

IDENTIFICATION

PRODUCT CODE: MAINDEC-08-DHAKC-E-D
PRODUCT NAME: RKSE DATA RELIABILITY PROGRAM
DATE CREATED: APRIL 15, 1975
MAINTAINER: DIAGNOSTIC GROUP
AUTHOR: JOHN VROBEL

COPYRIGHT (C) 1972-1973-1974-1975, DIGITAL EQUIP. CORP., MAYNARD, MASS.

THE INFORMATION IN THIS STATEMENT IS SUBJECT TO CHANGE WITHOUT NOTICE AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL EQUIPMENT CORPORATION.

ACTUAL DISTRIBUTION OF THE SOFTWARE DESCRIBED IN THIS DOCUMENT WILL BE SUBJECT TO TERMS AND CONDITIONS TO BE ANNOUNCED ON SOME FUTURE DATE BY DIGITAL EQUIPMENT CORPORATION.

DEC ASSUMES NO RESPONSIBILITY FOR THE USE OR RELIABILITY OF ITS SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.

THIS SOFTWARE IS FURNISHED TO PURCHASER UNDER A LICENSE TO USE ON A SINGLE COMPUTER SYSTEM AND CAN BE COPIED (WITH INCLUSION OF DEC'S COPYRIGHT NOTICE) ONLY FOR USE IN SUCH SYSTEM, EXCEPT AS MAY OTHERWISE BE PROVIDED IN WRITING BY DEC.

TABLE OF CONTENTS

1.	ABSTRACT
2.	REQUIREMENTS
2.1	HARDWARE
2.2	PROGRAM STORAGE
2.3	PRELIMINARY PROGRAMS
2.4	EXECUTION TIME
3.	SWITCH REGISTER SETTINGS
4.	OPERATOR AND/OR PROGRAM ACTION
4.1	STANDARD TEST PROCEDURE
4.2	RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE
4.3	RK05 DATA RELIABILITY (ACCEPT MODE)
4.4	RK05 DATA RELIABILITY (MANUAL INTERVENTION MODE)
4.5	CHANGE PROGRAM IOT CODES
5.	ERRORS
5.1	USEFUL INFORMATION
5.2	ERROR HALTS
5.3	ERROR TYPEOUTS
5.4	ERROR RECOVERY AND ERROR DISCONNECT
5.5	STATUS COMPLETE TYPEOUT AND PASS COMPLETE DISCONNECT
5.6	TYPICAL ERROR TYPEOUTS
6.	RESTRICTIONS
7.	TROUBLE SHOOTING INFORMATION
8.	PROGRAM DESCRIPTION (ACCEPT MODE)
9.	PROGRAM LISTING

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 3×10^9 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.

(NOTE: LOCATION 0 CONTAINS REVISION LEVEL (IN ASCII) OF PROGRAM ON PROGRAM LOAD).

2. REQUIREMENTS

2.1 HARDWARE

A. PDP-8/A, 8/E, 8/F, 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)

F. FORMATTED 2200 BPI-16 SECTOR PACK(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 3×10^9 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

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 PDP8/E, PDP8/M, AND PDP8/F COMPUTERS.
- B. LOAD THE PROGRAM INTO MEMORY FIELD 0 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 SWR4=1, 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

RK05 DATA RELIABILITY (ACCEPT MODE)

- A. MAKE READY ALL DRIVES TO BE TESTED USING THE RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE SECTION 4.2.
- B. SET SWITCH LABELED "PROM/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 0200 AND PRESS START.
- F. THE OPERATOR MAY SET SRRS=1 IF IT IS DESIRED TO HAVE THE PROGRAM AUTOMATICALLY DISCONNECT EACH DISK DRIVE AS EACH MAKE THEIR PASS COMPLETION. (NOTE: IF SRRS=0, ALL DISK DRIVES WILL CONTINUE TO RUN AFTER THEIR PASS COMPLETION)
- G. THE TTY WILL PRINT THE FOLLOWING PROGRAM NAME AND QUESTION,

RK05 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.

- 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)

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 LABELFD "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 (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 AND 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 MENTION 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 "CR LF" 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 0000, SET SWITCH REGISTER BITS 3-6 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 OCCURRES 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 "DLDC"
BADHLT	CHECKSUM FAILED BUT WORD-BY-WORD COMPARE WORKED
NODSKS	NO DISKS AVAILABLE TO RUN
KHLT	PROGRAM WILL ONLY RUN IN FIELD 0

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

5.3

ERROR TIMEOUTS

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 TIMEOUTS ARE AS FOLLOWS.

PC: PROGRAM LOCATION OF THE ACTUAL FAILURE.

SR: CONTENTS OF THE STATUS REGISTER.

CM: SOFTWARE COMMAND REGISTER.

IA: INITIAL SOFTWARE DISK ADDRESS REGISTER OF THE CYLINDER, SURFACE, AND SECTOR BITS.

DA: FINAL SOFTWARE DISK ADDRESS REGISTER OF THE CYLINDER, SURFACE, AND SECTOR BITS.

CA: SOFTWARE INITIAL CURRENT ADDRESS

WC: SOFTWARE INITIAL WORD COUNT

FW: SOFTWARE FINAL WORD COUNT

AS: SECTOR IN ERROR ON THE PARTICULAR CYLINDER AND SURFACE IN QUESTION.

WA: WORD ADDRESS WITHIN THE SECTOR IN ERROR

AD: BREAK ADDRESS OF DATA BREAK IN COMPUTER.

DG: EXPECTED DATA

DB: 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 FOUR (4) 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. (NOTE: THIS 64 RETRIES ON "SOFT" ERRORS WILL BE TERMINATED ON A "HARD" ERROR).

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!
DISK HARD SOFT COMP
  X 0030 0010 0001
  X 0240 5670 0001
```

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

```
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 SWP3=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 READ CRC STATUS ERROR WITH BAD DATA PER
            TRANSFER WITH RECOVERY POSSIBLE WITHIN FOUR (4)
            RETRYS. (NOTE: FOUR (4) CONSECUTIVE RETRYS WILL
            BE CONSIDERED AS A NON-RECOVERABLE ERROR OR A
            "HARD" ERROR).

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

```

IF SWR5=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 SWR5=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 SWR5=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 "ST:")

```
WRITE STATUS ERROR
PC:2371 ST:4010 CM:4000 IA:0001 DA:0002
CA:3600 WC:7000 FW:0000
```

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
PC:2076 ST:4002 CM:3000 DA:4007
```

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
PC:1674 ST:4010 CM:1432 IA:1035 DA:1021
CA:0001 WC:5000 FW:7400
AS:0015 WA:0007 AD:0010 DG:0537 DB:0536
AS:0015 WA:0077 AD:0100 DG:7777 DB:7776
AS:0016 WA:0002 AD:0403 DG:6167 DB:6166
```

6. RESTRICTIONS

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

7. TROUBLE SHOOTING INFORMATION

IOT	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	CLEAR THE AC AND STATUS REGISTER.
0	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	DLAG	"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	--	
0-11		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 FILM 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
--

0-2=0	READ DATA
0-2=1	READ ALL
0-2=2	WRITE LOCK
0-2=3	SEEK ONLY
0-2=4	WRITE DATA
0-2=5	WRITE ALL
0-2=6	NOT USED
0-2=7	NOT USED
3	ENABLE INTERRUPT
4	ENABLE SET TRANSFER DONE OR 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 10EN 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, 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 WAS FIELD 6, 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.

9. PROGRAM LISTING

```

/
/MAKE DATA RELIABILITY PROGRAM
/
/MAINDEC=HH=0HAKC=B=5
/
/COPYRIGHT (C) 1972-1973-1974-1975, DIGITAL EQUIP, CORP., MAYFORD, MASS.
/
/NO TELLOCATION & CONTAINS THE REVISION
/LEVEL (IN ASCII) ON PROGRAM LOAD,
/
/ALL KNOWN HALTS
/
0200 1410 EPHLT2 /SKIP TRAP OCLR
0201 1563 EPHLT1 /SKIP TRAP OLAG
0202 1555 EPHLT4 /SKIP TRAP OICA
0203 1545 EPHLT5 /SKIP TRAP URST
0204 1732 EPHLT6 /SKIP TRAP ULCD
0205 1126 INTFH1 /NO DISK INTERRUPT
0206 1357 INTFH2 /NON-FIRED INTERRUPT
0207 0225 HALT /PROGRAM WILL ONLY RUN IN FIELD 0
0210 2571 NOCHK8 /NO DISKS AVAILABLE TO RUN
0211 2600 STPHLT /PROGRAM STOP FROM FORWARD
0212 2751 CMNHLX /I/O CHANGE HALT
0213 1787 SADRBT /COMPUTER MUST BE DOWN. CHECKSUN FAILED
/NOT ADDR-BI*ADDR COMPARE WORKED,
/
6741 CSKPR6741 /SKIP ON TRANSFER DONE OR ERROR
6742 OCLR6742 /CLEAR DISK CONTROL LOGIC
6743 OLAG6743 /LOAD ADDRESS AND GO
6744 OICAR6744 /LOAD CURRENT ADDRESS
6745 URST6745 /READ STATUS REGISTER
6746 ULCD6746 /LOAD COMMAND REGISTER
/
4421 RANDAT#JMS I XNRARD
4422 DISCON#JMS I ABUMP
4423 SPAC#JMS I XSPAC
4424 XOC1#JMS I XOC1
4425 XOC4#JMS I XOC4
4426 XSTGEN#JMS I XSTGEN
4427 STFLD#JMS I STFLD
4431 XCHKYN#JMS I XCHKYN
4432 XCKPOT#JMS I XCKPOT
4433 SEKOUT#JMS I XSKOUT
4434 XRRDCH#JMS I XRRDCH
4435 ADKSGO#JMS I XADKSGO
4436 XRLST#JMS I XRLST
4437 XWALT#JMS I XWALT
4441 XERRC#JMS I XERRC
4442 XPDST#JMS I XPDST
4446 XUDAD#JMS I XUDAD
4451 XSDKP#JMS I XSDKP
4454 XLDCA#JMS I XLDCA
4455 XLDCA#JMS I XLDCA

```

```

4447 CLRAD#JMS I XCLR
4450 XPRN#JMS I XPRN
4451 XPROCT#JMS I XPROCT
4452 XPRINT#JMS I XPRINT
4453 XCRUF#JMS I XCRUF
4454 XGVDAT#JMS I XGVDAT
/
0202 *0
/
0007 0305 0305 /REVISION "E"; INTERRUPT SERVICE ROUTE
0001 5001 5001 /DCA SAVAC SAVE AC AT INT.
0002 0207 0207 /RAD SHIFT LINK AT TIME OF INT.
0003 0203 0203 /DCA SYLNK SAVE LINK AT TIME OF INT.
0004 0204 0204 /JMP I 5 RETURN TO INT. SERVICE
0005 0005 0005 /RETURN POINTED
/
0010 *10
/
0010 0020 AUTO10, 0
/
0011 0020 AUTO11, 0
/
0012 0020 AUTO12, 0
/
0013 0020 K0020, 0020
0014 0020 K0070, 0070
0015 0100 K0100, 0100
0016 0200 K0200, 0200
/
0020 *20
/
0020 1740 XGVDAT, GVDAT
0021 2020 XNRARD, NNRARD
0022 2027 XDUPD, DUV9
0023 1503 XSPAC, SPAC
0024 2407 XOC1, OCT1
0025 2410 XOC4, OCT4
0026 1754 XSTGEN, STGEN
0027 2673 XSTFLD, STFLD
0030 2141 XCKPOT, CKPOT
0031 2122 XCHKYN, CHKYN
0032 2000 XSKOUT, SEKOUT
0033 1716 XRRDCH, RRDCH
0034 2200 ADKSGO, DSKGO
0035 1762 XRRRAN, RRRAN
0036 3047 XPRSTR, PRSTR
0037 2102 XWALT, WALT
0040 2624 XPRINT, PRINT
0041 1270 XERRC, ERRC
0042 2543 XPDST, PDST
0043 2720 XSDKP, SDKP
0044 2725 XLDCA, LDCA
0045 2552 ALDCA, LDCA
0046 2554 ALDCA, LDCA

```

```

0047 1425 ACLEA, CLER
0052 1445 XEPA, PRN
0051 1423 XEHOCT, PROCT
0052 1411 ACRLF, UPGNE
0053 2000 AMOENT, A
0054 2023 K0023, 0003
0055 2006 K0006, 0006
0056 2007 K0007, 0007
0057 2010 K0010, 0010
0058 2017 K0017, 0017
0059 2020 K0020, 0020
0060 2023 K0023, 0023
0061 2026 K0026, 0026
0062 2029 K0029, 0029
0063 2032 K0032, 0032
0064 2035 K0035, 0035
0065 2038 K0038, 0038
0066 2041 K0041, 0041
0067 2044 K0044, 0044
0068 2047 K0047, 0047
0069 2050 K0050, 0050
0070 2053 K0053, 0053
0071 2056 K0056, 0056
0072 2059 K0059, 0059
0073 2062 K0062, 0062
0074 2065 K0065, 0065
0075 2068 K0068, 0068
0076 2071 K0071, 0071
0077 2074 K0074, 0074
0078 2077 K0077, 0077
0079 2080 K0080, 0080
0080 2083 K0083, 0083
0081 2086 K0086, 0086
0082 2089 K0089, 0089
0083 2092 K0092, 0092
0084 2095 K0095, 0095
0085 2098 K0098, 0098
0086 2101 K0101, 0101
0087 2104 K0104, 0104
0088 2107 K0107, 0107
0089 2110 K0110, 0110
0090 2113 K0113, 0113
0091 2116 K0116, 0116
0092 2119 K0119, 0119
0093 2122 K0122, 0122
0094 2125 K0125, 0125
0095 2128 K0128, 0128
0096 2131 K0131, 0131
0097 2134 K0134, 0134
0098 2137 K0137, 0137
0099 2140 K0140, 0140
0100 2143 K0143, 0143
0101 2146 K0146, 0146
0102 2149 K0149, 0149
0103 2152 K0152, 0152
0104 2155 K0155, 0155
0105 2158 K0158, 0158
0106 2161 K0161, 0161
0107 2164 K0164, 0164
0108 2167 K0167, 0167
0109 2170 K0170, 0170
0110 2173 K0173, 0173
0111 2176 K0176, 0176
0112 2179 K0179, 0179
0113 2182 K0182, 0182
0114 2185 K0185, 0185
0115 2188 K0188, 0188
0116 2191 K0191, 0191
0117 2194 K0194, 0194
0118 2197 K0197, 0197
0119 2200 K0200, 0200
0120 2203 K0203, 0203
0121 2206 K0206, 0206
0122 2209 K0209, 0209
0123 2212 K0212, 0212
0124 2215 K0215, 0215
0125 2218 K0218, 0218
0126 2221 K0221, 0221
0127 2224 K0224, 0224
0128 2227 K0227, 0227
0129 2230 K0230, 0230
0130 2233 K0233, 0233
0131 2236 K0236, 0236
0132 2239 K0239, 0239
0133 2242 K0242, 0242
0134 2245 K0245, 0245
0135 2248 K0248, 0248
0136 2251 K0251, 0251
0137 2254 K0254, 0254
0138 2257 K0257, 0257
0139 2260 K0260, 0260
0140 2263 K0263, 0263
0141 2266 K0266, 0266
0142 2269 K0269, 0269
0143 2272 K0272, 0272
0144 2275 K0275, 0275
0145 2278 K0278, 0278
0146 2281 K0281, 0281
0147 2284 K0284, 0284
0148 2287 K0287, 0287
0149 2290 K0290, 0290
0150 2293 K0293, 0293
0151 2296 K0296, 0296
0152 2299 K0299, 0299
0153 2302 K0302, 0302
0154 2305 K0305, 0305
0155 2308 K0308, 0308
0156 2311 K0311, 0311
0157 2314 K0314, 0314
0158 2317 K0317, 0317
0159 2320 K0320, 0320
0160 2323 K0323, 0323
0161 2326 K0326, 0326
0162 2329 K0329, 0329
0163 2332 K0332, 0332
0164 2335 K0335, 0335
0165 2338 K0338, 0338
0166 2341 K0341, 0341
0167 2344 K0344, 0344
0168 2347 K0347, 0347
0169 2350 K0350, 0350
0170 2353 K0353, 0353
0171 2356 K0356, 0356
0172 2359 K0359, 0359
0173 2362 K0362, 0362
0174 2365 K0365, 0365
0175 2368 K0368, 0368
0176 2371 K0371, 0371
0177 2374 K0374, 0374
0178 2377 K0377, 0377
0179 2380 K0380, 0380
0180 2383 K0383, 0383
0181 2386 K0386, 0386
0182 2389 K0389, 0389
0183 2392 K0392, 0392
0184 2395 K0395, 0395
0185 2398 K0398, 0398
0186 2401 K0401, 0401
0187 2404 K0404, 0404
0188 2407 K0407, 0407
0189 2410 K0410, 0410
0190 2413 K0413, 0413
0191 2416 K0416, 0416
0192 2419 K0419, 0419
0193 2422 K0422, 0422
0194 2425 K0425, 0425
0195 2428 K0428, 0428
0196 2431 K0431, 0431
0197 2434 K0434, 0434
0198 2437 K0437, 0437
0199 2440 K0440, 0440
0200 2443 K0443, 0443
0201 2446 K0446, 0446
0202 2449 K0449, 0449
0203 2452 K0452, 0452
0204 2455 K0455, 0455
0205 2458 K0458, 0458
0206 2461 K0461, 0461
0207 2464 K0464, 0464
0208 2467 K0467, 0467
0209 2470 K0470, 0470
0210 2473 K0473, 0473
0211 2476 K0476, 0476
0212 2479 K0479, 0479
0213 2482 K0482, 0482
0214 2485 K0485, 0485
0215 2488 K0488, 0488
0216 2491 K0491, 0491
0217 2494 K0494, 0494
0218 2497 K0497, 0497
0219 2500 K0500, 0500
0220 2503 K0503, 0503
0221 2506 K0506, 0506
0222 2509 K0509, 0509
0223 2512 K0512, 0512
0224 2515 K0515, 0515
0225 2518 K0518, 0518
0226 2521 K0521, 0521
0227 2524 K0524, 0524
0228 2527 K0527, 0527
0229 2530 K0530, 0530
0230 2533 K0533, 0533
0231 2536 K0536, 0536
0232 2539 K0539, 0539
0233 2542 K0542, 0542
0234 2545 K0545, 0545
0235 2548 K0548, 0548
0236 2551 K0551, 0551
0237 2554 K0554, 0554
0238 2557 K0557, 0557
0239 2560 K0560, 0560
0240 2563 K0563, 0563
0241 2566 K0566, 0566
0242 2569 K0569, 0569
0243 2572 K0572, 0572
0244 2575 K0575, 0575
0245 2578 K0578, 0578
0246 2581 K0581, 0581
0247 2584 K0584, 0584
0248 2587 K0587, 0587
0249 2590 K0590, 0590
0250 2593 K0593, 0593
0251 2596 K0596, 0596
0252 2599 K0599, 0599
0253 2602 K0602, 0602
0254 2605 K0605, 0605
0255 2608 K0608, 0608
0256 2611 K0611, 0611
0257 2614 K0614, 0614
0258 2617 K0617, 0617
0259 2620 K0620, 0620
0260 2623 K0623, 0623
0261 2626 K0626, 0626
0262 2629 K0629, 0629
0263 2632 K0632, 0632
0264 2635 K0635, 0635
0265 2638 K0638, 0638
0266 2641 K0641, 0641
0267 2644 K0644, 0644
0268 2647 K0647, 0647
0269 2650 K0650, 0650
0270 2653 K0653, 0653
0271 2656 K0656, 0656
0272 2659 K0659, 0659
0273 2662 K0662, 0662
0274 2665 K0665, 0665
0275 2668 K0668, 0668
0276 2671 K0671, 0671
0277 2674 K0674, 0674
0278 2677 K0677, 0677
0279 2680 K0680, 0680
0280 2683 K0683, 0683
0281 2686 K0686, 0686
0282 2689 K0689, 0689
0283 2692 K0692, 0692
0284 2695 K0695, 0695
0285 2698 K0698, 0698
0286 2701 K0701, 0701
0287 2704 K0704, 0704
0288 2707 K0707, 0707
0289 2710 K0710, 0710
0290 2713 K0713, 0713
0291 2716 K0716, 0716
0292 2719 K0719, 0719
0293 2722 K0722, 0722
0294 2725 K0725, 0725
0295 2728 K0728, 0728
0296 2731 K0731, 0731
0297 2734 K0734, 0734
0298 2737 K0737, 0737
0299 2740 K0740, 0740
0300 2743 K0743, 0743
0301 2746 K0746, 0746
0302 2749 K0749, 0749
0303 2752 K0752, 0752
0304 2755 K0755, 0755
0305 2758 K0758, 0758
0306 2761 K0761, 0761
0307 2764 K0764, 0764
0308 2767 K0767, 0767
0309 2770 K0770, 0770
0310 2773 K0773, 0773
0311 2776 K0776, 0776
0312 2779 K0779, 0779
0313 2782 K0782, 0782
0314 2785 K0785, 0785
0315 2788 K0788, 0788
0316 2791 K0791, 0791
0317 2794 K0794, 0794
0318 2797 K0797, 0797
0319 2800 K0800, 0800
0320 2803 K0803, 0803
0321 2806 K0806, 0806
0322 2809 K0809, 0809
0323 2812 K0812, 0812
0324 2815 K0815, 0815
0325 2818 K0818, 0818
0326 2821 K0821, 0821
0327 2824 K0824, 0824
0328 2827 K0827, 0827
0329 2830 K0830, 0830
0330 2833 K0833, 0833
0331 2836 K0836, 0836
0332 2839 K0839, 0839
0333 2842 K0842, 0842
0334 2845 K0845, 0845
0335 2848 K0848, 0848
0336 2851 K0851, 0851
0337 2854 K0854, 0854
0338 2857 K0857, 0857
0339 2860 K0860, 0860
0340 2863 K0863, 0863
0341 2866 K0866, 0866
0342 2869 K0869, 0869
0343 2872 K0872, 0872
0344 2875 K0875, 0875
0345 2878 K0878, 0878
0346 2881 K0881, 0881
0347 2884 K0884, 0884
0348 2887 K0887, 0887
0349 2890 K0890, 0890
0350 2893 K0893, 0893
0351 2896 K0896, 0896
0352 2899 K0899, 0899
0353 2902 K0902, 0902
0354 2905 K0905, 0905
0355 2908 K0908, 0908
0356 2911 K0911, 0911
0357 2914 K0914, 0914
0358 2917 K0917, 0917
0359 2920 K0920, 0920
0360 2923 K0923, 0923
0361 2926 K0926, 0926
0362 2929 K0929, 0929
0363 2932 K0932, 0932
0364 2935 K0935, 0935
0365 2938 K0938, 0938
0366 2941 K0941, 0941
0367 2944 K0944, 0944
0368 2947 K0947, 0947
0369 2950 K0950, 0950
0370 2953 K0953, 0953
0371 2956 K0956, 0956
0372 2959 K0959, 0959
0373 2962 K0962, 0962
0374 2965 K0965, 0965
0375 2968 K0968, 0968
0376 2971 K0971, 0971
0377 2974 K0974, 0974
0378 2977 K0977, 0977
0379 2980 K0980, 0980
0380 2983 K0983, 0983
0381 2986 K0986, 0986
0382 2989 K0989, 0989
0383 2992 K0992, 0992
0384 2995 K0995, 0995
0385 2998 K0998, 0998
0386 3001 K1001, 1001
0387 3004 K1004, 1004
0388 3007 K1007, 1007
0389 3010 K1010, 1010
0390 3013 K1013, 1013
0391 3016 K1016, 1016
0392 3019 K1019, 1019
0393 3022 K1022, 1022
0394 3025 K1025, 1025
0395 3028 K1028, 1028
0396 3031 K1031, 1031
0397 3034 K1034, 1034
0398 3037 K1037, 1037
0399 3040 K1040, 1040
0400 3043 K1043, 1043
0401 3046 K1046, 1046
0402 3049 K1049, 1049
0403 3052 K1052, 1052
0404 3055 K1055, 1055
0405 3058 K1058, 1058
0406 3061 K1061, 1061
0407 3064 K1064, 1064
0408 3067 K1067, 1067
0409 3070 K1070, 1070
0410 3073 K1073, 1073
0411 3076 K1076, 1076
0412 3079 K1079, 1079
0413 3082 K1082, 1082
0414 3085 K1085, 1085
0415 3088 K1088, 1088
0416 3091 K1091, 1091
0417 3094 K1094, 1094
0418 3097 K1097, 1097
0419 3100 K1100, 1100
0420 3103 K1103, 1103
0421 3106 K1106, 1106
0422 3109 K1109, 1109
0423 3112 K1112, 1112
0424 3115 K1115, 1115
0425 3118 K1118, 1118
0426 3121 K1121, 1121
0427 3124 K1124, 1124
0428 3127 K1127, 1127
0429 3130 K1130, 1130
0430 3133 K1133, 1133
0431 3136 K1136, 1136
0432 3139 K1139, 1139
0433 3142 K1142, 1142
0434 3145 K1145, 1145
0435 3148 K1148, 1148
0436 3151 K1151, 1151
0437 3154 K1154, 1154
0438 3157 K1157, 1157
0439 3160 K1160, 1160
0440 3163 K1163, 1163
0441 3166 K1166, 1166
0442 3169 K1169, 1169
0443 3172 K1172, 1172
0444 3175 K1175, 1175
0445 3178 K1178, 1178
0446 3181 K1181, 1181
0447 3184 K1184, 1184
0448 3187 K1187, 1187
0449 3190 K1190, 1190
0450 3193 K1193, 1193
0451 3196 K1196, 1196
0452 3199 K1199, 1199
0453 3202 K1202, 1202
0454 3205 K1205, 1205
0455 3208 K1208, 1208
0456 3211 K1211, 1211
0457 3214 K1214, 1214
0458 3217 K1217, 1217
0459 3220 K1220, 1220
0460 3223 K1223, 1223
0461 3226 K1226, 1226
0462 3229 K1229, 1229
0463 3232 K1232, 1232
0464 3235 K1235, 1235
0465 3238 K1238, 1238
0466 3241 K1241, 1241
0467 3244 K1244, 1244
0468 3247 K1247, 1247
0469 3250 K1250, 1250
0470 3253 K1253, 1253
0471 3256 K1256, 1256
0472 3259 K1259, 1259
0473 3262 K1262, 1262
0474 3265 K1265, 1265
0475 3268 K1268, 1268
0476 3271 K1271, 1271
0477 3274 K1274, 1274
0478 3277 K1277, 1277
0479 3280 K1280, 1280
0480 3283 K1283, 1283
0481 3286 K1286, 1286
0482 3289 K1289, 1289
0483 3292 K1292, 1292
0484 3295 K1295, 1295
0485 3298 K1298, 1298
0486 3301 K1301, 1301
0487 3304 K1304, 1304
0488 3307 K1307, 1307
0489 3310 K1310, 1310
0490 3313 K1313, 1313
0491 3316 K1316, 1316
0492 3319 K1319, 1319
0493 3322 K1322, 1322
0494 3325 K1325, 1325
0495 3328 K1328, 1328
0496 3331 K1331, 1331
0497 3334 K1334, 1334
0498 3337 K1337, 1337
0499 3340 K1340, 1340
0500 3343 K1343, 1343
0501 3346 K1346, 1346
0502 3349 K1349, 1349
0503 3352 K1352, 1352
0504 3355 K1355, 1355
0505 3358 K1358, 1358
0506 3361 K1361, 1361
0507 3364 K1364, 1364
0508 3367 K1367, 1367
0509 3370 K1370, 1370
0510 3373 K1373, 1373
0511 3376 K1376, 1376
0512 3379 K1379, 1379
0513 3382 K1382, 1382
0514 3385 K1385, 1385
0515 3388 K1388, 1388
0516 3391 K1391, 1391
0517 3394 K1394, 1394
0518 3397 K1397, 1397
0519 3400 K1400, 1400
0520 3403 K1403, 1403
0521 3406 K1406, 1406
0522 3409 K1409, 1409
0523 3412 K1412, 1412
0524 3415 K1415, 1415
0525 3418 K1418, 1418
0526 3421 K1421, 1421
0527 3424 K1424, 1424
0528 3427 K1427, 1427
0529 3430 K1430, 1430
0530 3433 K1433, 1433
0531 3436 K1436, 1436
0532 3439 K1439, 1439
0533 3442 K1442, 1442
0534 3445 K1445, 1445
0535 3448 K1448, 1448
0536 3451 K1451, 1451
0537 3454 K1454, 1454
0538 3457 K1457, 1457
0539 3460 K1460, 1460
0540 3463 K1463, 1463
0541 3466 K1466, 1466
0542 3469 K1469, 1469
0543 3472 K1472, 1472
0544 3475 K1475, 1475
0545 3478 K1478, 1478
0546 3481 K1481, 1481
0547 3484 K1484, 1484
0548 3487 K1487, 1487
0549 3490 K1490, 1490
0550 3493 K1493, 1493
0551 3496 K1496, 1496
0552 3499 K1499, 1499
0553 3502 K1502, 1502
0554 3505 K1505, 1505
0555 3508 K1508, 1508
0556 3511 K1511, 1511
0557 3514 K1514, 1514
0558 3517 K1517, 1517
0559 3520 K1520, 1520
0560 3523 K1523, 1523
0561 3526 K1526, 1526
0562 3529 K1529, 1529
0563 3532 K1532, 1532
0564 3535 K1535, 1535
0565 3538 K1538, 1538
0566 3541 K1541, 1541
0567 3544 K1544, 1544
0568 3547 K1547, 1547
0569 3550 K1550, 1550
0570 3553 K1553, 1553
0571 3556 K1556, 1556
0572 3559 K1559, 1559
0573 3562 K1562, 1562
0574 3565 K1565, 1565
0575 3568 K1568, 1568
0576 3571 K1571, 1571
0577 3574 K1574, 1574
0578 3577 K1577, 1577
0579 3580 K1580, 1580
0580 3583 K1583, 1583
0581 3586 K1586, 1586
0582 3589 K1589, 1589
0583 3592 K1592, 1592
0584 3595 K1595, 1595
0585 3598 K1598, 1598
0586 3601 K1601, 1601
0587 3604 K1604, 1604
0588 3607 K1607, 1607
0589 3610 K1610, 1610
0590 3613 K1613, 1613
0591 3616 K1616, 1616
0592 3619 K1619, 1619
0593 3622 K1622, 1622
0594 3625 K1625, 1625
0595 3628 K1628, 1628
0596 3631 K1631, 1631
0597 3634 K1634, 1634
0598 3637 K1637, 1637
0599 3640 K1640, 1640
0600 3643 K1643, 1643
0601 3646 K1646, 1646
0602 3649 K1649, 1649
0603 3652 K1652, 1652
0604 3655 K1655, 1655
0605 3658 K1658, 1658
0606 3661 K1661, 1661
0607 3664 K1664, 1664
0608 3667 K1667, 1667
0609 3670 K1670, 1670
0610 3673 K1673, 1673
0611 3676 K1676, 1676
0612 3679 K1679, 1679
0613 3682 K1682, 1682
0614 3685 K1685, 1685
0615 3688 K1688, 1688
0616 3691 K1691, 1691
0617 3694 K1694, 1694
0618 3697 K1697, 1697
0619 3700 K1700, 1700
0620 3703 K1703, 1703
0621 3706 K1706, 1706
0622 3709 K1709, 1709
0623 3712 K1712, 1712
0624 3715 K1715, 1715
0625 3718 K1718, 1718
0626 3721 K1721, 1721
0627 3724 K1724, 1724
0628 3727 K1727, 1727
0629 3730 K1730, 1730
0630 3733 K1733, 1733
0631 3736 K1736, 1736
0632 3739 K1739, 1739
0633 3742 K1742, 1742
0634 3745 K1745, 1745
0635
```

```

/ PAL:0 V142A 19-MAR-75 15:21 PAGE 1-4

0206 7402 KHLT, HLT /WILL ONLY RUN IN FIELD 0777?
0207 1103 TAD KCDF
0210 0211 DCA ,+1
0211 7402 HLT /MAKE DF=10
/
/SETUP INTERRUPT SERVICE1
/
0212 1386 TRD ACCCA
0213 3021 DCA 1 /SETUP AC DCA
0214 1247 TAD KR07
0215 3022 DCA 2 /SETUP ROTATE LINK
0216 1365 TAD LNKDCA
0217 3023 DCA 3 /SETUP SAVE LINK
0220 1364 TAC X5405
0221 3024 DCA 4 /SETUP JMP RETURN
0222 1367 TAD BRKRET
0223 3025 DCA 5 /RETURN POINTER
/
/CLEAR DATA INFORMATION TABLE
/AT END OF PROGRAM!
/
0224 1074 STRTEX, TAC X7700
0225 3110 DCA TRASH1 /CLEAR COUNTER
0226 1775 TRD RANJMS
0227 3774 DCA SWDAT /SET INSTRUCTION SWITCH
0228 7340 CLA CLL CMA
0231 1147 TAD TIMPOT
0232 3010 DCA AUTO10 /LOCATION POINTER
0233 3410 DCA I AUTO10 /CLEAR
0234 2110 ISZ TRASH1
0235 5233 JMF ,+2 /MORE TO CLEAR
0236 3155 DCA DATFLG
/
/
/PRINT PROGRAM NAME AND
/ASK OPERATOR ABOUT AMOUNT
/OF MEMORY!
/
0237 4452 CRLF
0238 4450 PRNTER /PRINT "RWVE DATA RELIABILITY"
0241 3303 MES1 /PRINT "AMOUNT OF MEMORY"
0242 4450 PRNTER
0243 3337 MES5
0244 4424 ONEIN /RECEIVE ONE OCTAL
0245 0070 R070 /LIMITS
0246 5242 JMF ,+4 /INPUT ERROR
0247 7004 KRGT, RAL
0248 7006 PTL
0251 7040 CMA /COMPLEMENT
0252 3141 DCA MAXFLD /MAXIMUM FIELD POINTER
0253 4450 ALLAGN, PRNTER /PRINT "EXERCISE"
0254 3316 MES2
0255 3110 DCA TRASH1
0256 1106 TAD M4
0257 3111 DCA TRASH2

```

```

/ PAL:0 V142A 19-MAR-75 15:21 PAGE 1-5

0260 3055 DCA AMOUNT /A FEW POINTERS
/
/ASK OPERATOR ABOUT DISK(S) TO TEST!
/
0261 1110 NEXT, TAD TRASH1
0262 1152 TAD RUNPOT
0263 3112 DCA TRASH3 /SAVE RUN POINTER
0264 7340 CLA CLL CMA
0265 4450 PRNTER /PRINT "DISK"
0266 3323 MES3
0267 1061 TAD X0260
0270 1110 TAD TRASH1 /ADD IN DISK NUMBER
0271 4440 TYPE /TYPE DISK NUMBER
0272 1065 TAD X0277
0273 4440 TYPE /TYPE ?
0274 4437 RECELV /RECEIVE KEY INPUT
0275 4431 YESNO /WAS IT YES OR NO
0276 5253 JMP ALLAGN /NEITHER
0277 5302 JMP ,+3 /WAS A NO
0300 2053 ISZ AMOUNT /AMOUNT OF DISK FOUND
0301 7340 CLA CLL CMA /AC TO 7777 FOR EXISTING DISK
0302 3512 DCA I TRASH3 /SETUP RUN POINTER
0303 2110 ISZ TRASH1
0304 2111 ISZ TRASH2
0305 5261 CMP NEXT /ASK ABOUT NEXT DISK
/
/
/ASK IF ACCEPT MODE!
/
0306 1053 TAD AMOUNT /GET AMOUNT FOUND
0307 7650 SNA CLA /WERE ANY FOUND
0310 5224 JMP STRTEX /OPERATOR ERROR NO DISK INPUT
0311 4450 PRNTER /PRINT "ACCEPT MODE?"
0312 3361 MES6
0313 4437 RECELV /RECEIVE INPUT
0314 4431 YESNO /YES OR NO????
0315 5311 JMP ,+4 /NEITHER ALL AGAIN
0316 7610 SRP CLA /MANUAL TEST
0317 5773 JMP ASKSUP /ASK "ARE YOU SURE"
/
/
/IF ACCEPT MODE, INTERGATE
/ABOUT CONSTANT FIELD!
/
0320 4450 MANUAL, PRNTER /PRINT "FIELD?"
0321 3402 MES8
0322 4437 RECELV /RECEIVE Y OR N
0323 4431 YESNO /CHECK FOR Y OR N
0324 5320 JMP MANUAL /NEITHER Y OR N
0325 5343 JMP ASKNX1 /WAS A N, ASK ABOUT NEXT
0326 4423 SPACE /SPACE OUT ONE
0327 4424 ONEIN /GET 1 OCTAL
0330 0070 R070 /LIMITS
0331 5320 JMP MANUAL /INPUT ERROR ASK AGAIN
0332 7124 CLL RAL

```

```

0332 7026 HDL
0334 7158 DCA SPFLD /SAVE INPUT
0335 1158 TAD SPFLD
0336 1141 TAD *AXFLD /COMPARE TO *AXFLD?
0337 7707 SZA CLA /C.R.?
0338 5324 JNF MANUAL /INPUT ERROR
0341 7340 CLA CLL CMA
0342 3772 DCA HLFPLG /SETUP FIELD FLAG
/
/
/INTERIGATE ABOUT CONSTANT TRACK1
/
0343 4450 ASKX1, PRINTER /PRINT "TRACK1"
0344 3408 MESS
0345 4437 RECEIV /RECEIVE INPUT
0346 4431 YESNO /CHECK FOR Y OR N
0347 5343 JMP ASKX1 /ERROR, ASK AGAIN
0348 5771 JMP ASKX2 /N, ASK ABOUT NEXT
0351 4423 SPACE
0352 4424 ONEIN /RECEIVE 1 IN OCTAL
0353 0210 0210 /LIMITS
0354 5343 JMP ASKX1 /ERROR, ASK AGAIN
0355 3157 DCA SPTRK1 /SAVE EXTENDED TRACK BIT
0356 4425 FORIN /RECEIVE FOUR IN OCTAL
0357 5343 JMP ASKX1 /ERROR, ASK AGAIN
0360 3162 DCA SPTRK2 /SAVE CYL, SURFACE, AND SECTOR
0361 7340 CLA CLL CMA
0362 3772 DCA TRKFLG /SETUP TRACK FLAG
0363 5771 JNF ASKX2 /ASK ABOUT NEXT
/
/
0364 5405 K5405, 5405
0365 3166 UNKDCA, DCA SVALK
0366 3155 ACDCA, DCA SAVAC
0367 2304 BRKBT, RETURN
/
/
0370 3542
0371 4404
0372 3541
0373 0524
0374 2601
0375 0554
0376 2023
0377 2733
0400 PAGE
/
/
/INTERIGATE ABOUT CONSTANT
/BLOCK LENGTH1
/
0400 4450 ASKX2, PRINTER /PRINT "BLOCK LENGTH1"
0401 3422 MESS11
0402 4437 RECEIV /RECEIVE INPUT
0403 4431 YESNO /CHECK FOR Y OR N
0404 5208 JNF ASKX2 /ERROR, ASK AGAIN
0405 5217 JNF ASKX3 /N, ASK ABOUT NEXT

```

```

0406 4421 SPACE /Y, SPACE OUT 1
0407 4424 ONEIN /RECEIVE 1 IN OCTAL
0408 0210 0210 /LIMITS
0409 5208 JNF ASKX2 /ERROR, ASK AGAIN
0412 7640 SZA CLA /SET HALF BLOCK?
0413 7340 CLA CLL CMA /YES
0414 3162 DCA SPBLK /SETUP BLOCK NUMBER
0415 7340 CLA CLL CMA
0416 3772 DCA HLFPLG /SETUP BLOCK FLAG
/
/
/INTERIGATE ABOUT CONSTANT
/SECTORS1
/
0417 4450 ASKX3, PRINTER /PRINT "EXTRA SECTORS?"
0420 3412 MESS10
0421 4437 RECEIV /RECEIVE INPUT
0422 4431 YESNO /CHECK FOR Y OR N
0423 5217 JMP ASKX3 /INPUT ERROR
0424 5256 JMP ASKX4 /N, ASK ABOUT NEXT
0425 4423 SPACE /SPACE OUT 1
0426 4424 ONEIN /RECEIVE 1 IN OCTAL
0427 0210 0210 /LIMITS
0430 5217 JMP ASKX3 /ERROR, ASK AGAIN
0431 7104 CLG HAL
0432 7026 RTL
0433 3151 DCA SPSEC /SAVE IT
0434 4424 ONEIN /RECEIVE 1 IN OCTAL
0435 0270 0270 /LIMITS
0436 5217 JMP ASKX3 /INPUT ERROR, ASK AGAIN
0437 1161 TAD SPSEC /ADD IN LAST
0440 3161 DCA SPSEC /SAVE ALL
0441 1162 TAD SPBLK
0442 7640 SZA CLA /BLOCK LENGTH 0????
0443 5246 JNF ,+3 /NO LIMIT IS 17.
0444 1156 TAD SPFLD
0445 7640 SZA CLA /FIELD 0?????
0446 1057 TAD K0010 /LIMIT IS 17.
0447 1056 TAD K0007
0448 7140 CLL CMA
0449 1161 TAD SPSEC /COMPARE SECTION INPUT
0452 7630 SZL CLA /IN LIMITS???
0453 5217 JMP ASKX3 /NO, INPUT ERROR
0454 7340 CLA CLL CMA
0455 3772 DCA SECFLG /SETUP SECTOR FLAG
/
/
/INTERIGATE ABOUT SEQUENCE1
/
0456 1775 ASKX4, TAD TRKFLG /GET TRACK FLAG
0457 7640 SZA CLA /WAS IT SET?
0458 5271 JMP ASKX5 /YES, DON'T ASK SEQUENCE
0459 4450 PRNTER /PRINT "SEQUENCE1"
0462 3431 MESS12
0463 4437 RECEIV /RECEIVE INPUT

```



```

0464 4431 YESNO /Y OP N
0465 5256 JMP ASKNX4 /ERROR, ASK AGAIN
0466 5271 JMP ASKNX5 /Y ASK ABOUT NEXT
0467 7340 CLA CLL CMA /SETUP SEQUENCE FLAG
0468 7774 DCA SEQFLG
/
/INVESTIGATE ABOUT OPERATOR
/SELECT DATA/
/
0471 4454 ASKNX5, PRINTER /PRINT "DATA?"
0472 3636 MSG13
0473 1359 TAD RANJMS
0474 7773 DCA SADR1 /SET INSTRUCTION SWITCH
0475 4437 RECEIV /RECEIVE INPUT
0476 4431 YESNO /Y OR N
0477 5271 JMP ASKNX5 /ERROR, ASK AGAIN
0500 5320 JMP ASNSUP /ASK "ARE YOU SURE?"
0501 7340 TAD ASKP
0502 7773 DCA SWDAT /SET INSTRUCTION SWITCH
0503 7340 TAD Y12
0504 3617 DCA TRASH1 /SETUP WORD COUNTER
0505 7340 CLA CLL CMA
0506 1148 TAD DRIPOT /GET POT POINTER
0507 7340 DCA AUTOP1
0510 4452 ONLY
0511 4425 FORIN /RECEIVE 4 IN OCTAL
0512 5271 JMP ASKNX5 /INPUT ERROR, ASK AGAIN
0513 5410 DCA I AUTO1P /SAVE DATA
0514 2110 ISZ TRASH1 /UPDATE COUNTER
0515 5320 JMP ,+5 /GET NEXT
0516 7340 CLA CLL CMA
0517 7340 DCA DATFLG /SETUP DATA FLAG
/
/ASK IF HE'S SURE/
/
0520 4434 ASKSUR, PRINTER /PRINT "ARE YOU SURE?"
0521 3641 MSG14
0522 4437 RECEIV /GET INPUT
0523 4431 YESNO /Y OR N
0524 5320 JMP ASKSUR /INPUT ERROR
0525 5772 JMP STRTX /CALL AGAIN
/
/SEND EXISTING DRIVES TO A RANDOM TRACK
/AND SAVE THE TRACK ADDRESS
/
0526 7110 STXSEK, DCA TRASH1
0527 1253 TAD AMOUNT
0530 7041 CLA
0531 7110 DCA TRASH2 /MOVE POINTERS
0532 1110 NXTSEK, TAD TRASH1
0533 4434 SELCHK /CHECK RUN POINTER
0534 5754 JMP RTSEK /HAS A ZERO DON'T RUN
0535 1110 RESET, TAD TRASH1

```

```

0536 7104 CLL R1L
0537 4476 RECAL /RECALIBRATE DRIVE
0540 7517 KSKP, SKP CLA /SCALIBRATE IS O.K.
0541 5347 JMP RTSEK +3 /DUMPED BUT MORE AVAILABLE
0542 1110 TAD TRASH1
0543 7104 CLL R1L
0544 4432 SELK /SEEK ONLY A RANDOM TRACK
0545 7610 SKP CLA
0546 5335 JMP RESET /ERROR, TRY TO RECALIBRATE
0547 2111 ISZ TRASH2 /UPDATE POINTER
0550 7610 SKP CLA /MOVE TO SEND OUT
0551 5771 JMP RUN /START RANDOM DATA
0552 2110 RTSEK, ISZ TRASH1
0553 5332 JMP RTSEK /SEND OUT NEXT EXISTING DISK
/
0554 4428 RANJMS, GENDAT
/
0571 0600
0572 0224
0573 2401
0574 3545
0575 3542
0576 3543
0577 3544
PAGE
2600
/
/SETUP ADDRESSING, COMMAND,
/AND DATA PARAMETERS/
/IF SW6 IS SET, INHIBIT DATA
/TESTING/
/
0600 3163 RUN, DCA EPFLG /CLEAR ERROR POINTER
0601 7604 CAS
0602 0360 AND X0240 /MASK SWITCH 6
0603 3164 DCA SEKSW /LATCH
0604 1164 TAD SEKSW
0605 7540 SZA CLA /SEEK ONLY SET????
0606 5777 JMP POLNEX /YES, SEEK ONLY
/
/MAKE FIELD1
/
0607 1776 TAD FLD1FLG /GET FIELD FLAG
0610 7650 SNA CLA /WAS IT SET?
0611 5214 JMP ,+3 /NO, USE RANDOM FIELD
0612 1155 TAD SPFLD /YES, GET OPERATOR FIELD
0613 5213 JMP RFLD /GO
0614 7301 CLA CLL IAC
0615 1141 TAD MAXFLD /GET MAXIMUM FIELD POINTER
0616 7650 SNA CLA /ANY FIELDS THERE
0617 5213 JMP RFLD /NO EXTENDED FIELDS TO USE
0620 4434 RANJMS
0621 0214 AND K0070 /YES, GET A RANDOM FIELD
0622 7450 SNA /MASK
0623 5213 JMP RFLD /COULD BE 0
/WAS DON'T HAVE TO CHECK LIMITS

```

```

/ PAL12 V142A 19-MAR-75 15:21 PAGE 1-11
0624 3134 DCA INTCM /SAVE FIELD POINT
0627 1174 TAD JALCM /
0628 1141 TAD MAXFLD /RND IN MAXIMUM FIELD POINTING
0629 7710 SPA CLA /CN LIMITS????
0630 5274 JMP /YES, USE IT
0631 1141 TAD MAXFLD /NO, USE MAXIMUM IN THE MACHINE
0632 7940 CMA /
0633 3134 RNFLL, DCA INTCM /
/MAKE BLOCK LENGTH
/
0634 1775* TAD HLFPLG /GET BLOCK FLAG
0635 7650 SPA CLA /HAS IT SET????
0636 4433 RANGEN /NO, USE RANDOM
0637 1102 TAD SPBCK /MASK
0640 0015 AND KALM2 /
0641 1134 TAD INTCM /
0642 1134 DCA INTCM /INITIAL HALF BLOCK BIT ***
0643 1134 TAD INTCM /
0644 1134 AND K0100 /MASK
0645 7640 SPA CLA /HALF BLOCK SET????
0646 1079 TAD K0200 /YES, SETUP AC POINTER
0647 1144 TAD K7400 /
0648 3171 DCA TRASH2 /NO BUILDER
0649 3171 TAD TRASH2 /
0650 1141 CIA /
0652 7441 DCA UPDATE /UPDATER FOR FWREG
0653 3134 TAD INTCM /
0654 1134 AND A017F /MASK FIELD BITS
0655 0301 SPA CLA /WERE THERE ANY
0656 7640 TAD /YES
0657 1057 TAD K0007 /MAKE MAXIMUM SECTOR POINTER
0658 1056 TAD K0007 /SAVE IT
0659 3171 DCA TRASH1 /
/MAKE AMOUNT OF SECTORS
/TO TRANSFER
/
0662 1774* TAD SECFLG /GET SECTOR FLAG
0663 7650 SPA CLA /HAS IT SET????
0664 4433 RANGEN /USE RANDOM
0665 1102 TAD SPSEC /GET OPERATOR INPUT
0666 0310 AND TRASH1 /MASK OUT
0667 3145 DCA CONSEC /SAVE
0668 1145 TAD CONSEC /
0669 7240 CMA /
0670 3134 DCA TRASH1 /CONSECUTIVE TO DC
/
/MAKE CYLINDER, SURFACE, AND
/STARTING SECTOR:
/
0673 1774* TAD TRKFLG /GET TRACK FLAG
0674 7650 SPA CLA /HAS IT SET????
0675 4433 RANGEN /USE RANDOM
0676 1102 TAD SPTRK2 /GET INPUT
0677 0015 AND K0017 /MASK
/
/ PAL10 V142A 19-MAR-75 15:21 PAGE 1-11
0700 3134 DCA TRASH1 /STARTING SECTOR
0701 1110 TAD TRASH2 /COMPUTE INITIAL WC
0702 2110 ISZ TRASH1 /
0703 5301 JMP /#2 /UPDATE BY BUILDER
0704 3125 DCA WCREG /INITIAL WORD COUNT ***
/
/MAKE CURRENT ADDRESS:
/
0705 4433 RANGEN /GENERATE RANDOM CA
0706 3124 DCA CAREG /SAVE IT
0707 1134 TAD INTCM /
0710 0015 AND K0070 /MASK FIELD BITS
0711 7640 SPA CLA /EXTENDED FIELD????
0712 5230 JMP FILLER /INITIAL CA 0,K,***
0713 1144 TAD BGNBUP /
0714 7140 CMA CLL /
0715 1124 TAD CAREG /
0716 7620 SHL CLA /GREATER THAN PROGRAM #1
0717 5126 JMP CONCUR /NO, USE CONSTANT VALUE
0720 1125 TAD WCREG /GET WORD COUNT
0721 7041 CIA /
0722 1124 TAD CAREG /ADD IN CA
0723 1015 TAD K0200 /
0724 7630 SHL CLA /WITHIN BOUNDS????
0725 5730 JMP FILLER /YES, INITIAL CA 0,K,***
0726 1144 CONCUR, TAD BGNBUP /NO, USE PROGRAM #1
0727 3124 DCA CAREG /SAVE IT
/
/ROUTINE TO FILL AND CHECK SUP BUFFER
/
0730 4425 FILLER, BGENEN /SETUP AND SAVE GENERATE
0731 1106 TAD M4 /
0732 1135 DCA BSTRY /SETUP TRY COUNTER
0733 4427 RNFLL, SETFLD /FIELD + BUFTAL + AUTO 11 * 12
0734 3135 DCA /FIELD TO BUFFER IN AC
0735 7402 HLT /,=1 /CDF TO BUFFER
0736 3137 DCA CHKSAV /START WITH 0
0737 4421 NEWRD, RANDAT /GENERATE DATA
0740 3110 DCA TRASH1 /SAVE OUTPUT WORD
0741 1110 TAD TRASH1 /GET BACK WORD
0742 4411 DCA I AUTO11 /STORE IN BUFFER
0743 7100 CLL /
0744 1134 TAD TRASH1 /GET BACK WORD
0745 1137 TAD CHKSAV /ADD IN LAST
0746 7430 SHL /LINK SET?
0747 7501 TAD /ADD IT IN
0750 3127 DCA CHKSAV /SAVE FOR NEXT
0751 2115 ISZ BUFTAL /UPDATE BUFFER TALLY
0752 5337 JMP NEWRD /MORE WORDS TO GO
0753 0201 CDF 0 /
0754 1163 TAD KRFLLG /
0755 7650 SPA CLA /ERROR FLAG SET????
0756 5771* JMP POLRES /POLE DRIVES
0757 0772* JMP WREFC /YES, MUST BE A WRITE ERROR

```

```

0787 0000 00000 0000
0788 0100 01000 0100
/
0772 1054
0773 1052
0774 1051
0775 1050
0776 1049
0777 1048
PAGE
/
/ROTATE TO POLE DRIVE; WAIT FOR FIRST DRIVE COMPLETION,
/THEN START WRITE SEQUENCE!
/
1000 2114 POLDEX, ISZ  POLDSK  /UPDATE POLE POINTER
1001 7002 DCP
1002 1115 SAMPOL, TAD  POLDSK  /GET POINTER
1003 4432 SLLCHK  /CHECK POLE POINTER
1004 5200 JMP  POLDEX  /TRY NEXT DRIVE
1005 1115 TAD  POLDSK  /GET POINTER
1006 0000 AND  X0000  /MASK
1007 7004 CLL HAL  /MAKE DRIVE NUMBER
1008 4444 DCCMD  /LOAD COMMAND REGISTER
1009 4442 PSTAT  /READ STATUS REGISTER
1010 1071 TAD  X0000
1011 7050 SNA
1012 5202 JMP  POLDEX  /AS DRIVE BUSY
1013 1067 TAD  X2000  /YES, TRY NEXT DRIVE
1014 7050 SNA CLA  /NO, THEN AT FIRST BR DONE
1015 5235 JMP  GOTAT  /YES, DONE
1016 4441 BRPOB  /ERROR ON DRIVE POLE
1017 0203 SNA  /HEADER POINTER
1018 7200 TAD  POLDSK  /MESSAGE POINTER
1019 1114 BRREC, TAD  POLDSK  /LAST DRIVE USED
1020 7104 CLL HAL  /RECALIBRATE DISK
1021 4436 RECAL  /RECALIBRATE C.N.
1022 7010 EXP CLA  /COMP, BUT MORE AVAILABLE
1023 5202 JMP  POLDEX  /GET DISK NO.
1024 7104 CLL HAL
1025 4432 SEEK  /SEEK A RANDOM TRACK
1026 5209 JMP  POLDEX  /ENTER POLE DISK
1027 5223 JND  BRREC  /UNCOR. RECALIBRATE
/
/
/DRIVE COMPLETED, START
/WRITE SEQUENCE!
/
1035 1114 GOTAT, TAD  POLDSK  /GET POINTER
1036 0000 AND  X0000  /MASK
1037 1151 TAD  DSKPOT  /GET DISK ADDRESS POINTER
1038 3110 DCA  TRASH1
1039 1010 TAD  I  /GET DISK ADDRESS
1040 0000 AND  X0000  /MASK DRIVE + EXTENDED BIT
1041 1134 TAD  I*200  /ADD IN COMMAND

```

```

1044 3134 DCA  INTCH  /DRIVE NUMBER + EXTENDED BIT ***
1045 1054 TAD  SEKBW  /GET SEEK SWITCH LATCH
1046 7040 SNA CLA  /LOOP ON SEEK ONLY????
1047 5354 JMP  RESSEK  /YES!!!
1048 1010 TAD  I  /GET DISK ADDRESS
1049 0000 AND  X7000  /MASK OFF TRACK
1050 1112 TAD  TRASH3  /END IN STARTING SECTOR
1051 3122 DCA  INTCH  /INITIAL DISK ADDRESS ****
/
/WRITE INFORMATION!
/CLAMP BUFFER ON THE FLY!
/
1054 4434 REWAT, DISKGO  /GO WRITE
1055 4400 4000  /WRITE DATA POINTER
1056 5270 JMP  GOREAD  /WRITE 0,K.
1057 7342 CLA  CLL  CMA
1058 3163 DCA  BRFLG  /SET WRITE ERROR FLAG
1059 4435 RESRAN  /RESET GENERATOR
1060 2130 ISZ  STATRY  /UPDATE WRITE RS=TRY
1061 5777 JMP  REFILL  /TRY AGAIN
/
/CHECK FOR LOOP ON WRITE!
/
1064 7004 LAS  /GET SWITCH 0
1065 7700 TRYTRY, SNA CLA  /LOOP ON WRITE????
1066 5354 JMP  RESSEK  /NO, TRY TO SEEK IT
1067 5776 JMP  REFILL =2  /TRY WRITE AGAIN
1068 7004 GOREAD, LAS  /GET SWITCH 0
1069 7700 SNA CLA  /LOOP SWITCH SET????
1070 5277 JMP  REREAD  /NO
1071 7340 CLA  CLL  CMA
1072 3163 DCA  BRFLG  /SET ERROR FLAG
1073 4435 RESRAN  /RESET DATA GENERATOR
1074 5776 JMP  REFILL =2
1075 1205 REREAD, TAD  TRYTRY
1076 3172 DCA  TRYCNT  /SETUP FOR SOFT ERROR RETRY
1077 3163 DCA  BRFLG  /CLEAR ERROR FLAG
1078 1106 TAD  M4
1079 3135 DCA  STATRY  /SETUP TRY COUNTER
1080 1106 TAD  M4
1081 3130 DCA  DATTRY  /SETUP TRY COUNTER
1082 3153 DCA  CROCNT  /CLEAR CRC COUNTER!!!
/
/READ INFORMATION!
/CHECK BUFFER ON THE FLY!
/
1107 4434 PTRIN, DISKGO  /READ DATA
1108 4400 4000  /READ DATA POINTER
1109 7010 SKP CLA  /DATA READ 0,K.
1110 5321 JMP  PSTAT  /STATUS ERROR
1111 3153 DCA  CROCNT  /CLEAR CRC COUNTER!
/
/CHECK DATA ON NO STATUS ERRORS!
/
1114 4776 JMS  STOPK  /CHECK DATA

```

```

1116 5342      JMP      SEKGO      /DATA CLY,
1116 5336      ISZ      RATCHY  /UPDATE READ MEMORY
1117 5307      JMP      RDRY     /TRY AGAIN
1127 5337      JMP      SEKGO +1 /TRY TO SEEK IT
1127 1129      HDSTA, TAD      SIBEG  /GET STATUS READ
1122 4257      AND      K2010  /MASK CRC
1123 1450      SNA      /CRC ERROR????
1124 5304      JMP      UPTRY   /NO, TRY READ AGAIN
1125 4154      DCA      CRCFLG /YES, SET FLAG
1126 2153      ISZ      CRCCNT  /UPDATE CRC POINTER
/
/CHECK DATA AFTER CRC ERROR!
/
1127 4775*     JMS      D1CHK     /CHECK DATA
1128 7854      SNA      CLA      /IS A HARD ERROR!
1131 7340      CLA      CMA      /SET RETRY COUNTER!
1132 1163      DCA      ERFLG   /SETUP FOR 64 RETRIES IF ACB777
1133 7610      SNA      /CHECK ON RETRY!!!
1134 3159      DCA      CRCCNT  /UPDATE TRY POINTER
1135 2135      ISZ      STACRY  /TRY AGAIN
1136 5307      JMP      RDRY     /IS A HARD ERROR
1137 3453      DCA      ERFLG   /CLEAR CRC COUNT
1142 4154      DCA      CRCFLG /CLEAR CRC FLAG
1141 3154      DCA      CRCFLG /CHECK TIME POINTERS
1142 4774*     JMS      CKTIM  /IS IT 64 RETRIES FOR SOFT ERROR?
1143 1161      TAD      ERFLG   /NO DON'T BOTHER
1144 7854      SNA      CLA      /YES, UPDATE RETRY COUNTER
1145 8354      JMP      +3
1146 2174      ISZ      TRYCNT  /TRY AGAIN
1147 5342      JMP      PERBAD +3
/
/CHECK FOR LOOP ON READ!
/
1150 7874      LAS      /GET SWITCH 1
1151 1164      CLL      RAG     /LOOP???
1152 7714      SNA      CLA      /YES, LOOP
1153 5277      DCA      PERBAD  /CLEAR ERROR FLAG
/
/CHECK FOR TYPE STATUS
/REPORT!
/
1155 7844      LAS      /MASK
1156 4265      AND      K249D  /TYPE STATUS REPORT????
1157 7852      SNA      CLA      /NO
1158 3353      JMP      +3
1159 4452      CRLF
1162 4773*     JMS      TPSTA  /YES
1163 1121      TAD      CMREG  /GET DRIVE NUMBER
1164 4432      SEEK      /SEEK A RANDOM TRACK
1165 5772*     JMP      RDN     /DO NEXT DRIVE
1166 1121      TAD      CMREG
1167 4435      RECAL      /RECALIBRATE DRIVE
1170 5363      JMP      +5     /TRY, SEEK AGAIN
1171 5772*     JMP      RDN     /DUMPED, BUT NONE AVAILABLE

```

```

1172 7824
1173 3220
1174 2454
1175 1620
1176 2131
1177 3733
1200
PAGE
/
/ERROR HANDLER!
/UPDATE "SOFT" OR "HARD" TALLYS!
/PRINT ERROR TEXT AND DATA!
/CHECK INHIBIT ERROR SA!
/
ERRD, 0
1201 7821      IAC
1202 3373      DCA      PCNTR2  /UPDATE AC FLAG
/SAVE NON-RECOVERABLE POINTERS!
/
/COMPUTE WAY TO "HARD"/"SOFT" TALLYS!
/
1203 1877      TAD      K7772
1204 3374      DCA      PCNTR3  /LINE COUNTER
1205 1121      TAD      CMREG  /GET LAST COMMAND
1206 2855      AND      K2008  /MASK DRIVE NUMBER
1207 1178      CLL      CMA      RAR
1210 1372      DCA      PCNTR1  /SETUP COUNTER
1211 1854      TAD      K2003
1212 2372      ISZ      PCNTR1
1213 5211      JMP      +*2
/COMPUTE WAY TO BUFFER
1214 1150      TAD      STAPUT
1215 3372      DCA      PCNTR1  /POINTER TO BUFFER
/
/DETERMINE IF ERROR IS "HARD" OR "SOFT"!
/
1216 1154      TAD      CRCFLG  /GET CRC FLAG
1217 7850      SNA      CLA      /CRC ERROR????
1220 5251      JMP      NOSOFT  /NO, WAS DEFINITELY A HARD ERROR!
1221 1600      TAD      I      ERRO  /GET ERROR POINTER!
1222 7650      SNA      CLA      /WAS IT FIRST TIME?
1223 5255      JMP      NTERR   /NO ERROR, ADDITIONAL CRC DATA!
1224 1123      TAD      DAREG  /COMPARE FAILING SECTOR TO
1225 4262      AND      K2617  /SECTOR WHERE DATA ERROR
1226 7841      CIA
1227 1127      TAD      ASREG
1230 7640      SNA      CLA      /SAME SECTOR?
1231 5251      JMP      NOSOFT  /NO, "HARD" ERROR
1232 7340      CLA      CMA
1233 1153      TAD      CRCCNT  /GET CRC COUNTER
1234 7452      SNA      /WAS THIS FIRST POSSIBLE "SOFT"?
1235 5245      JMP      SOFT  /YES, UPDATE "SOFT" TALLY!
1236 1107      TAD      K7773  /CHECK IF NONRECOVERABLE "SOFT"!
/
1237 7650      SNA      CLA      /WAS IT?
1240 2372      ISZ      PCNTR1  /NO, DUMP "SOFT" TALLY!
1241 1772      TAD      I      PCNTR1 /OTHERWISE DUMP "HARD" TALLY!
1242 7449      SNA      /DON'T GO BACK AHEAD!!!!

```

```

/ PAGE 19-VI42A 19-MAR-75 15121 PAGE 1416
1243 1171 TAB 17777 /DUMP APPROPRIATE TABLE;
1244 5254 SWP WRRM +1 /DUMP IT!
1245 1121 SCFI, TAB 17777
1246 1772 TAB 1 PCNTR1 /REDUCE HARD ERROR COUNT
1247 3772 DCA 1 PCNTR1
1248 3772 ISZ PCNTR1 /YES, UPDATE POINTER
1251 1121 WTSOFT, TAB 1 17777
1252 2772 ISZ 1 PCNTR1 /UPDATE ERROR COUNT
1253 7610 SKP CLA
1254 3772 DCA 1 PCNTR1 /HOLD AT 7777
/
/CHECK INHIBIT SW:
/
1255 1621 INTR, LAR
1256 1126 CLL R16
1257 7710 SWP CLA /INHIBIT WRRM???
1258 5355 JMP ERROX W1 /YES
/
/CHECK FOR NO HEADER ON SECOND DATA ERROR:
1259 1620 DCHDAD, INC 1 ERRO /GET TEXT POINTER
1262 7550 SWA CLA /DATA ERROR?
1263 5354 JMP ERROX /EXIT
/
/TYPE ERROR MESSAGE:
/
1264 4452 CRUF
1265 4452 CRUF
1266 1371 TAB PCNTR2 /GET NONRECOV, FLAG
1267 7540 SWA CLA /WAS IT SET
1272 5274 JNE ,+1 /NO DON'T TYPE IT
1271 7340 CLA CLL CMA
1272 4450 PRINTER /PRINT "NON-RECOVERABLE "
1273 5726 MSG4
1274 1620 TAB 1 ERRO /GET TEXT POINTER
1275 1375 IAC MEDTAD /MAKE ERROR HEADER POINTER;
1276 3117 DCA PCREG /SAVE POINTER;
1277 1517 TAB 1 PCREG /GET CORRECT TEXT!
1300 3823 DCA ,+3
1301 7340 CLA CLL CMA
1302 4450 PRINTER /PRINT HEADER
1303 7402 HLT
1304 7340 CLA CLL CMA
1305 4450 PRINTER /PRINT "ERROR"
1326 1277 MSG6
1307 4452 CRUF
1310 1200 TAB ERRO
1311 1117 DCA PCREG /SAVE PC
1312 2200 ISZ ERRO
1313 1500 TAB 1 ERRO
1314 1170 DCA ESAVE
1315 2200 ISZ ERRO /UPDATE PC RETURN
1316 1170 TAB XTEXT
1317 1371 DCA PCNTR2
1320 1371 TAB XPLEG

```

```

/ PAGE 19-VI42A 19-MAR-75 15121 PAGE 1417
1321 3010 DCA AUTO10
1322 1125 TAB N12
1323 3372 DCA PCNTR1 /COUNTER FOR # OF HEADS
1324 1370 STRAUT, TAB ESAVE /GET TEXT POINTER
1325 7500 SWA
1326 5362 JMP NOTEX /NOT THIS ONE
1327 7124 CLL RAL
1328 3372 DCA ESAVE
1331 1174 ISZ PCNTR3 /UPDATE LINE FILL COUNTER
1332 7510 SKP CLA /NO CHRG
1333 4450 CRUF
1334 1371 TAB PCNTR2 /GET TEXT MESSAGE POINTER
1335 2373 ISZ PCNTR2
1336 3373 ISZ PCNTR2
1337 3362 DCA ,+3
1340 7340 CLA CLL CMA /STORE FOR PRINTER
1341 4450 PRINTER
1342 7402 HLT /PRINT XXI
1343 1410 TAB 1 AUTO10 /MODIFIED TEXT POINTER
1344 4451 OCTEL /PRINT FOUR OCTAL
1345 2772 AGAIN, ISZ PCNTR1
1346 5324 SWP STRAUT /CHECK FOR NEXT XXI
1347 1517 TAB 1 PCREG /GET ERROR POINTER,
1348 1120 TAB MS
1349 7650 SWA CLA /FIRST DATA ERROR?
1352 4572 JMS 1 PRNDAT /YES, PRINT DATA
1353 5387 JMP ,+4
1354 4572 ERROX, JMS 1 PRNDAT /PRINT ONLY DATA
1355 2200 ISZ ERRO
1356 2200 ISZ ERRO /UPDATE FOR RETURN
1357 7301 CLA CLL IAC /ENABLE CLEAR CONTROL
1360 4447 CLPAUL /CLEAR CONTROL
1361 5600 JMP 1 ERRO /EXIT
1362 7124 NOTEX, CLL RAL
1363 1370 DCA ESAVE
1364 2373 ISZ PCNTR2
1365 2373 ISZ PCNTR2
1366 2812 ISZ AUTO10
1367 5345 JMP AGAIN
/
1370 0200 ESAVE, 0
1371 0116 XREG, PCREG +1
1372 0000 PCNTR1, 0
1373 0000 PCNTR2, 0
1374 0000 PCNTR3, 0
1375 1377 MEDTAD, BUFPVC +1
/
PAGE
/
/POINTERS FOR TEXT INFORMATION:
/
1400 3210 PRNDAT, EPTX1
1401 3243 ERRO, EPTX2
1402 3254 ERRO, EPTX3
1403 3250 ERRO, EPTX4

```

```

PAGE 11424 19-MAR-75 15121 PAGE 1-18
1424 3212          EPTAB
/
/SUBROUTINE TO ISSUE "CLEAR" CLEAR LOG
/
1425 3202      CLEAR, 2
1426 3742      ISZ,  CCLA
1427 4505      JMP I   CLEAR
1428 7402      BR012, HLT
/
/ROUTINE TO DO CRIF
/
1411 2202      UPONE, 0
1412 7302      CLA CLL
1413 1221      TAD   K2215
1414 4442      TYPE
1415 1222      TAD   K2212
1416 4442      TYPE
1417 4442      TYPE
1420 5511      JMP I   UPONE
/
R2215,  R215
R2212,  R212
/
/ROUTINE TO PRINT FOUR OCTALS
/
1423 2020      FROCT, 2
1424 7000      RCL
1425 7005      RTL
1426 3211      DCA   UPONE
1427 1145      TAD   M4
1428 3245      DCA   PRN
1429 1211      TAD   UPONE
1430 4202      AND   K2207
1431 1141      TAD   K2200
1434 4442      TYPE
1435 1211      TAD   UPONE
1436 7005      RTL
1437 7004      RAL
1438 3211      DCA   UPONE
1439 2345      ISZ   PRN
1442 5211      JMP   *-11
1443 4423      SPACE
1444 5823      JMP I   FROCT
/
/SUBROUTINE TO PRINT TEXT
/
1445 2002      PRN, 0
1446 7052      SNA CLA
1447 4452      CRLF
1448 1045      TAD I   PRN
1449 2244      ISZ   PRN
1452 3223      DCA   FROCT
1453 7302      MRRPN, CLA CLL
1454 1623      TAD I   FROCT
1455 2072      AND   K7700
/TYPE CRLF
/YES!!!
/GET POINTLE

```

```

PAGE 11424 19-MAR-75 15121 PAGE 1-19
1456 7450      SNA
1457 5201      JMP   EX11
1464 7502      SNA
1465 7420      CML
1467 7001      CAC
1468 7012      RTR
1469 7012      RTR
1470 7012      PTR
1475 4442      TYPE
1477 1423      TAD I   FROCT
1478 0102      AND   K0277
1479 7450      SNA
1472 5201      JMP   EX11
1473 1210      TAD   K3740
1474 7500      SNA
1475 1327      TAD   K4100
1476 4423      SPACE
1477 2223      ISZ   FROCT
1480 5253      JMP   MRRPN
1481 7302      EXIT,  CLA CLL
1482 5645      JMP I   PRN
/
/ROUTINE TO SPACE OUT 1
/
1505 2020      SPAC, 0
1506 1062      TAD   K0240
/
1505 4442      TYPE
1508 5723      JMP I   SPAC
/
K4100,  4100
K3740,  3740
/
PAGE
/
/ROUTINE TO CHECK DATA READ
/
1600 2020      DTCHK, 2
1601 1154      TAD   CROFLG
1602 7040      SZA CLA
1603 5212      JMP   WRDCHK
1604 1140      TAD   FNDSUM
1605 7041      CIA
1606 1137      TAD   CFSAV
1607 7050      SNA CLA
1610 5602      JMP I   DTCHK
1611 7347      CLA CLL CMA
1612 3441      WRDCHK, DCA I   XERPO
1613 1121      TAD   CMREG
/
AND   K0100
SZA CLA
TAD   K0200
TAD   K7400
DCA   TRASH2
/GET CRC FLAG
/AS IT 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!

```

```

/      PAL10  V142A  19-MAR-75  15121  PAGE 1-20
1621  1111      TAD  TRASH2
1622  7000      CMA
1623  3315      JCA  MSKER
1624  7340      CLA  CLL  CMA
1625  3140      DCA  FMSUM
1626  4435      RLSRAN
1627  1126      TAD  FAREG
1628  4421      SETPLD
1631  3246      DCA  GOCDF
1632  1111      TAD  TRASH2
1633  3382      DCA  RSRAN
1634  1122      TAD  IRTDA
1635  3354      DCA  STGEN
1636  1362      DTR1, TAD  PSRAN
1637  0315      AND  MSKER
1640  3134      DCA  FAREG
1641  1354      TAD  STGEN
1642  0000      AND  KW017
1643  3127      DCA  ASREG
1644  4421      RANDAT
1645  3132      DCA  DGREG
1646  7402      GOCDF, HLT/COF
1647  1411      TAD  I  AUTO11
1650  6201      COF  0
1651  3133      DCA  DRREG
1652  1011      TAD  AUTO11
1653  3131      DCA  DRREG
1654  1133      TAD  DRREG
1655  7041      CIA
1656  1132      TAD  DGREG
1657  7650      SNA  CLA
1660  5272      JMP  NOERR
1661  2147      ISZ  FMSUM
1662  5311      JMP  MWRKS
1663  1150      TAD  CRCFLG
1664  7650      SNA  CLA
1665  1136      TAD  DATTRY
1666  2200      ISZ  DTCHK
1667  4441      ERK00
1668  0005      M005
1669  7760      7700
1672  2362      NOERR, ISZ  RSRAN
1673  5300      JMP  +5
1674  2354      ISZ  STGEN
1675  7000      NOP
1676  1111      TAD  TRASH2
1677  3362      DCA  RSRAN
1678  2116      ISZ  BUFTAL
1679  5236      JMP  DTR1
1680  1441      TAD  I  XERRO
1683  7650      SNA  CLA
1684  3153      DCA  CRCCNT
1685  2441      ISZ  I  XERRO
1686  4500      JMP  I  DTCHK
1687  7422      BADFLT, HLT
/SET FIRST TIME FLAG
/NO, SETUP RANDOM GENERATOR
/GET FINAL WC
/GET AUTO11 + BUFTAL + FIELD
/SAVE FIELD COF
/GENERATE DATA
/SAVE GOOD DATA POINTER
/COF TO BUFFER FIELD
/GET BAD DATA WORD
/HOME DF
/SAVE BAD WORD
/GET ADDRESS
/SAVE FOR PRINTER
/GET DATA READ
/COMPARE TO GOOD VALUE
/WERE THEY THE SAME
/YES, NO ERROR
/FIRST TIME PRINT????
/NO, JUST ADDRESS AND DATA
/GET CRC FLAG
/IF SET NO NO=RECOVERABLE,
/NO, GET NO=RECOVERABLE FLAG,
/UPDATE FOR ERROR RETURN
/ERROR DATA
/POINTER
/POINTER
/UPDATE BUFFER TALLY
/MORE WORDS TO CHECK
/GET ERROR INDICATOR1
/WAS THERE AN ERROR?
/NO, CLEAR CRC COUNTER
/CHECK FOR COMPUTER ERROR?
/ALL O.K.
/COMPUTER MUST BE DOWN, CHECKSUM

```

```

/      PAL10  V142A  19-MAR-75  15121  PAGE 1-21
1710  5307      JMP  -1
1711  4441      MWRKS, ERROP
1712  0000      0000
1713  0000      0000
1714  5272      JMP  NOERR
/
MSKER, 0
/
/ROUTINE TO GENERATE RANDOM NUMBERS
/
RANDOM, 0
1716  0000      CLA  CLL  IAC
1717  7301      TAD  PAD1
1720  1374      TAD  PAD1
1721  1375      TAD  PAD2
1722  1376      TAD  PAD3
1723  1374      DCA  RAD1
1724  7004      RAL
1725  1374      TAD  RAD1
1726  1375      TAD  RAD2
1727  1376      TAD  RAD3
1730  1375      DCA  RAD2
1731  7004      RAL
1732  1374      TAD  RAD1
1733  1375      TAD  RAD2
1734  1376      TAD  RAD3
1735  1376      DCA  RAD3
1736  1376      TAD  RAD1
1737  5716      JMP  I  RANDOM
/EXIT, RANDOM NUMBER IN AC
/GENERATOR FOR RANDOM DATA
/
GNDAT, 0
1740  0000      CLA  CLL  IAC
1741  7301      TAD  RAN1
1742  1370      TAD  RAN2
1743  1371      TAD  RAN2
1744  7100      CLL  RTL
1745  3370      DCA  RAN1
1746  1371      TAD  RAN2
1747  7012      RTR
1750  1370      TAD  RAN1
1751  3371      DCA  RAN2
1752  1371      TAD  RAN2
1753  5740      JMP  I  GNDAT
/ROUTINE TO SAVE RANDOM GENERATOR
/
STGEN, 0
1754  0000      TAD  RAN1
1755  1370      DCA  SAV1
1756  3372      TAD  RAN2
1757  1371      DCA  SAV2
1760  3373      JMP  I  STGEN
/ROUTINE TO RESET RANDOM GENERATOR
/

```

```

1762 0200 PSRAN, 0
1763 1372 TAD SAV1
1764 1372 DCA HAN1
1765 1373 TAD SAV2
1766 1373 DCA HAN2
1767 5762 JMP I HANAN
/
1770 1234 RAN1, 1234
1771 5670 RAN2, 5670
/
1772 0200 SAV1, 0
1773 0200 SAV2, 0
1774 1234 RAD1, 1234
1775 5670 RAD2, 5670
1776 4321 RAD3, 4321
/
/
/
2000 PAGE
/
/ROUTINE TO SEND A DRIVE TO A RANDOM TRACK
/AND SAVE THE TRACK
/
2000 0200 SEEKOUT, 0
2001 0205 AND K7000 /MASK DRIVE NUMBER
2002 1302 DCA WAIT /SAVE POINTER
2003 1600 STARTP, GAS
2004 0010 AND K0200 /MASK
2005 7640 SZA CLA /PROGRAM STOP???
2006 7402 STOPLT, HUI /PROGRAM STOP ON SWITCH 4
2007 1302 RESEK, TAD WAIT
2008 7110 CLL PAR
2009 1151 TAD DSKPOT /GET ADDRESS SAVE POINTER
2010 3322 DCA CHKYN /SAVE MADE POINTER
2011 1777 TAD TRKFLG /GET TRACK FLAG
2012 7650 SZA CLA /WAS IT SET??
2013 5222 JMP ,+5 /NO, USE OTHER
2014 1150 TAD SPTRK2 /GET OPERATOR TRACK
2015 0205 AND K7760 /MASK
2016 1157 TAD SPTRK1 /GET OPERATOR TRACK
2017 5253 JMP DSKOUT =2 /DO IT
2018 1776 TAD SEQFLG /GET SEQUENCE FLAG
2019 7650 SZA CLA /WAS IT SET??
2020 5237 JMP ,+6 /NO, USE RANDOM
2021 1720 TAD I CHKYN /GET LAST USED
2022 1010 TAD K2020 /UPDATE
2023 7430 SZL /LMA SET?
2024 7001 TAC /YES, SET EXTENDED BIT
2025 7410 SKP /UPDATE AND CHECK BOUNDARIES
2026 4433 RANGEM /GENERATE RANDOM ADDRESS
2027 0076 AND K7761 /MASK OFF
2028 1302 TAD WAIT /ADD IN DRIVE NUMBER
2029 1722 DCA I CHKYN /SAVE MADE ADDRESS
2030 1722 TAD I CHKYN
2031 7110 CLL MAR
2032 7620 SNL CLA /WAS IT SET

```

```

2041 5255 JMP DSKOUT /NO, DON'T CHECK LIMITS
2042 1143 TAD MAXTRK /ADD IN FUZZE FACTOR
2043 1722 TAD I CHKYN /GET ADDRESS FOUND
2044 7630 SZL CLA /IN LIMITS?
2045 5255 JMP DSKOUT /YES, C.K.
2046 1776 TAD SEQFLG /GET SEQUENCE FLAG
2047 7640 SZA CLA /WAS IT SET???
2048 5253 JMP DSKOUT =2 /DO
2049 1722 TAD I CHKYN /NO
2050 0075 AND K7760 /MASK
2051 1302 TAD WAIT /ADD IN DRIVE NUMBER
2052 1302 DCA I CHKYN /SAVE IT NOW
2053 1722 DSKOUT, TAD I CHKYN /GET ADDRESS
2054 0007 AND K0007 /MASK DRIVE NUMBER + EXTENDED
2055 1302 TAD X1000 /FUNCTION SEEK ONLY
2056 4144 LDCMD /LOAD COMMAND
2057 1722 TAD I CHKYN /GET ADDRESS
2058 0075 AND K7760
2059 4446 LDADD /LOAD DISK ADDRESS + GO
2060 4443 DSSEK /WAIT FOR DONE FLAG
2061 5264 JMP ,=1
2062 4442 RDSTAT /READ STATUS
2063 7500 SNA /DONE FLAG SET???
2064 5274 JMP SEKER /SEK ERROR, NO DONE FLAG
2065 0077 AND K1777 /MASK OTHER ERROR BITS
2066 7650 SZA CLA /ANY SET???
2067 5300 JMP SEKEX /NO, EXIT
2068 4441 SEKER, EPROR /PRINT ERROR
2069 0003 R003 /HEADER POINTER
2070 7200 TAD /MESSAGE POINTER
2071 2200 ISZ /UPDATE FOR RETURN
2072 4447 SEKEX, CLRALL /CLEAR STATUS
2073 5300 JMP I SEKOUT
/
/ROUTINE TO WAIT FOR KEY FROM OPERATOR
/
2102 0000 WAIT, 0
2103 7300 CLA CLL
2104 0032 XCC
2105 0031 KSF
2106 5305 JMP ,=1
2107 0010 KRB
2108 1320 AND K177
2109 1321 TAD K200
2110 0040 TLR
2111 0041 ISF
2112 5311 JMP ,=1
2113 0042 TCF
2114 5702 JMP I WAIT /EXIT
/
2117 3000 K3000, 3000
2118 0177 K177, 0177
2119 0200 K200, 0200
/
/ROUTINE TO CHECK FOR YES OR NO

```



```

2122 0000 /
CHKRN, 0
2123 3102 DCA WAIT /SAVE POINTER
2124 1322 TAD CHKRN /GET PC STORED
2125 3343 DCA CHKPN0 /SAVE IT
2126 1302 TAD WAIT
2127 2322 ISZ CHKRN
2130 7041 CIA
2131 1053 TAD K0016
2132 7650 SNA CLA /WAS IT A NO
2133 5722 JMP I CHKRN /YES
2134 1302 TAD WAIT
2135 2322 ISZ CHKRN
2136 7041 CIA
2137 1064 TAD K0031
2140 7650 SNA CLA /WAS IT A YES
2141 5722 JMP I CHKRN /YES
2142 5743 JMP I CHKPN0 /WAS NEITHER

/ROUTINE TO CHECK DISK FOR POINTERS
/
2143 0000 CHKPN0, 0
2144 0054 AND K0003
2145 1152 TAD RUNPN0
2146 3302 DCA WAIT
2147 1702 TAD I WAIT /GET RUN POINTER
2150 7640 SZA CLA /RUN THIS DRIVE
2151 2343 ISZ CHKPN0 /NO
2152 5743 JMP I CHKPN0 /EXIT

/ROUTINE TO RESET REGISTERS FOR ERROR PRINTER
/
2153 0000 SETREG, 0
2154 1070 TAD K4000 /GET STATUS
2155 3120 DCA STREG /SAVE FOR ERROR PRINTER
2156 7342 CLA CLL CMA /DECREASE BY 1
2157 1110 TAD TRASH1 /GET SECTOR POINTER
2160 0000 AND K0017
2161 1111 TAD TRASH2 /ADD IN ADDRESS
2162 3123 DCA CARG /SAVE FOR ERROR PRINTER
2163 1167 TAD FIRTIM /CHECK IF FIRST SECTOR?
2164 7540 SZA CLA /IF 0, DON'T UPDATE COMMAND;
2165 5753 JMP I SETREG /NO, DON'T;
2166 1173 TAD SAVCM /GET COMMAND REG.
2167 3121 DCA CMREG /SAVE FOR ERROR PRINTER
2170 5753 JMP I SETREG /RETURN

2176 3545
2177 3542
2200 PAGE
/
/ROUTINE TO WRITE OR READ SECTORS SELECTED
/
2200 0000 DSXGG, 0
2201 7340 CLA CLL CMA

```

```

2202 3167 DCA FIRTIP /SETUP FIRST TIME POINTER
2203 3154 DCA CRCPLG /CLEAR CRC FLAG
2204 1124 TAD CARG /GET INITIAL CURRENT ADDRESS
2205 4445 LDCCUR /LOAD CURRENT ADDRESS
2206 1120 TAD WCREG
2207 3120 DCA FWREG /SETUP FINAL PC
2210 1122 TAD INDA /GET INITIAL STARTING SECTOR
2211 3110 DCA TRASH1 /SAVE
2212 1122 TAD INTDA /GET DISK ADDRESS
2213 0075 AND K7760 /MASK
2214 3111 DCA TRASH2 /SAVE
2215 1134 TAD INTCM /GET INITIAL COMMAND
2216 1600 TAD I DSXGO /GET READ OR WRITE
2217 4444 LDCCMD /LOAD COMMAND
2220 1121 TAD CMREG
2221 1072 TAD X1000 /MAKE READ ALL OR WRITE ALL
2222 2173 DCA SAVCM /SAVE FOR SWITCH TO CONSECUTIVE MODE
2223 1110 TAD TRASH1 /SECTOR TO DO
2224 0000 AND K0017 /MASK
2225 1111 TAD TRASH2 /ADD TO TRACK
2226 4446 LDADD /LOAD AND GO
2227 6001 ISN /TURN INTERRUPT ON

/ROUTINE TO CLEAR OR CHECK SUM BUFFER ON THE FLY
/
2230 3777 GOBAK, 0
2231 3140 DCA TIMER2 /CLEAR LONG TIMER
2232 4427 DCA FNDSUM /CLEAR SUM CHECK
2233 3254 SETFLD /GET FIELD TO BUFFER
2234 1157 DCA CHNCDF /SAVE CDF
2235 7650 TAD FIRTIM
2236 5241 SNA CLA /TIME TO GO
2237 3776 JMP STRRK /YES!!!!
2240 5234 JMS TIME /WAIT FOR FIRST INTERRUPT
2241 1116 JMP .-4 /NOT HERE YET
2242 7041 STRRK, TAD BUFTAL
2243 1126 CIA
2244 7450 TAD FWREG /COMPARE TO SOFTWARE FINAL
2245 5274 SNA /WAIT FOR DISK???
2246 7041 JMP WRKDON /YES!!!!
2247 3174 DCA CLRBAK /SAVE DIFFERENCE
2250 1174 TAD CLRBAK
2251 7041 CIA
2252 1116 TAD BUFTAL
2253 3116 DCA BUFTAL /UPDATE BUFFER TALLY
2254 7402 CHNCDF, HLT /CDF TO BUFFER FIELD
2255 1121 TAD CMREG
2256 7700 SNA CLA /READ OR WRITE
2257 5264 JMP WASRD /WAS A READ?
2260 3411 GOCLR, DCA I AUTO15 /WAS A WRITE, CLEAR BUFFER
2261 2174 ISZ CLRBAK /UPDATE TALLY
2262 5260 JMP GOCLR /MORE TO CLEAR
2263 5274 JMP WRKDON /DONE WITH SOME
2264 1140 WASRD, TAD FNDSUM
2265 7100 GOCLR, CLL

```

```

/      PAL10  V1028  19-MAR-75  15121  PAGE 1-26
2265 1411      TAD I  AUTO11      /GET WORD
2267 1453      BZL
2270 1481      LDC
2271 2174      ISZ  CLRBAK      /UPDATE CLEAR POINTER
2272 5265      JMP  CRCHK      /MOVE TO CHECKSUM
2273 3142      DCA  FMSBUP      /SAVE IT
2274 5201      RFECON, CDF  M
2275 1110      TAD  BUFTAL
2276 785K      SNA CLA      /LAST WORD DONE??
2277 5302      JMP  DSXEX      /EXIT
2280 4775*     JMS  TIME      /TIME AND WAIT
2281 5241      JMP  STRNRY      /WAIT FOR INT. OR DONE!!!
2282 220K      DSXEX, ISZ  DSKGD
2283 568K      JMP I  DSKGD      /EXIT
/
/INTERRUPT SERVICE
/
2304 5141      RETURN, DSKP      /DISK SKIP INT
2305 5353      JMP  MODSKP      /NOT THE DISK
2306 211K      ISZ  TRASH1      /UPDATE SECTOR NUMBER
2307 7800      RCF
2310 1113      TAD  UPDATE      /UPDATE WORD COUNT
2311 1126      TAD  FAREG
2312 3125      DCA  FAREG
2313 5745      STATUS, DRST
2314 1870      TAD  K4000
2315 7440      SZA
2316 5337      JMF  STATER      /STATUS ERROR
2317 1125      TAD  FAREG
2320 7652      SNA CLA      /LAST TRANSFER?
2321 5365      JMP  TRDONE      /TRANSFER IS DONE
2322 3167      DCA  F1PTIM      /CLEAR FIRST TIME POINTER!
2323 1173      TAD  SAVCH
2324 5746      RDL=RL, DLCC      /LOAD COMMAND REGISTER
2325 1119      TAD  TRASH1      /GET SECTOR TO DC
2326 8064      AND  K0017      /MASK OFF
2327 1111      TAD  TRASH2      /ADD IN TRACK
2330 6743      LODCC, DLCC      /LOAD DISK AND CC
2331 1166      RETRN, TAD  SVLNK      /GET LINK
2332 711K      CLL  RAR
2333 1165      TAD  SAVAC      /GET AC
2334 6244      RMF
2335 6201      ION
2336 5400      JMP I  0
2337 4775*     STATEH, JMS  SETREG      /SETUP REGISTERS!
2340 1121      DAD  CMREG
2341 7714      SRA CLA      /WRITE OR READ
2342 7001      IAC
2343 7001      IAC
2344 3347      DCA  *-3      /MODIFY HEADER POINTER
2345 1145      TAD  STARY
2346 4441      ERROR
2347 2020      2020
2348 7762      7760
2351 220K      ISZ  DSKGD      /UPDATE FOR ERROR

```

```

/      PAL10  V142A  19-MAR-75  15121  PAGE 1-27
2352 5302      JMP  DSXEX      /EXIT
2353 5231      MODSKP, KSF
2354 7610      SNA CLA      /CHECK READER FLAG
2355 5362      JMP  KEYRET      /NOT READER
2356 6041      ISF
2357 7402      INTER2, HLT      /UNDEFINED INTERRUPT
2360 6042      TCF
2361 5311      JMP  RETRN      /AS THE PUNCH, CLEAR FLAG
2362 6034      KEYRET, KRS      /RETURN
2363 4046      TDS
2364 4032      KCC
2365 5331      JMP  RETRN      /GET INPUT
2366 4775*     TRDONE, JMS  SETREG      /PRINT
2367 3167      DCA  F1PTIM      /CLEAR READER FLAG
2370 1165      TAD  SVLNK      /RETURN TO DISK ROUTINE
2371 7112      CLL  RAR      /SETUP REGISTERS!
2372 1165      TAD  SAVAC      /CLEAR FIRST TIME POINTER!
2373 6244      RMF
2374 5400      JMP I  0      /REPLACE LINK
/
2375 2153      /REPLACE AC
2376 3121      /RESTORE MEMORY FIELDS + FLAGS
2377 3131      /RETURN TO BACK GROUND
2400 3002      /
2401 4437      PAGE
2402 3365      /
2403 1602      /ROUTINE TO GET ONE IN OCTAL
2404 0056      /
2405 1061      OCT1, 0
2406 7141      RECEIV
2407 1165      DCA  ISAVE1      /RECEIVE
2408 3365      TAD I  OCT1      /SAVE IT
2409 0056      AND  K0007      /GET LIMITS
2410 7141      TAD  K0260      /MASK
2411 8226      CLL  CIA
2412 7622      TAD  ISAVE1      /GET INPUT
2413 8226      SNA CLA      /IN LIMITS??
2414 8226      JMP  INERR      /NO, ERROR EXIT
2415 1602      TAD I  OCT1      /GET LIMITS
2416 0014      AND  K0070      /MASK
2417 7012      CLL  RAR
2418 1051      RTR
2419 7040      TAD  K0260
2420 1365      CMA
2421 7510      TAD  ISAVE1      /GET INPUT
2422 5226      SRA CLA      /IN LIMITS??
2423 1365      JMP  INERR      /NO, ERROR
2424 0056      TAD  ISAVE1      /GET INPUT
2425 2200      AND  K0007      /MASK
2426 2200      ISZ  OCT1
2427 5600      INERR, ISZ  OCT1
2428 5600      JMP I  OCT1      /GOOD EXIT
/
/ROUTINE TO RECEIVE FOUR OCTAL
/
2430 0000      OCT4, 0

```

```

2431 1166 LAD R0
2432 1350 DCA ISAVE2 /SETUP COUNTER
2433 1367 DCA ISAVE3 /START AID 0
2434 1424 DBLIM /RECEIVE ONE TOTAL
2435 1472 RYTO /COUNTS
2436 1534 JMP I CCT4 /ERROR EXIT
2437 1551 LAD ISAVE3 /GET LAST
2438 1566 ISA ISAVE2 /UPDATE COUNTER
2439 1610 RMP /
2440 1625 JMP ,*4 /EXIT
2441 1680 RAL
2442 1695 RIL
2443 1700 JMP CCT4 *3
2444 1715 ISA CCT4
2445 1730 JMP I CCT4 /EXIT TOTAL IN AC
2446 1745
2447 1810
/
/SUBROUTINE TO UPDATE AND CHECK FOR PASS COMPLETE
/
2452 0200 CRTIM, 0
2453 1121 LAD CMREG /GET CURRENT TIME NUMBER
2454 1136 AND K0006 /MASK
2455 1151 CLL PAR
2456 1166 DCA ISAVE2 /POINTER
2457 1181 LAD ISAVE2
2458 1196 TAD TAMPOT /GET TIME POINTER
2459 1211 DCA ISAVE3 /SAVE IT
2460 1226 CLA CLL IAC /NO FOR 0
2461 1241 LAD CMREG /GET AMOUNT DONT
2462 1256 TAD I ISAVE1 /ADD IN AMOUNT COMPLETED NO PAR
2463 1271 DCA I ISAVE1 /SAVE IT
2464 1286 AND CLL /LINK UP???
2465 1301 JMP I CRTIM /NO, EXIT
2466 1316 PRGREN /GET PROGRAM NUMBER
2467 1331 DCA RAN1 /PRE-PRIME GENERATOR
2468 1346 RANGEN /GET RANGUM NUMBER
2469 1361 DCA RAN2 /SE-PRIME GENERATOR
2470 1376 CLL
2471 1391 TAD ISAVE1
2472 1406 TAD K0004
2473 1421 DCA ISAVE1 /SECOND TIME POINTER
2474 1436 ISA I ISAVE1 /UPDATE IT
2475 1451 TAD I ISAVE1 /GET COUNT
2476 1466 TAD KAYTIM /ADD IN FUDGE FACTOR
2477 1481 RAL CLL /PASS COMPLETE???
2478 1496 JMP I CRTIM /NO, EXIT
2479 1511 DCA I ISAVE1 /SETUP SECOND COUNTER
2480 1526 TAD ISAVE2
2481 1541 DCA ISAVE2 /SETUP COUNTER
2482 1556 TAD CMPTOT /ADD IN POINTER
2483 1571 DCA K0006
2484 1586 TAD K0006
2485 1601 DCA ISAVE2 /COMPUTE BUFFER
2486 1616 ISA ,*2
2487 1631 JMP ISAVE2 /SAVE ADDRESS POINTER
2488 1646 CLA CLL DCA

```

```

2515 2155 ISA I ISAVE2 /UPDATE PASS COMPLETE POINTER
2516 2170 RMP CLL
2517 2185 DCA I ISAVE2 /PROG AT ????
2518 2200 CHLF
2519 2215 PRNTRF /PRINT "DISK"
2520 2230 MES17
2521 2245 LAD CMREG /GET LAST COMMAND
2522 2260 AND K0006 /MASK
2523 2275 CLL PAR
2524 2290 TAD K0250
2525 2305 TYPE /TYPE DISK NO.
2526 2320 CLA CLL DCA
2527 2335 PRNTRF /PRINT "PASS COMPLETE"
2528 2350 MES18
2529 2365 LAG
2530 2380 AND K2100 /MASK
2531 2395 SVA CLA /PASS COMPLETE DISCONNECT???
2532 2410 CFP ,*2 /NO KAYTIM
2533 2425 DISCON /DUMP DRIVE
2534 2440 JMP PHN /MORE TO TEST!!!!
2535 2455 JMS TFSTA /STATUS=COMPLETE TYPEOUT
2536 2470 JMP I CRTIM /EXIT
/
/SUBROUTINE TO READ STATUS REGISTER
/
2543 0000 RDST, 0
2544 0105 IOTS, 0 /READ STATUS IOT
2545 0210 SKP
2546 0315 ERHLT5, NLT /SKIP TRAP
2547 0420 DCA STREG /SAVE RESULTS
2548 0525 TAD STREG
2549 0630 JMP I RDST /EXIT
/
/SUBROUTINE TO LOAD CURRENT ADDRESS REGISTER
/
2552 0000 LDCA, 0
2553 0105 IOT9, DLCA /LOAD CURRENT ADDRESS IOT
2554 0210 JMP I LDCA /EXIT
/
2555 0315 ERHLT4, NLT /SKIP TRAP
/
/SUBROUTINE TO LOAD TRACK ADDRESS REGISTER
/
2556 0000 LDAD, 0
2557 0105 DCA DAREG
2558 0210 TAD DAREG
2559 0315 IOT3, DIAG /LOAD DISK ADDRESS REGISTER
2560 0420 JMP I LDAD /EXIT
2561 0525 ERHLT3, NLT /SKIP TRAP
/
2564 0000 CMPTOT, DVCMP *3
2565 0105 ISAVE1, 0
2566 0210 ISAVE2, 0
2567 0315 ISAVE3, 0
2568 0420 K0004, 0004

```

```

2574 3020
2575 3620
2576 1771
2577 1770
2578 2600
PAGE
/
/ROUTINE TO GET RANDOM OR OPERATOR DATA
/
2600 2000 RNWRD, 0
2601 7402 SWDAT, HLT
2602 5600 JMP I RNWRD /MODIFIED SWITCH
2603 5221 CDF 2 /EXIT
2604 1412 TAD 1 AUTO12 /HOME CDF
2605 7402 RECF, HLT /GET DATA
2606 2115 ISZ OPRTAL /BUFFER CDF
2607 5600 JMP I RNWRD /UPDATE TALLY
2610 1320 DCA PRINT /EXIT
2611 1105 TAD M12 /SAVE WORD
2612 2115 DCA OPRTAL /REPLACE TALLY
2613 7340 CLA CLL CMA
2614 1140 TAD DATPOT
2615 3012 DCA AUTO12 /REPLACE AUTO INDEX
2616 1220 TAD PRINT /GET SAVED WORD
2617 5600 JMP I RNWRD /EXIT

/ROUTINE TO TYPE
/
2620 0000 PRINT, 0
2621 6040 TIS
2622 6041 ISF
2623 5222 JMP ,+1
2624 6042 TCF
2625 7200 CLA
2626 5620 JMP I PRINT

/ROUTINE TO DUMP AND REPORT DISK STATUS
/
2627 0000 DUMP, 0
2630 4450 PRINTER /PRINT "DISK "
2631 1502 MES17
2632 1121 TAD CREG /GET LAST COMMAND
2633 2055 AND K0000
2634 7110 CLL PAR
2635 3200 DCA RNWRD /SAVE
2636 1200 TAD RNWRD /GET DISK NUMBER
2637 1061 TAD K0200
2640 4440 TYPE /TYPE DISK NUMBER
2641 7340 CLA CLL CMA
2642 4450 PRINTER /PRINT "DISCONNECTED!"
2643 3450 MES15
2644 4770 JMS SPSTA /TYPE STATUS REPORT
2645 1200 TAD RNWRD
2646 1152 TAD RUNPOT
2647 3200 DCA RNWRD /SAVE POINTER ADDRESS

```

```

2650 3503 DCA I RNWRD /CLEAR RUN POINTER
2651 3200 DCA RNWRD
2652 1105 TAD #0
2653 1320 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 2200 ISZ RNWRD
2661 2220 ISZ PRINT /UPDATE POINTERS
2662 5254 JMP ,+6
2663 4452 CNCF
2664 4450 PRINTER /PRINT "DISK"
2665 1502 MES17
2666 7340 CLA CLL CMA
2667 4450 PRINTER /PRINT "SYSTEM DOWN"
2670 3400 MES16
2671 7402 MODSKS, HLT /ERROR, NO DISK AVAILABLE
2672 5271 JMP ,+1

/ROUTINE TO SETUP FIELD TO BUFFER + AUTO11 + BUFFER TALLY
/
2673 0000 STFLD, 0
2674 7041 CIA
2675 1125 TAD WCREG
2676 3110 DCA BUFTAL
2677 7340 CLA CLL CMA
2700 1124 TAD CREG /GET INITIAL CA
2701 3011 DCA AUTO11 /SAVE
2702 1155 TAD DATFLG /GET DATA FLAG
2703 7650 SKA CLA /WAS IT SET???
2704 5312 JMP ,+6 /NO, USE REGULAR
2705 1105 TAD M12
2706 2115 DCA OPRTAL /SETUP SPECIAL TALLY
2707 7340 CLA CLL CMA
2710 1140 TAD DATPOT
2711 3012 DCA AUTO12 /SETUP SPECIAL AUTO INDEX
2712 1134 TAD INTCM /GET LAST COMMAND
2713 0014 AND K0070 /MASK FIELD BITS
2714 1103 TAD KCDF /MAKE BUFFER CDF
2715 1205 DCA RECF /SETUP SPECIAL CDF
2716 1205 TAD RECF /GET BACK CDF
2717 5673 JMP I STFLD /EXIT, FIELD IN AC

/SUBROUTINE TO ISSUE "DSKP" DISK SKIP LOT
/
2720 0000 SKP, 0
2721 6741 IOI, DSKP /DISK SKIP LOT
2722 7410 SKP /DID NOT SKIP
2723 2320 ISZ SDRP
2724 5720 JMP I SDRP /EXIT

/SUBROUTINE TO LOAD COMMAND REGISTER
/
2725 0000 LDCM, 0

```

```

/      PAD10  V142A  19-MAR-75  15121  PAGE 1-32
2726  3121          DCA  CMREG
2727  1121          TAD  CMREG
2730  5746          ICTA, DUCM          /LOAD COMMAND REGISTER
2731  5725          JMP I  DUCM          /EXIT
2732  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  3125          DCA  DUCM          /SAVE DESIRED CODE
2736  1300          TAD  CHNPOT          /POINTER
2737  3110          DCA  TRASH1          /ADDRESS POINTER
2738  1307          TAD  CCCTR1          /AMOUNT TO DO
2741  3111          DCA  TRASH2          /SETUP COUNTER
2742  1510          CHANGR, TAU 1 TRASH1 /GET ADDRESS POINTER
2743  3112          DCA  TRASH3          /SAVE ADDRESS
2744  1512          TAU 1 TRASH3          /GET OLD CODE
2745  0356          AND  A7007          /MASK OFF OLD CODE
2746  1325          TAD  DUCM          /ADD IN DESIRED CODE
2747  3512          DCA I TRASH3          /RESTORE
2750  2110          ISZ  TRASH1          /UPDATE POINTER
2751  2111          ISZ  TRASH2          /UPDATE CHANGE COUNTER
2752  5342          JMP  CHANGR          /MORE TO CHANGE
2753  7402          CHNHLT, HLT          /ALL DEVICE IOT CODES CHANGED
2754  5353          JMP  ,=1
/
2755  0770          A0770, 0770
2756  7007          A7007, 7007
2757  7766          CCNTRL, 7766
/
2760  2761          CHNPOT, CHNPOT +1
2761  2304          RETURN
2762  2313          STATUS
2763  2324          ROLWRL
2764  2330          LDDCC
2765  2721          IOT1
2766  1400          IOT2
2767  2561          IOT3
2770  2551          IOT4
2771  2544          IOT5
2772  2730          IOT6
/
2777  3000          PAGE
/
/ROUTINE TO TYPE STATUS REPORT
/
3000  0000          TPSTA, 0
3001  4450          BRNTR          /PRINT "DISK HARD SOFT COMP"
3002  3370          MES7
3003  1100          TAD  M6
3004  3242          DCA  TSAVE1          /MAXIMUM TO DO
3005  3243          DCA  TSAVE2
3006  3244          DCA  TSAVE3          /CLEAR SOME COUNTERS

```

```

/      PAD10  V142A  19-MAR-75  15121  PAGE 1-33
3007  1243          CHKRES, TAD  TSAVE2
3010  1054          TAD  K0003
3011  1243          DCA  TSAVE2
3012  1243          TAD  TSAVE2
3013  1150          TAD  STAPOT
3014  1244          DCA  TSAVE5          /LOCATION OF DISK STATUS
3015  1244          TAD  TSAVE3
3016  4430          SELCHK          /CHECK RUN POINTER
3017  5236          JMP  NOTSTA          /DISK NOT RUNNING
3020  4452          CRLF
3021  4423          SPACE          /SPACE OUT ONE
3022  1244          TAD  TSAVE3          /GET DISK NO.
3023  1061          TAD  K0200
3024  4440          TYPE
3025  4423          SPACE          /SPACE OUT ONE
3026  4423          SPACE          /SPACE OUT ONE
3027  7346          CLA CLL CMA RTL
3030  3245          DCA  TSAVE4          /COUNTER FOR FOUR WORDS
3031  1646          TAD I TSAVE5          /GET STATUS
3032  4451          OCTEL          /TYPE IT
3033  2246          ISZ  TSAVE5
3034  2245          ISZ  TSAVE4
3035  5231          JMP  ,=4
3036  2244          NOTSTA, ISZ  TSAVE3          /UPDATE DRIVE NUMBER
3037  2242          ISZ  TSAVE1
3040  5207          JMP  CHKRES          /MORE TO REPORT
3041  5600          JMP I TPSTA          /EXIT
/
3042  0000          TSAVE1, 0
3043  0000          TSAVE2, 0
3044  0000          TSAVE3, 0
3045  0000          TSAVE4, 0
3046  0000          TSAVE5, 0
/
/ROUTINE TO RECALIBRATE SELECTED DRIVE
/DISCONNECT DRIVE ON ERROR;
/
3047  0000          RESTOR, 0
3050  0055          AND  K0006
3051  1200          DCA  TPSTA          /SAVE DRIVE NUMBER
3052  1074          TAD  K7700
3053  3331          DCA  TIMER2          /SETUP COUNTER
3054  2330          ISZ  TIMER1
3055  5254          JMP  ,=1
3056  2331          ISZ  TIMER2          /WAIT FOR DISK TO COOL OFF!
3057  5264          JMP  ,=3
3060  1200          TAD  TPSTA          /CURRENT DRIVE
3061  4444          LDCMD          /LOAD COMMAND
3062  7326          CLA CLL CML RTL          /ENABLE RECALIBRATE BIT
3063  4447          CLMALL          /"RECALIBRATE"
3064  4443          DSKSKP          /DISK SKIP IOT
3065  5264          JMP  ,=1          /WAIT FOR FIRST DONE FLAG
3066  4442          RDSTAT          /READ STATUS
3067  7500          SMA          /DONE FLAG SET???
3070  5306          JMP  RESERR          /NO. ERROR

```

```

3071 0073 AND R1777 /MASK STACK ERROR BITS
3072 7540 SZA CLA /ANY S&T???
3073 5306 JMP RESERR /YES, ERROR
3074 4447 HXSTA, CLRALL /CLEAR STATUS
3075 1016 TAD K0200 /ENABLE SET SECOND DONE FLAG
3076 1700 TAD TPSTA /ORIGINAL COMMAND
3077 4444 LDCMD /LOAD COMMAND
3107 4443 DSKSKP /DISK SKIP IOT
3108 5300 JMP *-1 /WAIT FOR SECOND DONE
3109 4442 HDSTAT /READ STATUS
3103 1070 TAD K4000
3104 7650 SNA CLA /HAS IT ONLY DONE FLAG
3105 5647 JMP I RESTOR /YES, RETURN
3106 7300 RESERR, CLA CLL
3107 4441 EPROR /ERROR
3110 0024 0024
3111 7200 7200
3112 4452 CRLF
3113 4452 CRLF
3114 4450 PRINTER /PRINT"RECALIBRATE ERROR DISCONNECT"
3115 3154 YES19
3116 4422 DISCON /DISCONNECT DISK
3117 2767 INZ RESTOR
3120 5647 JMP I RESTOR /MORE DISK AVAILABLE

```

/ROUTINE TO TIME AND WAIT

```

3121 0000 TIME, 0
3122 2330 ISZ TIMER1
3123 5727 JMP I TIME /EXIT
3124 2331 ISZ TIMER2
3125 5727 JMP I TIME /EXIT
3126 7402 INTER1, HLT /NO INTERRUPT OCCURRED, I GUESS!
3127 5326 JMP *-1

```

```

3130 0000
3131 0000

```

/ROUTINE TO TYPE OUT DATA INFORMATION

```

3132 0000 TYPDAT, 0
3133 4450 PRINTER /PRINT "AS:"
3134 3223 TEXAS
3135 1127 TAD ASREG
3136 4451 OCTEL
3137 7340 CLA CLL CMA
3138 4450 PRINTER /PRINT "WA:"
3139 3225 TEXWA
3140 1130 TAD WAREG
3141 4451 OCTEL
3142 7340 CLA CLL CMA
3143 4450 PRINTER /PRINT "AD:"
3144 3227 TEXAD
3145 1131 TAD ADREG
3146 4451 OCTEL

```

```

3151 7340 CLA CLL CMA
3152 4450 PRINTER /PRINT "DG1"
3153 3231 TEXDG
3154 1132 TAD DGREG
3155 4451 OCTEL
3156 7340 CLA CLL CMA
3157 4450 PRINTER /PRINT "DB1"
3158 3233 TEXDB
3159 1133 TAD DBREG
3160 4451 OCTEL
3161 5732 JMP I TYPDAT

```

YES19, TEXT "RECALIBRATE ERROR DISCONNECT"

```

3164 2205
3165 0301
3166 1411
3167 0222
3170 0124
3171 0540
3172 0522
3173 2217
3174 2240
3175 0411
3176 2303
3177 1716
3200 1605
3201 0324
3202 4100

```

```

3203 2003 TEXPC, TEXT "PC:"
3204 7200
3205 2324 TEXST, TEXT "ST:"
3206 7200
3207 0315 TEXCM, TEXT "CM:"
3210 7200
3211 1100 TEXIA, TEXT "IA:"
3212 7200
3213 0401 TEXOA, TEXT "OA:"
3214 7200
3215 0301 TEXCA, TEXT "CA:"
3216 7200
3217 2703 TEXWC, TEXT "WC:"
3220 7200
3221 0627 TEXFW, TEXT "FW:"
3222 7200
3223 0123 TEXAS, TEXT "AS:"
3224 7200
3225 2701 TEXWA, TEXT "WA:"
3226 7200
3227 0104 TEXAD, TEXT "AD:"
3230 7200
3231 0407 TEXDG, TEXT "DG:"
3232 7200
3233 0402 TEXDB, TEXT "DB:"
3234 7200

```

PAL10 V142A 19-MAR-75 15:21 PAGE 1-36
 3235 2205 ERTX1, TEXT "HEAD STATUS"
 3236 0104
 3237 4023
 3244 2401
 3241 2425
 3242 2300
 3243 2722 ERTX2, TEXT "WRITE STATUS"
 3244 1124
 3245 0540
 3246 2324
 3247 0124
 3250 2523
 3251 0000
 3252 2305 ERTX3, TEXT "SEEK STATUS"
 3253 0513
 3254 4023
 3255 2401
 3256 2425
 3257 2300
 3260 2205 ERTX4, TEXT "RECALIBRATE STATUS"
 3261 0301
 3262 1411
 3263 0222
 3264 0124
 3265 0540
 3266 2324
 3267 0124
 3270 2523
 3271 0000
 3272 0411 ERTX5, TEXT "DISK DATA"
 3273 2313
 3274 0000
 3275 0524
 3276 0100
 /
 3277 4005 MES0, TEXT " ERROR"
 3300 2222
 3301 1722
 3302 0000
 3303 2213 MES1, TEXT "RMBE DATA RELIABILITY"
 3304 7005
 3305 4000
 3306 0124
 3307 0140
 3310 2205
 3311 1411
 3312 0102
 3313 1114
 3314 1124
 3315 3100
 3316 0530 MES2, TEXT "EXERCISE"
 3317 0522
 3320 0311
 3321 2305
 3322 0000

PAL10 V142A 19-MAR-75 15:21 PAGE 1-37
 3323 4004 MES3, TEXT " DISK"
 3324 1123
 3325 1300
 3326 1617 MES4, TEXT "NON-RECOVERABLE "
 3327 1656
 3328 2205
 3331 0317
 3332 2605
 3333 2201
 3334 0214
 3335 0540
 3336 0000
 3337 0115 MES5, TEXT "AMOUNT OF EXTENDED R/W MEMORY(0=7)?"
 3340 1725
 3341 1024
 3342 4017
 3343 0540
 3344 0530
 3345 2405
 3346 1604
 3347 0504
 3350 4022
 3351 0727
 3352 4015
 3353 0515
 3354 1722
 3355 3150
 3356 0055
 3357 6751
 3360 7700
 3361 0103 MES6, TEXT "ACCEPT MODE?"
 3362 0305
 3363 2024
 3364 4015
 3365 1704
 3366 0577
 3367 0000
 3370 0423 MES7, TEXT "DSK HARD SOFT COMP"
 3371 1340
 3372 1001
 3373 2204
 3374 4023
 3375 1706
 3376 2440
 3377 0317
 3400 1520
 3401 0000
 3402 0611 MES8, TEXT "FIELD?"
 3403 0514
 3404 0477
 3405 0000
 3406 2422 MES9, TEXT "TRACK?"
 3407 0103
 3410 1377
 3411 0000

```

3412 0530 MES10, TEXT "EXTRA SECTORS?"
3413 0422
3414 0140
3415 2305
3416 0325
3417 1722
3420 2377
3421 0000
3422 0214 MES11, TEXT "BLOCK LENGTH?"
3423 1723
3424 1340
3425 1405
3426 1627
3427 2610
3430 7700
3431 2305 MES12, TEXT "SEQUENCE?"
3432 2125
3433 0516
3434 0105
3435 7700
3436 0401 MES13, TEXT "DATA?"
3437 2421
3440 7700
3441 0122 MES14, TEXT "ARE YOU SURE?"
3442 0540
3443 1117
3444 2542
3445 2325
3446 2205
3447 7700
3450 0000 MES15, TEXT "DISCONNECTED!"
3451 1123
3452 0317
3453 1616
3454 0503
3455 2605
3456 0041
3457 0000
3460 2331 MES16, TEXT "SYSTEM SHUT DOWN, NO DISKS TO RUN!"
3461 2324
3462 0515
3463 0022
3464 1025
3465 2440
3466 0417
3467 2716
3470 5440
3471 1617
3472 0004
3473 1123
3474 1323
3475 0024
3476 1740
3477 2225
3500 1641

```

```

3501 0000
3502 0011 MES17, TEXT "DISK "
3503 2313
3504 0000
3505 0000 MES18, TEXT "PASS COMPLETE!"
3506 0123
3507 2340
3510 0317
3511 1520
3512 1405
3513 2405
3514 0000
/
3515 0000 D0TM1, 0
3516 0000 D1TM1, 0
3517 0000 D2TM1, 0
3520 0000 D3TM1, 0
3521 0000 D0TM2, 0
3522 0000 D1TM2, 0
3523 0000 D2TM2, 0
3524 0000 D3TM2, 0
/
3525 0000 D0HRD, 0
3526 0000 D0SOF, 0
3527 0000 D0CNP, 0
3530 0000 D1HRD, 0
3531 0000 D1SOF, 0
3532 0000 D1CNP, 0
3533 0000 D2HRD, 0
3534 0000 D2SOF, 0
3535 0000 D2CNP, 0
3536 0000 D3HRD, 0
3537 0000 D3SOF, 0
3540 0000 D3CNP, 0
/
3541 0000 FLDPLG, 0
3542 0000 TRKPLG, 0
3543 0000 SECPLG, 0
3544 0000 HELFPLG, 0
3545 0000 SEQPLG, 0
/
3546 0000 DSK0A, 0
3547 0000 DSK1A, 0
3550 0000 DSK2A, 0
3551 0000 DSK3A, 0
/
3552 0000 DSK0B, 0
3553 0000 DSK1B, 0
3554 0000 DSK2B, 0
3555 0000 DSK3B, 0
/
/PLACE FOR DATA IN MANUAL MODE
/
3556 0000 DAT1, 0000
3557 0000 DAT2, 0000

```



```

/ PAGE 0142A 19-MAR-75 15121 PAGE 1-47
3560 0000 DATE, 0000
3561 0000 DATE, 0000
3562 0000 DATE, 0000
3563 0000 DATE, 0000
3564 0000 DATE, 0000
3565 0000 DATE, 0000
3566 0000 DATE, 0000
3567 0000 DATE, 0000
3570 0000 DATE1, 0000
3571 0000 DATE2, 0000
/
3600 PAGE
/
3600 STRBUF=
/
0000

```

```

/ PAGE 0142A 19-MAR-75 15121 PAGE 1-41
0000 11111100 11111100 11111111 11111111 11111111 11111111 11111111 11111111
0100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
0200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
0300 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
0400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
0500 11111111 11111111 11111111 11111111 11111111 11111100 00000000 01111111
0600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
0700 11111111 11111111 11111111 11111111 11111111 11111111 11000000 00111111
1000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1100 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 00000000 00000000 00000000 00000000 00000000 00000000 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 11000011
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 10001111
2600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
2700 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11100000
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 11000000
3600
3700

```

420A
412P

420A
430A

440A
450P

450A
470A

500P
510P

520A
530P

540P
550A

550A
570A

600P
610P

620P
630P

640P
650A

660A
670A

700P
710A

200
730A

740P
750P

760P
770P

AGTFA	2761	DICHP	3532	DSKPT	6741	IPAG71	2581
AGTGB	2762	DHHPD	3534	DSAPPT	6751	IPAG72	2584
AGTGT	2763	DSDI	3531	DSAPRT	4483	IPAG73	2574
AGDCA	2365	DITM1	3534	LDCHK	1899	IPAG74	2575
AGDCC	2121	DITM2	3532	DTPL	1839	IPAG75	2576
AGATV	1345	DICHP	3532	DITM	2627	IPAG76	2577
AJLXGA	2233	DTRSD	3533	EPFLG	6363	IPAG77	2580
AMOUNT	2031	DZSOP	3544	EPHIT4	1414	IPAG78	2513
ASXKX1	2343	DZTM1	3537	EPHIT5	2583	IPAG79	2570
ASXKX2	2424	DZTM2	3537	EPHIT6	2555	IPAG80	2514
ASXKX3	2417	DZGVP	3548	EPHIT5	2556	IPAG81	2516
ASXKX4	2456	DZGRD	3536	EPHIT5	2532	IPAG82	2517
ASXKX5	2471	DZSOF	3537	EPHIT5	2530	IPAG83	2518
ASXKX6	2520	DZTMC	3521	EPHIT5	1454	IPAG84	2521
ASXKX7	2527	DZTMC	3521	EPHIT5	1454	IPAG85	2521
ASXKX8	2520	DZTMC	3521	EPHIT5	1454	IPAG86	2521
ASXKX9	2520	DZTMC	3521	EPHIT5	1454	IPAG87	2521
ASXKX0	2520	DZTMC	3521	EPHIT5	1454	IPAG88	2521
ASXKX1	2520	DZTMC	3521	EPHIT5	1454	IPAG89	2521
ASXKX2	2520	DZTMC	3521	EPHIT5	1454	IPAG90	2521
ASXKX3	2520	DZTMC	3521	EPHIT5	1454	IPAG91	2521
ASXKX4	2520	DZTMC	3521	EPHIT5	1454	IPAG92	2521
ASXKX5	2520	DZTMC	3521	EPHIT5	1454	IPAG93	2521
ASXKX6	2520	DZTMC	3521	EPHIT5	1454	IPAG94	2521
ASXKX7	2520	DZTMC	3521	EPHIT5	1454	IPAG95	2521
ASXKX8	2520	DZTMC	3521	EPHIT5	1454	IPAG96	2521
ASXKX9	2520	DZTMC	3521	EPHIT5	1454	IPAG97	2521
ASXKX0	2520	DZTMC	3521	EPHIT5	1454	IPAG98	2521
ASXKX1	2520	DZTMC	3521	EPHIT5	1454	IPAG99	2521
ASXKX2	2520	DZTMC	3521	EPHIT5	1454	IPAG00	2521

AGTFA	2761	DICHP	3532	DSKPT	6741	IPAG71	2581
AGTGB	2762	DHHPD	3534	DSAPPT	6751	IPAG72	2584
AGTGT	2763	DSDI	3531	DSAPRT	4483	IPAG73	2574
AGDCA	2365	DITM1	3534	LDCHK	1899	IPAG74	2575
AGDCC	2121	DITM2	3532	DTPL	1839	IPAG75	2576
AGATV	1345	DICHP	3532	DITM	2627	IPAG76	2577
AJLXGA	2233	DTRSD	3533	EPFLG	6363	IPAG77	2580
AMOUNT	2031	DZSOP	3544	EPHIT4	1414	IPAG78	2513
ASXKX1	2343	DZTM1	3537	EPHIT5	2583	IPAG79	2570
ASXKX2	2424	DZTM2	3537	EPHIT6	2555	IPAG80	2514
ASXKX3	2417	DZGVP	3548	EPHIT5	2556	IPAG81	2516
ASXKX4	2456	DZGRD	3536	EPHIT5	2532	IPAG82	2517
ASXKX5	2471	DZSOF	3537	EPHIT5	2530	IPAG83	2518
ASXKX6	2520	DZTMC	3521	EPHIT5	1454	IPAG84	2521
ASXKX7	2527	DZTMC	3521	EPHIT5	1454	IPAG85	2521
ASXKX8	2520	DZTMC	3521	EPHIT5	1454	IPAG86	2521
ASXKX9	2520	DZTMC	3521	EPHIT5	1454	IPAG87	2521
ASXKX0	2520	DZTMC	3521	EPHIT5	1454	IPAG88	2521
ASXKX1	2520	DZTMC	3521	EPHIT5	1454	IPAG89	2521
ASXKX2	2520	DZTMC	3521	EPHIT5	1454	IPAG90	2521
ASXKX3	2520	DZTMC	3521	EPHIT5	1454	IPAG91	2521
ASXKX4	2520	DZTMC	3521	EPHIT5	1454	IPAG92	2521
ASXKX5	2520	DZTMC	3521	EPHIT5	1454	IPAG93	2521
ASXKX6	2520	DZTMC	3521	EPHIT5	1454	IPAG94	2521
ASXKX7	2520	DZTMC	3521	EPHIT5	1454	IPAG95	2521
ASXKX8	2520	DZTMC	3521	EPHIT5	1454	IPAG96	2521
ASXKX9	2520	DZTMC	3521	EPHIT5	1454	IPAG97	2521
ASXKX0	2520	DZTMC	3521	EPHIT5	1454	IPAG98	2521
ASXKX1	2520	DZTMC	3521	EPHIT5	1454	IPAG99	2521
ASXKX2	2520	DZTMC	3521	EPHIT5	1454	IPAG00	2521

NTSPT	1251	SAMPOL	1002	TEXAT	1705	ABSHAY	0035
NTRKS	1711	SAN1	1772	EDWA	1225	XSDAP	0043
NATSEK	0532	SAN2	1773	TEXWC	1217	XSKOUT	0032
UCY1	7400	SAVAC	0165	TIME	3121	ASPAC	0123
UCY4	2330	SAVCM	0173	TIMR1	3137	ASTG0	0027
UCYEL	4451	SONP	2726	TIMR2	3131	ASTG1	0026
ONEIN	4424	SECFLG	3943	TIMPCT	0147	XTEXT	0171
OPRTAL	0115	SEXY	4432	TPSTA	3000	XAAIF	0037
PCNTK1	1372	SEK1R	2074	TRASH1	0110	YNSAU	4431
PCNTR2	1373	SEK1A	2100	TRASH2	0111		
PCNTR3	1374	SEXGO	1140	TRASH3	0112		
PCREU	0117	SEADUT	2000	TRDNE	2306		
PVUSSK	0114	SEK5*	0164	TPKFLG	3542		
PCLNTR	1000	SELCNK	4430	TRICNT	0170		

/ PAGE 1 01:21 19-MAR-75 15:21 PAGE 1-45

ERRORS DETECTED: 0
 LINKS GENERATED: 46
 RUN-TIME: 11 SECONDS
 BK CORE USED