7301 CLA CLL IAC /ONE FOR 0
2461 1191 TAD CONSEC /GET AMOUNT DONE
2462 1765 TAD I ISAVE1 /ADD IN AMOUNT COMPLETED SO FAR
2463 3765 DCA I ISAVE1 /SAVE IT

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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 1305 TAD ISAVE1
2474 1057 TAD K0004
2475 3365 DCA ISAVE1 /SECOND TIME POINTER
2476 2765 ISZ I ISAVE1 /UPDATE IT
2477 1765 TAD I ISAVE1 /GET COUNT
2500 1146 TAD MAXTIM /ADD IN FUDGE FACTOR
2501 7620 SNL CLA /PASS COMPLETE???
2502 5650 JMP I CKTIM /NO, EXIT
2503 3765 DCA I ISAVE1 /ZERO SECOND COUNTER
2504 1366 TAD ISAVE2
2505 7040 CHA
2506 3366 DCA ISAVE2 /SETUP COUNTER
2507 1304 TAD CHPTOT /ADD IN POINTER
2510 1305 TAD 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 ORLF
2521 4451 PRNTER /PRINT "DISK"
2522 3507 MES17
2523 1123 TAD CHREG /GET LAST COMMAND
2524 0000 AND K0000 /MASK
2525 7110 CLL RAR
2526 1265 TAD K0200
2527 4440 TYPE /TYPE DISK NO.
2530 7340 CLA CLL CHA
2531 4451 PRNTER /PRINT "PASS COMPLETE"
2532 3512 MES18
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 TPSTA /STATUS=COMPLETE TYPEOUT
2542 5650 JMP I CKTIM /EXIT

/SUBROUTINE TO READ STATUS REGISTER
/
2543 0000 RDS1, 0
2544 6745 IOTS, DRST /READ STATUS IOT
2545 7410 SKP
2546 7422 ERHLT5, HLT /SKIP TRAP
2547 3122 DCA SYREG /SAVE RESULTS

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/ PAL12 V142 16-JUL-73 17142 PAGE 1628
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 5752 JMP I LDCA /EXIT
/
2555 7402 ERHLT4, HLT /SKIP TRAP
/
/SUBROUTINE TO LOAD TRACK ADDRESS REGISTER
/
2556 0000 LDAD, 0
2557 3126 DCA DAREG
2558 1126 TAD DAREG
2559 6743 IOT3, DLAC /LOAD DISK ADDRESS REGISTER
2560 5756 JMP I LDAD /EXIT
2561 7402 ERHLT3, HLT /SKIP TRAP
/
2564 3531 CMPPT, D2CMP *3
2565 7000 ISAVE1, 0
2566 7000 ISAVE2, 0
2567 0000 ISAVE3, 0
/
2574 3000
2575 0600
2576 1772
2577 1771
2600 2600 PAGE
/
/ROUTINE TO GET RANDOM OR OPERATOR DATA
/
2600 0000 RNWRD, 0
2601 7402 SMOAT, HLT /MODIFIED SWITCH
2602 5600 JMP I RNWRD /EXIT
2603 6201 CDF 0 /HOME CDF
2604 1412 TAD I AUTO12 /GET DATA
2605 7402 RECDP, HLT /BUFFER CDF
2606 2117 ISZ OPRTAL /UPDATE TALLY
2607 5600 JMP I RNWRD /EXIT
2608 3200 DCA PRINT /SAVE WORD
2609 1107 TAD M12
2610 3117 DCA OPRTAL /REPLACE TALLY
2611 7340 CLA CLL CHA
2612 1152 TAD DATPT
2613 3012 DCA AUTO12 /REPLACE AUTO INDEX
2614 1220 TAD PRINT /GET SAVED WORD
2615 5600 JMP I RNWRD /EXIT
/
/ROUTINE TO TYPE
/
2620 0000 PRINT, 0
2621 6046 TIS

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/ PAL12 V142 16-JUL-73 17142 PAGE 1629
2622 0041 TSF
2623 5222 JMP 101
2624 6042 TCF
2625 7200 CLA
2626 5620 JMP I PRINT
/
/ROUTINE TO DUMP AND REPORT DISK STATUS
/
2627 0000 DUMP, 0
2628 4651 PRINTER /PRINT "DISK "
2629 3507 MES17 /GET LAST COMMAND
2630 1123 TAD CMREG
2631 0060 AND K0006
2632 7110 CLL RAR
2633 3200 DCA RNWRD /SAVE
2634 1200 TAD RNWRD /GET DISK NUMBER
2635 1065 TAD K0200
2636 4440 TYPE /TYPE DISK NUMBER
2637 7340 CLA CLL CHA
2638 4451 PRINTER /PRINT "DISCONNECTED!"
2639 3455 MES15 /TYPE STATUS REPORT
2640 4777 JMS TPSTA
2641 1200 TAD RNWRD
2642 1156 TAD RUNPCT
2643 3200 DCA RNWRD /SAVE POINTER ADDRESS
2644 3600 DCA I RNWRD /CLEAR RUN POINTER
2645 3200 DCA RNWRD
2646 1115 TAD M1 /CHECK FOR MORE POINTER
2647 3225 TAD PRINT
2648 1200 TAD RNWRD /CHECK SELECT POINTERS
2649 4430 SELCHK /DISK NOT HERE
2650 7610 SKP CLA /MORE AVAILABLE
2651 5627 JMP I DUMP
2652 2200 ISZ RNWRD
2653 7220 ISZ PRINT /UPDATE POINTERS
2654 9254 JMP 100
2655 4453 CLL /PRINT "DISK"
2656 4451 PRINTER
2657 3507 MES17
2658 7340 CLA CLL CHA /PRINT "SYSTEM DOWN"
2659 4451 PRINTER
2660 3465 MES16 /ERROR, NO DISK AVAILABLE
2661 7402 NODSKS, HLT
2662 5271 JMP 101
/
/ROUTINE TO SETUP FIELD TO BUFFER * AUTO11 + BUFFER TALLY
/
2673 0000 SYFLD, 0
2674 7041 CCA
2675 1131 TAD HOREG
2676 3120 DCA BUFTAL
2677 7340 CLA CLL CHA
2678 1130 TAD CAREG /GET INITIAL CA
2679 3011 DCA AUTO11 /SAVE
2680 1160 TAD DAYFLG /GET DATA FLAG

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/ PALIB V142 16-JUL-73 17142 PAGE 1030
2723 7652 SNA CLA /WAS IT SET???
2724 5312 JMP 100 /NO, USE REGULAR
2725 1107 TAD M12 /SETUP SPECIAL TALLY
2726 3117 DCA CPTAL
2727 7340 CLA CLL CMA
2710 1152 TAD DATPOY
2711 3012 DCA AUTO12 /SETUP SPECIAL AUTO INDEX
2712 1140 TAD INTCH /GET LAST COMMAND
2713 0064 AND K0072 /MASK FIELD BITS
2714 1105 TAD KCOF /MAKE BUFFER CDF
2715 3205 DCA RECOF /SETUP SPECIAL CDF
2716 1205 TAD RECOF /GET BACK CDF
2717 5673 JMP I STFLD /EXIT, FIELD IN AC

/
/SUBROUTINE TO ISSUE "DSKP" DISK SKIP IOT
/
2720 2000 SSKP, 0
2721 6741 IOT1, DSKP /DISK SKIP IOT
2722 7412 SKP /DID NOT SKIP
2723 2320 ISZ SSKP
2724 5720 JMP I SSKP /EXIT

/
/SUBROUTINE TO LOAD COMMAND REGISTER
/
2725 0000 LDCH, 0
2726 3123 DCA CMREG
2727 1323 TAD CMREG
2730 6746 IOT6, DLDC /LOAD COMMAND REGISTER
2731 5725 JMP I LDCH /EXIT
2732 7402 ERHLT6, HLT /SKIP TRAP

/
/ROUTINE TO CHANGE DEVICE IOT CODES
/
2733 7604 CHANG, LAS /GET SWITCHES
2734 2355 AND A0772 /MASK 3-8
2735 3325 DCA LDCH /SAVE DESIRED CODE
2736 1360 TAD CHNPOT /POINTER
2737 3112 DCA TRASH1 /ADDRESS POINTER
2740 1397 TAD CNTR1 /AMOUNT TO DO
2741 3113 DCA TRASH2 /SETUP COUNTER
2742 1512 CHANG, TAD I TRASH1 /GET ADDRESS POINTER
2743 1114 DCA TRASH3 /SAVE ADDRESS
2744 1914 TAD I TRASH3 /GET OLD CODE
2745 0356 AND A7037 /MASK OFF OLD CODE
2746 1325 TAD LDCH /ADD IN DESIRED CODE
2747 3514 DCA I TRASH3 /RESTORE
2750 2112 ISZ TRASH1 /UPDATE POINTER
2751 2113 ISZ TRASH2 /UPDATE CHANGE COUNTER
2752 5342 JMP CHANG /MORE TO CHANGE
2753 7402 CHNHLT, HLT /ALL DEVICE IOT CODES CHANGED
2754 5353 JMP 101

/
2755 2770 A0770, 2770
2756 7007 A7007, 7007
2757 7766 CNTR1, 7766

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/ PALIB V142 16-JUL-73 17142 PAGE 1031
2760 2761 CHNPOT, CHNPOT +1
2761 2300 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

/
2777 3000 PAGE
2778 3000 /
/ROUTINE TO TYPE STATUS REPORT
/
3000 0000 TPSTA, 0
3021 4451 PRINTER /PRINT "DISK HARD SOFT COMP"
3022 3375 MES7
3023 1110 TAD M4
3024 3242 DCA TSAVE1 /MAXIMUM TO DO
3025 3243 DCA TSAVE2
3026 3244 DCA TSAVE3 /CLEAR SOME COUNTERS
3027 1243 CHKRES, TAD TSAVE2
3010 1056 TAD K0003
3011 3243 DCA TSAVE2
3012 1243 TAD TSAVE2
3013 1154 TAD STAPOT
3014 3246 DCA TSAVE5 /LOCATION OF DISK STATUS
3015 1244 TAD TSAVE3
3016 4430 SELCHK /CHECK RUN POINTER
3017 5236 JMP NOTSTA /DISK NOT RUNNING
3020 4453 CRLF
3021 4423 SPACE /SPACE OUT ONE
3022 1244 TAD TSAVE3 /GET DISK NO.
3023 1065 TAD K0260
3024 4442 TYPE
3025 4423 SPACE /SPACE OUT ONE
3026 4423 SPACE /SPACE OUT ONE
3027 7346 CLA CLL CMA RYL
3030 3245 DCA TSAVE4 /COUNTER FOR FOUR WORDS
3031 1646 TAD I TSAVE5 /GET STATUS
3032 4452 OCTEL /TYPE IT
3033 2246 ISZ TSAVE5
3034 2245 ISZ TSAVE4
3035 5231 JMP 104
3036 2244 NOTSTA, ISZ TSAVE5 /UPDATE DRIVE NUMBER
3037 2242 ISZ TSAVE1 /MORE TO REPORT
3040 5207 JMP CHKRES
3041 5600 JMP I TPSTA /EXIT

/
3042 0000 TSAVE1, 0
3043 0000 TSAVE2, 0

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3044 0000 TSARE, 0
3045 0000 TSARE, 0
3046 0000 TSARE, 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 TIMER2 /SETUP COUNTER
3054 2331 ISZ TIMER1
3055 5254 JMP ,+1
3056 2332 ISZ TIMER2 /WAIT FOR DISK TO COOL OFF
3057 5254 JMP ,+3
3060 3157 DCA CRCFLG /CLEAR CRC ERROR POINTER
3061 1200 TAD TPSTA /CURRENT DRIVE
3062 4444 LDCHD /LOAD COMMAND
3063 7326 CLA CLL CHL RTL /ENABLE RECALIBRATE BIT
3064 4450 CLRALL /"RECALIBRATE"
3065 4443 DSXSKP /DISK SKIP 10Y
3066 5265 JMP ,+1 /WAIT FOR FIRST DONE FLAG
3067 4442 RDSTAT /READ STATUS
3070 7500 SNA /DONE FLAG SET???
3071 5327 JMP RESERR /NO, ERROR
3072 0075 AND K1777 /MASK OTHER ERROR BITS
3073 7640 SZA CLA /ANY SET???
3074 5327 JMP RESERR /YES, ERROR
3075 4450 RESTA, CLRALL /CLEAR STATUS
3076 1016 TAD K0200 /ENABLE SET SECOND DONE FLAG
3077 1200 TAD TPSTA /ORIGINAL COMMAND
3078 4444 LDCHD /LOAD COMMAND
3079 4443 DSXSKP /DISK SKIP 10Y
3082 5301 JMP ,+1 /WAIT FOR SECOND DONE
3083 4442 RDSTAT /READ STATUS
3084 1073 TAD K4000 /HAS IT ONLY DONE FLAG
3085 7650 SNA CLA /YES, RETURN
3086 5647 JMP I RESTOR
3087 7320 RESERR, CLA CLL /ERROR
3088 4441 ERROR
3089 0004
3090 7540
3091 4450 CLRF
3092 4453 CLRF
3093 4451 PRINTER /PRINT"RECALIBRATE ERROR DISCONNECT"
3094 3165 HES19
3095 4422 DISCON /DISCONNECT DISK
3096 2247 ISZ RESTOR /MORE DISK AVAILABLE
3097 5647 JMP I RESTOR
/
/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 ,+1
/
3131 0000 TIMER1, 0
3132 0000 TIMER2, 0
/
/ROUTINE TO TYPE OUT DATA INFORMATION
/
3133 0000 TYPDAT, 0
3134 4451 PRINTER /PRINT "AS1"
3135 3230 TEXAS
3136 1133 TAD ASREG
3137 4452 OCTEL
3138 7340 CLA CLL CHA
3139 4451 PRINTER /PRINT "WAI"
3140 3232 TEXAS
3141 1134 TAD WAREG
3142 4452 OCTEL
3143 7340 CLA CLL CHA
3144 4451 PRINTER /PRINT "ADI"
3145 3234 TEXAD
3146 1135 TAD ADREG
3147 4452 OCTEL
3148 7340 CLA CLL CHA
3149 4451 PRINTER /PRINT "DCI"
3150 3236 TEXDG
3151 1136 TAD DGREG
3152 4452 OCTEL
3153 7340 CLA CLL CHA
3154 4451 PRINTER /PRINT "DBI"
3155 3236 TEXDB
3156 1136 TAD DBREG
3157 4452 OCTEL
3158 7340 CLA CLL CHA
3159 4451 PRINTER
3160 3240 TEXDB
3161 1137 TAD DBREG
3162 4452 OCTEL
3163 5733 JMP I TYPDAT
/
3165 2205 RES19, TEXT "RECALIBRATE ERROR DISCONNECT!"
3166 0301
3167 1411
3168 0222
3169 3124
3170 0540
3171 0522
3172 2217
3173 2340
3174 0411
3175 2303
3176 1716
3177 1505
3178 7324
3179 4100
/
3204 2303 TEXPC, TEXT "PCI"
3205 7200

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/ PAL12 V142 16-JUL-73 17:42 PAGE 1-34
3206 2324 TEXT, TEXT "STI"
3207 7230
3210 0315 TEXT, TEXT "CHI"
3211 7200
3212 1515 TEXT, TEXT "HHI"
3213 7200
3214 1101 TEXT, TEXT "IAI"
3215 7200
3216 0401 TEXT, TEXT "DAI"
3217 7200
3220 2323 TEXT, TEXT "SSI"
3221 7200
3222 0301 TEXT, TEXT "CAI"
3223 7200
3224 2703 TEXT, TEXT "WCI"
3225 7200
3226 0627 TEXT, TEXT "FWI"
3227 7200
3230 0123 TEXT, TEXT "ASI"
3231 7200
3232 2701 TEXT, TEXT "WAI"
3233 7200
3234 0104 TEXT, TEXT "ADI"
3235 7200
3236 0407 TEXT, TEXT "DCI"
3237 7200
3240 0402 TEXT, 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 0000
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

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/ PAL12 V142 16-JUL-73 17:42 PAGE 1-35
3274 0124
3275 2523
3276 0000
3277 0411 ERTX5, TEXT "DISK DATA"
3280 2313
3281 4004
3282 0124
3283 0100
/
3284 4005 MES0, TEXT "ERROR"
3285 2222
3286 1722
3287 0000
3288 2213 MES1, TEXT "RKBE DATA RELIABILITY"
3289 7005
3292 4004
3293 0124
3294 0140
3295 2205
3296 1411
3297 0100
3298 1114
3299 1124
3302 3100
3303 0532 MES2, TEXT "EXERCISE"
3304 0522
3305 0311
3306 2305
3307 0000
3308 4004 MES3, TEXT "DISK"
3309 1123
3312 1300
3313 1417 MES4, TEXT "NON-RECOVERABLE"
3314 1455
3315 2205
3316 0317
3317 2605
3318 2201
3319 2214
3322 2540
3323 0000
3324 1725 MES5, TEXT "AMOUNT OF EXTENDED R/W MEMORY(0-7)?"
3325 1624
3326 4017
3327 0640
3328 0530
3329 2405
3332 1624
3333 2504
3334 4022
3335 5727
3336 4215
3337 2515
3338 1722

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PAL10	V142	16-JUL-73	17142	PAGE 1-36
3362	3158			
3363	6055			
3364	6751			
3365	7700			
3366	2103	MES6, TEXT	"ACCEPT MODE?"	
3367	2305			
3370	2024			
3371	4015			
3372	1704			
3373	2577			
3374	3000			
3375	0423	MES7, TEXT	"OSK HARD SOFT COMP"	
3376	1340			
3377	1201			
3400	2204			
3401	4023			
3402	1706			
3403	2440			
3404	0317			
3405	1520			
3406	0200			
3427	7611	MES8, TEXT	"FIELD?"	
3410	0514			
3411	2477			
3412	0203			
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	0000			
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	2122	MES14, TEXT	"ARE YOU SURE?"	
3447	0540			
3450	3117			

PAL10	V142	16-JUL-73	17142	PAGE 1-37
3451	2540			
3452	2325			
3453	2205			
3454	7700			
3455	4004	MES15, TEXT	"DISCONNECTED?"	
3456	1123			
3457	0317			
3460	1616			
3461	0505			
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	2716			
3475	5440			
3476	1617			
3477	4874			
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	0002	/		
3523	0000	D07M1, 0		
3524	0000	D17M1, 0		
3525	0000	D27M1, 0		
3526	0000	D37M1, 0		
3527	0000	D07M2, 0		
3528	0000	D17M2, 0		
3529	0000	D27M2, 0		
3531	0000	D37M2, 0		
3532	0000	/		
3533	0000	D0HRD, 0		
3534	0000	D0SOP, 0		
3535	0000	D0CWP, 0		
3536	0000	D1HRD, 0		

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3538 0000 D1SOF, 0
3539 0000 D1SOF, 0
3540 0000 D1SOF, 0
3541 0000 D2SOF, 0
3542 0000 D2CHP, 0
3543 0000 D3HRO, 0
3544 0000 D3SOF, 0
3545 0000 D3CHP, 0
/
3546 0000 FLDPLG, 0
3547 0000 TRKPLG, 0
3550 0000 SECPLG, 0
3551 0000 HLFPLG, 0
3552 0000 SECPLG, 0
/
3553 0000 OSK0A, 0
3554 0000 OSK1A, 0
3555 0000 OSK2A, 0
3556 0000 OSK3A, 0
/
3557 0000 OSK0B, 0
3558 0000 OSK1B, 0
3561 0000 OSK2B, 0
3562 0000 OSK3B, 0
/
/PLACE FOR DATA IN MANUAL MODE
/
3563 0000 DAT1, 0000
3564 0000 DAT2, 0000
3565 0000 DAT3, 0000
3566 0000 DAT4, 0000
3567 0000 DAT5, 0000
3570 0000 DAT6, 0000
3571 0000 DAT7, 0000
3572 0000 DAT8, 0000
3573 0000 DAT9, 0000
3574 0000 DAT10, 0000
3575 0000 DAT11, 0000
3576 0000 DAT12, 0000
/
3600 *3600
/
3600 STORBUF,
/
$$$$

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2000 11111100 11111110 11111111 11111111 11111111 11111111 11111111 11111111
2100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111100
/
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 11111111
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2600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
2700 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
/
1800 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1900 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
/
1200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1300 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
/
1400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1500 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
/
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 11111111
/
2200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
2300 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
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2400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
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/
2600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
2700 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
/
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
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3400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
3500 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
/
3600
3700

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4000
4100

4200
4300

4400
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5000
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6000
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6200
6300

6400
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6600
6700

7000
7100

7200
7300

7400
7500

7600
7700

A0170	2760	D1HRD	3535	DSKIP	6741	10T5	2544
A0770	2755	D1SOF	3536	DSKDOT	2155	10T6	2732
A7707	2756	D1TH1	3523	DSKRET	2316	10T7	1405
ACDCA	0369	D1TH2	3527	DSKSKP	4443	ISAVE1	2565
ADREG	0135	D2CHP	3542	DYCHK	1600	ISAVE2	2566
AGAIN	1333	D2HRD	3540	OTR1	1636	ISAVE3	2567
ALLACN	2252	D2SOF	3541	OUNP	2627	K0203	0056
AMOUNT	0055	D2TH1	3524	ERFLG	0166	K0204	0057
ASKNX1	2342	D2TH2	3530	ERHLT2	1403	K0206	0060
ASKNX2	0400	D3CHP	3545	ERHLT3	2563	K0207	0061
ASKNX3	0417	D3HRD	3543	ERHLT4	2555	K0210	0062
ASKNX4	0456	D3SOF	3544	ERHLT5	2546	K0217	0063
ASKNX5	2471	D3TH1	3525	ERHLT6	2732	K0220	0013
ASKSUR	2520	D3TH2	3531	ERHLT7	1407	K0240	0014
ASREG	2133	DAREG	0126	ERRO	1200	K0270	0064
AUTO10	0010	DAT1	3565	ERRDEX	1342	K0277	0104
AUTO11	0011	DAT10	3574	ERROR	4441	K0100	0015
AUTO12	0012	DAT11	3575	ERTX1	3242	K0220	0016
BADHLT	1710	DAT12	3576	ERTX2	3250	K0212	1473
BDRCC	1024	DAT2	3564	ERTX3	3257	K0215	1472
RGN	2200	DAT3	3565	ERTX4	3265	K0240	0066
RGNBUF	2150	DAT4	3566	ERTX5	3277	K0250	0065
BRKRET	2366	DAT5	3567	ESAVE	1355	K0277	0071
BUFFAL	0120	DAT6	3570	EXIT	1582	K0316	2067
CAREC	0130	DAT7	3571	FILLER	2730	K0331	2070
CONTR1	2757	DAT8	3572	FIPTH	0173	K0402	0072
CHAND	2733	DAT9	3573	FLOFLG	3546	K1300	0074
CHANCOR	2742	DATFLG	0160	FNDSDM	0144	K177	2125
CHKPOT	2150	DATPOT	0182	FORFL	4425	K1777	0075
CHKPCS	1007	DATTRY	2142	FROOT	1474	K200	2126
CHKSAY	0143	DBREG	0137	FURED	0132	K2020	0076
CHKYN	2127	DCLR	0742	GENDAT	4420	K3200	0077
CHNCDF	2252	DBREG	0136	GETAD	2103	K3740	1561
CHNKLT	2753	DISCON	4422	GNDAT	1741	K4000	0078
CHNPOT	2742	DISKGD	4434	GDAGN	2341	K4100	1562
CKTHM	2450	OLAG	6743	GDRAK	2226	K5405	0363
CLDR	1420	OLCA	6744	GDGDF	1646	K6000	2100
CLFALL	4450	LDCC	6746	GDCHP	2263	K7402	2126
CLRBK	2174	JMAN	6747	GDCLD	2256	K7702	0121
CLRSTA	2332	DOHEAD	1242	GDREAD	1072	K7762	0102
CHPOT	2564	DRST	0745	GDYIT	1236	K7761	2103
CHREG	2123	DSKPA	3553	HCDTAD	1366	K7764	1357
CONCUR	2726	DSKBB	3557	HFFFLG	3551	K7771	1356
CONSEC	2151	DSK1A	3554	INERR	2426	KCDF	2125
CRCLG	2157	DSK1B	3550	INTCH	0140	KEYRET	2312
CRLF	4453	DSK2A	3555	INTON	0125	KHLT	2205
DCHP	3534	DSK2B	3551	INTER1	3127	KROT	0246
DHRD	3532	DSK3A	3556	INTER2	2307	KSKP	0540
DOSOF	3533	DSK3B	3562	10T1	2721	LDAD	2556
DTH1	3522	DSKEX	2374	10T2	1421	LDADD	4446
DTH2	3526	DSKGD	2200	10T3	2561	LDCA	2552
D1CHP	3537	DSKOUT	2056	10T4	2553	LDCH	2725

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LDCMD	4444	PCNTR1	1363	SEKER	2075	TPSTA	3000
LDCUR	4445	PCNTR2	1364	SEKEX	2101	TRASH1	2112
LDMAN	4447	PCNTR3	1365	SEKGO	1136	TRASH2	2113
LDMN	1404	PCREG	0121	SEKOUT	2100	TRASH3	2114
LNKDDCA	2364	POLDSK	0116	SEKSW	2167	TRKFLG	3547
M12	0107	POLNEX	1000	SELCHK	4430	TRYCNT	1166
M4	0110	PRINT	2620	SECFLG	3552	TRYTIM	1067
M5	0111	PRV	1516	SETFLD	4427	TSAVE1	3042
MANUAL	0317	PRNDAT	1360	SETGEN	4426	TSAVE2	3043
MAXFLD	0145	PRNTER	4451	SPAC	1554	TSAVE3	3044
MAXTIM	0146	RAD1	1775	SPACE	4423	TSAVE4	3045
MAXTRK	0147	RAD2	1776	SPBLK	2165	TSAVE5	3046
MES2	3304	RAD3	1777	SPFLD	2161	TYPDAT	3133
MES1	3318	RAN1	1771	SPSEC	2164	TYPE	4440
MES10	3417	RAN2	1772	SPTK1	2162	UPDATE	0115
MES11	3427	RANDAT	4421	SPTK2	2163	UPDNE	1462
MES12	3436	RANDEM	1717	SSREG	2127	UPTRY	1133
MES13	3443	RANGEN	4433	STADPT	2154	WAIT	2110
MES14	3446	RANJMS	0554	STATER	2357	WAREG	0134
MES15	3455	RDHSS	1410	STATRY	2141	WASRD	2262
MES16	3465	RDS1	2543	STATUS	2324	WCREG	0131
MES17	3507	RDSTA	1122	STFLD	2673	WRDCHK	1612
MES18	3512	RDSTAT	4442	STGEN	1755	WRKCON	2272
MES19	3165	RDRY	1110	STPHLY	2006	XCHKYN	0031
MES2	3323	RECAL	4436	STRAUT	1312	XCKPOT	0030
MES3	3332	RECOF	2605	STRBUF	3600	XCLDR	0050
MES4	3333	RECEIV	4437	STREC	1122	XCLF	0053
MES5	3344	REFILL	0733	STRSEK	0526	XDSKGD	0054
MES6	3366	RELDAD	0172	STRSTP	2033	XDUMP	0022
MES7	3375	REREAD	1101	STRTEX	0223	XERRD	0041
MES8	3407	RESEK	1150	STRWRK	2237	XFROCT	0052
MES9	3413	RESEK	2010	SVLNK	2171	XGETAC	0054
MHREG	0124	RESEK	3107	SHOAT	2601	XGNDAT	0020
MHPRN	1524	RESEK	0535	TEXAD	3234	XLDAD	0046
MSKER	1716	RESRAN	4435	TEXAS	3230	XLOCA	0045
MWRO	0737	RESTA	3075	TEXCA	3222	XLOCH	0044
MEKSEC	2547	RESTOR	3047	TEXCH	3210	XLDHN	0047
MEY	0260	RETRN	2353	TEXDA	3216	XOCT1	0024
MODRC	1232	RETURN	2300	TEXDB	3240	XOCT4	0025
MODSKS	2671	REWRT	1055	TEXDG	3236	XPRINT	0040
MODERR	1676	PNFLD	0633	TEXFW	3226	XPRN	0051
MODCRC	1236	RNRD	2600	TEXJA	3214	XRDST	0042
MODTEX	1347	RSRAN	1763	TEXMP	3212	XREG	1362
MODSTA	3036	RUN	0600	TEXPC	3204	XRESTR	0036
MTSEK	0552	RUNPOT	0156	TEXSS	3220	XRNDDH	0033
MYNRKS	1712	SAMPOL	1002	TEXST	3206	XRNHRD	0021
MYTSEK	0532	SAV1	1773	TEXWA	3232	XRSRAN	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	0117	SEK	4432	TIMPOT	2153	XSTGEN	0026

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XTXYT	1361				
XWALT	2037				
YESNO	4431				

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



