

IDENTIFICATION

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PRODUCT CODE: MAINDEL-08-DHRKC-H-0  
PRODUCT NAME: RKBE/RKBL DATA RELIABILITY PROGRAM  
DATE RELEASED: FEBRUARY, 1977  
MAINTAINER: DIAGNOSTIC ENGINEERING  
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1.

**ABSTRACT**

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THE RK8E/RK8L 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  $3 \times 10^9$  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 B CONTAINS REVISION LEVEL (IN ASCII) OF PROGRAM ON PROGRAM LOAD).

2.

**RESTRICTIONS**

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THE RK8L CONTROL, WHICH CAN CONTROL UP TO 8 DRIVES, WILL NOT RUN WITH THE DW8E BUS ADAPTER. THE REASON FOR THIS STATEMENT IS THAT THE RK8L CONTROL USES IOTS FOR EXTENDED DRIVES 4-7 WHICH IS NOT AVAILABLE ON THE DW8E.

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. AT LEAST 8K OF MEMORY IS NECESSARY FOR OPERATION OF THE CONSOLE PACKAGE.
- C. ASR-33 TELETYPE OR EQUIVALENT
- D. RK8E OR RK8L DISK CONTROL
- E. RK05J OR RK05F DISK DRIVE(S)
- F. FORMATTED 2200 BPI-16 SECTOR PACK(S).

NOTE: THE RK05F DISK DRIVE IS CONSIDERED AS TWO SEPARATE UNITS. WHEN ANSWERING ALL QUESTIONS THE SEPARATE DRIVES MUST BE SPECIFIED. DSK07, DSK17, DSK27, ETC.

2.2

**PROGRAM STORAGE**

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THE PROGRAM OCCUPIES OR UTILIZES LOCATION 8000 TO LOCATION 7577 OF FIELD B. 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 SHOULD BE RUN PRIOR TO RUNNING THIS PROGRAM.

RK8E CONTROL: RUN THE RK8E DISKLESS CONTROL TEST AND THE RK8E/RK8L DISK FORMATTER IF THIS DIAGNOSTIC FAILS TO OPERATE PROPERLY.

RK8L CONTROL: RUN THE RK8L INSTRUCTION TEST AND THE RK8E/RK8L FORMATTER IF THIS DIAGNOSTIC FAILS TO OPERATE PROPERLY.

## 2.4 EXECUTION TIME -----

THE PROGRAM EXECUTION TIME (I.E. PASSING 3 X 10<sup>(9)</sup> BITS OF DATA ON A DISK DRIVE), IS APROX. 4 HOURS PER DISK DRIVE ON A 4K MEMORY SYSTEM OR APROX. 3.5 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 ON 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 THROUGHOUT 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 4.6.
- D. RUN THE ACCEPTANCE MODE OF DATA RELIABILITY WITH ALL DRIVES AND MEMORY AVAILABLE BY FOLLOWING THE PROCEDURE

IN SECTION 4.4.

- E. THE MANUAL INTERVENTION MODE, SECTION 4.5, 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 0205 AS THE RESTART ADDRESS.
- H. FOR THE ABSOLUTE LOCATIONS OF ALL KNOWN HALTS IN THIS PROGRAM, ACCESS PAGE 1-22 OF THE PROGRAM LISTING.

4.2

**RK05J DRIVE CARTRIDGE MOUNTING PROCEDURE**  
-----

THE FOLLOWING IS THE CORRECT CARTRIDGE MOUNTING PROCEDURE FOR THE RK05J 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

**RK05F DRIVE SETUP PROCEDURE**  
-----

THE FOLLOWING IS THE CORRECT SETUP PROCEDURE

FOR THE RK05F 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 ON.
- C. VERIFY THAT LIGHT LABELED "PWR" IS ON.
- D. WAIT FOR LIGHT LABELED "LOAD" TO COME ON.
- E. VERIFY THAT LIGHTS LABELED "RDY", "ON CYL", "FAULT", "WT", AND "RD" ARE OFF.
- F. SET SWITCH LABELED "RUN/LOAD" TO THE "RUN" POSITION.
- G. WAIT FOR LIGHTS LABELED "RDY" AND "ON CYL" TO COME ON.
- H. TOGGLE SWITCH LABELED "WT PROT" AND VERIFY THAT THE LIGHT LABELED "WT PROT" GOES ON AND OFF.
- I. TOGGLE SWITCH LABELED "WT PROT" UNTIL LIGHT LABELED "WT PROT" GOES OFF.
- J. VERIFY THAT LIGHTS LABELED "FAULT", "WT", "RD", AND "LOAD" ARE OFF.

4.4

RK0E/RK0L DATA RELIABILITY (ACCEPT MODE)  
-----

- A. MAKE READY ALL DRIVES TO BE TESTED USING THE RK05J DRIVE CARTRIDGE MOUNTING PROCEDURE SECTION 4.2 OR THE RK05F DRIVE PROCEDURE IN SECTION 4.3.
- B. SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION ON ALL DRIVES NOT BEING TESTED.
- C. VERIFY THAT AC POWER IS ON, ON ALL DRIVES NOT BEING TESTED.
- D. SET THE SWITCH REGISTER TO 0200 AND PRESS LOAD ADDRESS.
- E. SET THE SWITCH REGISTER TO 0000 AND PRESS START.
- F. THE OPERATOR MAY SET SWR5=1 IF IT IS DESIRED TO HAVE THE PROGRAM AUTOMATICALLY DISCONNECT EACH DISK DRIVE AS EACH MAKE THEIR PASS COMPLETION. (NOTE: IF SWR5=0, ALL DISK DRIVES WILL CONTINUE TO RUN AFTER THEIR PASS COMPLETION)
- G. THE TTY WILL PRINT THE FOLLOWING PROGRAM NAME AND QUESTION,

RK0E/RK0L DATA RELIABILITY  
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 DISK07  
EXERCISE DISK17  
EXERCISE DISK27  
EXERCISE DISK37  
EXERCISE DISK47  
EXERCISE DISK57  
EXERCISE DISK67  
EXERCISE DISK77

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

I. THE TTY WILL PRINT THE FOLLOWING QUESTION.

ACCEPT MODE?

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

J. THE TTY WILL PRINT THE FOLLOWING QUESTION.

ARE YOU SURE?

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

K. THE PROGRAM SHOULD START TESTING THE DISK DRIVE(S) AND MEMORY SELECTED.

L. THE "STATUS=COMPLETE" TIMEOUT SHOULD OCCUR UPON PASS COMPLETION OF EACH DISK DRIVE. ALL OTHER TIMEOUTS OR HALTS WILL BE CONSIDERED AS AN ERROR CONDITION. SEE SECTION 5.5 FOR "STATUS=COMPLETE" TIMEOUT.

M. A SUCCESSFUL PASS COMPLETE ON A DISK DRIVE WILL BE CONSIDERED AS NO "HARD" ERRORS AND NO MORE THAN ONE (1) "SOFT" ERROR PER PASS COMPLETE.

N. IF ANY ERRORS DO OCCUR, THE OPERATOR SHOULD ACCESS SECTION 5 IN THIS DOCUMENTATION.

4.5

RK8E/RK8L 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 RK05J DRIVE CARTRIDGE MOUNTING PROCEDURE SECTION 4.2. OR THE RK05F DRIVE PROCEDURE SECTION 4.3.

B. SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION ON



ALL DRIVES NOT BEING TESTED.

- C. VERIFY THAT AC POWER IS ON, ON ALL DRIVES NOT BEING TESTED.
- D. SET THE SWITCH REGISTER TO 0200 AND PRESS LOAD ADDRESS.
- E. SET THE SWITCH REGISTER TO 0000 AND PRESS START.
- F. THE TTY WILL PRINT THE FOLLOWING PROGRAM NAME AND QUESTION.

RK0E/RK0L DATA RELIABILITY  
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?  
EXERCISE DISK1?  
EXERCISE DISK2?  
EXERCISE DISK3?  
EXERCISE DISK4?  
EXERCISE DISK5?  
EXERCISE DISK6?  
EXERCISE DISK7?

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

DATA?

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

- N. 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.

- P. THE PROGRAM SHOULD START EXECUTING THE OPERATIONS SELECTED.

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

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

- A. SET THE SWITCH REGISTER TO 0204 AND PRESS LOAD ADDRESS.
- B. SET THE SWITCH REGISTER TO 0000, SET SWITCH REGISTER BITS 3-8 TO THE DESIRED DEVICE IOT CODE, AND PRESS START.
- C. THE PROGRAM WILL CHANGE THE DEVICE IOT CODES WITHIN THE PROGRAM AND THEN HALT.
- D. PRESSING KEY CONTINUE WILL START THE PROGRAM AT LOCATION 0200 (SEE SECTIONS 4.4 OR 4.5 FOR OPERATION INSTRUCTIONS).

5. ERRORS  
-----

5.1 USEFUL INFORMATION  
-----

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

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

5.2 ERROR HALTS  
-----

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

BIGSTP	MASTER ERROR HALT FOR ALL OF THE FOLLOWING ERROR STOPS. WHEN THE COMPUTER HALTS THE AC REGISTER WILL INDICATE THE PC OF THE FAILING ERROR STOP.
INTER1	NO DISK INTERRUPT
ERHLT0	SKIP TRAP FOR IOT "OLSC"
ERHLT2	SKIP TRAP FOR IOT "OCLR"
ERHLT3	SKIP TRAP FOR IOT "DLAG"
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

FLDHLT

PROGRAM WILL ONLY RUN IN FIELD 0

FOR THE ABSOLUTE LOCATIONS OF THE HALTS LISTED ABOVE,  
ACCESS PAGE 1-22 OF THE PROGRAM LISTING.

5.3

### ERROR TYPEOUTS

\*\*\*\*\*

WHEN AN ERROR OCCURRES 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.

WRITE STATUS ERROR  
READ STATUS ERROR  
DISK DATA ERROR  
RECALIBRATE STATUS ERROR

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

PC: PROGRAM LOCATION OF THE ACTUAL FAILURE.  
ST: CONTENTS OF THE STATUS REGISTER.  
EX: EXTENDED DRIVE BIT  
CM: SOFTWARE COMMAND REGISTER.  
IA: INITIAL SOFTWARE DISK ADDRESS REGISTER OR THE  
CYLINDER, SURFACE, AND SECTOR BITS.  
DA: FINAL SOFTWARE DISK ADDRESS REGISTER OR 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. 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 RETRY 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 NON-RECOVERABLE READ OR WRITE ERROR SHOULD OCCUR, 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!  
DSK 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 HALT.

DISK SYSTEM SHUT DOWN, NO DISKS TO RUN!

5.5

STATUS-COMPLETE TYPEOUT AND PASS COMPLETE DISCONNECT  
-----

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

THE FOLLOWING IS AN EXAMPLE OF THE "STATUS-COMPLETE" TYPEOUT THAT WILL OCCUR WHEN SWR3=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 TIMEOUT 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 18(9) BITS>

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

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

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

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

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

DISK SYSTEM SHUT DOWN, NO DISKS TO RUN!

## 5.6

### TYPICAL ERROR TIMEOUTS

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

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

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

SEEK STATUS ERROR  
PC:2076 ST:4002 EX:0001 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 EX:0001 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
---		-----
6740	DLSC	LOAD SECTOR COUNTER AND EXTENDED DRIVE BIT FOR RK6L.
AC	--	
0-3		LOAD THE DESIRED AMOUNT OF SECTORS TO BE TRANSFERRED WITH THE BINARY VALUE IN AC BITS 0-3.
4		EXTENDED DRIVE BIT FOR DRIVES 4-7
6741	D\$KP	"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 FILE READY
5		CONTROL BUSY ERROR
6		TIME OUT ERROR
7		WRITE LOCK ERROR
8		CRC ERROR
9		DATA RATE ERROR
10		DRIVE STATUS ERROR
11		CYLINDER ADDRESS ERROR
6746	DLDC	"LOAD COMMAND" LOAD THE COMMAND REGISTER FROM AC, CLEAR THE AC, AND CLEAR THE STATUS REGISTER.
AC	--	
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



0-205	WRITE ALL
0-206	NOT USED
0-207	NOT USED
3	ENABLE INTERRUPT
4	ENABLE SET TRANSFER DONE ON SEEK DONE
5	HALF BLOCK 120 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 DCLK "CLEAR CONTROL".

AC  
--

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

8. PROGRAM DESCRIPTION (ACCEPT MODE)  
-----

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

- A. A RANDOM FIELD IS GENERATED. IF FIELD GENERATED IS A NON-EXISTING FIELD, THE MAXIMUM FIELD AVAILABLE WILL BE USED.

- B. A RANDOM BLOCK LENGTH IS GENERATED (128 OR 256 WORD SECTORS).
- C. 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).
- D. 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.
- E. AN INITIAL SOFTWARE WORD COUNT WILL BE CALCULATED.
- F. AN INITIAL RANDOM CURRENT ADDRESS WILL BE GENERATED. IF THE FIELD PREVIOUSLY GENERATED WAS FIELD 0, THE CURRENT ADDRESS WILL BE LIMITED WITHIN THE END OF THE PROGRAM +4000 LOCATIONS.
- G. 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.)
- H. THE PROGRAM WILL THEN POLE THE DISK DRIVES. DRIVE SELECTION IS SEQUENTIAL, THAT IS DISK0, DISK1, DISK2, ETC.
- I. DATA WILL BE WRITTEN ON THE SELECTED 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.
- J. 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.
- K. 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.
- L. STEPS A-H WILL BE REPEATED AND THE DRIVE POLE WILL BE STARTED AT THE CURRENT DRIVE +1.
- M. FOR ALL POSSIBLE ERRORS, SEE SECTION 5 IN THIS DOCUMENT.

9.

CONSOLE PACKAGE ADDENDUM

-----

9.1. DESCRIPTION  
-----

THE CONSOLE PACKAGE HAS BEEN ADDED TO THIS DIAGNOSTIC TO ALLOW THE PROGRAM TO RUN WITH NO HARDWARE SWITCH REGISTER AND TO HAVE COMMUNICATIONS WITH THE DIAGNOSTIC VIA A TERMINAL. THE DIAGNOSTIC CAN BE RUN IN TWO MODES WITH THE CONSOLE PACKAGE . 1) RUNNING WITH THE CONSOLE PACKAGE ACTIVE . THIS ALLOWS THE OPERATOR CONTROL OF THE DIAGNOSTIC THROUGH THE TERMINAL. THE DIAGNOSTIC WILL ASK FOR THE VALUE OF THE PSEUDO SWITCH REGISTER, BEFORE CONTINUING WITH EXECUTION OF THE DIAGNOSTIC. ALL ERRORS AND PASS COMPLETES WILL BE PRINTED AT THE TERMINAL. NO HALTS WILL BE EXECUTED. 2) CONSOLE PACKAGE NOT ACTIVE-THIS WILL RESULT IN THE NORMAL STANDALONE OPERATION OF THE PROGRAM AS DISCRIBED IN SECTIONS 1 THROUGH 8 OF THIS DUCUMENT,

9.2 RESTRICTIONS  
-----

- 1) RUNNING THE CONSOLE PACKAGE REQUIRES THAT THE PSEUDO SWITCH REGISTER BE USED.
- 2) ONCE RUNNING THE CONSOLE PACKAGE NONACTIVE AND NOW DESIRE TO RUN IT ACTIVE, ONE MUST RELOAD THE DIAGNOSTIC AND INITILIZE FOR A ACTIVE CONSOLE PACKAGE.

9.3 INITIALIZATION  
-----

FOR A ACTIVE CONSOLE PACKAGE  
-----

- 1.) SET LOCATION 21 BIT0=0 TO INDICATE USE PSEUDO SWITCH REGISTER.
- 2.) SET LOCATION 22 BIT3=1 TO INDICATE CONSOLE PACKAGE ACTIVE.

FOR A NON ACTIVE CONSOLE PACKAGE  
-----

- 1.) SET LOCATION 21 BIT0=1 TO INDICATE NOT TO USE PSEUDO SWITCH REGISTER, BUT TO USE HARDWARE SWITCHES.
- 2.) SET LOCATION 22 BIT3=0 TO INDICATE CONSOLE PACKAGE NOT ACTIVE.

9.4 CONTROL CHARACTERS  
-----

CONTROL CHARACTERS ARE USED TO GIVE THE OPERATOR THE

ABILITY TO PERFORM THE FOLLOWING FUNCTIONS.  
NOTE: THE PROGRAM WILL RESPOND TO THE CONTROL CHARACTER IN FIVE (5) SECONDS OR LESS.

CONTROL C  
-----

THIS WILL START THE LOADER THAT IS IN LOCATION 7600.

CONTROL R  
-----

THIS WILL RESTART THE PROGRAM AND REASK THE SWITCH REGISTER QUESTION AS DESCRIBED IN SECTION 9.6.

CONTROL E  
-----

THIS WILL CONTINUE THE PROGRAM FROM AN ERROR IF ALLOWED BY THE DIAGNOSTIC OR FROM A WAITING STATEMENT.

CONTROL L  
-----

THIS WILL SWITCH THE TERMINAL MESSAGES FROM THE DISPLAY TO A LINE PRINTER. TO RESTORE THE MESSAGES ON THE TERMINAL CONTROL L MUST BE TYPED AGAIN. IF NO PRINTER IS AVAILABLE AND CONTROL L IS TYPED THE RESULT WILL BE THAT THE CONSOLE PACKAGE WILL WAIT FOR CONTROL C OR R. THE CONTROL L WILL OUTPUT TO THE LINE PRINTER AND THE PROGRAM WILL ATTEMPT TO CONTINUE AS IF A CONTROL E WAS TYPED IN.

CONTROL D  
-----

THIS WILL ALLOW THE ABILITY TO CHANGE THE SWITCH REGISTER DURING PROGRAM OPERATION. TYPING THIS CHARACTER WILL RESULT IN AN INTERIGATION OF THE SWITCH REGISTER QUESTION AS DESCRIBED IN SECTION 9.6.

CONTROL S  
-----

THIS WILL STOP PROGRAM EXECUTION AND WAIT IN A LOOP FOR A CONTINUE. THE ONLY WAY TO CONTINUE WILL BE TO TYPE A CONTROL Q, R OR C. THIS IS A NONPRINTING CHARACTER.

CONTROL Q  
-----

THIS IS TO CONTINUE A PROGRAM AFTER A CONTROL S IS TYPED. THIS IS A NONPRINTING CHARACTER.

## 9.5

WAITING MESSAGE  
-----

THE WAITING MESSAGE IS USED TO ALLOW THE OPERATOR TIME TO MAKE A DECISION AS TO WHAT CONTROL CHARACTER TO TYPE. THIS MESSAGE MAY APPEAR AT THE END OF PASS MESSAGE IF THE HALT ON PASS BIT IS SET. THE CONTROL CHARACTERS MAY NOW BE USED TO PERFORM THE NEEDED FUNCTION.

THE WAITING MESSAGE MAY BE PRINTED AFTER A ERROR MESSAGE IF THE HALT ON ERROR BIT IS SET. HERE AGAIN THE CONTROL CHARACTERS MAY BE USED. THE WAITING MESSAGE MAY BE PRINTED IF OPERATOR INTERVENTION IS REQUIRED.

9.6 SWITCH REGISTER MESSAGE  
-----

THIS MESSAGE IS USED TO SETUP THE PSEUDO SWITCH REGISTER BEFORE PROGRAM EXECUTION TAKES PLACE. THE SWITCH REGISTER IS SETUP WHEN THE FOURTH CHARACTER IS ENTERED OR A CARRIAGE RETURN IS TYPED

\*\*\*\*\*  
SR=0000 4000  
----

UNDER SCORING INDICATES OPERATOR RESPONSE

9.7 END OF PASS  
-----

THE NORMAL PASS COMPLETE TYPEOUT AS DESCRIBED IN SECTION 5.5 IS USED.

9.8 ERRORS  
-----

THE STANDARD ERROR REPORTS AS DESCRIBED IN SECTION 5 OF THIS DOCUMENT WILL BE USED.

9.9 SWITCH REGISTER SETTINGS  
-----

THE STANDARD SWITCH SETTINGS AS DESCRIBED IN SECTION 3 OF THIS DOCUMENT WILL BE USED.

9.10 PARAMETER CONTROL WORDS  
-----

THE CONSOLE PACKAGE USES THE LUCATIONS 20 21 22 FOR THE FOLLOWING PURPOSES.

LOCATION 20  
PSEUDO SWITCH REGISTER

LOCATION 21  
HARDWARE IDENTIFIER 1

LOCATION 22



## 10.1 DESCRIPTION

-----  
TWO INTERFACES HAVE BEEN PROVIDED WHICH ALLOW THIS DIAGNOSTIC TO RUN UNDER THE STANDARD APT-8 SYSTEM. THESE INTERFACES ARE:

1. TIMING INTERFACE

2. ERROR INTERFACE

EACH WILL BE EXPLAINED IN DETAIL.

## 10.2 SETUP

-----  
THE FOLLOWING INFORMATION MUST BE INDICATED DURING THE INITIAL PROGRAM START UP.

1. SINGLE OR MULTIPLE DRIVE TESTING.
2. DRIVE OR DRIVES TO BE TESTED.
3. DIAGNOSTIC RUNNING UNDER APT-8.
4. THE AMOUNT OF MEMORY IN 1K INCREMENTS.

IF SINGLE DRIVE TESTING BIT 5 OF ADDRESS 22 MUST BE SET TO A ONE (1) WITH BITS 6-11 CONTAINING THE DRIVE TO BE TESTED. IF MULTIPLE DRIVES ARE TO BE DONE BIT MUST BE SET TO A ZERO (0) AND BIT 6-11 CONTAINING THE HIGHEST NUMBER DRIVE TO BE TESTED. WHEN MULTIPLE DRIVE TESTING ONLY A SPECIFIC NUMBER OF DRIVES CAN BE INDICATED. THE PROGRAM ASSUMES THE DRIVES ARE TO BE DONE BEGINNING WITH DRIVE ZERO (0) AND FINISHING WITH THE HIGHEST DRIVE INDICATED. IF MULTIPLE DRIVES OTHER THAN CONSECUTIVELY NUMBERED DRIVES BEGINNING WITH DRIVE ZERO (0) ARE TO BE DONE, THEY MUST BE DONE AS SINGLE DRIVES AND TESTED INDEPENDANTLY.

THE PROGRAM ALLOWS DRIVES 0-7 TO BE SELECTED. USER SHOULD NOT EXCEED 0-3 DRIVES FOR THE MK8E CONTROL.

BIT ZERO OF ADDRESS 22 MUST BE SET TO A ONE TO INDICATE THAT THE PROGRAM WILL RUN UNDER APT-8.

NOTE: IT SHOULD BE NOTED AT THIS TIME THAT WHILE RUNNING UNDER APT-8 THE HARDWARE SWITCH REGISTER IS INOPERATIVE. ONLY THE HALT AND SINGLE STEP SWITCH WILL EFFECT THE PROGRAM RUN.

AMOUNT OF MEMORY IN 1K INCREMENTS SHOULD BE STORED IN BITS 7-11 OF LOCATION 21. AN ADDITION OF 1 TO THE NUMBER OF BITS IN 7-11 INCREASES MEMORY SIZE BY 1K. EX. 4K=3/8K=7. REMEMBER TO RETAIN STATUS OF BITS WHEN MODIFYING LOCATION 21.

### APT-8 INTERFACES:

#### 10.3.1. TIMING

-----  
APT-8 IS NOTIFIED OF PROGRAM RUN BETWEEN .2 SEC AND 2.0 SEC ON A 1.2 MICROSECOND MEMORY CYCLE. THIS WILL ALLOW THE DIAGNOSTIC TO RUN WITHOUT CAUSING AN APT-8 TIMEOUT ERROR IF THE DIAGNOSTIC IS TO BE RUN ON ON THE SLOWER MOS MEMORY.

### 10.3.2. ERRORS

\*\*\*\*\*

ONLY THE DRIVE IN ERROR IS REPORTED TO APT-8 SYSTEM.  
SYSTEM. ERRORS WHICH CAUSE A PROGRAMMED HALT CAUSE A TIMEOUT  
ERROR. IF A PROGRAMMED HALT SHOULD OCCUR, THE ERROR PC WILL  
APPEAR IN THE AC ON THE DEVICE UNDER TEST. PROGRAMMED HALTS  
ARE EXPLAINED EARLIER IN THIS DOCUMENT.

### 11. PROGRAM LISTING

\*\*\*\*\*



```

/RK8E/RK8L DATA RELIABILITY PROGRAM: MU=88-DHRKC=H
/
/MAINDEC=88-DHRKC=M=L
/
/COPYRIGHT 1972,1975,1976,1977 DIGITAL EQUIP. CORP.
/
/MAYNARD, MASS. 01754
0001 FIELD 1
/
/CONSOL SRC=V2=R8= CONSOLE PACKAGE
/
/THE PROGRAM SHOULD CHECK FOR A CONTROL CHARACTER FROM THE TERMINAL
/EVERY FIVE(5) SECONDS OR SOONER.
/
/Locations THAT NEED TO BE SET UP FOR USING THE CONSOLE PACKAGE.
/
/CNTVAL IN XC8PASS THIS LOCATION DETERMINES THE NUMBER OF
/PROGRAM COMPLETIONS THAT ARE NEEDED BEFORE THE PASS MESSAGE IS TYPED
/THE VALUE SHOULD PUT THE PASS MESSAGE OUT IN THE RANGE OF 1 TO 5 MINUTES.
/THIS SHOULD BE A POSITIVE NUMBER.
/
/C8STRY THIS IS FOUND IN CNTRL ROUTINE CONTROL R PART
/IT IS THE RETURN WHEN CONTROL R IS ENTERED (RESTART PROGRAM)
/THE RETURN JUMPS TO X008H WHICH CONTAINS C8STRY SO PUT THE LABEL C8STRY
/WHERE YOU WANT TO RESTART THE PROGRAM.
/
/SETUP1 IN XC8ERR THIS IS THE MASK BIT FOR HALT ON ERROR
/PLACE THE CORRECT BIT IN THIS LOCATION FOR HALTING ON ERRORS.
/
/SETUP2 IN XC8PASS THIS IS THE MASK FOR HALT A END OF PASS.
/
/THE CALL TABLE IS A CONDITIONAL ASSEMBLY.
/TO ASSEMBLE THE CALL REMOVE THE / BEFORE CONSOL=8.
/IN COMBINING THE CONSOL PACKAGE TO A DIAGNOSTIC.
/THE CALL TABLE IS TO BE AT THE BEGINNING OF A PROGRAM.

```

```

0000 CONSOL=8
0001 P8KF= 0001
0002 PCLF= 0002
0003 P8KE= 0003
0004 P8TS= 0004
0005 P8IE= 0005
0006 GTF= 0006
0007 ACL= 0007
0008 CAF= 0008
0009 HQL= 0009
0010 HQA= 0010
/
0020 *20
/
0020 0000 F13WR, 0
0021 4000 F10P1, 4000

```

```

0022 0000 F10P2, 0
/
IFDEF CONSOL *
0024 *24
/
0024 4424 C8PASS= JMS I .
0200 XC8PAS /C8 PASS COMPLETION ROUTINE
4425 C8CKSW= JMS I .
0025 0262 XC8SW /CHECK SW REG SETTING
4426 C8TTYI= JMS I .
0026 0272 XC8TTY /FETCH CONSOL CHAR
4427 C8CNTR= JMS I .
0027 0400 XC8CNT /CHECK FOR CONTROL CHAR
4430 C8PRNT= JMS I .
0030 0303 XC8PNT /C8 PRINT A BUFFER
4431 C8SWIT= JMS I .
0031 0636 XC8PSW /SET UP PSEUDO SW, REG
4432 C8OCTA= JMS I .
0032 1000 XC8OCT /CONVERT TO ASCII AND PRINT
4433 C8CRLF= JMS I .
0033 1023 XC8CRL /DO A CARRIAGE RETURN LINE FEED
4434 C8ECHO= JMS I .
0034 1063 XC8ECH /CHECK INPUT CHAR
4435 C8TYPE= JMS I .
0035 1077 XC8TYP /C8 PRINT ONE CHAR
4436 C8ERR= JMS I .
0036 1207 XC8ERR /C8 ERROR HANDLER
4437 C8INQU= JMS I .
0037 0635 XC8ING /LOOK FOR OPERATOR INTERVENTION
4440 C8CKPA= JMS I .
0040 1041 XC8CKP /CHECK IF CONTROL CHAR
4441 C8PAUS= JMS I .
0041 0337 XC8PAU /IF CONSOL PACKAGE RETURN CALL PLUS ONE
/IF NOT USING CONSOL REPLACE CALL WITH
/ A HLT AND THEN GO TO THE HALT
/
/*****
/*20 /PSEUDO SWITCH REGISTER
/*21 /HARDWARE INDICATORS
/4000=USE FRONT PANEL SWITCH REGISTER
/0000=USE THE PSEUDO SWITCH REGISTER LOC.20
/*22 /SYSTEM CONFIGURATION
/4000=CONSOL PACKAGE SET ACTIVE
/0000=CONSOL PACKAGE SET DEACTIVE
/*23 /RESERVED FOR FUTURE USE
/
0200 *200
/
/*****
/C8PASS

```

```

/THIS IS CALLED AT THE END OF EACH PROGRAM COMPLETION
/THE VALUE OF** CNTVAL** WILL BE DETERMINED BY THE TIME IT TAKES
/THE PROGRAM TO COMPLETE THIS MANY C0PASS TO BE IN THE 1 TO 4 MINUTE
/RANGE
/
C0PASS=JMS XC0PAS
/EX. OF CALL C0PASS
/
JMP HLT /HALT IF NON CONSOL PACKAGE
START1 /CONTINUE RUNNING THIS PROGRAM
    
```

```

/RETURN TO LOCATION CALL PLUS ONE WITH THE AC=0 IF NON CONSOL PACKAGE AND HLT
/IF CONTINUE TO RUN THEN RETURN TO CALL PLUS2 AC=0
/THE LOCATION SETUP2 IS THE MASK BIT FOR THE HALT AT END OF PASS
/CHECK THAT IT IS CORRECT FOR THE CURRENT PROGRAM
    
```

/CALLS USED BY XC0PAS ARE CHKCLA-XC0CNLF-XC0OCTA-XC0SW-XC0PNT-XC0ING-

```

0200 0000 XC0PAS, 0
0201 7200 CLA
0202 4777* JMS CHKCLA /IS WORD 22 BIT 3 ACTIVE CONSOLE?
0203 5212 JMP DOPACK /IS CLASSIC
0204 4776* JMS C0GET /GET REGISTERS.
0205 4262 JMS XC0SW /DEACTIVE CONSOL CHECK SR SETTING
0206 0375 AND (400 /FOR HALT ON END OF C0PASS
0207 7640 SZA CLA /1= HALT 0 CONTINUE
0210 5600 JMP I XC0PAS /GO TO HALT
0211 5230 JMP C0BY1 /CONTINUE ON RUNNING PROGRAM
0212 4232 DOPACK, JMS CKCOUT /CLASS CHECK C0PASS COUNT
0213 5230 JMP C0BY1 /C0PASS COUNT NOT DONE REDO PROGRAM
0214 2250 ISZ PASCNT /C0PASS COUNT DONE SET C0PASS COUNT
0215 4774* JMS XC0CRLF
0216 4303 JMS XC0PNT /C0PNT BUFFER
0217 0253 MESPAS
0220 1250 TAD PASCNT /GET NUMBER
0221 4773* JMS XC0OCTA /CONVERT IT TO ASCII
0222 4774* JMS XC0CRLF /DO A CARRIAGE RETURN
0223 4776* JMS C0GET /GET REGISTERS.
0224 4262 JMS XC0SW /CHECK A HALT AT END OF C0PASS
0225 0375 SETUP2, AND (400 /MASK BIT
0226 7640 SZA CLA /HALT 0 NO SKIP CONTINUE 00
0227 4772* JMS XC0ING /STOP PROGRAM EXECUTION-LOOK FOR INPUT
0230 2200 C0BY1, ISZ XC0PAS /BUMP RETURN
0231 5600 JMP I XC0PAS
0232 0000 CKCOUT, 0
0233 1251 TAD DOSET /CHECK IF SET UP NEEDED
0234 7640 SZA CLA /0=SET UP C0PASS COUNT VALUE
/1=C0PASS COUNT VALUE OK
/C0PASS COUNT VALUE ON
/SET COUNT VALUE FOR THIS PROG
/SET TO NEGATIVE
/STORE IN HERE
/INDICATE VALUE SET UP
/COUNT THE NUMBER OF PASSES
/EXIT FOR ANOTHER PASS
0235 5242 JMP NOSET
0236 1252 TAD CNTVAL
0237 7040 CMA
0240 3247 DCA DOCNT
0241 2251 ISZ DOSET
0242 2247 NOSET, ISZ DOCNT
0243 5230 JMP C0BY1
    
```

```

0244 3251 DCA DOSET /SET TO C0PNT C0PASS
0245 2232 ISZ CKCOUT /BUMP RETURN FOR
0246 5632 JMP I CKCOUT /C0PASS C0TYPE OUT
0247 0000 DOCNT, 0
0250 0000 PASCNT, 0
0251 0000 DOSET, 0
0252 0000 CNTVAL, 0
0253 0410 MESPAS, TEXT "DHRKC PASS "
0254 2213
0255 0310
0256 4040
0257 2001
0260 2323
0261 4000
    
```

\*\*\*\*\*

/C0CKSW

```

/THIS ROUTINE CAN BE USED INPLACE OF A READ THE SWITCHES LAS.
/ROUTINE THAT WILL CHECK WHERE TO READ THE
/C0 SWITCHES FROM IE. FROM PANEL OR PSEUDO SWITCH REGISTER
/THE SELECTION IS DETERMINED BY THE STATE OF BIT 0 IN LOCATION 21.
    
```

```

/C0CKSW= JMS XC0SW
/EX. JMS XC0SW /READ THE C0SWIT REGISTER
/RETURN WITH THE CONTENTS OF SWITCH REGISTER
    
```

/RETURN TO NEXT LOCATION FOLLOWING CALL WITH THE AC= TO VALUE OF C0SWIT SETTING

/CALLS USED ARE-XC0CKPA-

```

0262 0000 XC0SW, 0
0263 4771* JMS XC0CKPA /GO CHECK THE IF ANY CONTRL
0264 7000 NOP
0265 1021 TAD 21 /GET WD FUN INDICATOR
0266 7710 SPA CLA /CHECK IF FROM PANEL 4000
0267 7614 7614 /00 LAS AND SKIP GET FROM PANEL WITH LAS
0270 1020 TAD 20 /PSEUDO SWITCH
0271 5662 JMP I XC0SW /EXIT WITH STATUS BIT IN AC.
    
```

\*\*\*\*\*

/C0TTY1

```

/THIS ROUTINE WILL LOOK FOR A INPUT FROM THE TERMINAL
/AND REMOVE ANY PARITY BITS, THEN MAKE IT 8 BIT ASCII.
    
```

```

/C0TTY1= JMS XC0TTY1
/EX. JMS XC0TTY1 /READ CHAR FROM THE CONSOL DEVICE
/RETURN TO CALL PLUS ONE AC CONTAINS THE CHAR
    
```

/CALLS USED=NONE= BUT C6CHAR IS OFF PAGE AND IN ROUTINE CALLED XC6ECHO

```

/
/
0272 0000 XC6TTY, 0
0273 0031 KSF /LOOK FOR KEYBOARD FLAG
0274 0273 JMP =-1
0275 0036 KRB /GET CHAR
0276 0370 AND (177 /MASK FOR 7 BITS
0277 1367 TAD (200 /ADD THE EIGHTH BIT
0300 3766 DCA C6CHAR /STORE IT
0301 1766 TAD C6CHAR
0302 5672 JMP I XC6TTY /EXIT

```

\*\*\*\*\*

/C6PRNT

/THIS ROUTINE WILL TYPE THE CONTENTS OF THE C6 PRINT BUFFER. THE LOCATION /OF THE BUFFER WILL BE IN THE ADDR8 FOLLOWING THE CALL. PRINTING OF THE BUFFER /WILL STOP WHEN A 00 CHAR IS DETECTED, CHAANCTERS ARE PACKED 2 PER WORD.

/ C6PRNT= JMS XC6PNT

/EX. JMS XC6PNT /C6PRNT THE CONTENTS OF THE FOLLOWING BUFFER  
/ MESS77 /LOCATION OF C6PRNT BUFFER

/C6PRNT WILL USE THE LOCATION FOLLOWING THE CALL AS THE POINTER FOR THE /C6PRNT ROUTINE, RETURN TO CALL PLUS TWO WITH AC= 0

/CALLS USED ARE=XC6TYPE=XC6PNT

```

0303 0000 XC6PNT, 0
0304 7300 CLA CLL
0305 1703 TAD I XC6PNT /GET C6PRNT BUFFERS STARTING LOCATION
0306 3336 DCA PTSTOR /STORE IN PTSTOR
0307 2303 ISZ XC6PNT /BUMP RETURN
0310 1736 C6D01, TAD I PTSTOR /GET DATA WORD
0311 0365 AND (7700 /MASK FOR LEFT BYTE
0312 7450 SNA /CHECK IF 00 TERMINATE
0313 5703 JMP I XC6PNT /EXIT
0314 7500 SMA /IS AC MINUS
0315 7020 CML /MAKE CHAR A 300 AFTER ROTATE
0316 7001 IAC /MAKE CHAR A 200 AFTER ROTATE
0317 7012 RTR
0320 7012 RTR
0321 7012 RTR
0322 4764 JMS XC6TYPE /PUT CHAR IN BITS 4-11 MAKE IT 8 BIT ASCII
0323 1736 TAD I PTSTOR /C6PRNT IT ON CONSOLE
/GET DATA WORD

```

```

0324 0363 AND (0077 /MASK FOR RIGHT BYTE
0325 7450 SNA /CHECK IF 00 TERMINATOR
0326 5703 JMP I XC6PNT //EXIT
0327 1362 TAD (3740 /ADD FUDGE FACTOR TO DETERMINE IF 200
0330 7500 SMA /OR 300 IS TO BE ADD TO CHAR
0331 1361 TAD (100 /ADD 100
0332 1360 TAD (240 /ADD 200
0333 4764 JMS XC6TYPE /C6TYPE ONLY BITS 4-11
0334 2336 ISZ PTSTOR /BUMP POINTER FOR NEXT WORD
0335 5310 JMP C6D01 /DO AGAIN
0336 0000 PTSTOR, 0 /STOP FOR C6PRNT BUFFER

```

\*\*\*\*\*

/C6PAUS  
/THIS ROUTINE WILL CHECK IF THE CONSOL PACKAGE IS ACTIVE, IF ACTIVE /IT WILL RETURN TO CALL PLUS ONE AC= 0, AND DO THAT INSTRUCTION. /IF THE CONSOL PACKAGE IS NOT ACTIVE THE CALL WILL BE REPLACED /WITH A 7402 HALT AND THEN RETURN TO THE HALT.

/ C6PAUS= JMS XC6PAU

/EX. JMS XC6PAUS /CHECK IF ON ACTIVE CONSOL IF NOT HALT HERE  
/ ANYTHING /RETURN HERE IF ON ACTIVE CONSOL

/CALLS USED ARE=CHKCLA=

```

0337 0000 XC6PAU, 0
0340 7300 CLA CLL
0341 4777 JMS CHKCLA /CHECK LOC 22 BIT 3 CONSOLE BIT
0342 5350 JMP C6D03 /GO DO CONSOL PART RETURN CALL+1
0343 7040 CMA /DEACTIVE CONSOL PACKAGE PUT HLT IN CALL
0344 1337 TAD XC6PAU /GET CORRECT RETURN ADDR8
0345 3337 DCA XC6PAU /SET UP RETURN
0346 1357 TAD (7402 /GET CODE FOR HLT
0347 3737 DCA I XC6PAU /PUT HALT IN CALL LOCATION
0350 5737 C6D03, JMP I XC6PAU /GO TO HALT OR RETURN TO NEXT LOCATION

```

```

0357 7402
0360 0240
0361 0100
0362 3740
0363 0077
0364 1077
0365 7700
0366 1075
0367 0200
0370 0177
0371 1041

```

0372 0635
0373 1000
0374 1023
0375 0400
0376 0624
0377 1200
0400

PAGE
/\*\*\*\*\*

/CBCNTH
/THIS ROUTINE WILL CHECK FOR THE PRESENCE OF CONTROL CHARACTERS
/IT WILL CHECK FOR THE FOLLOWING CHAN U-R=Q=L-S
/ CBCNTR= JMS XCBCNT

/EX. JMS XCBCNTR /CHECK FOR CONTROL CHARACTER
/ JMP ANYTHING /LOC FOLLOWING CALL IS FOR CONTINUING THE PROGRAM
/ JMP ANYTHING /LOC. IS FOR RETURN IF INMODE SET AND NOT CNTRL CHAR

/RETURN IS TO CALL PLUS ONE IF CONTINUE
/RETURN IS TO CALL PLUS TWO IF INMODE SET AND NOT CONTROL CHAR
/RETURN IS TO CALL PLUS TWO IF INMODE IS NOT SET AND NO
/CNTRL CHAR.,THIS WILL PRINT THE CHARACTER AND A ?
/CLEAR THE AC AND RETURN CALL+2.

/CALLS USED ARE=CHKCLA=XCBCTYPE=XCBCRLF=C8GET=UPARON=XC8TYI=XC8PSW-

0400 0000 XCBCNT, B
0401 3777 DCA ACSAVE /SAVE THE AC
0402 4776 JMS CHKCLA /CHECK LOC.22 BITS FOR CONSOLE BIT
0403 5206 JMP ,+3 /ON ACTIVE CONSOLE
0404 1777 TAD ACSAVE /DEACTIVE CONSOLEGET AC FOR RETURN
0405 5600 JMP I XCBCNT /EXIT NOT UN ACTIVE CONSOLE
0406 6804 GTF
0407 3775 DCA FLSAVE
0410 7501 MOA
0411 3774 DCA MGSAVE /SAVE THE MQ
0412 3255 OCA INDEXA /SET DISPLACEMENT INTO TABLE B
0413 1257 TAD XTABLA /GET ADDR8 OF TABLE A
0414 3256 DCA GETDAT /CONTAINS POINTER TO CONTROL CHAR
0415 1656 REDDA, TAD I GETDAT /GET CNTRL CHAR FROM TABLE
0416 7450 SNA /CHECK FOR A 0 END OF TABLE
0417 5226 JMP DONEA /END OF TABLE NO CONTROL CHAR
0420 1773 TAD C8CHAR /COMPARE CHAR TO CONTROL CHAR
0421 7650 SNA CLA /0 IF MATCH
0422 5243 JMP GOITA /MATCH
0423 2255 ISZ INDEXA /NO MATCH NOT END OF TABLE REDD
0424 2256 ISZ GETDAT /BUMP INDEX FOR EXIT WHEN CONTROL FOUND
0425 5215 JMP REDDA /BUMP GETDAT FOR COMPARE OF NEXT CNTRL CHAR.
0426 1772 DONEA, TAD INMODE /CHECK IF PROGRAM EXPECTS CHAR
0427 7640 SZA CLA /1=CMAN EXPECTED 0= NO CHAR EXPECTED
0430 5240 JMP EXITA /CMAN EXPECTED

0431 1773 TAD C8CHAR /GET CHAR= NOT CONTROL+ NOT EXPECTED
0432 4771 JMS XC8TYPE /C8PKNT CHAR
0433 1370 TAD (277 /GET CUDE FOR "2"
0434 4771 JMS XC8TYPE
0435 4767 JMS XCBCRLF
0436 2200 ISZ XCBCNT /BUMP RETURN
0437 5600 JMP I XCBCNT /EXIT CALL+2
0440 2200 EXITA, ISZ XCBCNT /BUMP RETURN FOR MAIN PROGRAM CHECK OF CHAR
0441 1773 TAD C8CHAR /PUT CHAR IN AC.
0442 5600 JMP I XCBCNT /EXIT
0443 1773 GOITA, TAD C8CHAR /GET THE CONTENTS OF CHAR
0444 1366 TAD (100 /ADD 100 TO FORM A GOOD ASCII CHARACTER
0445 3773 DCA C8CHAR /RESTORE COFFECT CHAR
0446 1260 TAD XTABL8 /GET START OF TABLE B
0447 1255 TAD INDEXA /GET NUM F \ INTO TABLE
0450 3254 DCA GOTOA /STORE IT
0451 1654 TAD I GOTOA /GET THE ROUTINE STARTTING ADDRESS
0452 3254 DCA GOTOA /STORE IT IN HERE
0453 5654 JMP I GOTOA /GOTO CONTROL CHAR ROUTINE
0454 0000 GOTOA, 0000 /ADD OF CNTRL ROUTINE TO EXECUTE
0455 0000 INDEXA, 0000 /DISPLACEMENT INTO CNTRL TABLE
0456 0000 GETDAT, 0000 /LOCATION OF ADDR8 OF CONTROL CHAR.
0457 0461 XTABLA, TABLA /ADDR8 OF TABLEA
0460 0471 XTABL8, TABL8 /ADDR8 OF TABLEB
0461 7575 TABLA, 7575 /ADDR8 OF TABLEB
0462 7564 TABLA, 7564 /CNTRL C BACK TO MONITOR 203
0463 7557 TABLA, 7557 /CNTRL L SWITCH ERROR PRINTTING DEVICE 214
0464 7556 TABLA, 7556 /CNTRL Q STANT DISPLAYING CHAR, AGAIN 221
0465 7555 TABLA, 7555 /CNTRL R BACK TO BEGINNING OF PROGRAM 222
0466 7573 TABLA, 7573 /CNTRL S STOP SENDING CHAR TO DISPLAY WAIT FOR CNTRL Q 223
0467 7574 TABLA, 7574 /CNTRL E CONTINUE WITH PROGRAM 203
0470 0000 TABLA, 0000 /CNTRL D CHANGE SWITCH REGISTER ON FLY

0471 0551 TABL8, CNTRL8
0472 0537 CNTRL8
0473 0500 CNTRL8
0474 0511 CNTRL8
0475 0521 CNTRL8
0476 0545 CNTRL8
0477 0600 CNTRL8

/CNTRL Q
/START SENDING CHAM. TO THE DISPLAY
/THIS WILL RETURN CONTROL TO CALL THAT WAS SET BY
/THE CALL FOR CONTROL S.

0500 3772 CNTRLQ, DCA INMODE /SET SUFT FLAG FOR UNEXPECTED CHAM
0501 1335 TAD C8SETS /CHECK IF CONTROL S TYPED IN
0502 7640 SZA CLA
0503 5306 JMP BYRETR /CONTROL S TYPED IN
0504 4765 JMS C8GET /NO CONTROL S TYPED PREVIOUSLY
0505 5600 JMP I XCBCNTH /LEAVE VIA CNTH ENTRY ADDRESS
0506 3335 BYRETR, DCA C8SETS /CLEAR THE SUFT FLAG
0507 4765 JMS C8GET /RESTORE REGISTERS
0510 5736 JMP I C8METH /EXIT TO ADDRESS SET BY CONTROL S

```

/
/CONTRUL R
/GO TO THE QUESTION C08WIT
0511 3764* CNTRLR, DCA TTYLPT /CLEAR THE TYPE FLAG SET TO TTY
0512 3335 DCA C08ETS /CLEAR SOFT FLAG FOR CNTRL S
0513 3772* DCA INMODE
0514 4763* JMS UPAROW /PRINT THE " AND C08CHN
0515 3762* C08Y4, DCA C08WST /CLEAR FLAG FOR CNTRL D OR R
0516 6203 CDF CDF 0
0517 5720 JMP I X08SW /GO TO ADDRS OF C08WIT
0520 0200 X08SW, BGN /D08W IS LABEL FOR C08WIT QUESTION
/
/CONTRUL S
/STOP SENDING CHAR. TO DISPLAY UNTIL A "Q IS RECEIVED
/
0521 1335 CNTRLS, TAD C08ETS /IF1 DO NOT STORE IN C08RETR
0522 7640 SZA CLA
0523 5327 JMP C08D07 /DONT SET UP C08RETR
0524 7001 IAC /MAKE RETURN CALL PLUS 2
0525 1200 TAD XC0CNT /GET RETURN FOR THIS CALL
0526 3336 DCA C08RETR /STORE IT HERE FOR USE BE CNTRL Q
0527 2335 C08D07, ISZ C08ETS /SET FLAG TO SAVE CALL
0530 4761* JMS XC0TTYI /LOOK FOR THE INPUT
0531 4765* JMS C08ET /GET REGISTERS
0532 4200 JMS XC0CNTR /CHECK FOR THE CONTROL CHAR
0533 7200 CLA
0534 5321 JMP CNTRLS /IF NOT A CNTRL Q R C REASK
0535 0000 C08ETS, 0
0536 0000 C08RETR, 0
/
/SWITCH OUTPUT FROM ONE OUTPUT DEVICE TO ANOTHER- THE TWO OUTPUTS ARE THE
/CONSOLE AND THE PRINTER WITH DEVICE CODE 06.
/
0537 1764* CNTRLR, TAD TTYLPT /GET PRESENT C08WIT INDICATOR
0540 7000 CMA /COMPLEMENT IT
0541 3764* DCA TTYLPT /STORE NEW C08WIT
0542 4763* JMS UPAROW /C08PNT " AND CHAR ON NEW DEVICE
0543 4765* JMS C08ET /RESTORE THE REGISTERS
0544 5000 JMP I XC0CNT /EXIT
/
/CONTRUL E
/CONTINUE RUNNING FROM A INQUIRE OR ERROR
/
0545 4763* CNTRLE, JMS UPAROW /PRINT THE CONTROL CHAR
0546 3762* DCA C08WST /CLEAR ENTRY FLAG.
0547 4765* JMS C08ET /GET THE REGISTERS
0550 5000 JMP I XC0CNT /RETURN TO CALL PLUS ONE
/
/CONTRUL C

```

```

/RETURN TO MONITOR CONTROL C
0551 3764* CNTRLC, DCA TTYLPT /CLEAR THE LPT FLAG TO PRINT ON DISPLAY
0552 3762* DCA C08WST /CLEAR ENTRY FLAG.
0553 4763* JMS UPAROW /C08PNT " AND LETTER IN CHAR
0554 6203 CDF CDF 0 /GO TO 0 FLD
0555 6007 CAF /CLEAR THE WORLD
0556 3760 JMP I (7600) /GO TO DIAGNOSTIC MONITOR
/*****
/
/
0560 7600
0561 0272
0562 0745
0563 0615
0564 1121
0565 0624
0566 0100
0567 1023
0570 0277
0571 1077
0572 1076
0573 1075
0574 1346
0575 1347
0576 1200
0577 1345
0600 PAGE
/
/CONTRUL D
/CHANGE THE SWITCH REGISTER ANYTIME CNTRL D AND RETURN TO
/THE PROGRAM RUNNING.
0600 4215 CNTRLD, JMS UPAROW
0601 1213 TAD C08ETD /CHECK IF THE RETURN ADDRS IS SAFE
0602 7640 SZA CLA
0603 5207 JMP C08D011 /DO NOT CHANGE THE RETURN ADDRS
0604 1777* TAD XC0CNT /GET THE RETURN ADDRS AND SAVE IT
0605 3214 DCA C08RETR /SAVE THE RETURN HERE
0606 2213 ISZ C08ETD /INDICATE RETURN SAVED DONT DESTROY
0607 4256 C08D011, JMS XC0PSW /GO CHANGE THE SWITCH REGISTER
0610 3213 DCA C08ETD /CLEAR THE FLAG
0611 4224 JMS C08ET /RESTORE THE AC MQ LINK ETC
0612 5614 JMP I C08RETR /RETURN TO THE PROGRAM
/
0613 0000 C08ETD, 0
0614 0000 C08RETR, 0
/
/THIS WILL TYPE A UP ARROW AND THE CHAN IN C08CHN.
0615 0000 UPAROW, 0 /C08PNT THE " AND THE CHAR C08TYPED IN

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0715 0000 TSTCHA, 0
0716 7041 CIA
0717 1356 TAD (215
0720 7650 SNA CLA
0721 5342 JMP ENDIT
0722 1774* TAD C8CHAR
0723 1355 TAD (-260
0724 7710 SPA CLA
0725 5336 JMP ERR1
0726 1774* TAD C8CHAR
0727 1354 TAD (-270
0730 7700 SNA CLA
0731 5336 JMP ERR1
0732 1774* TAD C8CHAR
0733 0353 AND (7
0734 3774* DCA C8CHAR

0735 5715 JMP I TSTCHA
0736 1352 ERN1, TAD (277
0737 4775* JMS XC8TYPE
0740 4773* JMS XC8CRLF
0741 5266 JMP C8RDP5
0742 4773* ENDIT, JMS XC8CRLF
0743 3345 DCA C88NST
0744 5656 JMP I XC8PSW
0745 0000 C88NST, 0

0746 0000 TMCNT, 0
0747 2322 MESA, TEXT "SR="
0750 7540
0751 0000

```

```

0752 0277
0753 0007
0754 7510
0755 7520
0756 0215
0757 7775
0760 1063
0761 1076
0762 0040
0763 1000
0764 0515
0765 0272
0766 0303
0767 1200
0770 1345
0771 1347
0772 1346
0773 1023
0774 1075
0775 1077
0776 0336
0777 0400

```

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1000 PAGE
/C8OCTA

/OCTAL TO ASCII CONVERSION
/THIS ROUTINE WILL TAKE THE OCTAL NUMBER IN THE AC AND CONVERT IT TO ASCII
/THE RESULT WILL BE PRINTED ON THE CONSOLE TERMINAL
/ C8OCTA= JMS XC8OCT
/
/EX. JMS XC8OCTA /AC CONTAINS NUMBER TO BE CHANGE
/ RETURN IS TO CALL PLUS ONE AC=0
/
/CALLS USED ARE=XC8TYPE=

1000 0000 XC8OCT, 0
1001 7106 CLL RTL
1002 7006 RTL
1003 3221 DCA C8TMP1
1004 1377 TAD (-4
1005 3222 DCA C8CKP
1006 1221 C8O04, TAD C8TMP1
1007 0376 AND (8007
1010 1375 TAD (260
1011 4277 JMS XC8TYPE
1012 1221 TAD C8TMP1
1013 7006 RTL
1014 7004 RAL
1015 3221 DCA C8TMP1
1016 2222 ISZ C8CKP
1017 5206 JMP C8O04
1020 5600 JMP I XC8OCT
1021 0000 C8TMP1, 0
1022 0000 C8CKP, 0

/*****
/C8CRLF
/C8TYPE CR AND LF WITH FILLERS FOLLOWING EACH LF AND CR
/
/ C8CRLF= JMS XC8CRL
/EX. JMS XC8CRLF /C8PN1 A CR AND LF WITH FILL
/ /RETURN TO CALL PLUS ONE AC =0
/CALLS USED ARE=XC8TYPE=

1023 0000 XC8CRLF, 0
1024 7300 CLA CLL
1025 1374 TAD (215
1026 4277 JMS XC8TYPE
1027 1237 TAD FILLER
1030 7040 CMA
1031 3240 DCA FILLCNT

```

1032 1373 TAD (212 /GET CODE FOR LF
1033 4277 C000R, JMS XC8TYPE
1034 2240 ISZ FILCNT /CHECK ON FILLER CHAR
1035 5233 JMP C0002 /TYPE A NON PRINTING CHAR
1036 5623 JMP I XC8CRL /EXIT
1037 8084 FILLER, 8084 /FILLER SET FOR 4 CHAR
1040 8080 FILCNT, 0 /COUNTER FOR FILL

\*\*\*\*\*
/C8CKPA
/THIS ROUTINE WILL CHECK IF A CHARACTER WAS ENTERED FROM THE
/TERMINAL. IF THE FLAG IS SET AND THE CONSOLE PACKAGE IS
/ACTIVE A CHECK IS MADE TO DETERMINE IF IT IS A CONTROL CHAR.
/IF IT WAS A CONTROL CHAR THEN ITS CONTROL FUNCTION IS PERFORMED.
/IF NOT A CONTROL CHARACTER OR A CONTROL E-D-L-O- IT WILL DO
/THE CONTROL FUNCTION AND RETURN TO CALL PLUS 2.
/IF A NON CONTROL CHARACTER WILL BE PRINTED AND A "2" IT WILL RETURN TO
/CALL PLUS 2.
/IF NO FLAG IS SET OR THE CONSOLE IS NOT ACTIVE THE RETURN IS TO
/CALL PLUS 1.

/ C8CKPA= JMS XC8CKP

/EX, JMS XC8CKPA /CALL TO CHECK IF CONTROL CHAR SET
/ ANYTHING(SKIP) /RETURN IF NOT FLAG OR NOT CONSOLE ACTIVE
/ ANYTHING(JMP EXIT SKIP CHAIN) /RETURN IF NOT CONTROL OR CONTINUE CONTROL

/CALLS USED ARE=XC8TTYI-XC8CNTR=C8GET=

1041 8080 XC8CKP, 0
1042 3772 DCA ACBAVE /SAVE THE AC
1043 6084 GTF /SAVE THE FLAGS
1044 3771 DCA FLBAVE /SAVE THE FLAGS
1045 7581 MOA /PUT MO IN AC
1046 3778 DCA MGBAVE /SAVE THE MO
1047 6031 K&F /CHECK THE KEYBOARD FLAG
1050 5261 JMP C8BY3 /EXIT TO CALL PLUS 1
1051 4767 JMS CMKCLA /CHECK LOC 28 BIT 3 CONSOLE BIT
1052 7418 SKP /ACTIVE CONSOLE PACKAGE
1053 5261 JMP C8BY3 /EXIT TO CALL PLUS 1
1054 4766 JMS XC8TTYI /GET THE CHAR
1055 4765 JMS C8GET /GET THE FLAGS
1056 4764 JMS XC8CNTR /CHECK IF CONTROL CHAR.
1057 7088 NOP /RETURN IF A CONTINUE CHAR.
1060 2241 ISZ XC8CKP /BUMP RETURN FOR CALL PLUS 2
1061 4765 C8BY3, JMS C8GET /GET REGISTERS
1062 5041 JMP I XC8CKP /SAY GOOD BY

\*\*\*\*\*

/C8ECHU
/THIS ROUTINE WILL LOOK FOR A CHAR FROM THE KEYBOARD. STORE IT IN LOCATION CHAR
/CHECK IF IT WAS A CONTROL CHARACTER= SET INMODE= PRINT CHARACTER

/ C8ECHU = JMS XC8ECH
/EX, JMS XC8ECH /LOOK FOR CONSOLE CHAR & PRINT IT
/RETURN CALL PLUS ONE AC @ CHAR C8TYPED IN

/CALLS USED ARE=XC8TTYI-XC8CNTR=C8GET-XC8ECH-XC8TYP

1063 8080 XC8ECH, 0
1064 4766 JMS XC8TTYI /WAIT FOR CHAR FROM KEYBOARD
1065 4765 JMS C8GET /RESTORE THE REGISTERS
1066 2276 ISZ INMODE /SET INMODE IDENTIFYING THIS AS A EXPECTED CHAR
1067 4764 JMS XC8CNTR /GO CHECK IF IT IS A CONTROL CHAR
1070 5663 JMP I XC8ECH /HAS A CONTROL CHAR= CONTINUE RUNNING
1071 4277 JMS XC8TYPE /NOT A CONTROL CHAR= CONTINUE RUNNING
1072 3276 DCA INMODE /CLEAR FLAG THAT CHAR EXPECTED
1073 1275 TAD C8CHAR /GET CHAR IN AC
1074 5663 JMP I XC8ECH /EXIT
1075 8080 C8CHAR, 0
1076 8080 INMODE, 0

\*\*\*\*\*

/C8TYPE
/THIS ROUTINE WILL PRINT ON THE CONSOLE OR THE LPT WITH DEVICE CODE 66.

/ C8TYPE= JMS XC8TYP

/EX, JMS XC8TYPE /PRINT THE CHAR IN THE AC.
/RETURN CALL PLUS ONE AC @8888
/DO NOT CLEAN THE LINK IN THIS ROUTINE NEEDED BYC8OCT

/CALLS USED ARE=C8MANG-XC8CNTR-XC8PNT-XC8CHLP-XC8INGU=

1077 8080 XC8TYP, 0
1100 3320 DCA PNTBUF /STORE CHAR
1101 1321 TAD TTYLPT /CHECK 0TTY 7777=LPT
1102 7640 SZA CLA
1103 5312 JMP XDULPT /DO OUT PUT ON LPT
1104 1320 TAD PNTBUF
1105 6046 TLS
1106 6041 TSP
1107 5306 JMP =-1
1110 6042 TCF
1111 5316 JMP C8BY5
1112 1320 XDULPT, TAD PNTBUF /GET CHAR
1113 6666 PSTB PCLF /PRINT IT
1114 4322 JMS C8MANG /CHECK KEYBOARD IF MUNG
1115 6662 PCLF /CLEAR THE FLAG
1116 7600 C8BY5, 7600 /CLEAR THE AC



```

1117 5677      JMP I  XC8TYP      /EXIT
1120 0000      PNTBUF, 0
1121 0000      TTYLPT, 0

1122 0000      C0HANG, 0
1123 7200      CLA
1124 1316      TAD          C0BYS      /GET CONSTANT 7000
1125 3320      OCA          PNTBUF    /PNTBUF IS NOW A COUNTER
1126 6661      PSKF
1127 7410      SKP
1130 5722      JMP I  C0HANG    /SAW FLAG DONE
1131 2345      ISZ          C0CONT    /FIRST COUNTER FAST ONE
1132 5326      JMP          .-4      /CHECK IF FLAG SET YET
1133 2320      ISZ          PNTBUF    /MADE 4096 COUNTS ON FAST COUNTER
1134 5331      JMP          .-5      /KEEP IT UP FOR 5 SEC
1135 1764      TAD          XC0CNTR   /GET THE RETURN ADDRESS IN CONTROL
1136 3322      OCA          C0MANG    /SAVE IT IN MANG
1137 3321      OCA          TTYLPT    /ALLOW PRINTING ON TTY
1140 4763      JMS          XC0PNT
1141 1146      MESMANG
1142 4223      JMS          XC0CRLF   /LPT ERR0R
1143 4762      JMS          XC0INQU   /PRINT WAITING
1144 5722      JMP I  C0HANG    /CONTINUE TO SAVE ADDRESS
1145 0000      C0CONT, 0
1146 1420      MESMANG,TEXT "LPT ERROR" /COUNTER FOR TIMER
1147 2440
1150 0522
1151 2217
1152 2200

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1162 0635
1163 0303
1164 0400
1165 0624
1166 0272
1167 1200
1170 1346
1171 1347
1172 1345
1173 0212
1174 0215
1175 0200
1176 0007
1177 7774

```

1200

PAGE

\*\*\*\*\*

/THIS ROUTINE WILL CHECK LOCATION 22 THE HARD WARE CONFIG WORD.  
/TO SEE IF THE CONSOLE BIT 3 (400) IS SET IF SET THEN RETURN  
/TO CALL PLUS TWO FOR A ACTIVE CONSOLE PACKAGE AC=0  
/IF NOT SET THEN TO CALL PLUS ONE FOR A DEACTIVE CONSOLE PACKAGE.

```

1200 0000      CHKCLA, 0
1201 7200      CLA
1202 1022      TAD          22
1203 0377      AND          (400)    /GET THE CONTENTA OF LOCATION 22
1204 7650      SNA          CLA      /MASK FOR BIT 3 (400)
1205 2200      ISZ          CHKCLA    /
1206 5600      JMP I  CHKCLA    /ACTIVE CONSOLE PACKAGE RETURN
                                      /CALL PLUS ONE (1) FOR ACTIVE
                                      /DEACTIVE CONSOLE PACKAGE RETURN
                                      /CALL PLUS TWO (2)

/COBERR
/THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A COBERR IS ENCOUNTERED
/WILL CHECK IF CLASSIC SYSTEM, WILL CHECK COBERR REGISTERS.
/ COBERR= JMS XC0BERR
/EX.  JMS  XC0BERR      /GO TO COBERR CALL IF NOT CONSOLE
                                      /RETURN IS CALL PLUS ONE AC =0000

/CALLS USED ARE-CHKCLA-XC0CRLF-XC0BYS-XC0INQU-XC0PNT-XC0OCTA-

1207 0000      XC0BERR, 0
1210 6002      IOF
1211 3345      OCA          ACSAVE    /SAVE AC
1212 6004      GTF
1213 3347      OCA          FLSAVE    /SAVE THE FLAGS
1214 7501      MGA
1215 3346      OCA          MGSAVE    /SAVE THE MG
1216 7340      CLA          CLL      CMA /SUBTRACT A 1 FOR TRUE LOCATION
1217 1207      TAD          XC0BERR  /GET RETURN LOCATION
1220 3344      OCA          PCSAVE    /SAVE ADD OF COBERR CALL
1221 6201      CDF
1222 7340      CLA          CLL      CMA
1223 1776      TAD          I        (CLASIK) /GET REAL PC.
1224 3316      OCA          REALPC    /SAVE IT.
1225 6211      CDF          10
1226 4200      JMS          CHKCLA    /CHECK LOG.22 BIT 3 CONSOLE BIT
1227 7410      SKP
1230 5270      JMP          NTCLAS   /ACTIVE CONSOLE PACKAGE
                                      /NOT CLASSIC SYSTEM
1231 4775      JMS          C0GET     /GET REGISTERS.
1232 4774      JMS          XC0BWS   /CHECK SWITCH REG FOR BIT THAT INDICATES
                                      /NO ERROR MESSAGE

1233 0373      SETUP1, AND          L0000 /MASK FOR BIT FOR NO ERROR PRINTING
                                      /IF THIS ERROR MESSAGE IS TO ALWAYS
                                      /BE PRINTED LEAVE AND VALUE AT 0000
                                      /SKIP IF BIT IS 0 PRINT ERROR MESSAGE
                                      /DO NOT PRINT

1234 7640      SZA          CLA
1235 5262      JMP          C0U010
1236 4772      JMS          XC0CRLF
1237 4771      JMS          XC0PNT
1240 1320      ERRMES
1241 4771      JMS          XC0PNT    /PRINT THE ERROR MESSAGE
1242 1330      MESPC
1243 1316      TAD          REALPC    /PRINT THE PC STATEMENT
1244 4770      JMS          XC0OCTA   /GET PC
1245 4771      JMS          XC0PNT    /CONVERT 4 DIGIT PC TO ASCII
1246 1333      MESAC

```

/PRINT THE AC MESS

```

1247 1345      TAD      AC8AVE
1250 4770*    JMS      XC8OCTA
1251 4771*    JMS      XC8PNT
1252 1336      MESMQ
1253 1346      TAD      MQ8AVE
1254 4770*    JMS      XC8OCTA
1255 4771*    JMS      XC8PNT
1256 1341      MESFL
1257 1347      TAD      FL8AVE
1260 4770*    JMS      XC8OCTA
1261 4772*    JMS      XC8CRLF
1262 4775*    C8DD10, JMS      C8GET
1263 4774*    JMS      XC8SW
1264 7610      SKP      CLA
1265 5300      JMP      C8BY2
1266 4767*    JMS      XC8ING
1267 5300      JMP      C8BY2
1270 4775*    NTCLAS, JMS      C8GET
1271 4774*    JMS      XC8SW
1272 7610      SKP      CLA
1273 5607      JMP      I      XC8ERR
1274 1366      TAD      (7402)
1275 3744      DCA      I      PC8AVE
1276 4775*    JMS      C8GET
1277 5744      JMP      I      PC8AVE
1300 4775*    C8BY2, JMS      C8GET
1301 5607      JMP      I      XC8ERR
/
1302 7402      /ROUNS, HLT
1303 7000      NOP
1304 3317      DCA      MYAC
1305 6201      CDF      0
1306 1020      TAD      SWH
1307 3765      DCA      I      (8WR)
1310 1776      TAD      I      (CLASIK)
1311 3315      DCA      CLRTRN
1312 1317      TAD      MYAC
1313 6202      CIF      0
1314 5715      JMP      I      CLRTRN
/
1315 0000      CLTRN, 0
1316 0000      REALPC, 0
1317 0000      MYAC, 0
/
1320 0410      /ERMES, TEXT "DMRKC FAILED "
1321 2213
1322 0310
1323 4040
1324 0001
1325 1114
1326 0504
1327 4000
1330 4040      MESPC, TEXT " PC:"

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1331 2003
1332 7200
1333 4040      MESAC, TEXT " AC:"
1334 0103
1335 7200
1336 4040      MESMQ, TEXT " MQ:"
1337 1521
1340 7200
1341 4040      MESFL, TEXT " FL:"
1342 0614
1343 7200
1344 7777      PC8AVE, 7777
1345 7777      AC8AVE, 7777
1346 7777      MQ8AVE, 7777
1347 7777      FL8AVE, 7777
/
1365 0020
1366 7402
1367 0635
1370 1000
1371 0303
1372 1023
1373 0000
1374 0262
1375 0624
1376 1514
1377 0400
0000
FIELD 0

```

0000	00000000	00000000	11101111	11111111	11000000	00000000	00000000	00000000
0100	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
0200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0300	11111111	11111111	11111111	11111111	11111111	10000001	11111111	11111111
0400	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0500	11111111	11111111	11111111	11111111	11111111	11111110	11111111	11111111
0600	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0700	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1000	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1100	11111111	11111111	11111111	11111111	11111111	11100000	00111111	11111111
1200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1300	11111111	11111111	11111111	11111111	11111111	00000000	00000111	11111111

1400  
1500

1600  
1700

2000  
2100

2200  
2300

2400  
2500

2600  
2700

3000  
3100

3200  
3300

3400  
3500

3600  
3700

4000  
4100

4200  
4300

4400  
4500

4600  
4700

5000  
5100

5200  
5300

5400  
5500

5600  
5700

6000  
6100

6200  
6300

6400  
6500

6600  
6700

7000  
7100

7200  
7300

7400  
7500

7600  
7700

```

/NOTE: LOCATION 0 CONTAINS THE REVISION
/LEVEL (IN ASCII) ON PROGRAM LOAD.
/
/ALL KNOWN HALTS
/
1400 0556 ERMLT0 /SKIP TRAP DLSC
1401 0563 ERMLT2 /SKIP TRAP DCLR
1402 2561 ERMLT3 /SKIP TRAP DLAG
1403 2544 ERMLT5 /SKIP TRAP DRST
1404 0547 ERMLT6 /SKIP TRAP DLDC
1405 3130 INTER1 /NO DISK INTERRUPT
1406 2362 INTER2 /UNDEFINED INTERRUPT
1407 0206 FLDHLT /PROGRAM WILL ONLY RUN IN FIELD 0
1410 2702 NDDSKS /NO DISKS AVAILABLE TO RUN
1411 0003 STPHLT /PROGRAM STOP FROM SWR4=1
1412 2755 CHNHLT /IOT CHANGE HALT
1413 1707 BADHLT /COMPUTER MUST BE DOWN, CHECKSUM FAILED
/BUT WORD-BY-WORD COMPARE WORKED.
/STOP FOR ALL ERROR HALTS.
/
1414 3136 BIG8TP
/
6740 DLSC=6740 /LOAD SECTOR COUNTER
6741 DSKP=6741 /SKIP ON TRANSFER DONE OR ERROR
6742 DCLR=6742 /CLEAR DISK CONTROL LOGIC
6743 DLAG=6743 /LOAD ADDRESS AND GO
6744 DLCA=6744 /LOAD CURRENT ADDRESS
6745 DRST=6745 /READ STATUS REGISTER
6746 DLDC=6746 /LOAD COMMAND REGISTER
/
4406 LAB=JMS I XLAS
4407 CLASIC=JMS I XCLAS
4427 RANDAT=JMS I XRNWRD
4430 DISCON=JMS I XDUMP
4431 SPACE=JMS I XSPAC
4432 ONEIN=JMS I XOCT1
4433 FORIN=JMS I XOCT4
4434 SETGEN=JMS I XSTGEN
/
4435 SETFLD=JMS I XSTFLD
4437 YESNO=JMS I XCHKYN
/
4436 SELCHK=JMS I XCKPOT
4440 RANGEN=JMS I XRNDDM
4442 REBRAN=JMS I XRBRAN
4441 DISKGO=JMS I XDSKGO
4443 RECAL=JMS I XRESTR
4444 RECEIV=JMS I XWAIT
4446 ERROR=JMS I XERRO
4447 RDSTAT=JMS I XRDST
4453 LDADD=JMS I XLDD
4450 DSKSKP=JMS I XSKKP

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4451 LDCM=JMS I XLDCM
4452 LOCUR=JMS I XLDCA
4454 CLRALL=JMS I XCLDR
4455 PRNTER=JMS I XPRN
4456 OCTEL=JMS I XPROCT
4445 TYPE=JMS I XPRINT
4457 CRLF=JMS I XCRLF
4426 GENDAT=JMS I XGN DAT
4424 CMK22=JMS I XCHK22
4425 KTICK=JMS I XTKCK
/
0000 *0
/
0000 0310 310 /REVISION "H"; INTERRUPT SERVICE RETURN
0001 5001 5001 /DCA SAVAC SAVE AC AT INT.
0002 0002 0002 /RAL SHFT LINK AT TIME OF INT.
0003 0003 0003 /DCA SVLNK SAVE LINK AT TIME OF INT.
0004 0004 0004 /JMP I 5 RETURN TO INT. SERVICE
0005 0005 0005 /RETURN POINTER
/
0006 1546 XLAS, MYLAS
0007 1514 XCLAS, CLASIX
/
0010 *10
/
0010 0000 AUTO10, 0
/
0011 0000 AUTO11, 0
/
0012 0000 AUTO12, 0
/
0013 0004 K0004, 0004
0014 0070 K0070, 0070
0015 0100 K0100, 0100
0016 0200 K0200, 0200
0017 0400 K0400, 0400
/
0020 *20
/
0020 0000 SWK, 0
0021 4000 OP1, 4000
0022 0000 OP2, 0
/
0023 2136 KAERRO, AERRO
0024 0523 XCHK22, CHK22
0025 1154 XTKCK, KTKCK
0026 1737 XGN DAT, GNDAT
0027 2600 XRNWRD, RNWRD
0030 2637 XDUMP, DUMP
0031 1506 XSPAC, SPAC
0032 2400 XOCT1, OCT1
0033 2430 XOCT4, OCT4
0034 1753 XSTGEN, STGEN
0035 2703 XSTFLD, STFLD

```

0036	2060	XCKPOT,	CHKPOT
0037	2035	XCHKYN,	CHKYN
0040	1715	XRNDOM,	RANDOM
0041	2200	XDSKGO,	DSKGO
0042	1761	XRSRAN,	RSRAN
0043	3052	XRESTR,	RESTOR
0044	2000	XWAIT,	WAIT
0045	2620	XPINT,	PRINT
0046	1200	XERRD,	ERRO
0047	2541	XROST,	ROST
0050	0751	XSKP,	SKP
0051	0542	XLDCM,	LDCM
0052	2530	XLDCA,	LDCA
0053	2554	XLOAD,	LDA0
0054	0560	XCLDR,	CLDR
0055	1450	XPRN,	PRN
0056	1426	XFRCT,	FROCT
0057	1414	XCLF,	UPONE
0060	0000	AMOUNT,	0
0061	0001	K0001,	0001
0062	0003	K0003,	0003
0063	0006	K0006,	0006
0064	0007	K0007,	0007
0065	0010	K0010,	0010
0066	0017	K0017,	0017
0067	0260	K0260,	0260
0070	0277	K0277,	0277
0071	0770	A0770,	0770
0072	7007	A7007,	7007
0073	4000	K4000,	4000
0074	4100	K4100,	4100
0075	1000	K1000,	1000
0076	1777	K1777,	1777
0077	7700	K7700,	7700
0100	7760	K7760,	7760
0101	7777	K7777,	7777
0102	0077	K0077,	0077
0103	6201	KCDF,	CF
0104	7400	K7400,	7400
		/	
		DECIMAL	
		/	
0105	7764	M12,	-12
		/	
		OCTAL	
		/	
0106	7774	M4,	-4
0107	7770	M10,	-10
0110	7775	K7775,	7775
		/	
0111	0000	TRASH1,	0
0112	0000	TRASH2,	0
0113	0000	TRASH3,	0
0114	0000	UPDATE,	0
0115	0000	POLDSK,	0

0116	0000	OPHTAL,	0
0117	0000	BUFTAL,	0
0120	0000	PCNEG,	0
0121	0000	STNEG,	0
0122	0000	EXNEG,	0
0123	0000	CHNEG,	0
0124	0000	INTDA,	0
0125	0000	DANEG,	0
0126	0000	CANEG,	0
0127	0000	WCNEG,	0
0130	0000	FWNEG,	0
0131	0000	ASNEG,	0
0132	0000	WANEG,	0
0133	0000	ADNEG,	0
0134	0000	OGNEG,	0
0135	0000	DBNEG,	0
0136	0000	INTCM,	0
0137	0000	STATRY,	0
0140	0000	DATTRY,	0
0141	0000	CHKSAV,	0
0142	0000	FNUSUM,	0
0143	0000	MAXFLD,	0
0144	7607	MAXTIM,	7607
0145	3240	MAXTRK,	3240
0146	3600	BGNBUF,	STRBUF
0147	0000	CONSEC,	0
0150	7777	CLCNT,	-1
		/	
0151	0756	DATPOT,	DAT1
0152	3522	TIMPOT,	00TM1
0153	3517	STAPOT,	00NRD-5
0154	3512	RUNPOT,	DSK00
		/	
0155	0000	CRCNT,	0
0156	0000	CRCFLG,	0
0157	0000	DATFLG,	0
0160	0000	SPFLD,	0
0161	0000	SPTRK1,	0
0162	0000	SPTRK2,	0
0163	0000	SPSEC,	0
0164	0000	SPHLK,	0
0165	0000	ERFLG,	0
0166	0000	SAVAC,	0
0167	0000	SVLNK,	0
0170	0000	FINTIM,	0
0171	0000	TRYCNT,	0
0172	3213	XTEXT,	TEXPC
0173	3142	PRNDAT,	TYPDAT
0174	0000	SAVCM,	0
0175	0000	CLNBAK,	0
		/	
0176	3131	BGHLT,	BIGHT
	0200	*200	
		/	
		/	

```

/START OF PROGRAM BY OPERATOR;
/AT 0200, TTY INTERMIGATION;
/AT 0201, CHANGE IOT DEVICE CODES;
/AT 0202, RESTART AT SEEK ROUTINE;
/
0200 4777' BGN, JMS APT8 /TO REGULAR TEST
0201 5776' JMP CHANG /CHANGE IOT ROUTINE
0202 5775' JMP RUN
0203 3156 OCA CRCFLG /CLEAR CRC FLAG
0204 6224 RIF
0205 7440 SZA /FIELD 0777?
0206 4576 FLDMLT, JMS I 06MLT /WILL ONLY RUN IN FIELD 0777?
0207 1103 TAD KCDF
0210 3211 DCA ,+1
0211 7402 MLT /MAKE DF=IF
/
/SETUP INTERRUPT SERVICE;
/
0212 1362 TAD ACUCA
0213 3001 DCA 1 /SETUP AC DCA
0214 1250 TAD KRUT
0215 3002 DCA 2 /SETUP ROTATE LINK
0216 1301 TAD LNKDCA
0217 3003 DCA 3 /SETUP SAVE LINK
0220 1360 TAD K5405
0221 3004 DCA 4 /SETUP JMP RETURN
0222 1363 TAD 08KKRET
0223 3005 DCA 5 /RETURN POINTER
/
/CLEAR DATA INFORMATION TABLE
/AT END OF PROGRAM;
/
0224 1077 STRTEX, TAD K7700
0225 3111 DCA TRASH1 /CLEAR COUNTER
0226 1774' TAD RANJMS
0227 3773' DCA SMDAT /SET INSTRUCTION SWITCH
0230 7340 CLA CLL CMA
0231 1152 TAD TIMPOT
0232 3010 OCA AUTO10 /LOCATION POINTER
0233 3410 DCA I AUTO10 /CLEAR
0234 2111 ISZ TRASH1
0235 5233 JMP ,=2 /MURE TO CLEAR
0236 3137 DCA DATFLG
0237 5775' SKPNOP, JMP RUN
/
/PRINT PROGRAM NAME AND
/ASK OPERATOR ABOUT AMOUNT
/OF MEMORY;
/
0240 4457 CRLF
0241 4455 PRNTER /PRINT "RK8E/RK8L DATA RELIABILITY"
0242 3307 MES1
0243 4455 PRNTER /PRINT "AMOUNT OF MEMORY"
0244 3346 MESS

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```

0245 4432 ONEIN
0246 0070 0070 /RECEIVE ONE OCTAL
0247 5243 JMP ,=4 /LIMITS
0250 7004 KRUT, RAL /INPUT ERROR
0251 7006 RTL
0252 7000 CMA
0253 3143 DCA MAXFLD /COMPLEMENT
0254 4772' JMS CLAFLD /MAXIMUM FIELD POINTER
0255 3111 ALLAGN, DCA TRASH1 /CHECK FOR CLASSIC.
0256 1107 TAD M10
0257 3112 DCA TRASH2
0260 3000 DCA AMOUNT /A FEW POINTERS
/
/ASK OPERATOR ABOUT DISK(S) TO TEST;
/
0261 1111 NEXT, TAD TRASH1
0262 1154 TAD RUNPOT
0263 3113 DCA TRASH3 /SAVE RUN POINTER
0264 4455 PRNTER /PRINT "EXERCISE"
0265 3325 MES2
0266 7340 CLA CLL CMA
0267 4455 PRNTER /PRINT " DISK"
0270 3332 MES3
0271 1067 TAD K0260
0272 1111 TAD TRASH1
0273 4445 TYPE /ADD IN DISK NUMBER
0274 1070 TAD K0277 /TYPE DISK NUMBER
0275 4445 TYPE /TYPE ?
0276 4444 RECEIV /RECEIVE KEY INPUT
0277 4437 YESNO /WAS IT YES OR NO
0300 5255 JMP ALLAGN /NEITHER
0301 5304 JMP ,+3 /WAS A NO
0302 2000 ISZ AMOUNT /AMOUNT OF DISK FOUND
0303 7340 CLA CLL CMA /AC TO 7777 FOR EXISTING DISK
0304 3513 DCA I TRASH3 /SETUP RUN POINTER
0305 2111 ISZ TRASH1
0306 2112 ISZ TRASH2
0307 5261 JMP NEXT /ASK ABOUT NEXT DISK
/
/ASK IF ACCEPT MODE;
/
0310 1000 TAD AMOUNT /GET AMOUNT FOUND
0311 7650 SNA CLA /WERE ANY FOUND
0312 5224 JMP STRTEX /OPERATOR ERROR NO DISK INPUT
0313 4455 PRNTER /PRINT "ACCEPT MODE?"
0314 3363 MES6
0315 4444 RECEIV /RECEIVE INPUT
0316 4437 YESNO /YES OR NO????
0317 5313 JMP ,=4 /NEITHER ALL AGAIN
0320 7010 SKP CLA /MANUAL TEST
0321 5771' JMP ASKSUR /ASK "ARE YOU SURE"
/
/IF ACCEPT MODE, INTERAGATE

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/ABOUT CONSTANT FIELD1
/
0322 4455 MANUAL, PRNTER /PRINT "FIELD?"
0323 3404 MES0
0324 4444 RECEIV /RECEIVE Y OR N
0325 4437 YESNO /CHECK FOR Y OR N
0326 5322 JMP MANUAL /NEITHER Y OR N
0327 5345 JMP ASKNX1 /WAS A N, ASK ABOUT NEXT
0330 4431 SPACE /SPACE OUT ONE
0331 4432 ONEIN /GET 1 OCTAL
0332 0070 0070 /LIMITS
0333 5322 JMP MANUAL /INPUT ERROR ASK AGAIN
0334 7104 CLL RAL
0335 7006 RTL
0336 3160 DCA SPFLD /SAVE INPUT
0337 1160 TAD SPFLD
0340 1143 TAD MAXFLD /COMPARE TO MAXIMUM
0341 7700 SMA CLA /U.K.?
0342 5322 JMP MANUAL /INPUT ERROR
0343 7340 CLA CLL CMA
0344 3770* DCA FLOFLG /SETUP FIELD FLAG
/
/INTERIGATE ABOUT CONSTANT TRACK1
/
0345 4455 ASKNX1, PRNTER /PRINT "TRACK?"
0346 3410 MES0
0347 4444 RECEIV /RECEIVE Y OR N
0348 4437 YESNO /CHECK FOR Y OR N
0351 5345 JMP ASKNX1 /ERROR, ASK AGAIN
0352 5767* JMP ASKNX2 /N, ASK ABOUT NEXT
0353 4431 SPACE
0354 4432 ONEIN /RECEIVE 1 IN OCTAL
0355 0010 0010 /LIMITS
0356 5345 JMP ASKNX1 /ERROR, ASK AGAIN
0357 5766* JMP SAVE1 /TU SAVE SOME ROOM,
/
0360 5405 K5405, 5405
0361 3167 LNKDCA, DCA SVLNK
0362 3166 ACUCA, DCA SAVAC
0363 2304 BRKRET, RETURN
/
0366 0400
0367 0406
0370 3372
0371 0513
0372 1404
0373 2601
0374 0522
0375 0600
0376 2730
0377 2070
0400 PAGE
/
/

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/INTERIGATE ABOUT CONSTANT
/BLOCK LENGTH1
/
0400 3161 SAVE1, DCA SPTRK1 /SAVE EXTENDED TRACK BIT
0401 4433 FORIN /GET FOUR IN OCTAL,
0402 5777* JMP ASKNX1 /ERROR, ASK AGAIN
0403 3162 DCA SPTRK2 /SAVE CYL., SURFACE, AND SECTOR
0404 7340 CLA CLL CMA
0405 3776* DCA TRKFLG /SETUP TRACK FLAG
/
0406 4455 ASKNX2, PRNTER /PRINT "BLOCK LENGTH?"
0407 3424 MES11
0410 4444 RECEIV /RECEIVE INPUT
0411 4437 YESNO /CHECK FOR Y OR N
0412 5206 JMP ASKNX2 /ERROR, ASK AGAIN
0413 5225 JMP ASKNX3 /N, ASK ABOUT NEXT
0414 4431 SPACE /Y, SPACE OUT 1
0415 4432 ONEIN /RECEIVE 1 IN OCTAL
0416 0010 0010 /LIMITS
0417 5206 JMP ASKNX2 /ERROR, ASK AGAIN
0420 7640 SZA CLA /SET HALF BLOCK?
0421 7340 CLA CLL CMA /YES
0422 3164 DCA SPBLK /SETUP BLOCK NUMBER
0423 7340 CLA CLL CMA
0424 3775* DCA MLFFLG /SETUP BLOCK FLAG
/
/INTERIGATE ABOUT CONSTANT
/SECTORS1
/
0425 4455 ASKNX3, PRNTER /PRINT "EXTRA SECTORS?"
0426 3414 MES10
0427 4444 RECEIV /RECEIVE INPUT
0430 4437 YESNO /CHECK FOR Y OR N
0431 5225 JMP ASKNX3 /INPUT ERROR
0432 5264 JMP ASKNX5 /N, ASK ABOUT NEXT
0433 4431 SPACE /SPACE OUT 1
0434 4432 ONEIN /RECEIVE 1 IN OCTAL
0435 0010 0010 /LIMITS
0436 5225 JMP ASKNX3 /ERROR, ASK AGAIN
0437 7104 CLL RAL
0440 7006 RTL
0441 3163 DCA SPSEC /SAVE IT
0442 4432 ONEIN /RECEIVE 1 IN OCTAL
0443 0070 0070 /LIMITS
0444 5225 JMP ASKNX3 /INPUT ERROR, ASK AGAIN
0445 1163 TAD SPSEC /ADD IN LAST
0446 3163 DCA SPSEC /SAVE ALL
0447 1164 TAD SPBLK
0450 7640 SZA CLA /BLOCK LENGTH 0????
0451 5254 JMP .+5 /NO LIMIT IS 17.
0452 1160 TAD SPFLD
0453 7640 SZA CLA /FIELD 0?????
0454 1065 TAD K0010 /LIMIT IS 17.
0455 1064 TAD K0007

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0456 7140      CLL CMA
0457 1163      TAD      SPSEC          /COMPARE SECTOR INPUT;
0460 7630      SZL CLA          /IN LIMITS???
0461 5225      JMP      ASKNX3        /NO, INPUT ERROR
0462 7340      CLA CLL CMA
0463 3774      DCA      SECFLG        /SETUP SECTOR FLAG

/
/
/INTERIGATE ABOUT "OPERATOR
/SELECT DATA"
/
0464 4455      ASKNX5, PRNTR          /PRINT "DATA?"
0465 3433      MES13
0466 1322      TAD      RANJMS
0467 3773      DCA      SWDAT        /SET INSTRUCTION SWITCH
0470 4444      RECEIV          /RECEIVE INPUT
0471 4437      YESND          /Y OR N
0472 5204      JMP      ASKNX5        /ERROR, ASK AGAIN
0473 5313      JMP      ASKSUR        /ASK "ARE YOU SURE"
0474 1346      TAD      KSKP
0475 3773      DCA      SWDAT        /SET INSTRUCTION SWITCH
0476 1105      TAD      M12
0477 3111      DCA      TRASH1       /SETUP WORD COUNTER
0500 7340      CLA CLL CMA
0501 1151      TAD      DATPOT       /GET POT POINTER
0502 3010      DCA      AUTO10
0503 4457      CRLF
0504 4433      FORIN          /RECEIVE 4 IN OCTAL
0505 5264      JMP      ASKNX5        /INPUT ERROR, ASK AGAIN
0506 3410      DCA I      AUTO10     /SAVE DATA
0507 2111      ISZ      TRASH1       /UPDATE COUNTER
0510 5303      JMP      ,=5          /GET NEXT
0511 7340      CLA CLL CMA
0512 3157      DCA      DATFLG       /SETUP DATA FLAG

/
/ASK IF HE'S SURE;
/
0513 4455      ASKSUR, PRNTR        /PRINT "ARE YOU SURE"
0514 3436      MES14
0515 4444      RECEIV          /GET INPUT
0516 4437      YESND          /Y OR N
0517 5313      JMP      ASKSUR        /INPUT ERROR
0520 5772      JMP      STRTEX       /ALL AGAIN
0521 5771      JMP      RUN          /START DATA TESTING
0522 4426      RANJMS, GENDAT

/THIS ROUTINE TESTS FOR BEING ON APT,
/IF ON APT RETURN IS PLUS ONE, IF NOT RETURN IS PLUS TWO.
/
0523 0000      CHEK22, 0
0524 1022      TAD      22
0525 7700      SNA CLA          /ON APT?
0526 2323      ISZ      CHEK22       /NO, UPDATE RETURN.
0527 5723      JMP I      CHEK22     /AND RETURN.

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```

/ROUTINE TO NOTIFY APT.
/
0530 0000      KTIME, 0
0531 4424      CHK22
0532 7410      SKP
0533 5730      JMP I      KTIME      /ON APT.
0534 0002      IOF              /NOT ON APT, GO ABOUT NORMAL RUN.
0535 0201      CDF      00        /TURN INTERRUPT SYSTEM OFF
/                          /DATA FIELD SHOULD ALWAYS
/                          /BE ZERO IN PROGRAM RUN.
/CHANGED TO CURRENT DATA FIELD.
0536 6272      CIF      70
0537 4741      JMS I      K6500
0540 5730      JMP I      KTIME      /RETURN,

/
/
0541 6500      K6500, 6500

/
/
/SUBROUTINE TO LOAD COMMAND REGISTER
/
0542 0000      LDCM, 0
0543 3123      DCA      CMNEG
0544 1123      TAD      CMNEG
0545 6746      IOT6, DLDC          /LOAD COMMAND REGISTER
0546 7610      KSKP, SKP CLA
0547 4576      ERHLT6, JMS I      BGHLT
0550 1122      TAD      EXREG
0551 7110      CLL RAM
0552 7630      SZL CLA
0553 1016      TAD      K0200
0554 6740      IOT6, DLDC          /LOAD EXT. DRIVE
0555 7610      KSKP, SKP CLA
0556 4576      ERHLT6, JMS I      BGHLT /SKIP TRAP IOT6
0557 5742      JMP I      LDCM      /EXIT

/
/
/SUBROUTINE TO ISSUE "DCLR" CLEAR IOT
0560 0000      CLDR, 0
0561 6742      IOT2, DCLR
0562 5760      JMP I      CLDR      /DCLR "CLEAR IOT"
0563 4576      ERHLT2, JMS I      BGHLT /EXIT
/                          /ERRROR SKIP TRAP

0571 0600
0572 0224
0573 2601
0574 3574
0575 3575
0576 3573
0577 0345
0600      PAGE
/
/
/SETUP ADDRESSING, COMMAND,
/AND DATA PARAMETERS;

```



```

/MAKE FIELD1
/
0600 4406 RUN, LAS /GET THE SWITCHES.
0601 0016 AND K0200 /MASK HALT SW.
0602 7640 SZA CLA /TIME TO HALT?
0603 7402 STPHLT, HLT /HALT FROM SWR4#1.
0604 1777* TAD PLODFLG /GET FIELD FLAG
0605 7650 SNA CLA /WAS IT SETT
0606 5211 JMP +3 /NO, USE RANDOM FIELD
0607 1160 TAD SPFLD /YES, GET OPERATOR FIELD
0610 5230 JMP HNPLD /NO
0611 7301 CLA CLL IAC
0612 1143 TAD MAXFLD /GET MAXIMUM FIELD POINTER
0613 7650 SNA CLA /ANY FIELDS THERE
0614 5230 JMP HNPLD /NO EXTENDED FIELDS TO USE
0615 4440 RANGEN /YES, GET A RANDOM FIELD
0616 0014 AND K0070 /MASK
0617 7450 SNA /COULD BE 0
0620 5230 JMP HNPLD /WAS DON'T HAVE TO CHECK LIMITS
0621 3136 DCA INTCH /SAVE FIELD FOUND
0622 1136 TAD INTCH
0623 1143 TAD MAXFLD /ADD IN MAXIMUM FIELD POINTER
0624 7710 SPA CLA /IN LIMITS????
0625 5231 JMP RNPLD+1 /YES, USE IT
0626 1143 TAD MAXFLD /NO, USE MAXIMUM IN THE MACHINE
0627 7040 CMA
0630 3136 RNPLD, DCA INTCH

/MAKE BLOCK LENGTH1
/
0631 1776* TAD HLPFLG /GET BLOCK FLAG
0632 7650 SNA CLA /WAS IT SET????
0633 4440 RANGEN /NO, USE RANDOM
0634 1164 TAD SPBLK
0635 0015 AND K0100 /MASK
0636 1136 TAD INTCH
0637 3136 DCA INTCH /INITIAL HALF BLOCK BIT ****
0640 1136 TAD INTCH
0641 0015 AND K0100 /MASK
0642 7640 SZA CLA /HALF BLOCK SET????
0643 1016 TAD K0200 /YES, SETUP WC POINTER
0644 1104 TAD K7400
0645 3112 DCA TRASH2 /WC BUILDER
0646 1112 TAD TRASH2
0647 7041 CIA
0650 3114 DCA UPDATE /UPDATER FOR FWREG
0651 1136 TAD INTCH
0652 0350 AND A0170 /MASK FIELD BITS
0653 7640 SZA CLA /WERE THERE ANY
0654 1065 TAD K0010 /YES
0655 1064 TAD K0007 /MAKE MAXIMUM SECTOR POINTER
0656 3111 DCA TRASH1 /SAVE IT

/MAKE AMOUNT OF SECTORS
/TO TRANSFER1

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```

/
0657 1775* TAD SECFLG /GET SECTOR FLAG
0660 7650 SNA CLA /WAS IT SET????
0661 4440 RANGEN /USE RANDOM
0662 1103 TAD SPSEC /GET OPERATOR INPUT
0663 0111 AND TRASH1 /MASK OUT
0664 3147 DCA CONSEC /SAVE
0665 1147 TAD CONSEC
0666 7040 CMA
0667 3111 DCA TRASH1 /CONSECUTIVE TO DO

/MAKE WORD COUNT1
/
0670 1112 TAD TRASH2 /COMPUTE INITIAL WC
0671 2111 ISZ TRASH1
0672 5270 JMP +2 /UPDATE BY BUILDER
0673 3127 DCA WCNREG /INITIAL WORD COUNT ****

/MAKE CURRENT ADDRESS1
/
0674 4440 RANGEN /GENERATE RANDOM CA
0675 3126 DCA CAREG /SAVE IT
0676 1136 TAD INTCH
0677 0014 AND K0070 /MASK FIELD BITS
0700 7640 SZA CLA /EXTENDED FIELD????
0701 5317 JMP FILLUP /INITIAL CA O.K.,****
0702 1146 TAD 06NBUF
0703 7140 CMA CLL
0704 1126 TAD CAREG
0705 7620 SNL CLA /GREATER THAN PROGRAM+1
0706 5315 JMP CONCUR /NO, USE CONSTANT VALUE
0707 1127 TAD WCREG /GET WORD COUNT
0710 7041 CIA
0711 1126 TAD CAMEG /ADD IN CA
0712 1016 TAD K0200
0713 7630 SZA CLA /WITHIN BOUNDS????
0714 5317 JMP FILLUP /YES, INITIAL CA O.K.,****
0715 1146 CONCUR, TAD 06NBUF /NO, USE PROGRAM+1
0716 3126 DCA CAREG /SAVE IT

/ROUTINE TO FILL AND CHECK SUM BUFFER
/
0717 4425 FILLUP, KTICK /NOTIFY APT IF NEED BE.
0720 4434 SETGEN /SETUP AND SAVE GENERATOR
0721 1106 TAD M4
0722 3137 DCA STATRY /SETUP TRY COUNTER
0723 4435 REPILL, SETFLD /FIELD+ BUFTAL+ AUTO 11+ 12
0724 3325 DCA +*1 /FIELD TO BUFFER IN AC
0725 7402 HLT /CUF TO BUFFER
0726 3141 DCA CHKSAV /START WITH 0
0727 4427 NEWRD, RANDAT /GENERATE DATA
0730 3111 UCA TRASH1 /SAVE OUTPUT WORD
0731 1111 TAD TRASH1 /GET BACK WORD
0732 3411 DCA I AUTO11 /STORE IN BUFFER
0733 7100 CLL

```

```

0734 1111 TAD TRASH1 /GET BACK WORD
0735 1141 TAD CHKSAV /ADD IN LAST
0736 7430 SZL /LINK SET??
0737 7001 IAC /ADD IT IN
0740 3141 DCA CHKSAV /SAVE FOR NEXT
0741 2117 ISZ BUPTAL /UPDATE BUFFER TALLY
0742 5327 JMP NEWRD /MORE WORDS TO GO
0743 6201 CDF 0
0744 1165 TAD ERPLG
0745 7650 SNA CLA /ERROR FLAG SET????
0746 5774 JMP POLNEX /POLE DRIVES
0747 5773 JMP REWR /YES, MUST BE A WRITE ERROR

```

```

0750 0170 AB170, 0170
/
/SUBROUTINE TO ISSUE "DSKP" DISK SKIP IDT

```

```

0751 0000 DSKP, 0
0752 6741 IOT1, DSKP /DISK SKIP IDT
0753 7410 SKP /DID NOT SKIP
0754 2351 ISZ DSKP
0755 5751 JMP I DSKP /EXIT

```

```

/PLACE FOR DATA IN MANUAL MODE

```

```

0756 0000 DAT1, 0000
0757 0000 DAT2, 0000
0760 0000 DAT3, 0000
0761 0000 DAT4, 0000
0762 0000 DAT5, 0000
0763 0000 DAT6, 0000
0764 0000 DAT7, 0000
0765 0000 DAT8, 0000
0766 0000 DAT9, 0000
0767 0000 DAT10, 0000
0770 0000 DAT11, 0000
0771 0000 DAT12, 0000

```

```

0773 1047
0774 1000
0775 3374
0776 3375
0777 3372
1000

```

```

PAGE

```

```

/ROUTINE TO SELECT DRIVE NO.
/SEQUENTIAL SELECTION 0,1,2,3,0,1,ETC.

```

```

1000 2115 POLNEX, ISZ POLDISK /UPDATE POLE POINTER
1001 1115 TAD POLDISK /GET POINTER
1002 4436 SELCHK /CHECK IF DISK ON SYSTEM,
1003 5200 JMP POLNEX /NO, TRY NEXT DRIVE
1004 1115 TAD POLDISK
1005 7112 CLL RTM
1006 0061 AND K0001

```

```

1007 3122 DCA EXREG /SET EXT. DRIVE BIT
/
/DRIVE COMPLETED, START
/WRITE SEQUENCE!
/SELECT DISK ADDRESS.
/
1010 1115 GOTIT, TAD POLDISK /GET DRIVE NO.
1011 0062 AND K0003 /MASK
1012 7104 CLL RAL /MOVE TO 9-10.
1013 1136 TAD INTCH /ADD IN OTHER.
1014 3136 DCA INTCH /SAVE INITIAL COMMAND.
1015 1777 TAD TRKFLG /GET TRACK FLAG
1016 7650 SNA CLA /WAS IT SET????
1017 4440 RANGEN /GET RANDOM DA.
1020 1161 TAD SPTRK1 /GET OPERATOR CONSTANT INPUT.
1021 0061 AND K0001 /MASK EXT. BIT.
1022 1136 TAD INTCH /ADD IN OTHER.
1023 3136 DCA INTCH /SAVE COMPLETE INITIAL COMMAND.
1024 1777 TAD TRKFLG /GET TRACK FLAG
1025 7650 SNA CLA /WAS IT SET????
1026 4440 RANGEN /USE RANDOM
1027 1162 TAD SPTRK2 /GET INPUT
1030 3124 DCA INTDA /SAVE INITIAL DA.
1031 1777 TAD TRKFLG
1032 7640 SZA CLA /INPUT BY OPERATOR?
1033 5247 JMP REWR /LET HIM FAIL??
1034 1136 TAD INTCH
1035 7010 RAR
1036 7620 SNL CLA /EXT BIT SET?
1037 5247 JMP REWR /NO, DON'T LIMIT DA.
1040 1145 TAD MAXTRK
1041 1124 TAD INTDA
1042 7630 SZL CLA /BEOND MAXIMUM LIMIT?
1043 5247 JMP REWR /NO, DONT LIMIT.
1044 1124 TAD INTDA
1045 7000 CMA
1046 3124 DCA INTDA /YES, SET TO LEGAL LIMIT.
/
/WRITE INFORMATION!
/CLEAR BUFFER ON THE FLY!
/
1047 4441 REWR, DISKGO /GO WRITE
1050 4400 4000 /WRITE DATA POINTER
1051 5263 JMP REREAD /WRITE O.K.
1052 7340 CLA CLL CMA
1053 3165 DCA ERPLG /SET WRITE ERROR FLAG
1054 4442 RESRAN /RESET GENERATOR
1055 2137 ISZ STATRY /UPDATE WRITE HE=TRY
1056 5776 JMP REFILL /TRY AGAIN
/
/CHECK FOR LOOP ON WRITE!
/
1057 4406 LAS /SET SWITCH 0
1060 7710 TRYIM, SPA CLA /LOOP ON WRITE????
1061 5775 JMP REFILL=2 /YES, TRY WRITE AGAIN

```

```

1062 5351          JMP      STRREL      /RESMORE ALL DRIVES ON ERROR
1063 1260          REREAD, TAD  TRYTIM
1064 3171          DCA      TRYCNT      /SETUP FOR SOFT ERROR METHY
1065 3165          DCA      ERFLG      /CLEAR ERROR FLAG
1066 1106          TAD      M#
1067 3137          DCA      STATRY      /SETUP TRY COUNTER
1070 1106          TAD      M#
1071 3140          DCA      DATTRY      /SETUP TRY COUNTER
1072 3155          DCA      CRCNT      /CLEAR CRC COUNTER!!!!

/
/READ INFORMATION;
/CHECK BUFFER ON THE FLY;
/
1073 4441          RDTRY,  DISKGD      /READ DATA
1074 0400          0400
1075 7610          SKP  CLA      /READ DATA POINTER
1076 5305          JMP      RDSTA      /DATA READ O.K.
1077 3155          DCA      CRCNT      /STATUS ERROR
/CLEAR CRC COUNTER;

/
/CHECK DATA ON NO STATUS ERRORS;
/
1100 4774*         JMS      DTCHK      /CHECK DATA
1101 5324          JMP      RERUN      /DATA O.K.
1102 2140          ISZ      DATTRY      /UPDATE READ RE-TRY
1103 5273          JMP      RDTRY      /TRY AGAIN
1104 5323          JMP      RERUN-1    /TRY TO SEEK IT
1105 1121          RDSTA,  TAD  STREG      /GET STATUS READ
1106 0065          AND      K0010      /MASK CRC
1107 7450          SNA      /MASK CRC
1110 5320          JMP      UPTRY      /CRC ERROR????
1111 3156          DCA      CRCFLG      /NO, TRY READ AGAIN
1112 2155          ISZ      CRCNT      /YES, SET FLAG
/UPDATE CRC POINTER

/
/CHECK DATA AFTER CRC ERROR;
/
1113 4774*         JMS      DTCHK      /CHECK DATA
1114 7610          SKP  CLA      /IS A HARD ERROR;
1115 7340          CLA  CLL  CMA      /SET RETRY COUNTER;
1116 3165          DCA      ERFLG      /SETUP FOR 64 RETRY IF AC=7777
1117 7410          SKP
1120 3155          UPTRY,  DCA      CRCNT      /CHECK ON RETRY!!!!
1121 2137          ISZ      STATRY      /UPDATE TRY POINTER
1122 5273          JMP      RDTRY      /TRY AGAIN
1123 3165          DCA      ERFLG      /IS A HARD ERROR
1124 3155          RERUN,  DCA      CRCNT      /CLEAR CRC COUNT
1125 3156          DCA      CRCFLG      /CLEAR CRC FLAG
1126 4773*         JMS      CKTIM      /CHECK TIME POINTERS
1127 1165          TAD
1130 7650          SNA  CLA
1131 5334          JMP      .+3
1132 2171          ISZ      TRYCNT      /IS IT 64 RETRY FOR SOFT ERROR?
1133 5266          JMP      REREAD+3    /NO DON'T BOTHER
/YES, UPDATE RETRY COUNTER
/TRY AGAIN

/
/CHECK FOR LOOP ON READ;
/

```

```

1134 4406          LAS
1135 7104          CLL  RAL      /GET SWITCH 1
1136 7710          SPA  CLA
1137 5263          JMP      REREAD      /LOOP????
1140 1137          TAD      STATRY      /YES, LOOP
1141 7630          SNA  CLA      /TEST FOR HARD ERROR
1142 5351          JMP      STRREL      /YES
1143 3165          DCA      ERFLG      /CLEAR ERROR FLAG

/
/CHECK FOR TYPE STATUS
/REPORT;
/
1144 4406          LAS
1145 0017          AND      K0400      /MASK
1146 7640          SZA  CLA      /TYPE STATUS REPORT????
1147 4772*         JMS      TPSTA      /YES
1150 5771*         JMP      RUN      /DU NEXT DRIVE

/
/RESTORE DRIVE AFTER ERROR
/
1151 1123          STRREL, TAD  CMREG      /GET DRIVE NO.
1152 4443          RECAL
1153 5771*         JMP      RUN      /RESTORE
/START NEXT DRIVE

/
/ROUTINE TO DETERMINE IF TIMING NEEDS TO BE FOR APT SYSTEM.
/
1154 0000          KKTICK, 0
1155 4424          CHK22
1156 7410          SKP
1157 5754          JMP  I  KKTICK      /TEST FOR APT
1160 6201          CDF      0
1161 2150          ISZ      CLCNT      /NO, RETURN TO NORMAL RUN
1162 5366          JMP      EXTICK      /LONG COUNTER FOR APT
1163 1100          TAD      K7760      /NORMAL RETURN
1164 3150          DCA      CLCNT      /INIT COUNTER
1165 4770*         JMS      KTIME      /NOTIFY APT
1166 6201          EXTICK, CDF 0
1167 5754          JMP  I  KKTICK

1170 0530
1171 0600
1172 3000
1173 2450
1174 1600
1175 0721
1176 0723
1177 3573

1200 0000          PAGE
1201 7001          /
/ERROR HANDLER;
/UPDATE "SOFT" OR "HARD" TALLYS;
/PRINT ERROR TEXT AND DATA;
/CHECK INHIBIT ERROR SW;
/
ERNO, 0
IAC
/UPDATE AC FLAG

```

```

1202 3374          DCA  PCNTR2          /SAVE NON-RECOVERABLE POINTER;
/COMPUTE WAY TO "HARD"/"SOFT" TALLYS;
1203 1377          TAD  K7773
1204 3375          DCA  PCNTR3          /LINE COUNTER
1205 1123          TAD  CMREG          /GET LAST COMMAND
1206 0063          AND  K0006          /MASK DRIVE NUMBER
1207 7170          CLL  CML  CMA  RAR
1210 3373          DCA  PCNTR1          /SETUP COUNTER
1211 1062          TAD  K0003
1212 2373          ISZ  PCNTR1
1213 5211          JMP  .+2          /COMPUTE WAY TO BUFFER
1214 1153          TAD  STAPOT
1215 3373          DCA  PCNTR1          /PUNTER TO BUFFER
/DETERMINE IF ERROR IS "HARD" OR "SOFT";
1216 1156          TAD  CRCFLG          /GET CRC FLAG
1217 7650          SNA  CLA          /CMC ERRORETTT?
1220 5251          JMP  NTSOFT          /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 1125          TAD  DANEG          /COMPARE FAILING SECTOR TO
1225 0066          AND  K0017          /SECTOR WHERE DATA ERROR
1226 7041          CIA
1227 1131          TAD  ASREG          /OCCURRED;
1230 7640          SZA  CLA          /SAME SECTOR?
1231 5251          JMP  NTSOFT          /NO, "HARD" ERROR
1232 7340          CLA  CLL  CMA
1233 1155          TAD  CRCCNT          /GET CRC COUNTER
1234 7450          SNA
1235 5245          JMP  SOFT          /WAS THIS FIRST POSSIBLE "SOFT"?
1236 1110          TAD  K7775          /YES, UPDATE "SOFT" TALLY;
1237 7650          SNA  CLA          /CHECK IF NONRECOVERABLE "SOFT";
1240 2373          ISZ  PCNTR1          /WAS IT?
1241 1773          TAD  I  PCNTR1          /NO, DUMP "SOFT" TALLY;
1242 7440          SZA
1243 1101          TAD  K7777          /OTHERWISE DUMP "HARD" TALLY;
1244 5254          JMP  NTERR=1          /DUNT GO BACK WARDS!!!!!!
1245 1101          SOFT, TAD  K7777          /DUMP APPROPRIATE TALLY!!
1246 1773          TAD  I  PCNTR1          /REDUCE HARD ERROR COUNT
1247 3773          DCA  I  PCNTR1
1250 2373          ISZ  PCNTR1          /YES, UPDATE POINTER
1251 1101          NTSOFT, TAD  K7777
1252 2773          ISZ  I  PCNTR1          /UPDATE ERROR COUNT
1253 7610          SKP  CLA
1254 3773          DCA  I  PCNTR1          /HOLD AT 7777
/CHECK INHIBIT SW;
1255 4423          NTERR, JMS  I  KAERRO          /REPORT ERROR TO APT IF REQUIRED
1256 4406          LAR
1257 7106          CLL  RTL

```

```

1260 7710          SPA  CLA          /INHIBIT ERRORS????
1261 5356          JMP  ERROEX+1          /YES
/CHECK FOR NO HEADER ON SECOND DATA ERROR;
1262 1600          DOMEAD, TAD  I  ERMO          /GET TEXT POINTER
1263 7650          SNA  CLA          /DATA ERROR?
1264 5355          JMP  ERROEX          /EXIT
/TYPE ERROR MESSAGE;
1265 4457          CRLF
1266 4457          CRLF
1267 1374          TAD  PCNTR2          /GET NON-RECOV. FLAG
1270 7640          SZA  CLA          /WAS IT SET
1271 5275          JMP  .+4          /NO DON'T TYPE IT
1272 7340          CLA  CLL  CMA
1273 4455          PRNTER          /PRINT "NON-RECOVERABLE "
1274 3335          MES4
1275 1600          TAD  I  ERMO          /GET TEXT POINTER;
1276 1376          TAD  MOUTAD          /MAKE ERROR HEADER POINTER;
1277 3120          DCA  PCREG          /SAVE POINTER;
1300 1520          TAD  I  PCREG          /GET CORRECT TEXT;
1301 3304          DCA  .+5
1302 7340          CLA  CLL  CMA
1303 4455          PRNTER          /PRINT HEADER
1304 7402          HLT
1305 7340          CLA  CLL  CMA
1306 4455          PRNTER          /PRINT "ERROR"
1307 3303          MES0
1310 4457          CRLF
1311 1200          TAD  ERMO
1312 3120          DCA  PCREG          /SAVE PC
1313 2200          ISZ  ERMO
1314 1600          TAD  I  ERMO
1315 3371          DCA  ESAVE
1316 2200          ISZ  ERMO          /UPDATE FOR RETURN
1317 1172          TAD  XTEXT
1320 3374          DCA  PCNTR2
1321 1372          TAD  XREG
1322 3010          DCA  AUTO10
1323 1105          TAD  M12
1324 3373          DCA  PCNTR1          /COUNTER FOR # OF HEADS
1325 1371          STHAUT, TAD  ESAVE          /GET TEXT POINTER
1326 7500          SNA
1327 5363          JMP  NOTEX
1330 7104          CLL  RAL
1331 3371          DCA  ESAVE
1332 2375          ISZ  PCNTR3          /UPDATE LINE FILL COUNTER
1333 7610          SKP  CLA          /NO CRLF
1334 4457          CRLF
1335 1374          TAD  PCNTR2          /GET TEXT MESSAGE POINTER
1336 2374          ISZ  PCNTR2
1337 2374          ISZ  PCNTR2
1340 3343          DCA  .+3          /STONE FOR PRNTER

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1341 7340      CLA CLL CMA
1342 4455      PRNTR
1343 7402      MLT
1344 1410      TAD I  AUTO10
1345 4456      UCTEL
1346 2373      AGAIN, ISZ  PCNTR1
1347 5325      JMP  STMAUT
1350 1520      TAD I  PCNEG
1351 1106      TAD  M4
1352 7650      SNA CLA
1353 4573      JMS I  PRNDAT
1354 5360      JMP  ,+4
1355 4573      ERROEX, JMS I  PRNDAT
1356 2200      ISZ  ERMO
1357 2200      ISZ  ERMO
1360 7301      CLA CLL IAC
1361 4454      CLRALL
1362 5600      JMP I  ERMO
1363 7104      NOTEX, CLL RAL
1364 3371      DCA  ESAVE
1365 2374      ISZ  PCNTR2
1366 2374      ISZ  PCNTR2
1367 2010      ISZ  AUTO10
1370 5346      JMP  AGAIN

/
1371 0000      ESAVE, 0
1372 0117      XREG, PCREG=1
1373 0000      PCNTR1, 0
1374 0000      PCNTR2, 0
1375 0000      PCNTR3, 0
1376 1377      HEDTAD, BUFPNT=1
1377 7773      K7773, 7773

/
1400          PAGE
/
/POINTERS FOR TEXT INFORMATION;
/
1400 3247      BUFPNT, ERTX1
1401 3255      ERTX2
1402 3264      ERTX3
1403 3276      ERTX4

/
/ROUTINE TO CHECK FOR CLASSIC AND LIMIT
/TRANSFERS TO FIELD 0 IF AVAILABLE.
/
1404 0000      CLAFLO, 0
1405 1022      TAD  22
1406 0017      AND  K0400
1407 7650      SNA CLA
1410 5604      JMP I  CLAFLO
1411 7340      CLA CLL CMA
1412 3143      DCA  MAXFLO
1413 5604      JMP I  CLAFLO

/ON CLASSIC?
/NO.
/LIMIT TO FIELD 0.

/ROUTINE TO DO CRLF

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```

1414 0000      /
1415 7300      UPONE, 0
1416 1224      CLA CLL
1417 4445      TAD  K0215
1420 1225      TYPE
1421 4445      TAD  K0212
1422 4445      TYPE
1423 5614      JMP I  UPONE

/
1424 0215      K0215, 0215
1425 0212      K0212, 0212

/ROUTINE TO PRINT FOUR OCTAL
/
1426 0000      PROCT, 0
1427 7006      RTL
1430 7006      RTL
1431 3214      DCA  UPONE
1432 1106      TAD  M4
1433 3250      DCA  PRN
1434 1214      TAD  UPONE
1435 0064      AND  K0007
1436 1067      TAD  K0260
1437 4445      TYPE
1440 1214      TAD  UPONE
1441 7006      RTL
1442 7004      RAL
1443 3214      DCA  UPONE
1444 2250      ISZ  PRN
1445 5234      JMP  ,+11
1446 4431      SPACE
1447 5626      JMP I  FRUCT

/

/SUBROUTINE TO PRINT TEXT
/
1450 0000      PRN, 0
1451 7650      SNA CLA
1452 4457      CRLF
1453 1650      TAD I  PRN
1454 2250      ISZ  PRN
1455 3226      DCA  FRUCT

/TYPE CRLF
/YES!!!!
/GET POINTER

MKPRN, CLA CLL
1456 7300      TAD I  FRUCT
1457 1626      AND  K7700
1460 0077      SNA
1461 7450      JMP  EXIT
1462 5304      SNA
1463 7500      CML
1464 7020      IAC
1465 7001      RTR
1466 7012      RTR
1467 7012      RTR

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1470 7012      RTR
1471 4445      TYPE
1472 1626      TAD I  FRUCT
1473 0102      AND    K0077
1474 7450      SNA
1475 5304      JMP    EXIT
1476 1313      TAD    K3740
1477 7500      SMA
1500 1074      TAD    K4100
1501 4431      SPACE                /SPACE OUT 1
1502 2226      ISZ    FROCT
1503 5256      JMP    MRRRN                /MORE TO PRINT
1504 7300      EXIT,  CLA CLL
1505 5650      JMP I  PRN

/
/ROUTINE TO SPACE OUT 1
/
1506 0000      SPAC,  0
1507 1312      TAD    K0240
1510 4445      TYPE
1511 5706      JMP I  SPAC
/
1512 0240      K0240, 240
1513 3740      K3740, 3740
/
/THIS ROUTINE WILL BE A SKIP INSTRUCTION FOR SYSTEMS WITHOUT CLASSIC
/OTHERWISE IT WILL EXECUTE THE NEXT INSTRUCTION IN FIELD 0 AND THEN
/SKIP THE INSTRUCTION AFTER THAT ONE.
/
1514 0000      CLASIK, 0
1515 3345      DCA    SAVEAC                /SAVE CURRENT AC.
1516 1714      TAD I  CLASIK                /GET INSTRUCTION TO EXECUTE,
1517 3344      DCA    ROUTHMP                /SAVE IT.
1520 2314      ISZ    CLASIK
1521 1022      TAD    OP2
1522 0017      AND    K0400
1523 7640      SZA CLA                /ARE WE ON CLASSIC?
1524 5327      JMP    ,+3                /YES.
1525 1345      TAD    SAVEAC                /NO, THEN
1526 5714      JMP I  CLASIK                /EXIT.
1527 2314      ISZ    CLASIK
1530 6211      COF    10
1531 1020      TAD    SWR
1532 3777      DCA I  (SWR)                /SAVE SWITCH REGISTER.
1533 1021      TAD    OP1
1534 3776      DCA I  (OP1)                /SAVE CONTROL 1.
1535 1022      TAD    OP2
1536 3775      DCA I  (OP2)
1537 1344      TAD    ROUTHMP
1540 3774      DCA I  (ROUTINS)                /SAVE ROUTINE IN FIELD 1.
1541 1345      TAD    SAVEAC                /GET BACK AC.
1542 6212      CIF    10
1543 5774      JMP I  (ROUTINS)                /GO AND EXECUTE INSTRUCTION.
/
1544 0000      ROUTHMP, 0

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1545 0000      SAVEAC, 0
/
/ROUTINE TO GET THE SWITCHES.
/
1546 0000      MYLAS, 0
1547 4407      CLASIK                /CHECK FOR CLASSIC,
1550 4425      C0CKSW                /GET SWITCHES.
1551 7604      TAD    7604
1552 5746      JMP I  MYLAS                /EXIT.
/
/ROUTINE TO RESET REGISTERS FOR ERROR PRINTER
/
1553 0000      SETREG, 0
1554 1073      TAD    K4000                /GET STATUS
1555 3121      DCA    STREG                /SAVE FOR ERROR PRINTER
1556 7340      CLA CLL CMA                /DECREASE BY 1
1557 1111      TAD    TRASH1                /GET SECTOR POINTER
1560 0066      AND    K0017
1561 1112      TAD    TRASH2
1562 3125      DCA    DAREG                /ADD IN ADDRESS
1563 1170      TAD    FIKTIM                /SAVE FOR ERROR PRINTER
1564 7640      SZA CLA                /CHECK IF FIRST SECTOR?
1565 5753      JMP I  SETREG                /IF 00, DON'T UPDATE COMMAND!
1566 1174      TAD    SAVCH                /NO, DON'T!
1567 3123      DCA    CMREG                /GET COMMAND REG.
1570 5753      JMP I  SETREG                /SAVE FOR ERROR PRINTER
/RETURN
/
1574 1302
1575 0022
1576 0021
1577 0020
1600          1600

PAGE
/
/ROUTINE TO CHECK DATA READ
/
1600 0000      DTCHK, 0
1601 1156      TAD    CRCFLG                /GET CRC FLAG
1602 7640      SZA CLA                /WAS IT SET?
1603 5212      JMP    WRDCHK                /YES, THEN WORD BY WORD CHECK!!!
1604 1142      TAD    FNDUSM                /GET CHECK SUM FOUND
1605 7041      CIA
1606 1141      TAD    CHMSAV                /COMPARE TO GOOD VALUE SAVED
1607 7650      SNA CLA                /WERE THEY THE SAME
1610 5000      JMP I  DTCHK                /YES, DATA O.K.
1611 7340      CLA CLL CMA
1612 3446      WRDCHK, DCA I  XEMRO                /SETUP CHECKSUM ERROR FLAG
1613 1123      TAD    CMREG

1614 0015      AND    K0100
1615 7640      SZA CLA                /HALF BLOCK SET??
1616 1016      TAD    K0200                /YES!
1617 1104      TAD    K7400
1620 3112      DCA    TRASH2
1621 1112      TAD    TRASH2
1622 7040      CMA

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1623 3314      DCA  MSKER
1624 7300      CLA  CLL  CMA
1625 3142      DCA  FNDSUM
1626 4442      REGRAN
1627 1130      TAD  FWNEG
1630 4435      SETFLD
1631 3246      DCA  GOCDF
1632 1112      TAD  TRASH2
1633 3361      DCA  RSRAN
1634 1124      TAD  INTDA
1635 3353      DCA  STGEN
1636 1361      DTR1, TAD  RSRAN
1637 0314      AND  MSKER
1640 3132      DCA  WAREG
1641 1353      TAD  STGEN
1642 0066      AND  K0017
1643 3131      DCA  ASREG
1644 4427      RANDAT
1645 3134      DCA  DGREG
1646 7402      GOCDF, MLT/CDP
1647 1411      TAD  I   AUTO11
1650 6201      CDF
1651 3135      DCA  DBNEG
1652 1011      TAD  AUTO11
1653 3133      DCA  ADREG
1654 1135      TAD  DBREG
1655 7041      CIA
1656 1134      TAD  DGREG
1657 7650      SNA  CLA
1660 5272      JMP  NOERR
1661 2142      ISZ  FNDSUM
1662 5310      JMP  NTRKRS
1663 1156      TAD  CRCFLG
1664 7650      SNA  CLA
1665 1140      TAD  DATTRY
1666 2200      ISZ  DTCHK
1667 4446      ERROR
1670 0004      0004
1671 7760      7760
1672 2361      NOERR, ISZ  RSRAN
1673 5300      JMP  +5
1674 2353      ISZ  STGEN
1675 7000      NOP
1676 1112      TAD  TRASH2
1677 3361      DCA  RSRAN
1700 2117      ISZ  BUFTAL
1701 5236      JMP  DTK1
1702 1446      TAD  I   XENRD
1703 7650      SNA  CLA
1704 3155      DCA  CRCCNT
1705 2446      ISZ  I   XENRD
1706 5600      JMP  I   DTCHK
1707 4576      BADHLT, JMS  I  BGHLT
1710 4446      NTRKRS, ERROR
1711 0000      0000

/SET FIRST TIME FLAG
/NO, SETUP RANDOM GENERATOR
/GET FINAL WC
/GET AUTO11+ BUFTAL+ FIELD
/SAVE FIELD CDF

/GENERATE DATA
/SAVE GOOD DATA POINTER
/CDP TO BUFFER FIELD
/GET BAD DATA WORD
/NAME OF
/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 NON-RECOVERABLE.
/NO, GET NON-RECOVERABLE FLAG.
/UPDATE FOR ERROR RETURN
/ERROR DATA
/POINTER
/POINTER

```

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1712 0000      0000
1713 5272      JMP  NOERR
1714 0000      MSKER, 0
/ROUTINE TO GENERATE RANDOM NUMBERS
RANDOM, 0
1716 7301      CLA  CLL  IAC
1717 1373      TAD  RAD1
1720 1374      TAD  RAD2
1721 1375      TAD  RAD3
1722 3373      DCA  RAD1
1723 7004      RAL
1724 1373      TAD  RAD1
1725 1374      TAD  RAD2
1726 1375      TAD  RAD3
1727 3374      DCA  RAD2
1730 7004      RAL
1731 1373      TAD  RAD1
1732 1374      TAD  RAD2
1733 1375      TAD  RAD3
1734 3375      DCA  RAD3
1735 1375      TAD  RAD3
1736 5715      JMP  I   RANDOM
/EXIT, RANDOM NUMBER IN AC

/GENERATOR FOR RANDOM DATA
GNDAT, 0
1740 7301      CLA  CLL  IAC
1741 1367      TAD  RAN1
1742 1370      TAD  RAN2
1743 7106      CLL  RTL
1744 3367      DCA  RAN1
1745 1370      TAD  RAN2
1746 7012      RTW
1747 1367      TAD  RAN1
1750 3370      DCA  RAN2
1751 1370      TAD  RAN2
1752 5737      JMP  I   GNDAT

/ROUTINE TO SAVE RANDOM GENERATOR
STGEN, 0
1754 1367      TAD  RAN1
1755 3371      DCA  SAV1
1756 1370      TAD  RAN2
1757 3372      DCA  SAV2
1760 5753      JMP  I   STGEN

/ROUTINE TO RESET RANDOM GENERATOR
RSRAN, 0
1761 0000      0000
1762 1371      TAD  SAV1
1763 1367      DCA  RAN1

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1764 1372      TAD      SAV2
1765 3370      DCA      RAN2
1766 5701      JMP I    RSMAN
/
1767 1234      RAN1,   1234
1770 5670      RAN2,   5670
/
1771 0000      SAV1,   0
1772 0000      SAV2,   0
1773 1234      RAD1,   1234
1774 5670      RAD2,   5670
1775 4321      RAD3,   4321
/
/
2000          PAGE
/ROUTINE TO WAIT FOR KEY FROM OPERATOR.
/
2000 0000      WAIT,   0
2001 0032      KCC
2002 0031      KBF
2003 5202      JMP  -1
2004 6036      KRB
2005 0234      AND      K177
2006 1016      TAD      K0200
2007 3235      DCA      CHRYN      /SAVE CHARACTER
2010 1022      TAD      22          /CHECK FOR CLASSIC
2011 0017      AND      K0400      /MASK CLASSIC BIT
2012 7650      SNA CLA      /CLASSIC=NON ZERO
2013 5226      JMP      WAIT1
2014 1235      TAD      CHRYN      /RESTORE CHAR. FOR CLASSIC
2015 0211      CDF      10
2016 3777*     DCA      C0CHAR      /SAVE CHARACTER,
2017 2776*     ISZ      INMODE
2020 1777*     TAD      C0CHAR      /GET BACK AC.
2021 6201      CDF      0
2022 4407      CLASIC
2023 4427      C0CNTR      /CHECK FOR CLASSIC,
/ROUTINE TO EXECUTE.
2024 7000      NOP
2025 7300      CLA CLL
2026 1235      WAIT1,  TAD      CHRYN      /CLEAR CLASSIC AC RETURN
/RESTORE CHARACTER
2027 6046      TAD      TLB
2028 6041      TBF
2031 5230      JMP  -1
2032 6042      TCF
2033 5600      JMP I    WAIT      /EXIT
/
2034 0177      K177,   0177
/ROUTINE TO CHECK FOR YES OR NU
/
2035 0000      CHRYN,  0
2036 3200      DCA      WAIT      /SAVE POINTER
2037 1235      TAD      CHRYN      /GET PC STORED
2040 3260      DCA      CHRPT      /SAVE IT

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2041 1200      TAD      WAIT
2042 2235      ISZ      CHRYN
2043 7041      CIA
2044 1257      TAD      K0316
2045 7650      SNA CLA      /WAS IT A NO
2046 5635      JMP I    CHRYN      /YES
2047 1200      TAD      WAIT
2050 2235      ISZ      CHRYN
2051 7041      CIA
2052 1256      TAD      K0331
2053 7650      SNA CLA      /WAS IT A YES
2054 5635      JMP I    CHRYN      /YES
2055 5600      JMP I    CHRPT      /WAS NEITHER
/
/
2056 0331      K0331,  0331
2057 0316      K0310,  0316
/ROUTINE TO CHECK DISK RUN POINTERS
/
2060 0000      CHKPT,  0
2061 0064      AND      K0007
2062 1154      TAD      MUNPOT
2063 3200      DCA      WAIT
2064 1600      TAD I    WAIT      /GET RUN POINTER
2065 7640      SZA CLA      /RUN THIS DRIVE
2066 2260      ISZ      CHKPT      /NO
2067 5660      JMP I    CHKPT      /EXIT
/ROUTINE TO TEST FOR APT AND SET UP APPROPRIATE
/REGISTERS IN UN THE SYSTEM.
/
2070 0000      APT0,   0
2071 4424      CHK22
2072 5301      JMP      +7      /TEST FOR APT
/YES
2073 4407      CLASIC
2074 4431      C0SWIT
2075 7000      NOP
2076 1355      TAD      K7000
2077 3775*     DCA      SKPNOP
2100 5351      JMP      EXAPT0      /EXIT
2101 1022      TAD      0P2
2102 0354      AND      K7377      /NOP CONSOLE PACKAGE
2103 3022      DCA      0P2
2104 1355      TAD      K7000
2105 3774*     DCA      MYLAS+3      /NOP SWITCH REGISTER
/NO OPERATOR INTERVENTION ALLOWED
2106 1022      TAD      0P2
2107 0064      AND      K0007      /GET # OF DRIVES
2110 3111      DCA      TRASH1
2111 1022      TAD      0P2
2112 0015      AND      K0100
2113 7650      SNA CLA      /SINGLE DRIVE = NON ZERO AC
2114 5325      JMP      M0USKS      /NO.

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2115 7301          CLL CLA IAC
2116 3000          DCA          AMOUNT
2117 1111          TAD          TRASH1      /ONLY ONE DRIVE
2120 1154          TAD          MUNPOT      /GET DRIVE NUMBER
2121 3111          DCA          TRASH1
2122 7340          CLL CLA CMA
2123 3511          DCA I   TRASH1
2124 5342          JMP          MEMSET      /DU THIS DRIVE
2125 1111          MODSKS, TAD TRASH1
2126 7040          CMA
2127 3112          DCA          TRASH2
2130 3111          DCA          TRASH1      /SAVE THE NUMBER OF DRIVES
2131 1111          TAD          TRASH1
2132 1154          TAD          MUNPOT
2133 3113          DCA          TRASH3      /ESTABLISH DRIVE
2134 7340          CLL CLA CMA
2135 3513          DCA I   TRASH3
2136 2111          ISZ          TRASH1
2137 2000          ISZ          AMOUNT
2140 2112          ISZ          TRASH2
2141 5331          JMP          MODSKS+4    /DONET
2142 1021          MEMSET, TAD          21    /MORE TO DO
2143 7012          RTR
2144 0064          AND          K0007
2145 7104          CLL RAL
2146 7006          RTL
2147 7040          CMA
2150 3143          DCA          MAXFLD      /NEGATIVE AMOUNT OF FIELDS.
2151 2270          EXAPT8, ISZ APT8
2152 2270          ISZ          APT8
2153 5670          JMP I   APT8
/
2154 7377          K7377, 7377
2155 7000          K7000, 7000
/
/THIS ROUTINE WILL NOTIFY APT OF AN ENRROR.
/ONLY THE DRIVE IN ERROR IS ESTABLISHED.
/
2156 0000          AENRROR, 0
2157 4424          CHK22          /CHECK FOR APT=8.
2160 7410          SKP
2161 5756          JMP I   AENRROR      /EXIT
2162 6002          IOP
2163 7200          CLA
2164 1115          TAD          POLO8K      /DRIVE NUMBER
2165 0064          AND          K0007
2166 6201          CDF 00
2167 6272          CIF 70
2170 5772          JMP I   K6520
2171 7402          MLT          /NOTIFY APT
/                               /SOMETHING WENT WRONG IF IT GETS HERE
2172 6520          K6520, 6520
2174 1551
2175 0237
2176 1076

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2177 1075          PAGE
2178 2200          /
/ROUTINE TO WRITE OR READ SECTORS SELECTED
/
2200 0000          D8KGO, 0
2201 7340          CLA CLL CMA
2202 3170          DCA          FINTIM
2203 3156          DCA          CRCFLG
2204 1126          TAD          CAREG
2205 4452          LDCUR
2206 1127          TAD          WCREG
2207 3130          DCA          FWREG
2210 1124          TAD          INTDA
2211 3111          DCA          TRASH1
2212 1124          TAD          INTDA
2213 0100          AND          K7760
2214 3112          DCA          TRASH2
2215 1136          TAD          INTCM
2216 1000          TAD I   D8KGO
2217 4451          LDCMD
2220 1123          TAD          CMNEG
2221 1075          TAD          K1000
2222 3174          DCA          SAVCM
2223 1111          TAD          TRASH1
2224 0066          AND          K0017
2225 1112          TAD          TRASH2
2226 4453          LDADD
2227 6001          IDN
/
/ROUTINE TO CLEAR OR CHECK SUM BUFFER ON THE FLY;
/
2230 3777          GOBAK, DCA          TIMER2
2231 3142          DCA          FNDSUM
2232 4435          SETFLD
2233 3254          DCA          CHNCDF
2234 1170          TAD          FINTIM
2235 7050          SNA CLA
2236 5241          JMP          STNRK
2237 4776          JMS          TIME
2240 5234          JMP          =-4
2241 1117          STNRK, TAD          BUPTAL
2242 7041          CIA
2243 1130          TAD          FWREG
2244 7450          SNA
2245 5274          JMP          WRRDON
2246 7041          CIA
2247 3175          DCA          CLNBAK
2250 1175          TAD          CLNBAK
2251 7041          CIA
2252 1117          TAD          BUPTAL
2253 3117          DCA          BUPTAL
2254 7402          CHNCDF, HLT
2255 1123          TAD          CMNEG
2256 7700          SNA CLA
/READ OR WRITE

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2257 5204      JMP      WABRD      /WAS A HEAD11
2260 3411      GOCLR, DCA I AUTO11 /WAS A WRITE, CLEAR BUFFER
2261 2175      ISZ      CLMBAK  /UPDATE TALLY
2262 5206      JMP      GOCLR    /MORE TO CLEAR
2263 5274      JMP      WRKDON   /DONE WITH SOME
2264 1142      WABRD, TAD      FND8UM
2265 7180      GOCHK, CLL
2266 1411      TAD I AUTO11  /GET WORD
2267 7430      SZL
2270 7881      IAC
2271 2175      ISZ      CLMBAK  /UPDATE CLEAR POINTER
2272 5205      JMP      GOCHK    /MORE TO CHECKSUM
2273 3142      DCA      FND8UM  /SAVE IT
2274 6281      WRKDON, CDF      0
2275 1117      TAD      BUFTAL
2276 7650      SNA CLA  /LAST WORD DONE????
2277 5302      JMP      DSKEKX  /EXIT
2300 4776      JMS      TIME    /TIME AND WAIT
2301 5241      JMP      STRWRK  /WAIT FOR INT, OR DONE!!!!
2302 2200      DSKEK, ISZ      DSXGO
2303 5680      JMP I DSXGO  /EXIT

/
/INTERUPT SERVICE
/
2304 6741      RETURN, DSKP
2305 5353      JMP      NODSKP  /DISK SKIP IOT
2306 2111      ISZ      TRASH1  /NOT THE DISK
2307 7080      NOP
2310 1114      TAD      UPDATE   /UPDATE SECTOR NUMBER
2311 1130      TAD      FWREG   /IT WON'T WORK WITHOUT IT!
2312 3130      DCA      FWREG   /UPDATE WORD COUNT
2313 6745      STATUS, DRST
2314 1073      TAD      K4000
2315 7440      SZA
2316 5337      JMP      STATER   /ONLY DONE FLAG?
2317 1130      TAD      FWREG   /STATUS ERROR
2320 7450      SNA CLA  /LAST TRANSFER?
2321 5365      JMP      TRDONE  /TRANSFER IS DONE
2322 3170      DCA      FINTIM  /CLEAR FIRST TIME POINTER!
2323 1174      TAD SAVCM
2324 6746      RDLWRL, DLDC
2325 1111      TAD      TRASH1  /GET READ OR WRITE COMMAND
2326 0866      AND      K0017  /LOAD COMMAND REGISTER
2327 1112      TAD      TRASH2  /GET SECTOR TO DO
2330 6743      LOOGO, DLAG
2331 1167      RETRN, TAD      SVLNK  /MASK OFF
2332 7110      CLL RAM
2333 1166      TAD      SAVAC   /ADD IN TRACK
2334 6244      RMF
2335 6001      ION
2336 5400      JMP I 0
2337 4775      STATER, JMS      SETREG /LOAD DISK ANFD GO
2340 1123      TAD      CMREG
2341 7710      SPA CLA  /GET LINK
2342 7801      IAC
2343 7801      IAC
2344 3347      DCA      .+3
2345 1137      TAD      STATRY
2346 4446      ERROR
2347 8080      B000
2350 7770      7770
2351 2200      ISZ      DSXGO
2352 5302      JMP      DSKEKX  /MODIFY HEADER POINTER
2353 3374      NODSKP, DCA  TIMER3 /GET TRY POINTER
2354 2374      ISZ      TIMER3  /PRINT MESSAGE
2355 5354      JMP      .-1
2356 4407      CLASIC
2357 4440      C8CKPA
2360 7080      NOP
2361 6031      KBF
2362 4576      INTER2, JMS I 0GLT /MODIFIED HEADER POINTER
2363 6032      KCC
2364 5331      JMP      RETRN   /MESSAGE POINTER
2365 4775      TRDONE, JMS  SETREG /UPDATE FOR ERROR
2366 3170      DCA      FINTIM  /EXIT
2367 1167      TAD      SVLNK
2370 7110      CLL RAM
2371 1166      TAD      SAVAC   /WAIT FOR DISK TO STOP.
2372 6244      RMF
2373 5400      JMP I 0
2374 0000      TIMER3, 0 /CHECK FOR CLASSIC.
2375 1553      /ROUTINE TO EXECUTE.
2376 3123
2377 3141
2400 0000      PAGE
2401 4444      /
2402 3354      /ROUTINE TO GET ONE IN OCTAL
2403 1600      OCT1, 0
2404 0064      RECEIV
2405 1067      DCA      LOAD
2406 7141      TAD I OCT1
2407 1354      AND      K0007
2410 7620      TAD      K0260
2411 5226      CLL CIA
2412 1600      TAD      LOAD
2413 0014      JMS      INERR
2414 7110      TAD I OCT1
2415 7012      AND      K0070
2416 1067      CLL RAM
2417 7040      RTR
2420 1354      TAD      K0260
2421 7630      CMA
2422 5226      TAD      LOAD
2423 1354      SZL CLA  /GET INPUT
2424 3123      JMP      INERR
2425 1354      TAD      LOAD
2426 3123      TAD      INERR
2427 1354      TAD      LOAD

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2343 7801      IAC
2344 3347      DCA      .+3
2345 1137      TAD      STATRY
2346 4446      ERROR
2347 8080      B000
2350 7770      7770
2351 2200      ISZ      DSXGO
2352 5302      JMP      DSKEKX  /MODIFY HEADER POINTER
2353 3374      NODSKP, DCA  TIMER3 /GET TRY POINTER
2354 2374      ISZ      TIMER3  /PRINT MESSAGE
2355 5354      JMP      .-1
2356 4407      CLASIC
2357 4440      C8CKPA
2360 7080      NOP
2361 6031      KBF
2362 4576      INTER2, JMS I 0GLT /MODIFIED HEADER POINTER
2363 6032      KCC
2364 5331      JMP      RETRN   /MESSAGE POINTER
2365 4775      TRDONE, JMS  SETREG /UPDATE FOR ERROR
2366 3170      DCA      FINTIM  /EXIT
2367 1167      TAD      SVLNK
2370 7110      CLL RAM
2371 1166      TAD      SAVAC   /WAIT FOR DISK TO STOP.
2372 6244      RMF
2373 5400      JMP I 0
2374 0000      TIMER3, 0 /CHECK FOR CLASSIC.
2375 1553      /ROUTINE TO EXECUTE.
2376 3123
2377 3141
2400 0000      PAGE
2401 4444      /
2402 3354      /ROUTINE TO GET ONE IN OCTAL
2403 1600      OCT1, 0
2404 0064      RECEIV
2405 1067      DCA      LOAD
2406 7141      TAD I OCT1
2407 1354      AND      K0007
2410 7620      TAD      K0260
2411 5226      CLL CIA
2412 1600      TAD      LOAD
2413 0014      JMS      INERR
2414 7110      TAD I OCT1
2415 7012      AND      K0070
2416 1067      CLL RAM
2417 7040      RTR
2420 1354      TAD      K0260
2421 7630      CMA
2422 5226      TAD      LOAD
2423 1354      SZL CLA  /GET INPUT
2424 3123      JMP      INERR
2425 1354      TAD      LOAD
2426 3123      TAD      INERR
2427 1354      TAD      LOAD

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2424 0064      AND      K0007      /MASK
2425 2200      ISZ      UCT1
2426 2200      INERR, ISZ      UCT1
2427 5600      JMP      I      UCT1      /GOOD EXIT
/
/Routine TO RECEIVE FOUR OCTAL
/
2430 0000      OCT4,  0
2431 1106      TAD      M4
2432 3341      DCA      RDST      /SETUP COUNTER
2433 3350      DCA      LDCA      /START WITH 0
2434 4432      ONEIN
2435 0070      0070      /RECEIVE ONE OCTAL
2436 5630      JMP      I      OCT4      /LIMITS
2437 1350      TAD      LDCA      /EMRUR EXIT
2440 2341      ISZ      RDST      /GET LAST
2441 7410      SKP
2442 5246      JMP      ,+4      /EXIT
2443 7004      HAL
2444 7006      RTL
2445 5233      JMP      OCT4+3
2446 2230      ISZ      UCT4
2447 5630      JMP      I      UCT4      /EXIT OCTAL IN AC
/
/Routine TO UPDATE AND CHECK FOR PASS COMPLETE
/
2450 0000      CKTIM,  0
2451 1115      TAD      PDLSK
2452 0064      AND      K0007      /SETUP CURRENT DRIVE #
2453 3341      DCA      RDST      /POINTER
2454 1341      TAD      RDST
2455 1152      TAD      TIMPOT      /GET TIME POINTER
2456 3354      DCA      LDAD      /SAVE IT
2457 7301      CLA      CLL      IAC      /ONE FOR 0
2460 1147      TAD      CONSEC      /GET AMOUNT DONE
2461 1754      TAD      I      LDAD      /ADD IN AMOUNT COMPLETED 50 FAR
2462 3754      DCA      I      LDAD      /SAVE IT
2463 7620      SNL      CLA
2464 5650      JMP      I      CKTIM      /LINK UP????
2465 4440      RANGEN      /NO, EXIT
2466 3777      DCA      RAN1      /GET RANDOM NUMBER
2467 4440      RANGEN      /RE-PRIME GENERATOR
2470 3776      DCA      RAN2      /GET RANDOM NUMBER
2471 7100      CLL
2472 1354      TAD      LDAD
2473 1013      TAD      K0004
2474 3354      DCA      LDAD      /SECOND TIME POINTEN
2475 2754      ISZ      I      LDAD      /UPDATE IT
2476 1754      TAD      I      LDAD      /GET COUNT
2477 1144      TAD      MAXTIM      /ADD IN FUDGE FACTOR
2500 7620      SNL      CLA      /PASS COMPLETE????
2501 5650      JMP      I      CKTIM      /NO, EXIT
2502 3754      DCA      I      LDAD      /ZERU SECDUND COUNTER
2503 1341      TAD      RDST
2504 7040      CMA

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2505 3341      DCA      RDST      /SETUP COUNTER
2506 1362      TAD      CMPPOT      /ADD IN POINTER
2507 1062      TAD      K0003
2510 2341      ISZ      RDST      /COMPUTE BUFFER
2511 5307      JMP      ,+2
2512 3341      DCA      RDST      /SAVE ADDRESS POINTER
2513 7340      CLA      CLL      CMA
2514 2741      ISZ      I      RDST
2515 7610      SKP      CLA      /UPDATE PASS COMPLETE POINTER
2516 3741      DCA      I      RDST
2517 4457      CRLP
2520 4455      PRNTER      /PRINT "DISK"
2521 3477      MES17
2522 1115      TAD      PDLSK      /GET DISK POLE NUMBER
2523 0064      AND      K0007      /MASK
2524 1067      TAD      K0260
2525 4445      TYPE
2526 7340      CLA      CLL      CMA      /TYPE DISK NO,
2527 4455      PRNTER      /PRINT "PASS COMPLETE"
2530 3502      MES18
2531 4406      LAS
2532 0015      AND      K0100      /MASK
2533 7650      SNA      CLA      /PASS COMPLETE DISCONNECT????
2534 5337      JMP      ,+3      /NO WAY!!!!
2535 4430      DISCON      /DUMP DRIVE
2536 5775      JMP      RUN      /MORE TO TEST!!!!
2537 4774      JMS      TPSTA      /STATUS-COMLETE TYPEOUT
2540 5650      JMP      I      CKTIM      /EXIT
/
/SUBROUTINE TO READ STATUS REGISTER
/
2541 0000      RDST,  0
2542 6745      IOT5,  DRST      /HEAD STATUS IOT
2543 7410      SKP
2544 4576      ERHLT5, JMS      I      0GHLT      /SKIP TRAP
2545 3121      DCA      STREG      /SAVE RESULTS
2546 1121      TAD      STREG
2547 5741      JMP      I      RDST      /EXIT
/
/SUBROUTINE TO LOAD CURRENT ADDRESS REGISTER
/
2550 0000      LDCA,  0
2551 6744      IOT4,  DLCA      /LOAD CURRENT ADDRESS IOT
2552 4425      KTIK
2553 5750      JMP      I      LDCA      /NOTIFY APT
/EXIT
/
/SUBROUTINE TO LOAD TRACK ADDRESS REGISTER
/
2554 0000      LDAD,  0
2555 3125      DCA      DAREG
2556 1125      TAD      DAREG
2557 6743      IOT3,  DLAG
2560 5754      JMP      I      LDAD      /LOAD DISK ADDRESS REGISTER
2561 4576      ERHLT3, JMS      I      0GHLT      /EXIT
/EMRUR SKIP TRAP

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2562 3541 /
2574 3000 /CHPPOT, DUCMP-J
2575 0600
2576 1770
2577 1767
2600 2600 PAGE
/
/Routine TO GET RANDOM OR OPERATOR DATA
/
2600 0000 /RNWRD, 0
2601 7402 /SWDAT, MLT /MODIFIED SWITCH
2602 5600 /JMP I RNWRD /EXIT
2603 6201 /COF 0 /HOME COF
2604 1412 /TAD I AUTO12 /GET DATA
2605 7402 /RECDF, MLT /BUFFER COF
2606 2116 /ISZ OPNTAL /UPDATE TALLY
2607 5600 /JMP I RNWRD /EXIT
2610 3220 /DCA PRINT /SAVE WORD
2611 1105 /TAD M12
2612 3116 /DCA OPNTAL /REPLACE TALLY
2613 7340 /CLA CLL CMA
2614 1151 /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 3237 /DCA DUMP /STORE AC VALUE
2622 4424 /CHK22 /SEE IF DN APT
2623 5235 /JMP PREXIT /NO, EXIT
2624 1237 /TAD DUMP /RETURN AC.
2625 4407 /CLASIC /CHECK FOR CLASSIC.
2626 4435 /CBTYPE /ROUTINE TO EXECUTE.
2627 7410 /SKP
2630 5620 /JMP I PRINT /EXIT.
2631 6046 /TAS
2632 6041 /TSF
2633 5232 /JMP *-1
2634 6042 /TCF
2635 7200 /PREXIT, CLA
2636 5620 /JMP I PRINT
/
/Routine TO DUMP AND REPORT DISK STATUS
/
2637 0000 /DUMP, 0
2640 4424 /CHK22 /CHECK FOR APT
2641 5637 /JMP I DUMP
2642 4455 /PRNTER /PRINT "DISK "
2643 3477 /MES17
2644 1115 /TAD POLOSK
2645 0064 /AND K0070 /SETUP CURRENT DRIVE #
2646 3200 /DCA RNWRD /SAVE

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2647 1200 /TAD RNWRD /GET DISK NUMBER
2650 1067 /TAD K0260
2651 4445 /TYPE /TYPE DISK NUMBER
2652 7340 /CLA CLL CMA
2653 4455 /PRNTER /PRINT "DISCONNECTED!"
2654 3445 /MES15
2655 4777 /JMS TP3TA /TYPE STATUS REPORT
2656 1200 /TAD RNWRD
2657 1154 /TAD RUNPOT
2660 3200 /DCA RNWRD /SAVE POINTER ADDRESS
2661 3600 /DCA I RNWRD /CLEAR RUN POINTER
2662 3200 /DCA RNWRD
2663 1106 /TAD M6
2664 3220 /DCA PRINT /CHECK FOR MORE POINTER
2665 1200 /TAD RNWRD
2666 4436 /SELCHK /CHECK SELECT POINTERS
2667 7610 /SKP CLA /DISK NOT HERE
2670 5637 /JMP I DUMP /MORE AVAILABLE
2671 2200 /ISZ RNWRD
2672 2220 /ISZ PRINT /UPDATE POINTERS
2673 5265 /JMP *-6
2674 4457 /CRLF
2675 4455 /PRNTER /PRINT "DISK"
2676 3477 /MES17
2677 7340 /CLA CLL CMA
2700 4455 /PRNTER /PRINT "SYSTEM DOWN"
2701 3455 /MES16
2702 4576 /NOOSKB, JMS I BGHLT /ERROR, NO DISK AVAILABLE
/
/Routine TO SETUP FIELD TO BUFFER+ AUTO11+ BUFFER TALLY
/
2703 0000 /STFLD, 0
2704 7041 /CIA
2705 1127 /TAD WCNEG
2706 3117 /DCA BUFTAL
2707 7340 /CLA CLL CMA
2710 1126 /TAD CANEG /GET INITIAL CA
2711 3011 /DCA AUTO11 /SAVE
2712 1157 /TAD DATFLG /GET DATA FLAG
2713 7650 /SNA CLA /WAS IT SET???
2714 5322 /JMP *-6 /NO, USE REGULAR
2715 1105 /TAD M12
2716 3116 /DCA OPNTAL /SETUP SPECIAL TALLY
2717 7340 /CLA CLL CMA
2720 1151 /TAD DATPOT
2721 3012 /DCA AUTO12 /SETUP SPECIAL AUTO INDEX
2722 1136 /TAD INTCM /GET LAST COMMAND
2723 0014 /AND K0070 /MASK FIELD BITS
2724 1103 /TAD KCDF /MAKE BUFFER COF
2725 3205 /OCA WECDF /SETUP SPECIAL COF
2726 1205 /TAD WECDF /GET BACK COF
2727 5703 /JMP I STFLD /EXIT, FIELD IN AC
/
/Routine TO CHANGE DEVICE IOT CODES
/

```

```

2730 4407      CHANG, CLASIC
2731 4431      CSBWHIT
2732 7000      NOP
2733 4406      LAR
2734 0071      AND      A0770
2735 3776*     DCA      LDCH
2736 1300      TAD      CHNPOT
2737 3111      DCA      TRASH1
2740 1357      TAD      CCNTRI
2741 3112      DCA      TRASH2
2742 1511      CHANGR, TAD I TRASH1
2743 3113      DCA      TRASH3
2744 1513      TAD I TRASH3
2745 0072      AND      A7007
2746 1776*     TAD      LDCH
2747 3513      DCA I TRASH3
2750 2111      ISZ      TRASH1
2751 2112      ISZ      TRASH2
2752 5342      JMP      CHANGR
2753 4407      CLASIC
2754 4436      CSERR
2755 7402      CHNHLT, HLT
2756 5775*     JMP      BGN

/
2757 7765      CCNTRI, 7765
/
2760 2761      CHNPOT, CHNPOT+1
2761 2304      RETURN
2762 2313      STATUS
2763 2324      RDLWRL
2764 2330      LODGO
2765 0554      IOT0
2766 0752      IOT1
2767 0561      IOT2
2770 2557      IOT3
2771 2551      IOT4
2772 2542      IOT5
2773 0545      IOT6

/
2775 0200
2776 0542
2777 3000
3000          PAGE
/
/ROUTINE TO TYPE STATUS REPORT
/
3000 0000      TPSTA, 0
3001 4424      CHK22
3002 5600      JMP I TPSTA
3003 4457      CRLF
3004 4455      PRNTER
3005 3372      MEB7
3006 1107      TAD      M10
3007 3245      DCA      TSAVE1
/PRINT "DSK HARD SOFT COMP"
/MAXIMUM TO DO

```

```

3010 3246      DCA      TSAVE2
3011 3247      DCA      TSAVE3
3012 1246      CHKRES, TAD      TSAVE2
3013 1062      TAD      K0003
3014 3246      DCA      TSAVE2
3015 1246      TAD      TSAVE2
3016 1153      TAD      STAPOT
3017 3251      DCA      TSAVE5
3020 1247      TAD      TSAVE3
3021 4436      BELCHK
3022 5241      JMP      NOTSTA
3023 4457      CRLF
3024 4431      SPACE
3025 1247      TAD      TSAVE3
3026 1067      TAD      K0260
3027 4445      TYPE
3030 4431      SPACE
3031 4431      SPACE
3032 7346      CLA CLL CMA RTL
3033 3250      DCA      TSAVE4
3034 1651      TAD I TSAVE5
3035 4456      OCTEL
3036 2251      ISZ      TSAVE5
3037 2250      ISZ      TSAVE4
3040 5234      JMP      =-4
3041 2247      NOTSTA, ISZ TSAVE3
3042 2245      ISZ TSAVE1
3043 5212      JMP      CHKRES
3044 5600      JMP I TPSTA
/ROUTINE TO REPORT
/EXIT

3045 0000      TSAVE1, 0
3046 0000      TSAVE2, 0
3047 0000      TSAVE3, 0
3050 0000      TSAVE4, 0
3051 0000      TSAVE5, 0
/
/ROUTINE TO RECALIBRATE SELECTED DRIVE
/DISCONNECT DRIVE ON ERROR!
/
3052 0000      RESTOR, 0
3053 0003      AND      K0006
3054 3200      DCA      TPSTA
3055 1077      TAD      K7700
3056 3341      DCA      TIMER2
3057 2340      ISZ      TIMER1
3060 5257      JMP      =+1
3061 2341      ISZ      TIMER2
3062 5257      JMP      =+3
3063 1200      TAD      TPSTA
3064 4451      LDCHD
3065 7326      CLA CLL CML RTL
3066 4454      CLRALL
3067 4450      DSKSKP
3070 5267      JMP      =-1
3071 4447      RDSTAT
/SAVE DRIVE NUMBER
/SETUP COUNTER
/WAIT FOR DISK TO COOL OFF!
/CURRENT DRIVE
/LOAD COMMAND
/ENABLE RECALIBRATE BIT
/"RECALIBRATE"
/DISK SKIP IOT
/WAIT FOR FIRST DONE FLAG
/MEAU STATUS

```

```

3072 7500          SMA
3073 5311          JMP REBERR
3074 0076          AND K1777
3075 7640          SZA CLA
3076 5311          JMP REBERR
3077 4454          RESTA, CLRALL
3100 1016          TAD K0200
3101 1200          TAD TPSTA
3102 4451          LDCHD
3103 4450          DSKSKP
3104 5303          JMP
3105 4447          RDSTAT
3106 1073          TAD K4000
3107 7650          SNA CLA
3110 5652          JMP I RESTOR
3111 7300          REBERR, CLA CLL
3112 4446          ERROR
3113 0003          0003
3114 7500          7500
3115 4457          CRLF
3116 4457          CRLF
3117 4455          PRNTER
3120 3174          MES19
3121 4430          DISCON
3122 5652          JMP I RESTOR

/
/ROUTINE TO TIME AND WAIT
/
3123 0000          TIME, 0
3124 2340          ISZ TIMER1
3125 5723          JMP I TIME
3126 2341          ISZ TIMER2
3127 5723          JMP I TIME
3130 4576          INTER1, JMS I 00HLT

/
/ROUTINE TO COMBINE ERROR HALTS.
/WHEN THE COMPUTER HALTS THE AC
/ WILL EQUAL THE PC ON THE FAILING
/ HALT INSTRUCTION.
/
3131 0000          BIGHTL, 0
3132 7300          CLA CLL
3133 1331          TAD BIGHTL
3134 4407          CLASIC
3135 4436          CBERR
3136 7402          BIGHTP, HLT
3137 5332          JMP

/
TIMER1, 0
TIMER2, 0
/
/ROUTINE TO TYPE OUT DATA INFORMATION
/
3142 0000          TYPDAT, 0
3143 4455          PRNTER

```

/PRINT"RECALIBRATE ERROR DISCONNECT"

/DISCONNECT DISK  
/MORE DISK AVAILABLE

/EXIT

/EXIT

/NO INTERRUPT OCCURRED, I GUESS!

/LOAD AC WITH PC.  
/CHECK FOR CLASSIC.  
/ROUTINE TO EXECUTE.  
/AC=PC.  
/NON-RECOVERABLE.

/PRINT "AS!"

```

3144 3235          TEXAS
3145 1131          TAD ASREG
3146 4456          OCTEL
3147 7340          CLA CLL CMA
3150 4455          PRNTER
3151 3237          TEXWA
3152 1132          TAD WAREG
3153 4456          OCTEL
3154 7340          CLA CLL CMA
3155 4455          PRNTER
3156 3241          TEXAD
3157 1133          TAD ADREG
3160 4456          OCTEL
3161 7340          CLA CLL CMA
3162 4455          PRNTER
3163 3243          TEXDG
3164 1134          TAD DGREG
3165 4456          OCTEL
3166 7340          CLA CLL CMA
3167 4455          PRNTER
3170 3245          TEXDB
3171 1135          TAD DBREG
3172 4456          OCTEL
3173 5742          JMP I TYPDAT

/
MES19, TEXT "RECALIBRATE ERROR DISCONNECT!"

3174 2205
3175 0301
3176 1411
3177 0222
3200 0124
3201 0540
3202 0522
3203 2217
3204 2240
3205 0411
3206 2303
3207 1716
3210 1605
3211 0324
3212 4100

/
3213 2003          TEXPC, TEXT "PC!"
3214 7200
3215 2324          TEXT, TEXT "ST!"
3216 7200
3217 0530          TEXEX, TEXT "EX!"
3220 7200
3221 0315          TEXCM, TEXT "CM!"
3222 7200
3223 1101          TEXIA, TEXT "IA!"
3224 7200
3225 0401          TEXDA, TEXT "DA!"
3226 7200
3227 0301          TEXCA, TEXT "CA!"
3230 7200

```

/PRINT "WA!"

/PRINT "AD!"

/PRINT "DG!"

/PRINT "DB!"

3231	2703	TEXWC,	TEXT	"WC1"
3232	7200			
3233	0627	TEXFW,	TEXT	"FW1"
3234	7200			
3235	0123	TEXAS,	TEXT	"AS1"
3236	7200			
3237	2701	TEXWA,	TEXT	"WA1"
3240	7200			
3241	0104	TEXAD,	TEXT	"AD1"
3242	7200			
3243	0407	TEXDG,	TEXT	"DG1"
3244	7200			
3245	0402	TEXDB,	TEXT	"DB1"
3246	7200			
/				
3247	2205	ERTX1,	TEXT	"READ STATUS"
3250	0104			
3251	4023			
3252	2401			
3253	2425			
3254	2300			
3255	2722	ERTX2,	TEXT	"WRITE STATUS"
3256	1124			
3257	0540			
3260	2324			
3261	0124			
3262	2523			
3263	0000			
3264	2205	ERTX3,	TEXT	"RECALIBRATE STATUS"
3265	0301			
3266	1411			
3267	0222			
3270	0124			
3271	0540			
3272	2324			
3273	0124			
3274	2523			
3275	0000			
3276	0411	ERTX4,	TEXT	"DISK DATA"
3277	2313			
3300	4004			
3301	0124			
3302	0100			
/				
3303	4005	ME00,	TEXT	" ERROR"
3304	2222			
3305	1722			
3306	0000			
3307	2213	ME01,	TEXT	"MK0E/RK0L DATA RELIABILITY"
3310	7005			
3311	5722			
3312	1370			
3313	1440			
3314	0401			
3315	2401			

3316	4022			
3317	0514			
3320	1101			
3321	0211			
3322	1411			
3323	2431			
3324	0000			
3325	0530	ME02,	TEXT	"EXERCISE"
3326	0522			
3327	0311			
3330	2305			
3331	0000			
3332	4004	ME03,	TEXT	" DISK"
3333	1123			
3334	1300			
3335	1617	ME04,	TEXT	"NON-RECOVERABLE "
3336	1655			
3337	2205			
3340	0317			
3341	2605			
3342	2201			
3343	0214			
3344	0540			
3345	0000			
3346	0530	ME05,	TEXT	"EXTENDED R/W MEMORY(0-7)?"
3347	2405			
3350	1604			
3351	0504			
3352	4022			
3353	5727			
3354	4015			
3355	0515			
3356	1722			
3357	3150			
3360	6055			
3361	6751			
3362	7700			
/				
3363	0103	ME06,	TEXT	"ACCEPT MODE?"
3364	0305			
3365	2024			
3366	4015			
3367	1704			
3370	0577			
3371	0000			
3372	0423	ME07,	TEXT	"DSK HARD SOFT COMP"
3373	1340			
3374	1001			
3375	2204			
3376	4023			
3377	1706			
3400	2440			
3401	0317			
3402	1520			

3403	0000			
3404	0611	ME08,	TEXT	"FIELD?"
3405	0514			
3406	0477			
3407	0000			
3410	2422	ME09,	TEXT	"TRACK?"
3411	0103			
3412	1377			
3413	0000			
3414	0530	ME010,	TEXT	"EXTRA SECTORS?"
3415	2422			
3416	0140			
3417	2305			
3420	0324			
3421	1722			
3422	2377			
3423	0000			
3424	0214	ME011,	TEXT	"BLOCK LENGTH?"
3425	1703			
3426	1340			
3427	1405			
3430	1607			
3431	2410			
3432	7700			
3433	0401	ME013,	TEXT	"DATA?"
3434	2401			
3435	7700			
3436	0122	ME014,	TEXT	"ARE YOU SURE?"
3437	0540			
3440	3117			
3441	2540			
3442	2325			
3443	2205			
3444	7700			
3445	4004	ME015,	TEXT	" DISCONNECTED!"
3446	1123			
3447	0317			
3450	1016			
3451	0503			
3452	2405			
3453	0441			
3454	0000			
3455	2331	ME016,	TEXT	"SYSTEM SHUT DOWN, NO DISKS TO RUN!"
3456	2324			
3457	0515			
3460	4023			
3461	1025			
3462	2440			
3463	0417			
3464	2716			
3465	5440			
3466	1617			
3467	4004			
3470	1123			
3471	1323			

3472	4024			
3473	1740			
3474	2225			
3475	1641			
3476	0000			
3477	0411	ME017,	TEXT	"DISK "
3500	2313			
3501	4000			
3502	4020	ME018,	TEXT	" PASS COMPLETE!"
3503	0123			
3504	2340			
3505	0317			
3506	1520			
3507	1405			
3510	2405			
3511	4100			

3512	0000	DSK00,	0
3513	0000	DSK10,	0
3514	0000	DSK20,	0
3515	0000	DSK30,	0
3516	0000	DSK40,	0
3517	0000	DSK50,	0
3520	0000	DSK60,	0
3521	0000	DSK70,	0

3522	0000	D0TM1,	0
3523	0000	D1TM1,	0
3524	0000	D2TM1,	0
3525	0000	D3TM1,	0
3526	0000	D4TM1,	0
3527	0000	D5TM1,	0
3530	0000	D6TM1,	0
3531	0000	D7TM1,	0
3532	0000	D0TM2,	0
3533	0000	D1TM2,	0
3534	0000	D2TM2,	0
3535	0000	D3TM2,	0
3536	0000	D4TM2,	0
3537	0000	D5TM2,	0
3540	0000	D6TM2,	0
3541	0000	D7TM2,	0

3542	0000	D0MRD,	0
3543	0000	D0SOF,	0
3544	0000	D0CMP,	0
3545	0000	D1MRD,	0
3546	0000	D1SOF,	0
3547	0000	D1CMP,	0
3550	0000	D2MRD,	0
3551	0000	D2SOF,	0
3552	0000	D2CMP,	0





4000  
4100  
  
4200  
4300  
  
4400  
4500  
  
4600  
4700  
  
5000  
5100  
  
5200  
5300  
  
5400  
5500  
  
5600  
5700  
  
6000  
6100  
  
6200  
6300  
  
6400  
6500  
  
6600  
6700  
  
7000  
7100  
  
7200  
7300  
  
7400  
7500  
  
7600  
7700

A0170	0750	C0GET	0624	CONCUR	0715	DATA3	0760
A0770	0071	C0HANG	1122	CONSEC	0147	DATA4	0761
A7007	0072	C0INQU	4437	CONSUL	0000	DATA5	0762
ACDCA	0362	C0OCTA	4432	CRCCNT	0155	DATA6	0763
ACL	7701	C0PASS	4424	CRCPLG	0136	DATA7	0764
ACSAVE	1345	C0PAUS	4441	CRLF	4437	DATA8	0765
ADREG	0133	C0PRNT	4430	D0CMP	3544	DATA9	0766
AERROR	2156	C0RDP8	0606	D0HRU	3542	DATFLG	0137
AGAIN	1346	C0RETD	0614	D0SOP	3543	DATPDT	0151
ALLAGN	0255	C0RETR	0536	D0TM1	3522	DATTRY	0140
AMOUNT	0060	C0SETD	0613	D0TM2	3532	DBREG	0135
APTS	2070	C0SET8	0535	D1CMP	3547	OCLR	6742
ASKNX1	0345	C0SWIT	4431	D1HRU	3545	DGREG	0134
ASKNX2	0406	C0SW8T	0745	D1SOP	3546	DISCON	4430
ASKNX3	0425	C0TMP1	1021	D1TM1	3523	DISGO	4441
ASKNX5	0464	C0TTYI	4426	D1TM2	3533	OLAG	6743
ASKSUR	0513	C0TYPE	4435	D2CMP	3552	OLCA	6744
ASREG	0131	CAF	6007	D2HRU	3550	OLDC	6746
AUTO10	0010	CAREG	0126	D2SOP	3551	OLSC	6740
AUTO11	0011	CCNTR1	2757	D2TM1	3524	OCNT	0247
AUTO12	0012	CHANG	2730	D2TM2	3534	OMEAD	1262
BADHLT	1707	CHANGR	2742	D3CMP	3555	DONEA	0426
BGHLT	0176	CHEK22	0523	D3HRU	3553	DOPACK	0212
BGN	0200	CHK22	4424	D3SOP	3554	OBET	0251
BGNBUF	0146	CHKCLA	1200	D3TM1	3525	ORBT	6745
BIGHLT	3131	CHKPDT	2000	D3TM2	3535	OSK00	3512
BIGSTP	3136	CHKRES	3012	D4CMP	3560	OSK10	3513
BRKRET	0363	CHKSAV	0141	D4HRU	3556	OSK20	3514
BUFFNT	1400	CHKYN	2035	D4SOP	3557	OSK30	3515
BUFTAL	0117	CHCDF	2254	D4TM1	3526	OSK40	3516
BYRETR	0506	CHNHLT	2755	D4TM2	3536	OSK50	3517
C0BY1	0230	CHNPDT	2760	D5CMP	3563	OSK60	3520
C0BY2	1300	CKCOUT	0232	D5HRU	3561	OSK70	3521
C0BY3	1061	CKTIM	2450	D5SOP	3562	OSKEX	2302
C0BY4	0515	CLAFID	1404	D5TM1	3527	OSKGO	2200
C0BY5	1116	CLABIC	4407	D5TM2	3537	OSKP	6741
C0CMAR	1075	CLASIK	1514	D6CMP	3566	OSKSKP	4450
C0CKP	1022	CLDR	0500	D6HRU	3564	DTCHK	1000
C0CKPA	4440	CLKCNT	0150	D6SOP	3565	UTR1	1636
C0CKSN	4425	CLRALL	4454	D6TM1	3530	DUMP	2637
C0CNTR	4427	CLRBAX	0175	D6TM2	3540	ENDIT	0742
C0CNT7	1145	CLTRRN	1315	D7CMP	3571	ERFLG	0165
C0CRLF	4433	CHPPDT	2562	D7HRU	3567	ERHLT0	0556
C0D01	0310	CHREG	0123	D7SOP	3570	ERHLT2	0563
C0D010	1262	CNTRLC	0551	D7TM1	3531	ERHLT3	2561
C0D011	0607	CNTRLD	0600	D7TM2	3541	ERHLT5	2544
C0D02	1033	CNTRLE	0545	DARE6	0125	ERHLT6	0547
C0D03	0350	CNTRLL	0537	DAT1	0756	ERR1	0736
C0D04	1006	CNTRLQ	0500	DAT10	0707	ERRM5	1420
C0D07	0527	CNTRLR	0511	DAT11	0770	ERR0	1200
C0ECHO	4434	CNTRLS	0521	DAT12	0771	ERRDEX	1355
C0ERR	4436	CNTVAL	0252	DAT2	0757	ERROR	4446

ERTX1	3247	K0001	0001	M12	0105	NTWRKS	1710
ERTX2	3255	K0003	0002	M4	0106	OCT1	2400
ERTX3	3264	K0004	0013	MANUAL	0322	OCT4	2430
ERTX4	3276	K0006	0003	MAXFLD	0143	OCTEL	4456
ESAVE	1371	K0007	0004	MAXTIM	0144	ONEIN	4432
EXAPT8	2151	K0010	0005	MAXTHK	0145	OP1	0021
EXIT	1504	K0017	0006	MEMSET	2142	OP2	0022
EXITA	0440	K0070	0014	MES0	3303	OPRAT	0116
EXREG	0122	K0077	0102	MES1	3307	PASCNT	0250
EXTICK	1166	K0100	0015	MES10	3414	PCLF	6062
FLOP1	0021	K0200	0016	MES11	3424	PCNTR1	1373
FLOP2	0022	K0212	1425	MES13	3433	PCNTR2	1374
F13WR	0020	K0215	1424	MES14	3436	PCNTR3	1375
FILCNT	1040	K0240	1512	MES15	3445	PCREG	0120
FILLER	1037	K0260	0007	MES16	3455	PCSAVE	1344
FILLUP	0717	K0277	0070	MES17	3477	PNTBUF	1120
FIRTM	0170	K0316	2057	MES18	3502	POLD3K	0115
FIDFLG	3572	K0331	2056	MES19	3174	POLNEX	1000
FIDMLT	0206	K0400	0017	MES2	3325	PREXIT	2635
FLSAVE	1347	K1000	0075	MES3	3332	PRINT	2020
FNDSUM	0142	K1177	2034	MES4	3335	PRN	1450
FORIN	4433	K1777	0076	MES5	3346	PRNDAT	0173
FROCT	1426	K3740	1513	MES6	3363	PRNTER	4455
FHREG	0130	K4000	0073	MES7	3372	P8IE	6065
GENDAT	4426	K4100	0074	MES8	3404	P8KE	6063
GETCH1	0703	K5405	0360	MES9	3410	P8KF	6061
GETDAT	0456	K6500	0541	MESA	0747	P8TB	6064
GNDAT	1737	K6520	2172	MESAC	1533	PTSTOR	0336
GOBAC	2230	K7000	2135	MESFL	1541	RAD1	1773
GOCDF	1646	K7377	2154	MESHAN	1146	RAD2	1774
GOCHK	2265	K7400	0104	MESMU	1336	RAD3	1775
GOCLR	2260	K7700	0077	MESPAS	0253	RAN1	1767
GOITA	0443	K7760	0100	MESPC	1330	RAN2	1770
GOTIT	1010	K7773	1377	MODSR3	2125	RANDAT	4427
GOTOA	0454	K7775	0110	MOA	7501	RANDOM	1715
GTF	0004	K7777	0101	MOL	7421	RANGEN	4440
HEOTAD	1376	KAERRO	0023	MOSAVE	1346	RANJMS	0522
HLFFLG	3575	KCDF	0103	MRPRN	1456	RDWLRL	2324
INDEXA	0455	KROT	0230	MSKER	1714	R0ST	2541
INERR	2426	K8PK	0546	MYAC	1317	RDSTA	1105
INMODE	1076	KTICK	4425	MYLAB	1546	RDSTAT	4447
INTCM	0136	KTIME	0530	NEWRU	0727	RDTRY	1073
INTDA	0124	LAB	4406	NEXT	0201	REALPC	1316
INTER1	3130	LOAD	2554	NODSKP	2353	RECAL	4443
INTER2	2362	LOADD	4453	NODSKS	2702	RECDP	2605
IOT0	0554	LOCA	2550	NOERR	1072	RECEIV	4444
IOT1	0752	LDCM	0542	NOBET	0242	REDOA	0415
IOT2	0561	LDCMO	4451	NOTEX	1303	REFILL	0723
IOT3	2557	LOCUR	4452	NOTSTA	3041	REREAD	1063
IOT4	2551	LNKDCA	0301	NTCLAS	1270	RERUN	1124
IOT5	2542	LODGO	2330	NTERN	1255	RESERR	3111
IOT6	0545	M10	0107	NTBOPT	1251	RESRAN	4442

RESTA	3077	TABLB	0471	XC8CNL	1023		
RESTOR	3052	TEXAD	3241	XC8ECH	1063		
RETRN	2331	TEXAS	3235	XC8ENR	1207		
RETURN	2304	TEXCA	3227	XC8INU	0635		
REWRT	1047	TEXCM	3221	XC8OCT	1000		
RNFLD	0630	TEXDA	3225	XC8PAS	0200		
RNHRD	2600	TEXDB	3245	XC8PAU	0337		
ROUINS	1302	TEXDG	3243	XC8PNT	0303		
ROUTHP	1544	TEXEX	3217	XC8P3W	0656		
RSRAN	1761	TEXFW	3233	XC83W	0202		
RUN	0000	TEXIA	3223	XC8TTY	0272		
RUNPOT	0154	TEXPC	3213	XC8TYP	1077		
SAV1	1771	TEXST	3215	XCHKZ2	0024		
SAV2	1772	TEXWA	3237	XCHKYN	0037		
SAVAC	0166	TEXWC	3231	XCKPUT	0036		
SAVCM	0174	TIME	3123	XCLAS	0007		
SAVE1	0400	TIMER1	3140	XCLUK	0034		
SAVEAC	1545	TIMER2	3141	XCRLE	0057		
SDKP	0751	TIMER3	2374	XDOLMT	1112		
SECFLG	3574	TIMPOT	0152	XDO3W	0520		
SELCHK	4436	TMPCNT	0746	XDSKWD	0041		
SETFLD	4435	TPSTA	3000	XDUMP	0030		
SETGEN	4434	TRASH1	0111	XERRU	0046		
SETREG	1553	TRASH2	0112	XPROCT	0056		
SETUP1	1233	TRASH3	0113	XGNDAT	0026		
SETUP2	0225	TRDONE	2305	XKTCK	0025		
SKPNOP	0237	TRKFLG	3573	XKTICK	1154		
SOFT	1245	TRYCNT	0171	XLAB	0006		
SPAC	1506	TRYTIM	1000	XLDAD	0053		
SPACE	4431	TSAVE1	3045	XLDCA	0052		
SPBLK	0164	TSAVE2	3046	XLDCM	0051		
SPFLD	0160	TSAVE3	3047	XOCT1	0032		
SPSEC	0163	TSAVE4	3050	XOCT4	0033		
SPTRK1	0161	TSAVE5	3051	XPRINT	0045		
SPTRK2	0162	TSTCHA	0715	XPRN	0055		
STAPOT	0153	TYLPT	1121	XRDST	0047		
STATER	2337	TYPDAT	3142	XREG	1372		
STATRY	0137	TYPE	0445	XHESTR	0043		
STATUS	2313	UPAROW	0615	XRNDDM	0040		
STFLD	2703	UPDATE	0114	XRNHMD	0027		
STGEN	1753	UPONL	1414	XRSRAN	0042		
STPHLT	0603	UPTRY	1120	XSDKP	0050		
STRAUT	1325	WAIT	2000	XSPAC	0031		
STRBUF	3600	WAIT1	2026	XSTFLD	0035		
STREG	0121	WAREG	0132	XSTGEN	0034		
STRREL	1151	WASRD	2264	XTABLA	0457		
STRTEX	0224	WATME3	0651	XTABLB	0400		
STRWRK	2241	WCREG	0127	XTEAT	0172		
SVLNK	0167	WRDCHK	1612	XWAIT	0044		
SMDAT	2601	WRKDDN	2274	YESNU	4437		
SWR	0020	XC8CKP	1041				
TABLA	0461	XC8CNT	0400				

ERRURS DETECTED: 0

LINKS GENERATED: 163

RUN-TIME: 6 SECONDS

3K CORE USED