

IDENTIFICATION

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PRODUCT NAME: RK8E/RK8L DATA RELIABILITY PROGRAM
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1.

ABSTRACT

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 3×10^9 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 8 CONTAINS REVISION LEVEL (IN ASCII) OF PROGRAM ON PROGRAM LOAD).

2.

RESTRICTIONS

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

THE PROGRAM OCCUPIES OR UTILIZES LOCATION 8000 TO LOCATION 7577 OF FIELD 8. 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⁽⁹⁾ 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-COMPLETEN" 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 THROUGH OUT THIS DOCUMENTATION IS KEY CLEAR AND THEN KEY CONTINUE ON PDP8/E, PDP8/M, AND PDP8/F COMPUTERS.
- B. LOAD THE PROGRAM INTO MEMORY FIELD 0 USING THE STANDARD BINARY LOADER TECHNIQUE.
- C. IF IT IS DESIRED TO CHANGE THE IOT CODES WITHIN THE PROGRAM, FOLLOW THE PROCEDURE IN SECTION 4.6.
- 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

RK05E/RK05L 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 SWRS=1 IF IT IS DESIRED TO HAVE THE PROGRAM AUTOMATICALLY DISCONNECT EACH DISK DRIVE AS EACH MAKE THEIR PASS COMPLETION. (NOTE: IF SWRS=0, ALL DISK DRIVES WILL CONTINUE TO RUN AFTER THEIR PASS COMPLETION)
- G. THE TTY WILL PRINT THE FOLLOWING PROGRAM NAME AND QUESTION.

RK05E/RK05L 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

RK0E/RK0L 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 OCCURRES THE PROGRAM WILL REPORT THE ERROR AS A READ STATUS ERROR. THE PROGRAM WILL THEN CHECK THE DATA READ FOR DATA ERRORS. IF DATA ERRORS EXIST THEY WILL BE REPORTED AS DISK DATA ERRORS.

5.2 ERROR HALTS -----

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

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 ENRROR
READ STATUS ENRROR
DISK DATA ENRROR
RECALIBRATE STATUS ENRROR

AFTER THE "ERROR HEADEN" MENTIUNED 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 ADURESS 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 UF DATA BREAK IN COMPUTEN.
DG: EXPECTED DATA
DB: DATA FOUND DURING DATA BREAK.

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!

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 10(9) BITS>

IF SWR5=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 SWR5=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 SWR5=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
PC12371 ST14010 EX10001 CM14000 IA10001 DA10002
CA13600 WC17000 FW10000

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:12076 ST:14002 EX:10001 CM:13000 DA:14007

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:11674 ST:14010 EX:10001 CM:11432 IA:11035 DA:11021
CA:10001 WC:15000 FW:17400
AS:10015 WA:10007 AD:10010 DG:10537 DB:10536
AS:10015 WA:10077 AD:10100 DG:17777 DB:17776
AS:10016 WA:10002 AD:10403 DG:16167 DB:16166

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 RK0L.
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 DSKP	"SKIP" SKIP IF TRANSFER DONE FLAG OR ERROR FLAG IS SET.
6742 DCLR	"CLEAR" FUNCTION IS REGULATED BY AC BITS 10 AND 11. THE AC IS THEN CLEARED.
AC10 AC11 -----	
0 0	CLEAR THE AC AND STATUS REGISTER.
0 1	CLEAR THE AC, CONTROL, AND MAJOR REGISTERS. THIS INSTRUCTION WILL STOP THE CONTROL EVEN IF IT IS WRITING A HEADER. THIS IS THE ONLY INSTRUCTION THAT CLEARS MAINTENANCE MODE.

1	0	CLEAR AC, RECALIBRATE DISK DRIVE, AND CLEAR STATUS REGISTER.
6743	DLAG	"LOAD DISK ADDRESS AND GO" LOAD THE DISK CYLINDER, SURFACE, AND SECTOR FROM THE AC, CLEAR THE AC, AND DO THE COMMAND IN THE COMMAND REGISTER.
AC	--	
0-6		CYLINDER
7		SURFACE (1=UPPER) (0=LOWER)
8-11		SECTOR
6744	DLCA	"LOAD CURRENT ADDRESS" LOAD THE CURRENT ADDRESS FROM AC. THE AC IS THEN CLEARED.
AC	--	
0-11		CURRENT ADDRESS
6745	DRST	"READ STATUS" CLEAR THE AC AND READ THE CONTENTS OF THE STATUS REGISTER INTO THE AC.
AC	--	
0		TRANSFER DONE
1		READY TO SEEK, READ, OR WRITE.
2		NOT USED
3		SEEK FAIL
4		DISK 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 128 WORDS
6	EXTENDED MEMORY ADDRESS
7	EXTENDED MEMORY ADDRESS
8	EXTENDED MEMORY ADDRESS
9	UNIT SELECT
10	UNIT SELECT
11	EXTENDED CYLINDER ADDRESS

6747 DMAN

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

9.1. 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 LOCATIONS 20 21 22 FOR THE
FOLLOWING PURPOSES.

LOCATION 20
PSEUDO SWITCH REGISTER

LOCATION 21
HARDWARE IDENTIFIER 1

LOCATION 22

HARDWARE IDENTIFIER 2

LOCATION 0021

BIT ---	OCTAL VALUE -----	FUNCTION WHEN 0 -----	FUNCTION WHEN 1 -----
0	4000	USE PSEUDO SWITCHES	USE HARDWARE SWITCHES
1	2000	NO OPTION 1	HAS OPTION 1
2	1000	NO OPTION 2	HAS OPTION 2
3	400	NO 8A SIMULATOR	HAS 8A SIMULATOR
4	200	NO OPTION SIMULATOR	HAS OPTION SIMULATOR
5	100	NOT ON 8A XOR	ON 8A XOR
6	40	NOT PDP8-E TYPE CPU	PDP8-E TYPE CPU

7-11

8A MEMORY SIZE EX. 1K=00
2K=01
7K=06

32K=31

LOCATION 0022

BIT ---	OCTAL VALUE -----	FUNCTION WHEN 0 -----	FUNCTION WHEN 1 -----
0	4000	NOT ON ACT8A LINE	ON ACT 8A LINE
1	2000	NOT ON ACT 8E LINE	ON ACT 8E LINE
2	1000	NOT YET DEFINED	
3	400	DEACTIVE CONSOLE PACKAGE	ACTIVE CONSOLE PACKAGE

9.11

LOCATION CHANGES -----

THE FOLLOWING FIELD 1 LOCATIONS CAN BE CHANGED TO MEET THE SPECIFIC NEED FOR MODIFICATION OF THE DIAGNOSTIC.

0246

IS THE LOCATION FOR THE VALUE OF THE NUMBER OF PROGRAM PASSES NEED TO PRINT THE END OF PASS MESSAGE.

1037

IS THE LOCATION SET FOR THE NUMBER OF FILLER CHARACTERS AFTER A CRLF SET TO FOUR (4)

10.

APT-8 HOOKS -----

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 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=08-DHRKC=H
/
/MAINDEC=08-DHRKC=H=L
/
/COPYRIGHT 1972,1975,1976,1977 DIGITAL EQUIP. CORP.
/MAYNARD, MASS. 01754
0001      FIELD 1
/
/CONSOL SRC=V2=RS= 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 DETERMINDS 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=0.
/IN COMBINING THE CONSOL PACKAGE TO A DIAGNOSTIC.
/THE CALL TABLE IS TO BE AT THE BEGINNING OF A PROGRAM.

```

```

0000      CONSOL=0
0001      P8KF= 0001
0002      PCLF= 0002
0003      P8KE= 0003
0004      P8TB= 0004
0005      P8IE= 0005
0006      GTF= 0006
0007      ACL= 0007
0008      CAF= 0008
0009      HQL= 0009
0010      HQA= 0010
0020      /
0020      *20
0021      /
0020      F10P2, 0
0021      F10P1, 0000

```

```

0022      0000      F10P2, 0
0023      /
0024      *24

0024      4424      C8PASS= JMS I .
0025      0200      XC8PAS . /C8 PASS COMPLETION ROUTINE
0026      4425      C8CKSW= JMS I .
0027      0202      XC8SW . /CHECK SW REG SETTING
0028      4426      C8TTYI= JMS I .
0029      0272      XC8TTY . /FETCH CONSOL CHAR
0030      4427      C8CNTR= JMS I .
0031      0400      XC8CNT . /CHECK FOR CONTROL CHAR
0032      4430      C8PRNT= JMS I .
0033      0303      XC8PNT . /C8 PRINT A BUFFER
0034      4431      C8SWIT= JMS I .
0035      0656      XC8PSW . /SET UP PSEUDO SW, REG
0036      4432      C8OCTA= JMS I .
0037      1000      XC8OCT . /CONVERT TO ASCII AND PRINT
0038      4433      C8CRLF= JMS I .
0039      1023      XC8CRL . /DO A CARRIAGE RETURN LINE FEED
0040      4434      C8ECHO= JMS I .
0041      1063      XC8ECH . /CHECK INPUT CHAR
0042      4435      C8TYPE= JMS I .
0043      1077      XC8TYP . /C8 PRINT ONE CHAR
0044      4436      C8ERR= JMS I .
0045      1207      XC8ERR . /C8 ERROR HANDLER
0046      4437      C8INQU= JMS I .
0047      0655      XC8INQ . /LOOK FOR OPERATOR INTERVENTION
0048      4440      C8CKPA= JMS I .
0049      1041      XC8CKP . /CHECK IF CONTROL CHAR
0050      4441      C8PAUS= JMS I .
0051      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      /
0200      *200
0201      /
0202      /*****
0203      /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 CPASS TO BE IN THE 1 TO 4 MINUTE
/RANGE
/
  C0PASS=JMS  XC0PAS
/EX. OF CALL  C0PASS
/
  JMP  START1      /HALT IF NON CONSOL PACKAGE
                  /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  XC0CNLF
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  XC0CNLF /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 01 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
0234 7640  SZA CLA  /CHECK IF SET UP NEEDED
                  /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  CHA
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  TAD  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.

```

/*****

/C0TTYI

```

/THIS ROUTINE WILL LOOK FOR A INPUT FROM THE TERMINAL
/AND REMOVE ANY PARITY BITS, THEN MAKE IT 0 BIT ASCII.

```

```

/C0TTYI= JMS XC0TTYI
/EX. JMS XC0TTYI /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, CHAACHTERS 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 SNA /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 SNA /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 /STORE FOR C6PRNT BUFFER

```

/*****

/C6PAUS

/THIS ROUTINE WILL CHECK IF THE CONSOLE PACKAGE IS ACTIVE, IF ACTIVE
/IT WILL RETURN TO CALL PLUS ONE AC= 0, AND DO THAT INSTRUCTION.
/IF THE CONSOLE 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 CONSOLE IF NOT HALT HERE
/ ANYTHING /RETURN HERE IF ON ACTIVE CONSOLE
/

```

/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 CONSOLE PART RETURN CALL+1
0343 7040 CMA /DEACTIVE CONSOLE 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 HLT 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 0035
0373 1000
0374 1023
0375 0400
0376 0624
0377 1200
0400

PAGE

/*****

/C8CNTM

/THIS ROUTINE WILL CHECK FOR THE PRESENCE OF CONTROL CHARACTERS

/IT WILL CHECK FOR THE FOLLOWING CHAN C-R-U-L-S

/ C8CNTM= JMS XC8CNT

/EX.

JMS XC8CNT

/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

/CONTRL CHAR., THIS WILL PRINT THE CHARACTER AND A ?

/CLEAR THE AC AND RETURN CALL+2.

/CALLS USED ARE=CHKCLA=XC8TYPE=XC8CLRF=C8GET=UPARON=XC8TYI=XC8PSW=

/

/

0400 0000

XC8CNT, 0

0401 3777

DCA AC8AVE

/SAVE THE AC

0402 4776

JMS CHKCLA

/CHECK LOC.22 BITS FOR CONSOLE BIT

0403 5206

JMP ,+3

/ON ACTIVE CONSOLE

0404 1777

TAD AC8AVE

/DEACTIVE CONSOLEGET AC FOR RETURN

0405 5600

JMP I XC8CNT

/EXIT NOT ON ACTIVE CONSOLE

0406 6804

GTF

0407 3775

DCA FL8AVE

0410 7501

MOA

0411 3774

DCA MO8AVE

/SAVE THE MO

0412 3255

DCA INDEXA

/SET DISPLACEMENT INTO TABLE 0

0413 1257

TAD XTABLA

/GET ADDR0 OF TABLE A

0414 3256

DCA GETDAT

/CONTAINS POINTER TO CONTROL CHAR

0415 1656

REDOA, TAD I

GETDAT

/GET CONTROL 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 CHAN 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 REDO

0424 2256

GETDAT

/BUMP INDEX FOR EXIT WHEN CONTROL FOUND

0425 5215

JMP REDOA

/BUMP GETDAT FOR COMPARE OF NEXT CNTRL CHAR.

0426 1772

DONEA, TAD

INMODE

/CHECK IF PROGRAM EXPECTS CHAR

0427 7648

SZA CLA

/1=CHAN EXPECTED 0= NO CHAR EXPECTED

0430 5240

JMP EXITA

/CHAN EXPECTED

0431 1773

TAD C8CHAR

/GET CHAR= NOT CONTROL+ NOT EXPECTED

0432 4771

JMS XC8TYPE

/C8PKNT CHAR

0433 1370

TAD (277

/GET CODE FOR "7"

0434 4771

JMS XC8TYPE

0435 4767

JMS XC8CLRF

0436 2200

ISZ XC8CNT

/BUMP RETURN

0437 5600

JMP I XC8CNT

/EXIT CALL+2

0440 2200

EXITA, ISZ

XC8CNT

/BUMP RETURN FOR MAIN PROGRAM CHECK OF CHAR

0441 1773

TAD C8CHAR

/PUT CHAR IN AC.

0442 5600

JMP I XC8CNT

/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 CORRECT CHAR

0446 1260

TAD XTABLB

/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 STARTING ADDRESS

0452 3254

DCA GOTOA

/STORE IT IN HERE

0453 5654

JMP I GOTOA

/GOTO CONTROL CHAR ROUTINE

0454 0000

GOTOA, 0000

0000

/ADD OF CNTRL ROUTINE TO EXECUTE

0455 0000

INDEXA, 0000

0000

/DISPLACEMENT INTO CNTRL TABLE

0456 0000

GETDAT, 0000

0000

/LOCATION OF ADDR0 OF CONTROL CHAR.

0457 0461

XTABLA, TABLA

0000

/ADDR0 OF TABLEA

0460 0471

XTABLB, TABLB

0000

/ADDR0 OF TABLEB

0461 7575

TABLA, 7575

0000

/CNTRL C BACK TO MONITOR 203

0462 7564

7564

/CNTRL L SWITCH ERROR PRINTING DEVICE 214

0463 7557

7557

/CNTRL Q START DISPLAYING CHAR, AGAIN 221

0464 7556

7556

/CNTRL R BACK TO BEGINNING OF PROGRAM 222

0465 7555

7555

/CNTRL S STOP SENDING CHAR TO DISPLAY WAIT FOR CNTRL Q 223

0466 7573

7573

/CNTRL E CONTINUE WITH PROGRAM 203

0467 7574

7574

/CNTRL D CHANGE SWITCH REGISTER ON FLY

0470 0000

0000

0471 0551

TABLB, CNTRL0

0000

0472 0537

CNTRL1

0473 0500

CNTRL2

0474 0511

CNTRL3

0475 0521

CNTRL4

0476 0545

CNTRL5

0477 0600

CNTRL6

/

/CNTRL Q

/START SENDING CHAN. 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 CHAN

0501 1335

TAD C8SETS

/CHECK IF CONTROL S TYPED IN

0502 7640

SZA CLA

0503 5306

JMP BYMETR

/CNTRL S TYPED IN

0504 4765

JMS C8GET

/NO CNTRL S TYPED PREVIOUSLY

0505 5600

JMP I XC8CNTM

/LEAVE VIA CNTR ENTRY ADDRESS

0506 3335

BYMETR, DCA

C8SETS

/CLEAR THE SUFT FLAG

0507 4765

JMS C8GET

/RESTORE REGISTERS

0510 5736

JMP I C8METH

/EXIT TO ADDRESS SET BY CONTROL S

```

/
/CONTROL R
/GO TO THE QUESTION C8SWIT
0511 3764' CNTRLR, DCA TTYLPT /CLEAR THE TYPE FLAG SET TO TTY
0512 3335 DCA C8SETS /CLEAR SOFT FLAG FOR CNTRL S
0513 3772' DCA INMODE
0514 4763' JMS UPAROW /PRINT THE " AND C8CHAN
0515 3762' C8BY4, DCA C8SWST /CLEAR FLAG FOR CNTRL D OR R
0516 6203 CIP CDP 0
0517 5720 JMP I XDUSW /GO TO ADDRS OF C8SWIT
0520 0200 XDUSW, BGN /DOSW IS LABEL FOR C8SWIT QUESTION
/
/CONTROL S
/STOP SENDING CHAR. TO DISPLAY UNTIL A "Q IS RECEIVED
/
0521 1335 CNTRL3, TAD C8SETS /IF1 DO NOT STORE IN C8RETR
0522 7640 SZA CLA
0523 5327 JMP C8D07 /DONT SET UP C8RETR
0524 7001 IAC /MAKE RETURN CALL PLUS 2
0525 1200 TAD XC8CNT /GET RETURN FOR THIS CALL
0526 3336 DCA C8RETR /STORE IT HERE FOR USE BE CNTRL Q
0527 2335 C8D07, ISZ C8SETS /SET FLAG TO SAVE CALL
0530 4761' JMS XC8TTYI /LOOK FOR THE INPUT
0531 4765' JMS C8GET /GET REGISTERS
0532 4200 JMS XC8CNTR /CHECK FOR THE CONTROL CHAR
0533 7200 CLA
0534 5321 JMP CNTRL3 /IF NOT A CNTRL Q R C REASK
0535 0000 C8SETS, 0
0536 0000 C8RETR, 0
/
/ SWITCH OUTPUT FROM ONE OUTPUT DEVICE TO ANOTHER- THE TWO OUTPUTS ARE THE
/ CONSOLE AND THE PRINTER WITH DEVICE CODE 06.
/
0537 1764' CNTRL3, TAD TTYLPT /GET PRESENT C8SWIT INDICATOR
0540 7000 CMA /COMPLEMENT IT
0541 3764' DCA TTYLPT /STORE NEW C8SWIT
0542 4763' JMS UPAROW /C8PNT " AND CHAR ON NEW DEVICE
0543 4765' JMS C8GET /RESTORE THE REGISTERS
0544 5000 JMP I XC8CNT /EXIT
/
/CONTROL E
/CONTINUE RUNNING FROM A INQUIRE OR ERROR
/
0545 4763' CNTRL3, JMS UPAROW /PRINT THE CONTROL CHAR
0546 3762' DCA C8SWST /CLEAR ENTRY FLAG.
0547 4765' JMS C8GET /GET THE REGISTERS
0550 5000 JMP I XC8CNT /RETURN TO CALL PLUS ONE
/
/CONTROL C

```

```

/RETURN TO MONITOR CONTROL C
0551 3764' CNTRL3, DCA TTYLPT /CLEAR THE LPT FLAG TO PRINT ON DISPLAY
0552 3762' DCA C8SWST /CLEAR ENTRY FLAG.
0553 4763' JMS UPAROW /C8PNT " AND LETTER IN CHAR
0554 6203 CIP CDP 0 /GO TO 0 FLD
0555 6007 CAF /CLEAR THE WORLD
0556 5760 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
/
/CONTROL D
/CHANGE THE SWITCH REGISTER ANYTIME CNTRL D AND RETURN TO
/ THE PROGRAM RUNNING.
/
0600 4215 CNTRLD, JMS UPAROW
0601 1213 TAD C8SETD /CHECK IF THE RETURN ADDRS IS SAFE
0602 7640 SZA CLA
0603 5207 JMP C8D011 /DO NOT CHANGE THE RETURN ADDRS
0604 1777' TAD XC8CNT /GET THE RETURN ADDRS AND SAVE IT
0605 3214 DCA C8RETR /SAVE THE RETURN HERE
0606 2213 ISZ C8SETD /INDICATE RETURN SAVED DONT DESTROY
0607 4256 C8D011, JMS XC8PSW /GO CHANGE THE SWITCH REGISTER
0610 3213 DCA C8SETD /CLEAR THE FLAG
0611 4224 JMS C8GET /RESTORE THE AC MU LINK ETC
0612 5614 JMP I C8RETR /RETURN TO THE PROGRAM
/
0613 0000 C8SETD, 0
0614 0000 C8RETR, 0
/
/THIS WILL TYPE A UP ARROW AND THE CHAN IN C8CHAN.
0615 0000 UPAROW, 0 /C8PNT THE " AND THE CHAR C8TYPED IN

```

```
0616 1376      TAD      (336      /CODE FOR "
0617 4775'     JMS      XC8TYPE
0620 1774'     TAD      C8CHAR      /C8TYPE THE CHAR
0621 4775'     JMS      XC8TYPE
0622 4773'     JMP      XC8CRLF
0623 3615      JMP I    UPAROW      /EXIT
```

/

```

0624 0000   COGET, 0
0625 7200   CLA
0626 1772*   TAD      MSGSAVE
0627 7421   MQL      /RESTORE MQ
0630 1771*   TAD      FLSAVE
0631 7804   RAL      /RESTORE THE LINK
0632 7200   CLA
0633 1770*   TAD      ACBSAVE /RESTORE THE AC
0634 5624   JMP I     COGET  /GET THE REGISTER

```

/***** *****/

```

/CSINGU
/CSINGU ROUTINE WILL PRINT A WAITING
/AND THE PROGRAM IS EXPECTING A CONTROL CHAR INPUT
/IF CONTINUE FROM CONTROL CHAR RETURN IS CALL PLUS ONE
/IF NO CONTROL CHAR ENTERED THEN WAITING IS REPRINTED
/AND PROGRAM WAITS FOR A CONTROL CHAN AGAIN.

/      CSINGU =      JMS XC*CSING

/EX.      JMS      XC*CSING      /CS WILL PRINT A WAITINGAND WAIT FOR INPUT
DO ANYTHING      /RETURN IS CALL PLUS ONE AC *CS CONTINUE

/CALLS USED ARE=CHKCLA=XC*CPNT=XC*TYI=CS*GET=XC*CNTR=

```

```

0635 0000      XCQING, 0
0636 7300      CLA CLL
0637 4767*     JMS      CHKCLA      /CHECK LOC 22 BIT 3 CONSOLE BIT
0640 7410      SKP      /ACTIVE CONSOLE PACKAGE
0641 5635      JMP I     XCQING      /NOT CONSOLE LEAVE
0642 4766*     JMS      XCQINT
0643 0651      WATMES      /INQUIRY WAITING
0644 4765*     JMS      XCGETYI     /GET CHARACTER
0645 4224      JMS      CGET
0646 4777*     JMS      XCQCNTR     /CHECK IF CONTROL CHARACTER
0647 5635      JMP I     XCQING      /EXIT AND CONTINUE
0650 5236      JMP      XCQING+1    /REASK
0651 2701      WATMES, TEXT "WAITING "
0652 1124
0653 1114

```

0654	0740
0655	0800

/ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 10

/CS8WIT

```

/ROUTINE WILL CHECK IF CONSOL IS ACTIVE IF IT IS ACTIVE DISPLAY
/8W QUESTION . IN NOT ACTIVE IT WILL NOT PRINT THE SW QUESTION BUT
/RETURN TO CALL PLUS ONE AC=0.
/CSSWIT WILL SET UP THE PSEUDO SWITCH
/REGISTER WITH THE NEW DATA ENTERED

```

CB8WIT - JMS XC6P5W

```

/EX,          JMS      XC8PSW          /SET UP PSEUDO COSMIT REGISTER IF
                                         /ON THE CONSOL PACKAGE, RETURN IS CALL PLUS ONE AC = 8

```

/CALLS USED ARE-CHKCLA-XCOPSN-XCOPNT-XCBOCTA-XCOSTYPE-

```

0056 0000      XC0PSW, 0
0057 4767*    JMS      CNKCLA      /CHECK LOC 22 BIT 3 CONSOLE BIT
0060 7410      SKP      /ACTIVE CONSOLE
0061 5656      JMP I    XC0PSW     /DEACTIVE CONSOLE PACKAGE
                                      /RETURN WITHOUT ASKING PSEUDO SWITCH
0062 1345      TAD      C0SWST     /IS THE SOFT FLAG SET FOR SWITCH?
0063 7640      SZA CLA      /SKIP IF ONE ENTRY AT ATIME OK
0064 5764*    JMP      C0BY4     /SECOND ENTRY WITH OUT A EXIT GO TO SW QUESTION
0065 2345      ISZ      C0SWST     /FIRST ENTRY SET FLAG
0066 4766*    C0KOPS, JMS      XC0PNT /C0PNT SW
0067 0747      MESA
0070 1020      TAD      Z0
0071 4763*    JMS      XC0OCTA     /GET CONTENTS OF SW
0072 1362      TAD      (40
0073 4775*    JMS      XC0TYPE     /CONVERT IT TO ASCII
0074 2761*    ISZ      INMODE     /GET SPACE
0075 4760*    JMS      XC0ECHO     /SET FLAG FOR CHAR EXECTED
0076 4315      JMS      TSTCHA     /LOOK FOR INPUT
0077 1774*    TAD      C0CHAR     /NOT CONTROL TEST IT IS LEGAL
0780 3020      DCA      Z0        /STORE NEW CHAR IN SW REG

0701 1357      TAD      (=-3
0702 3346      DCA      T0PCNT     /GET A MINUS 3
0703 4760*    JMS      XC0ECHO     /STORE IN TEMP COUNT
0704 4315      JMS      TSTCHA     /GET NEXT CHAR
0705 1020      TAD      Z0        /CHECK IF CR+ GOOD CHAN
0706 7106      RTL CLL           /GET C0SWIT REGISTER
0707 7004      RAL              /ROTATE IT LEFT 3 PLACES
0710 1774*    TAD      C0CHAR     /GET CHAR+ ADD IT TO PREVIOUS CONTENTS
0711 3020      DCA      Z0        /SAVE NEW CONTENTS
0712 2346      ISZ      T0PCNT     /BUMP COUNT
0713 5303      JMP      GETCH1     /JMP BACK+ GET NEXT CHAR
0714 5342      JMP      ENDIT      /END 4 CHAN CATTYPED IN

```

```

0715 0000 TSTCHA, 0
0716 7041 CIA
0717 1356 TAD (215
0720 7650 SNA CLA
0721 5342 JMP ENDIT
0722 1774* TAD C0CHAR
0723 1355 TAD (-260
0724 7710 SPA CLA
0725 5336 JMP ERR1
0726 1774* TAD C0CHAR
0727 1354 TAD (-270
0730 7700 SNA CLA
0731 5336 JMP ERR1
0732 1774* TAD C0CHAR
0733 0353 AND (7
0734 3774* DCA C0CHAR

0735 5715 JMP I TSTCHA
0736 1352 ERN1, TAD (277
0737 4775* JMS XC0TYPE
0740 4773* JMS XC0CRLF
0741 5266 JMP C0RDP3
0742 4773* ENDIT, JMS XC0CRLF
0743 3345 DCA C0HST
0744 5656 JMP I XC0PSW
0745 0000 C0HST, 0

0746 0000 TMPCNT, 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

```

```

1000 PAGE
/CO0CTA

/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
/ C00CTA= JMS XC0CT
/
/EX. JMS XC00CTA /AC CONTAINS NUMBER TO BE CHANGE
/ RETURN IS TO CALL PLUS ONE AC=0
/
/CALLS USED ARE=XC0TYPE=

1000 0000 XC0CT, 0
1001 7106 CLL RTL
1002 7006 RTL
1003 3221 DCA C0TMP1
1004 1377 TAD (-4
1005 3222 DCA C0CKP
1006 1221 C0D04, TAD C0TMP1
1007 0376 AND (0007
1008 1375 TAD (260
1009 4277 JMS XC0TYPE
1010 1221 TAD C0TMP1
1011 7006 RTL
1012 7004 RAL
1013 3221 DCA C0TMP1
1014 2222 ISZ C0CKP
1015 5206 JMP C0D04
1016 5600 JMP I XC0CT
1017 0000 C0TMP1, 0
1018 0000 C0CKP, 0

/*****
/C0CRLF
/C0TYPE CR AND LF WITH FILLERS FOLLOWING EACH LF AND CR
/
/ C0CRLF= JMS XC0CRL
/EX. JMS XC0CRLF /C0PHNT A CR AND LF WITH FILL
/ /RETURN TO CALL PLUS ONE AC =0
/CALLS USED ARE=XC0TYPE=

1023 0000 XC0CRLF, 0
1024 7500 CLA CLL
1025 1374 TAD (215
1026 4277 JMS XC0TYPE
1027 1237 TAD FILLER
1028 7040 DCA FILCNT
1029 3240 DCA FILCNT

```

```

1032 1373      TAD      (212      /GET CODE FOR LF
1033 4277      JMS      XCSTYPE
1034 2240      C000R,   ISZ      FILCNT /CHECK ON FILLER CHAR
1035 5233      JMP      C0002      /TYPE A NON PRINTING CHAR
1036 5623      JMP I    XC0CRL      /EXIT
1037 0004      FILLER, 0004      /FILLER SET FOR 4 CHAR
1040 0000      FILCNT, 0      /COUNTER FOR FILL

```

```

//*****
/C0CKPA
/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 "P" 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.

```

```

/      C0CKPA= JMS      XC0CKP

```

```

/EX.      JMS      XC0CKPA      /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=XC0TTYI-XC0CNTR-C0GET=

```

```

1041 0000      XC0CKP, 0
1042 3772      DCA      AC0AVE      /SAVE THE AC
1043 6004      GTF      /SAVE THE FLAGS
1044 3771      DCA      FL0AVE      /SAVE THE FLAGS
1045 7501      MQA      /PUT MQ IN AC
1046 3770      DCA      MQ0AVE      /SAVE THE MQ
1047 6031      K&F      /CHECK THE KEYBOARD FLAG
1050 5201      JMP      C0BY3      /EXIT TO CALL PLUS 1
1051 4767      JMS      CMKCLA      /CHECK LOC 22 BIT 3 CONSOLE BIT
1052 7410      SKP      /ACTIVE CONSOLE PACKAGE
1053 5201      JMP      C0BY3      /EXIT TO CALL PLUS 1
1054 4766      JMS      XC0TTYI      /GET THE CHAR
1055 4765      JMS      C0GET      /GET THE FLAGS
1056 4764      JMS      XC0CNTR      /CHECK IF CONTROL CHAR.
1057 7000      NOP      /RETURN IF A CONTINUE CHAR.
1060 2241      ISZ      XC0CKP      /BUMP RETURN FOR CALL PLUS 2
1061 4765      JMS      C0GET      /GET REGISTERS
1062 5041      JMP I    XC0CKP      /SAY GOOD BY

```

```

//*****

```

```

/C0ECHO
/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

```

```

/      C0ECHO =      JMS XC0ECH
/EX.      JMS      XC0ECHO      /LOOK FOR CONSOLE CHAR & PRINT IT
/      /RETURN CALL PLUS ONE AC = CHAR C0TYPED IN

```

```

/CALLS USED ARE=XC0TTYI-XC0CNTR-C0GET-XC0ECH-XC0TYPE

```

```

1063 0000      /XC0ECH, 0
1064 4766      JMS      XC0TTYI      /WAIT FOR CHAR FROM KEYBOARD
1065 4765      JMS      C0GET      /RESTORE THE REGISTERS
1066 2276      ISZ      INMODE      /SET INMODE IDENTIFYING THIS AS A EXPECTED CHAR
1067 4764      JMS      XC0CNTR      /GO CHECK IF IT IS A CONTROL CHAR
1070 5663      JMP I    XC0ECH      /WAS A CONTROL CHAR- CONTINUE RUNNING
1071 4277      JMS      XC0TYPE      /NOT A CONTROL CHAR- C0PRINT IT
1072 3276      DCA      INMODE      /CLEAR FLAG THAT CHAR EXPECTED
1073 1275      TAD      C0CHAR      /SET CHAR IN AC
1074 5663      JMP I    XC0ECH      /EXIT
1075 0000      C0CHAR, 0
1076 0000      INMODE, 0

```

```

//*****

```

```

/C0TYPE
/THIS ROUTINE WILL C0PRINT ON THE CONSOLE OR THE LPT WITH DEVICE CODE 66.
/

```

```

/      C0TYPE= JMS XC0TYP

```

```

/EX.      JMS      XC0TYPE      /C0PRINT THE CHAR IN THE AC.
/      /RETURN CALL PLUS ONE AC =0000
/      /DO NOT CLEAN THE LINK IN THIS ROUTINE NEEDED BYC0CT

```

```

/CALLS USED ARE=C0MANG-XC0CNTR-XC0PNT-XC0CHLP-XC0INGU=

```

```

1077 0000      XC0TYP, 0
1080 3320      DCA      PNTBUF      /STORE CHAN
1081 1321      TAD      TTYLPT      /CHECK 0TTY 7777=LPT
1082 7640      SZA      CLA
1083 5312      JMP      XDULPT      /DO OUT PUT ON LPT
1084 1320      TAD      PNTBUF
1085 6046      TLS
1086 6041      TSF
1087 5306      JMP      =-1
1088 0042      TCF
1089 5316      JMP      C0BY5
1090 1320      XDULPT, TAD      PNTBUF      /GET CHAN
1091 6666      PSTB      PCLF      /C0PRINT IT
1092 4322      JMS      C0MANG      /CHECK KEYBOARD IF HUNG
1093 6662      PCLF
1094 7600      C0BY5, 7600      /CLEAR THE FLAG
/      /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 /
1125 3320      OCA          PNTBUF /GET CONSTANT 7600
1126 6661      PSKF          /PNTBUF IS NOW A COUNTER
1127 7410      SKP          /SKIP ON PRINTER DONE
1130 5722      JMP I  C0HANG      /NOT DONE YET
1131 2345      ISZ          C0CONT /SAW FLAG DONE
1132 5326      JMP          C0CONT /FIRST COUNTER FAST ONE
1133 2320      ISZ          PNTBUF /CHECK IF FLAG SET YET
1134 5331      JMP          C0CONT /MADE 4096 COUNTS ON FAST COUNTER
1135 1764      TAD          XC0CNTR /KEEP IT UP FOR 5 SEC
1136 3322      OCA          C0HANG /GET THE RETURN ADDRESS IN CONTROL
1137 3321      OCA          TTYLPT /SAVE IT IN MANG
1140 4763      JMS          XC0PNT /ALLOW PRINTING ON TTY
1141 1146      MESMANU
1142 4223      JMS          XC0CRLF /LPT ERROR
1143 4762      JMS          XC0INQU /PRINT WAITING
1144 5722      JMP I  C0HANG      /CONTINUE TO SAVE ADDRESS
1145 0000      C0CONT, 0
1146 1420      MESMANU,TEXT      "LPT ERROR" /COUNTER FOR TIMER
1147 2440
1150 0522
1151 2217
1152 2200

```

```

1162 0635
1163 0303
1164 0400
1165 0624
1166 0272
1167 1200
1170 1346
1171 1347
1172 1345
1173 0212
1174 0215
1175 0260
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      /GET THE CONTENTA OF LOCATION 22
1203 0377      AND          (400)  /MASK FOR BIT 3 (400)
1204 7650      SNA CLA
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)

```

/CBERR

```

/THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A CBERR IS ENCOUNTERED
/WILL CHECK IF CLASSIC SYSTEM, WILL CHECK C0SWIT REGISTERS.
/ CBERR= JMS XC0ERR
/EX. JMS XC0ERR
/

```

```

/GO TO CBERR CALL IF NOT CONSOLE
/RETURN IS CALL PLUS ONE AC =0000

```

/CALLS USED ARE-CHKCLA=XC0CRLF=XC0SW=XC0INQU=XC0PNT=XC0OCTA=

```

1207 0000      XC0ERR, 0
1210 6002      IOF
1211 3345      OCA          ACSAVE /SAVE AC
1212 6004      GTF
1213 3347      OCA          FLSAVE /SAVE THE FLAGS
1214 7501      MOA
1215 3346      OCA          M0SAVE /SAVE THE M0
1216 7340      CLA CLL CMA      /SUBTRACT A 1 FOR TRUE LOCATION
1217 1207      TAD          XC0ERR /GET RETURN LOCATION
1220 3344      OCA          PCSAVE /SAVE ADD OF CBERR 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          /ACTIVE CONSOLE PACKAGE
1230 5270      JMP          NTCLAS /NOT CLASSIC SYSTEM
1231 4775      JMS          C0GET  /GET REGISTERS.
1232 4774      JMS          XC0SW  /CHECK SWITCH REG FOR BIT THAT INDICATES
                                      /NO ERROR MESSAGE
1233 0373      SETUP1, AND      (0000 /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*     C8DO10, JMS      C8GET
1263 4774*     JMS      XC8SW
1264 7610      SKP CL A
1265 5300      JMP      C8BY2
1266 4767*     JMS      XC8INQ
1267 5300      JMP      C8BY2
1270 4775*     NTCLAS, JMS      C8GET
1271 4774*     JMS      XC8SW
1272 7610      SKP CL A
1273 5607      JMP I      XC8ERR
1274 1366      TAD      (7402)
1275 3744      DCA I      PC8AVE
1276 4775*     JMS      C8GET
1277 5744      JMP I      PC8AVE
1280 4775*     C8BY2, JMS      C8GET
1281 5607      JMP I      XC8ERR
1282 7402      /
1283 7000      /ROUTN, HLT
1284 3317      NOP
1285 6201      DCA      MYAC
1286 1020      CDF      0
1287 3765      TAD      SWR
1288 1776      DCA I      (SWR)
1289 3315      TAD I      (CLASIK)
1290 1317      DCA      CLRTRN
1291 6202      TAD      MYAC
1292 5715      CIF      0
1293 5715      JMP I      CLRTRN
1294 0000      /
1295 0000      CLTRN, 0
1296 0000      REALPC, 0
1297 0000      MYAC, 0
1298 0410      /
1299 2213      ERKME8, TEXT      "DMRKC8 FAILED "
1300 0310
1301 4040
1302 0001
1303 1114
1304 0504
1305 4000
1306 4040      MESPC, TEXT      " PC:"

```

```

1331 2003
1332 7200
1333 4040      MESAC, TEXT      " AC:"
1334 0103
1335 7200
1336 4040      MESMQ, TEXT      " MQ:"
1337 1521
1338 7200
1339 4040      MESFL, TEXT      " FL:"
1340 0614
1341 7200
1342 7777      PC8AVE, 7777
1343 7777      AC8AVE, 7777
1344 7777      MQ8AVE, 7777
1345 7777      FL8AVE, 7777
1346 7777
1347 0020
1348 7402
1349 0635
1350 1000
1351 0303
1352 1023
1353 0000
1354 0262
1355 0624
1356 1514
1357 0400
1358 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	11000000	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 DL3C
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 NODSKS /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
/
1414 3136 BIG8TP /BUT WORD-BY-WORD COMPARE WORKED.
/STOP FOR ALL ERROR HALTS.
/
6740 DLSC=6740 /LOAD SECTOR COUNTER
6741 DSKP=6741 /SKIP UN 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 XRNDOO
4442 RESRAN=JMS I XRSRAN
4441 DISKGO=JMS I XDSKGO
4443 RECAL=JMS I XRESTR
4444 RECEIV=JMS I XWAIT
4446 ERROR=JMS I XERRD
4447 ROSTAT=JMS I XROST
4453 LDADD=JMS I XLDDAD
4450 DSKSKP=JMS I XSKKP

```

```

4451 LDCMD=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 XCMLF
4426 GENDAT=JMS I XGN DAT
4424 CMK22=JMS I XCHK22
4425 KTICK=JMS I XKTCK
/
0000 *0
/
0000 0310 310 /REVISION "H"; INTERRUPT SERVICE RETURN
0001 5001 5001 /DCA SAVAC SAVE AC AT INT.
0002 0002 0002 /RAL SHIPT 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, CLASIC
/
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 2156 KAERRD, AERROR
0024 0523 XCHK22, CHK22
0025 1154 XKTCK, KTICK
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 XD8K60, D8K60
0042 1761 XRSRAN, RSRAN
0043 3052 XRESTR, RESTOR
0044 2000 XWAIT, WAIT
0045 2620 XPINT, PRINT
0046 1200 XENRO, ENRO
0047 2541 XROST, ROST
0050 0751 XSUKP, SOKP
0051 0542 XLDCM, LDCM
0052 2530 XLDCA, LDCA
0053 2554 XLOAD, LOAD
0054 0560 XCLOM, CLOR
0055 1450 XPRN, PRN
0056 1426 XFRCT, FROCT
0057 1414 XCHLF, 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, CDF
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 OPNTAL, 0
0117 0000 BUFTAL, 0
0120 0000 PCNEG, 0
0121 0000 STNEG, 0
0122 0000 EXNEG, 0
0123 0000 CMNEG, 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 WAREG, 0
0133 0000 ADREG, 0
0134 0000 DGREG, 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 CLKCNT, -1
/
0151 0756 DATPOT, DAT1
0152 3522 TIMPOT, D0TM1
0153 3517 STAPOT, D0HRD=J
0154 3512 RUNPUT, D8K00
/
0155 0000 CRCENT, 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, BIGHLT
0200
/
/

```

```

/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 FLDHLT, JMS I BGHLT /WILL ONLY RUN IN FIELD 0777?
0207 1103 TAD KCDF
0210 3211 OCA ,+1
0211 7402 HLT /MAKE DF=IF
/
/SETUP INTERRUPT SERVICE!
/
0212 1362 TAD ACUCA /SETUP AC DCA
0213 3001 DCA 1
0214 1250 TAD KRUT /SETUP ROTATE LINK
0215 3002 DCA 2
0216 1301 TAD LNKDCA /SETUP SAVE LINK
0217 3003 DCA 3
0220 1360 TAD K5405 /SETUP JMP RETURN
0221 3004 DCA 4
0222 1363 TAD BRKRET
0223 3005 DCA 5 /RETURN POINTER
/
/CLEAR DATA INFORMATION TABLE
/AT END OF PROGRAM!
/
0224 1077 STNTEX, TAD K7700
0225 3111 DCA TRASH1 /CLEAR COUNTER
0226 1774' TAD KANJMS
0227 3773' DCA SWDAT /SET INSTRUCTION SWITCH
0230 7340 CLA CLL CMA
0231 1152 TAD TIMPOT
0232 3010 OCA AUTD10 /LOCATION POINTER
0233 3410 OCA I AUTD10 /CLEAR
0234 2111 ISZ TRASH1
0235 5233 JMP ,+2 /MORE 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 MES5

```

```

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 3060 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 /ADD IN DISK NUMBER
0273 4445 TYPE /TYPE DISK NUMBER
0274 1070 TAD K0277
0275 4445 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 2060 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 1060 TAD AMOUNT /GET AMOUNT FOUND
0311 7650 SNA CLA /WERE ANY FOUND
0312 5224 JMP STNTEX /OPERATOR ERROR NO DISK INPUT
0313 4455 PRNTER /PRINT "ACCEPT MODE?"
0314 3363 MES6
0315 4444 RECEIV /RECEIVE INPUT
0316 4437 YESNO /YES OR NO7777
0317 5313 JMP ,+4 /NEITHER ALL AGAIN
0320 7610 SKP CLA /MANUAL TEST
0321 5771' JMP ASKSUR /ASK "ARE YOU SURE"
/
/IF ACCEPT MODE, INTERGATE

```

```

/ABOUT CONSTANT FIELD1
0322 4455 MANUAL, PRINTER /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, PRINTER /PRINT "TRACK?"
0346 3410 MES0
0347 4444 RECEIV /RECEIVE Y OR N
0350 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 SAYAC
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
/

```

```

/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, PRINTER /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, PRINTER /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 .+S /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

```

```

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, PRNTER      /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 5264      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
0505 5264      JMP      ASKNX5      /RECEIVE 4 IN OCTAL
0506 3410      DCA I      AUTO10      /INPUT ERROR, ASK AGAIN
0507 2111      ISZ      TRASH1      /SAVE DATA
0510 5303      JMP      ,=5      /UPDATE COUNTER
0511 7340      CLA CLL CMA      /GET NEXT
0512 3157      DCA      DATFLG      /SETUP DATA FLAG

/
/ASK IF HE'S SURE;
/
0513 4455      ASKSUR, PRNTER      /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.

```

```

/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 6201      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
0546 7610      KSKP, SKP CLA      /LOAD COMMAND REGISTER
0547 4576      ERHLT6, JMS I      BGHLT
0550 1122      TAD      EXREG
0551 7110      CLL RAM
0552 7630      SZL CLA
0553 1016      TAD      K0200
0554 6740      IOT0, DLDC
0555 7610      SKP CLA      /LOAD EXT. DRIVE
0556 4576      ERHLT0, JMS I      BGHLT      /SKIP TRAP IOT0
0557 5742      JMP I      LDCM      /EXIT

/
/
/SUBROUTINE TO ISSUE "DCLR" CLEAR IOT
CLDR, 0
0561 6742      IOT2, DCLR
0562 5760      JMP I      CLDR      /DCLR "CLEAR IOT"
0563 4576      ERHLT2, JMS I      BGHLT      /EXIT
                                /ENRUR 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
0601 0016 AND K0200
0602 7640 SZA CLA
0603 7402 STPHLT, HLT
0604 1777* TAD PLDFLG
0605 7650 SNA CLA
0606 5211 JMP ,+3
0607 1160 TAD SPFLD
0610 5230 JMP HNPLD
0611 7301 CLA CLL IAC
0612 1143 TAD MAXFLD
0613 7650 SNA CLA
0614 5230 JMP HNPLD
0615 4440 RANGEN
0616 0014 AND K0070
0617 7450 SNA
0620 5230 JMP HNPLD
0621 3136 DCA INTCH
0622 1136 TAD INTCH
0623 1143 TAD MAXFLD
0624 7710 SPA CLA
0625 5231 JMP RNPLD+1
0626 1143 TAD MAXFLD
0627 7040 CMA
0630 3136 RNPLD, DCA INTCH

/MAKE BLOCK LENGTH1
/
0631 1776* TAD MLFFLG
0632 7650 SNA CLA
0633 4440 RANGEN
0634 1164 TAD SPBLK
0635 0015 AND K0100
0636 1136 TAD INTCH
0637 3136 DCA INTCH
0640 1136 TAD INTCH
0641 0015 AND K0100
0642 7640 SZA CLA
0643 1016 TAD K0200
0644 1104 TAD K7400
0645 3112 DCA TRASH2
0646 1112 TAD TRASH2
0647 7041 CIA
0650 3114 DCA UPDATE
0651 1136 TAD INTCH
0652 0350 AND A0170
0653 7640 SZA CLA
0654 1065 TAD K0010
0655 1064 TAD K0007
0656 3111 DCA TRASH1

/MAKE AMOUNT OF SECTORS
/TO TRANSFER1

```

```

/GET THE SWITCHES.
/MASK HALT SW.
/TIME TO HALT?
/HALT FROM SWR4#1.
/GET FIELD FLAG
/WAS IT SET?
/NO, USE RANDOM FIELD
/YES, GET OPERATOR FIELD
/GO

/GET MAXIMUM FIELD POINTER
/ANY FIELDS THERE
/NO EXTENDED FIELDS TO USE
/YES, GET A RANDOM FIELD
/MASK
/COULD BE 0
/WAS DON'T HAVE TO CHECK LIMITS
/SAVE FIELD FOUND

/ADD IN MAXIMUM FIELD POINTER
/IN LIMITS????
/YES, USE IT
/NO, USE MAXIMUM IN THE MACHINE

```

```

/
0657 1775* TAD SECFLG
0660 7650 SNA CLA
0661 4440 RANGEN
0662 1163 TAD SPSEC
0663 0111 AND TRASH1
0664 3147 DCA CONSEC
0665 1147 TAD CONSEC
0666 7040 CMA
0667 3111 DCA TRASH1

/MAKE WORD COUNT1
/
0670 1112 TAD TRASH2
0671 2111 ISZ TRASH1
0672 5270 JMP ,+2
0673 3127 DCA WCNCG

/MAKE CURRENT ADDRESS1
/
0674 4440 RANGEN
0675 3126 DCA CAREG
0676 1136 TAD INTCH
0677 0014 AND K0070
0700 7640 SZA CLA
0701 5317 JMP FILLUP
0702 1146 TAD 06NBUF
0703 7140 CMA CLL
0704 1126 TAD CAREG
0705 7620 SNL CLA
0706 5315 JMP CONCUR
0707 1127 TAD WCREG
0710 7041 CIA
0711 1126 TAD CAMEG
0712 1016 TAD K0200
0713 7630 SZL CLA
0714 5317 JMP FILLUP
0715 1146 CONCUR, TAD 06NBUF
0716 3126 DCA CAREG

/ROUTINE TO FILL AND CHECK SUM BUFFER
/
0717 4425 FILLUP, KTICK
0720 4434 SETGEN
0721 1106 TAD M4
0722 3137 DCA STATRY
0723 4435 REPILL, SETFLD
0724 3325 DCA ,+1
0725 7402 HLT
0726 3141 DCA CHKSAV
0727 4427 NEWRD, RANDAT
0730 3111 UCA TRASH1
0731 1111 TAD TRASH1
0732 3411 DCA I AUTO11
0733 7100 CLL

/GENERATE RANDOM CA
/SAVE IT

/MASK FIELD BITS
/EXTENDED FIELD????
/INITIAL CA 0,K,****

/GENERATE RANDOM CA
/NO, USE CONSTANT VALUE
/GET WORD COUNT

/ADD IN CA

/WITHIN BOUNDS????
/YES, INITIAL CA 0,K,****
/NO, USE PROGRAM#1
/SAVE IT

/NOTIFY APT IF NEED BE.
/SETUP AND SAVE GENERATOR

/SETUP TRY COUNTER
/FIELD+ BUFTAL+ AUTO 11+ 12
/FIELD TO BUFFER IN AC
/BUF TO BUFFER
/START WITH 0
/GENERATE DATA
/SAVE OUTPUT WORK
/GET BACK WORK
/STORE IN BUFFER

```

```

0734 1111 TAD TRASH1 /GET BACK WORD
0735 1141 TAD CNKSAV /ADD IN LAST
0736 7430 SZL /LINK SET??
0737 7001 IAC /ADD IT IN
0740 3141 DCA CNKSAV /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 REWRT /YES, MUST BE A WRITE ERROR

```

```

0750 0170 A0170, 0170
/
/SUBROUTINE TO ISSUE "DSKP" DISK SKIP IOT
/

```

```

0751 0000 DSKP, 0
0752 6741 IOT1, DSKP /DISK SKIP IOT
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 REWRT /LET HIM FAIL??
1034 1136 TAD INTCH
1035 7010 RAR
1036 7620 SNL CLA
1037 5247 JMP REWRT /EXT BIT SET?
1040 1145 TAD MAXTRK /NO, DON'T LIMIT DA.
1041 1124 TAD INTDA
1042 7630 SZL CLA /BEYOND MAXIMUM LIMIT?
1043 5247 JMP REWRT /NO, DONT LIMIT.
1044 1124 TAD INTDA
1045 7040 CMA
1046 3124 DCA INTDA /YES, SET TO LEGAL LIMIT.
/
/WRITE INFORMATION!
/CLEAR BUFFER ON THE FLY!
/
1047 4441 REWRT, DISKGO /GO WRITE
1050 4400 4400 /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 RE=TRY
1056 5776 JMP REFILL /TRY AGAIN
/
/CHECK FOR LOOP ON WRITE!
/
1057 4406 LAS /GET SWITCH 0
1060 7710 TRYTIM, SPA CLA /LOOP ON WRITE????
1061 5775 JMP REFILL-2 /YES, TRY WRITE AGAIN

```

```

1062 5351      JMP      STRREL      /RESUME ALL UNITS ON ERROR
1063 1260      RENEAD, TAD      TRYTIM
1064 3171      DCA      TRYCNT      /SETUP FOR SOFT ERROR RETRY
1065 3165      DCA      ERFLG      /CLEAR ERROR FLAG
1066 1106      TAD      M4
1067 3137      DCA      STATRY      /SETUP TRY COUNTER
1070 1106      TAD      M4
1071 3140      DCA      DATTRY      /SETUP TRY COUNTER
1072 3155      DCA      CRCCNT      /CLEAR CRC COUNTER!!!!

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

/
/CHECK DATA ON NO STATUS ERRORS;
/
1100 4774*     JMS      DTCHK      /CHECK DATA
1101 5324      JMP      RENUN      /DATA O.K.
1102 2140      ISZ      DATTRY      /UPDATE READ RE-TRY
1103 5273      JMP      RDTRY      /TRY AGAIN
1104 5323      JMP      RENUN-1     /TRY TO SEEK IT
1105 1121      RDSTA, TAD      STNEG      /GET STATUS READ
1106 0065      AND      K0010      /MASK CRC
1107 7450      SNA      /CRC ERROR????
1110 5320      JMP      UPTRY      /NO, TRY READ AGAIN
1111 3156      DCA      CRCFLG      /YES, SET FLAG
1112 2155      ISZ      CRCCNT      /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 RETRYs IF AC=7777
1117 7410      SKP      /CHECK ON RETRY!!!!
1120 3155      UPTRY, DCA      CRCCNT
1121 2137      ISZ      STATRY      /UPDATE TRY POINTER
1122 5273      JMP      RDTRY      /TRY AGAIN
1123 3165      DCA      ERFLG      /IS A HARD ERROR
1124 3155      RENUN, DCA      CRCCNT      /CLEAR CRC COUNT
1125 3156      DCA      CRCFLG      /CLEAR CRC FLAG
1126 4773*     JMS      CKTIM      /CHECK TIME POINTERS
1127 1165      TAD      ERFLG
1130 7650      SNA CLA      /IS IT 64 RETRYs FOR SOFT ERROR?
1131 5334      JMP      .+3      /NO DON'T BOTHER
1132 2171      ISZ      TRYCNT      /YES, UPDATE RETRY COUNTER
1133 5266      JMP      RENEAD+3   /TRY AGAIN

/
/CHECK FOR LOOP ON READ;
/

```

```

1134 4406      LAS      /GET SWITCH 1
1135 7104      CLL RAL
1136 7710      SPA CLA      /LOOP????
1137 5263      JMP      RENEAD      /YES, LOOP
1140 1137      TAD      STATRY      /TEST FOR HARD ERROR
1141 7650      SNA CLA
1142 5351      JMP      STRREL      /YES
1143 3165      DCA      ERFLG      /CLEAR ERROR FLAG

/
/CHECK FOR TYPE STATUS
/REPORT;
/
1144 4406      LAS      /MASK
1145 0017      AND      K0400      /TYPE STATUS REPORT????
1146 7640      SZA CLA
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      /RESTORE
1153 5771*     JMP      RUN      /START NEXT DRIVE

/
/ROUTINE TO DETERMINE IF TIMING NEEDS TO BE FOR APT SYSTEM.
/
1154 0000      XKTICK, 0
1155 4424      CHK22
1156 7410      SKP      /TEST FOR APT
1157 5754      JMP I      XKTICK      /NO, RETURN TO NORMAL RUN
1160 6201      CDF      0
1161 2150      ISZ      CLKCNT      /LONG COUNTER FOR APT
1162 5366      JMP      EXTICK      /NORMAL RETURN
1163 1100      TAD      K7760      /INIT COUNTER
1164 3150      DCA      CLKCNT
1165 4770*     JMS      KTIME      /NOTIFY APT
1166 6201      EXTICK, CDF 0
1167 5754      JMP I      XKTICK
1170 0530
1171 0600
1172 3000
1173 2450
1174 1600
1175 0721
1176 0723
1177 3573
1200          PAGE
/
/ERROR HANDLER;
/UPDATE "SOFT" ON "HARD" TALLYS;
/PRINT ERROR TEXT AND DATA;
/CHECK INHIBIT ERROR SW;
/
1200 0000      ERNO, 0
1201 7001      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  STAPDT
1215 3373      DCA  PCNTR1      /POINTER TO BUFFER

/DETERMINE IF ERROR IS "HARD" OR "SOFT";
1216 1156      TAD  CRCFLG      /GET CRC FLAG
1217 7650      SNA  CLA      /CMC ERROR????
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      /OCCURRED;
1227 1131      TAD  ASREG
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      /WAS THIS FIRST POSSIBLE "SOFT"?
1235 5245      JMP  SOFT      /YES, UPDATE "SOFT" TALLY;
1236 1110      TAD  K7775      /CHECK IF NONRECOVERABLE "SOFT";
1237 7650      SNA  CLA      /WAS IT?
1240 2373      ISZ  PCNTR1      /NO, DUMP "SOFT" TALLY;
1241 1773      TAD  I  PCNTR1      /OTHERWISE DUMP "HARD" TALLY;
1242 7440      SZA      /DONT GO BACK WORDS!!!!!!
1243 1101      TAD  K7777      /DUMP APPROPRIATE TALLY!!
1244 5254      JMP  NTERR=1      /DUMP IT;
1245 1101      SOFT, TAD  K7777
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 SW1
1255 4423      NTERR, JMS  I  KAERRO      /REPORT ERROR TO APT IF REQUIRED
1256 4406      LAR
1257 7106      CLL  RTL

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```

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  MEUTAD      /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      MLT
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  ESARE
1316 2200      ISZ  ERMO      /UPDATE FOR RETURN
1317 1172      TAD  XTEXT
1320 3374      DCA  PCNTR2
1321 1372      TAD  XREG
1322 3010      DCA  AUTD10
1323 1105      TAD  M12
1324 3373      DCA  PCNTR1      /COUNTER FOR # OF HEADS
1325 1371      STNAUT, TAD  ESARE      /GET TEXT POINTER
1326 7500      SNA
1327 5363      JMP  NOTEX      /NOT THIS ONE
1330 7104      CLL  RAL
1331 3371      DCA  ESARE
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  =+5      /STONE FOR PRNTER

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1341 7340      CLA CLL CMA
1342 4455      PRNTER
1343 7402      /PRINT XX1
1344 1410      TAD I      AUTO10
1345 4456      /MODIFIED TEXT POINTER
1346 2373      AGAIN,    ISZ      PCNTR1
1347 5325      JMP      STNAUT
1348 1520      TAD I      PCNEG
1349 1106      TAD      M4
1350 7650      SNA CLA
1351 4573      JMS I      PRNDAT
1352 5360      JMP      ,+4
1353 4573      ERROEX,   JMS I      PRNDAT
1354 2200      ISZ      ERMO
1355 2200      ISZ      ERMO
1356 7301      CLA CLL IAC
1357 4454      CLRALL
1358 5600      JMP I      ERMO
1359 7104      NOTEX,    CLL RAL
1360 3371      DCA      ESAVE
1361 2374      ISZ      PCNTR2
1362 2374      ISZ      PCNTR2
1363 2010      ISZ      AUTO10
1364 5346      JMP      AGAIN
1371 0000      /
1372 0117      ESAVE,    0
1373 0000      XREG,     PCREG=1
1374 0000      PCNTR1,   0
1375 0000      PCNTR2,   0
1376 1377      PCNTR3,   0
1377 7773      HEDTAD,   BUFPNT=1
1378 7773      K7773,    7773
1400 1400      /
1401 3247      PAGE
1402 3255      /
1403 3264      /POINTERS FOR TEXT INFORMATION;
1404 3276      /
1405 3276      BUFPNT,   ERTX1
1406 3276      ERTX2
1407 3276      ERTX3
1408 3276      ERTX4
1409 3276      /
1410 3276      /ROUTINE TO CHECK FOR CLASSIC AND LIMIT
1411 3276      /TRANSFERS TO FIELD 0 IF AVAILABLE.
1412 3276      /
1413 0000      CLAFLO,   0
1414 1022      TAD      22
1415 0017      AND      K0400
1416 7650      SNA CLA
1417 5604      JMP I      CLAFLO
1418 7340      CLA CLL CMA
1419 3143      DCA      MAXFLO
1420 5604      JMP I      CLAFLO
1421 5604      /ON CLASSIC?
1422 5604      /NO.
1423 5604      /LIMIT TO FIELD 0.
1424 5604      /
1425 5604      /ROUTINE TO DO CRLF

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1414 0000      /
1415 7300      UPONE,    0
1416 1224      CLA CLL
1417 4445      TAD      K0215
1418 1225      TYPE
1419 4445      TAD      K0212
1420 4445      TYPE
1421 4445      TYPE
1422 4445      TYPE
1423 5614      JMP I      UPONE
1424 0215      /
1425 0212      K0215,    0215
1426 0212      K0212,    0212
1427 0212      /
1428 0212      /ROUTINE TO PRINT FOUR OCTAL
1429 0212      /
1430 0000      PROCT,    0
1431 7006      RTL
1432 7006      RTL
1433 3214      DCA      UPONE
1434 1106      TAD      M4
1435 3250      DCA      PRN
1436 1214      TAD      UPONE
1437 0064      AND      K0007
1438 1067      TAD      K0260
1439 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
1448 5626      /
1449 5626      /SUBROUTINE TO PRINT TEXT
1450 5626      /
1451 0000      PRN,      0
1452 7650      SNA CLA
1453 4457      CRLF
1454 1650      TAD I      PRN
1455 2250      ISZ      PRN
1456 3226      DCA      FRUCT
1457 7300      /TYPE CRLF
1458 1626      /YES!!!!
1459 0077      /GET POINTER
1460 7450      SNA
1461 5304      JMP      EXIT
1462 7500      SNA
1463 7020      CML
1464 7001      IAC
1465 7012      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      SNA
1500 1074      TAD     K4100
1501 4431      SPACE
1502 2226      ISZ     FROCT
1503 5256      JMP     MRRRN
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
1516 1714      TAD I   CLASIK
1517 3344      DCA     ROUTHMP
1520 2314      ISZ     CLASIK
1521 1022      TAD     OP2
1522 0017      AND     K0400
1523 7640      SZA CLA
1524 5327      JMP     ,+3
1525 1345      TAD     SAVEAC
1526 5714      JMP I   CLASIK
1527 2314      ISZ     CLASIK
1530 6211      COF     10
1531 1020      TAD     SWR
1532 3777      DCA I   (SWR)
1533 1021      TAD     OP1
1534 3776      DCA I   (OP1)
1535 1022      TAD     OP2
1536 3775      DCA I   (OP2)
1537 1344      TAD     ROUTHMP
1540 3774      DCA I   (ROUTINS)
1541 1345      TAD     SAVEAC
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
1550 4425      C0CKSW
1551 7604      7604
1552 5746      JMP I   MYLAS

/CHECK FOR CLASSIC.
/GET SWITCHES.
/EXIT.
/ROUTINE TO RESET REGISTERS FOR ERROR PRINTER
/
1553 0000      SETREG, 0
1554 1073      TAD     K4000
1555 3121      DCA     STNEG
1556 7340      CLA CLL CMA
1557 1111      TAD     TRASH1
1560 0066      AND     K0017
1561 1112      TAD     TRASH2
1562 3125      DCA     DAREG
1563 1170      TAD     FINTIM
1564 7640      SZA CLA
1565 5753      JMP I   SETREG
1566 1174      TAD     SAVCH
1567 3123      DCA     CMREG
1570 5753      JMP I   SETREG

/GET STATUS
/SAVE FOR ERROR PRINTER
/DECREASE BY 1
/GET SECTOR POINTER
/ADD IN ADDRESS
/SAVE FOR ERROR PRINTER
/CHECK IF FIRST SECTOR?
/IF 80, DON'T UPDATE COMMAND!
/NO, DON'T!
/GET COMMAND REG.
/SAVE FOR ERROR PRINTER
/RETURN
/
1574 1302
1575 0021
1576 0021
1577 0020
1600

PAGE
/ROUTINE TO CHECK DATA READ
/
1600 0000      DTCHK, 0
1601 1156      TAD     CRCFLG
1602 7640      SZA CLA
1603 5212      JMP     WRDCHK
1604 1142      TAD     FNDUSUM
1605 7041      CIA
1606 1141      TAD     CMRSV
1607 7650      SNA CLA
1610 5600      JMP I   DTCHK
1611 7340      CLA CLL CMA
1612 3446      WRDCHK, DCA I XEMRO
1613 1123      TAD     CMREG

/GET CRC FLAG
/AS IT SET?
/YES, THEN WORD BYB WORD CHECK!!!
/GET CHECK SUM FOUND
/COMPARE TO GOOD VALUE SAVED
/WERE THEY THE SAME
/YES, DATA O.K.
/SETUP CHECKSUM ERROR FLAG
/
1614 0015      AND     K0100
1615 7640      SZA CLA
1616 1016      TAD     K0200
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 3102      DCA  FNDSUM
1626 4402      RESRAN
1627 1130      TAD  FNREG
1630 4435      SETFLO
1631 3206      DCA  GOCDF
1632 1112      TAD  TRASH2
1633 3301      DCA  NSRAN
1634 1124      TAD  INTDA
1635 3353      DCA  STGEN
1636 1301      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, HLT/CDP
1647 1411      TAD I  AUTO11
1650 6201      CDF  0
1651 3135      DCA  DNREG
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  FNUSUM
1662 5310      JMP  NTRKS
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  NSRAN
1673 5300      JMP  +5
1674 2353      ISZ  STGEN
1675 7000      NOP
1676 1112      TAD  TRASH2
1677 3361      DCA  RSRAN
1678 2117      ISZ  BUFTAL
1679 5236      JMP  UTM1
1680 1446      TAD I  XENRO
1683 7650      SNA CLA
1684 3155      DCA  CRCCNT
1685 2446      ISZ I  XENRO
1686 5600      JMP I  DTCHK
1687 4576      BADHLT, JMS I  BGHLT
1690 4446      NTRKS, 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

/UPDATE BUFFER TALLY
/MORE WORDS TO CHECK
/GET ERROR INDICATOR!
/WAS THERE AN ERROR?
/NO, CLEAR CRC COUNTER
/CHECK FOR COMPUTER ERROR?
/ALL O.K.
/COMPUTER MUST BE DOWN, CHECKSUM
/OTHER ERRORS IN BUFFER

```

```

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
1737 0000      CLA CLL IAC
1740 7301      TAD  RAN1
1741 1367      TAD  RAN2
1742 1370      CLL RTL
1743 7106      DCA  RAN1
1744 3367      TAD  RAN2
1745 1370      RTN
1746 7012      TAD  RAN1
1747 1367      DCA  RAN2
1750 3370      TAD  RAN2
1751 1370      JMP I  GNDAT
/ROUTINE TO SAVE RANDOM GENERATOR
STGEN, 0
1753 0000      TAD  RAN1
1754 1367      DCA  SAV1
1755 3371      TAD  RAN2
1756 1370      DCA  SAV2
1757 3372      JMP I  STGEN
/ROUTINE TO RESET RANDOM GENERATOR
RSRAN, 0
1761 0000      TAD  SAV1
1762 1371      DCA  RAN1
1763 3367

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1764 1372      TAD      SAV2
1765 3370      DCA      RAN2
1766 5701      JMP I    RSHAN

/
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      K8F
2003 5202      JMP ,.-1
2004 0036      KRB
2005 0234      AND      K177
2006 1016      TAD      K0200
2007 3235      DCA      CHRYN
/SAVE CHARACTER
/CHECK FOR CLASSIC
/MASK CLASSIC BIT
/CLASSIC=NON ZERO
2010 1022      TAD      22
2011 0017      AND      K0400
2012 7650      SNA CLA
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 0201      CDF      0
2022 4407      CLASIC
/CHECK FOR CLASSIC,
2023 4427      C0CNTR
/ROUTINE TO EXECUTE,
2024 7000      NOP
2025 7300      CLA CLL
/CLEAR CLASSIC AC RETURN
2026 1235      WAIT1,   TAD      CHRYN
/RESTORE CHARACTER
2027 0046      TLD
2030 0041      T8F
2031 5230      JMP ,.-1
2032 0042      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      CHRPOT
/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
/NO 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
/NO WAS IT A YES
2053 7650      SNA CLA
/YES
2054 5635      JMP I    CHRYN
/NO WAS NEITHER
2055 5600      JMP I    CHRPOT
/
/
2056 0331      K0331,    0331
2057 0316      K0310,    0316
/ROUTINE TO CHECK DISK RUN POINTERS
/
2060 0000      CHRPOT,    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      CHRPOT
/NO
2067 5660      JMP I    CHRPOT
/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      OP2
2102 0354      AND      K7377
/NO CONSOLE PACKAGE
2103 3022      DCA      UP2
2104 1355      TAD      K7000
2105 3774*     DCA      MYLAS+3
/NO SWITCH REGISTER
/NO OPERATOR INTERVENTION ALLOWED
2106 1022      TAD      OP2
2107 0064      AND      K0007
2110 3111      DCA      TRASH1
/GET # OF DRIVES
2111 1022      TAD      UP2
2112 0015      AND      K0100
2113 7650      SNA CLA
/NO 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
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
2142 1021      MEMSET, TAD 21
2143 7012      RTR
2144 0064      AND K0007
2145 7104      CLL RAL
2146 7006      RTL
2147 7040      CMA
2150 3143      DCA MAXFLD
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
2160 7410      SKP
2161 5756      JMP I AENRROR      /CHECK FOR APT=8.
2162 6002      IOP
2163 7200      CLA
2164 1115      TAD POLO8K
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      DSKGO, 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 DSKGO
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
/MAKE READ ALL OR WRITE ALL
/SAVE FOR SWITCH TO CONSECUTIVE MODE
/SECTOR TO DO
/MASK
/ADD TO TRACK
/LUAD AND GO
/TURN INTERRUPT ON
/
/ROUTINE TO CLEAN 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 STNWRK
2237 4776      JMS TIME
2240 5234      JMP =4
2241 1117      STNWRK, TAD BUPTAL
2242 7041      CIA
2243 1130      TAD FWREG
2244 7450      SNA
2245 5274      JMP WRKDON
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
/CLEAR LONG TIMER
/CLEAR SUM CHECK
/GET FIELD TO BUFFER
/SAVE CDF
/TIME TO GO
/YES!!!!
/WAIT FOR FIRST INTERRUPT
/NOT HERE YET
/COMPARE TO SOFTWARE FINAL
/WAIT FOR DISK???
/YES!!!!
/SAVE DIFFERENCE
/UPDATE BUFFER TALLY
/CDF TO BUFFER FIELD
/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      18Z      CLMBAK    /UPDATE TALLY
2262 5204      JMP      GOCLR     /MORE TO CLEAR
2263 5274      JMP      WRKDON    /DONE WITH SOME
2264 1142      WABRD, TAD      FND8UM
2265 7100      GOCHK, CLL
2266 1411      TAD I AUTO11      /GET WORD
2267 7430      8ZL
2270 7001      IAC
2271 2175      18Z      CLMBAK    /UPDATE CLEAR POINTER
2272 5205      JMP      GOCHK     /MORE TO CHECKSUM
2273 3142      DCA      FND8UM    /SAVE IT
2274 6201      WRKDON, CDF      0
2275 1117      TAD      BUFTAL
2276 7650      8NA CLA
2277 5302      JMP      DSKEK     /LAST WORD DONE???
2300 4776      JMS      TIME      /EXIT
2301 5241      JMP      STRWRK    /TIME AND WAIT
2302 2200      DSKEK, 18Z      DSKEG /WAIT FOR INT, OR DONE!!!
2303 5600      JMP I DSKEG       /EXIT

/
/ INTERRUPT SERVICE
/
2304 6741      RETURN, DSKP
2305 5353      JMP      NODSKP    /DISK SKIP IOT
2306 2111      18Z      TRASH1    /NOT THE DISK
2307 7000      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     /READ STATUS
2315 7440      8ZA
2316 5337      JMP      STATER    /ONLY DONE FLAG?
2317 1130      TAD      FWREG     /STATUS ERROR
2320 7650      8NA CLA
2321 5305      JMP      TRDONE    /LAST TRANSFER?
2322 3170      DCA      FINTIM    /TRANSFER IS DONE
2323 1174      TAD SAVCH        /CLEAR FIRST TIME POINTER!
2324 6746      RDLNRL, DLDC      /GET READ OR WRITE COMMAND
2325 1111      TAD      TRASH1    /LOAD COMMAND REGISTER
2326 0066      AND      K0017    /GET SECTOR TO GO
2327 1112      TAD      TRASH2    /MASK OFF
2330 6743      LOOGO, DLAG
2331 1167      RETRN, TAD      SVLNK /ADD IN TRACK
2332 7110      CLL RAM
2333 1166      TAD      SAVAC     /LOAD DISK ANFD GO
2334 6244      RMF
2335 6001      ION
2336 5400      JMP I 0
2337 4775      STATER, JMS      SETREG /GET LINK
2340 1123      TAD      CMREG
2341 7710      SPA CLA
2342 7001      IAC

```

```

2343 7001      IAC
2344 3347      DCA      .+3
2345 1137      TAD      STATRY   /MODIFY HEADER POINTER
2346 4446      ERROR
2347 0000      0000            /GET TRY POINTER
2350 7770      7770            /PRINT MESSAGE
2351 2200      18Z      DSKEG    /MODIFIED HEADER POINTER
2352 5302      JMP      DSKEK    /MESSAGE POINTER
2353 3374      NODSKP, DCA      TIMERS /UPDATE FOR ERROR
2354 2374      18Z      TIMERS3
2355 5354      JMP      .-1
2356 4407      CLASSIC
2357 4440      C8CKPA
2360 7000      NOP
2361 6031      K8F
2362 4576      INTER2, JMS I 0GLT /KEYBOARD FLAG??
2363 6032      KCC
2364 5331      JMP      RETRN     /ILLEGAL INTERRUPT
2365 4775      TRDONE, JMS      SETREG /EXIT BACK
2366 3170      DCA      FINTIM    /SETUP REGISTERS!
2367 1167      TAD      SVLNK     /CLEAR FIRST TIME POINTER!
2370 7110      CLL RAM
2371 1166      TAD      SAVAC     /REPLACE LINK
2372 6244      RMF
2373 5400      JMP I 0
2374 0000      /
2375 1553      /
2376 3123      /
2377 3141      /
2378 2400      /
2379 0000      /
2380 4444      OCT1, 0
2381 3354      RECEIV
2382 1600      DCA      LOAD
2383 0064      TAD I OCT1
2384 1067      AND      K0007
2385 7141      TAD      K0260
2386 1354      CLL CIA
2387 7620      TAD      LOAD
2388 5226      8NL CLA
2389 1600      JMP      INERR
2390 0014      TAD I OCT1
2391 7110      AND      K0070
2392 7012      CLL RAM
2393 1067      RTR
2394 7040      TAD      K0260
2395 1354      CMA
2396 7630      TAD      LOAD
2397 5226      8ZL CLA
2398 1354      JMP      INERR
2399 1354      TAD      LOAD

```

```

2424 0064      AND      K0007      /MASK
2425 2200      ISZ      OCT1
2426 2200      INERN,  ISZ      OCT1
2427 5600      JMP I      OCT1      /GOOD EXIT

/ROUTINE TO RECEIIVE FOUR OCTAL
OCT4, 0
2430 0000      TAD      M4
2431 1106      DCA      R0ST      /SETUP COUNTER
2432 3341      DCA      LOCA      /START WITH 0
2433 3350      ONEIN     0070     /RECEIVE ONE OCTAL
2434 4432      JMP I      OCT4     /LIMITS
2435 0070      TAD      LOCA      /EMRUR EXIT
2436 5630      ISZ      R0ST      /GET LAST
2437 1350      SKP      ,+4        /UPDATE COUNTER
2440 2341      JMP      ,+4        /EXIT
2441 7410      HAL
2442 5246      RTL
2443 7004      JMP      OCT4+3
2444 7006      ISZ      OCT4
2445 5233      JMP I      OCT4     /EXIT OCTAL IN AC
2446 2230
2447 5630

```

/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      R0ST      /POINTER
2454 1341      TAD      R0ST
2455 1152      TAD      TIMPOT      /GET TIME POINTER
2456 3354      DCA      LOAD      /SAVE IT
2457 7301      CLA CLL  IAC
2460 1147      TAD      CONSEC      /ONE FOR 0
2461 1754      TAD I      LOAD      /GET AMOUNT DONE
2462 3754      DCA I      LOAD      /ADD IN AMOUNT COMPLETED SO FAR
2463 7620      SNL CLA
2464 5650      JMP I      CKTIM     /SAVE IT
2465 4440      RANGEN     /LINK UP????
2466 3777      DCA      RAN1      /NO, EXIT
2467 4440      RANGEN     /GET RANDOM NUMBER
2470 3776      DCA      RAN2      /RE-PRIME GENERATOR
2471 7100      CLL
2472 1354      TAD      LOAD
2473 1013      TAD      K0004
2474 3354      DCA      LOAD      /SECOND TIME POINTEN
2475 2754      ISZ I      LOAD      /UPDATE IT
2476 1754      TAD I      LOAD      /GET COUNT
2477 1144      TAD      MAXTIM     /AUD IN FUDGE FACTOR
2500 7620      SNL CLA
2501 5650      JMP I      CKTIM     /PASS COMPLETE???
2502 3754      DCA I      LOAD      /NO, EXIT
2503 1341      TAD      R0ST      /ZERU SECCOUND COUNTER
2504 7040      CMA

```

```

2505 3341      DCA      R0ST      /SETUP COUNTER
2506 1362      TAD      CMPPOT      /ADD IN POINTER
2507 1062      TAD      K0003
2510 2341      ISZ      R0ST
2511 5307      JMP      ,+2        /COMPUTE BUFFER
2512 3341      DCA      R0ST
2513 7340      CLA CLL  CMA
2514 2741      ISZ I      R0ST
2515 7610      SKP CLA
2516 3741      DCA I      R0ST      /UPDATE PASS COMPLETE POINTER
2517 4457      CRLP
2520 4455      PRNTER
2521 3477      MES17
2522 1115      TAD      PDLSK      /HOLD AT 7777
2523 0064      AND      K0007      /PRINT "DISK"
2524 1067      TAD      K0260
2525 4445      TYPE
2526 7340      CLA CLL  CMA
2527 4455      PRNTER
2530 3502      MES18
2531 4406      LAS
2532 0015      AND      K0100
2533 7650      SNA CLA
2534 5337      JMP      ,+3        /MASK
2535 4430      DISCON
2536 5775      JMP      RUN
2537 4774      JMS      TPSTA      /PASS COMPLETE DISCONNECT????
2540 5650      JMP I      CKTIM     /NO MAY!!!!
2541 0000      /DUMP DRIVE
2542 6745      /MORE TO TEST!!!!
2543 7410      /STATUS-COMLETE TYPEOUT
2544 4576      JMS I      BGHLT
2545 3121      DCA      STNEG
2546 1121      TAD      STNEG
2547 5741      JMP I      R0ST      /EXIT

```

/SUBROUTINE TO READ STATUS REGISTER

```

/
2541 0000      R0ST, 0
2542 6745      IOT5, DRST
2543 7410      SKP
2544 4576      ERHLT5, JMS I  BGHLT  /HEAD STATUS IOT
2545 3121      DCA      STNEG      /SKIP TRAP
2546 1121      TAD      STNEG      /SAVE RESULTS
2547 5741      JMP I      R0ST      /EXIT

```

/SUBROUTINE TO LOAD CURRENT ADDRESS REGISTER

```

/
2550 0000      LOCA, 0
2551 6744      IOT4, DLCA
2552 4425      KTICK
2553 5750      JMP I      LOCA      /LOAD CURRENT ADDRESS IOT
2554 0000      /NOTIFY APT
2555 3125      DCA      DAMEG
2556 1125      TAD      DAMEG
2557 6743      IOT3, DLAG
2560 5754      JMP I      LOAD      /EXIT
2561 4576      ERHLT3, JMS I  BGHLT  /EMRUR SKIP TRAP

```

```

2562 3541 /
2574 3000 /CHMPOT, DUCHMP-3
2575 0000
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 /RECD, 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 ON APT
2623 5235 /JMP PREXIT /NO, EXIT
2624 1237 /TAD DUMP /RETURN AC.
2625 4407 /CLASIC /CHECK FOR CLASSIC.
2626 4435 /CSTYPE /ROUTINE TO EXECUTE.
2627 7410 /SKP
2630 5620 /JMP I PRINT /EXIT.
2631 6046 /TLC
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 /PRINTER /PRINT "DISK "
2643 3477 /MES17
2644 1115 /TAD POLOSK
2645 0064 /AND K0007 /SETUP CURRENT DRIVE #
2646 3200 /DCA RNWRD /SAVE

```

```

2647 1200 /TAD RNWRD /GET DISK NUMBER
2650 1067 /TAD K0260
2651 4445 /TYPE /TYPE DISK NUMBER
2652 7340 /CLA CLL CMA
2653 4455 /PRINTER /PRINT "DISCONNECTED!"
2654 3445 /MES15
2655 4777 /JMS TPSTA /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 /PRINTER /PRINT "DISK"
2676 3477 /MES17
2677 7340 /CLA CLL CMA
2700 4455 /PRINTER /PRINT "SYSTEM DOWN"
2701 3455 /MES16
2702 4576 /NOOSKB, JMS I BGMLT /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 KCOF /MAKE BUFFER COF
2725 3205 /DCA 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,  CLASSIC
2731 4431      C8SWIT      /CHECK FOR CLASSIC.
2732 7000      NOP        /ROUTINE TO EXECUTE.
2733 4406      LAR
2734 0071      AND      A0770 /GET SWITCHES
2735 3776      DCA      LDCM  /MASK 3-0
2736 1300      TAD      CHNPOT /SAVE DESIRED CODE
2737 3111      DCA      TRASH1 /POINTER
2740 1357      TAD      CCNTR1 /ADDRESS POINTER
2741 3112      DCA      TRASH2 /AMOUNT TO DO
2742 1511      CHANGR, TAD I TRASH1 /SETUP COUNTER
2743 3113      DCA      TRASH3 /GET ADDRESS POINTER
2744 1513      TAD I      TRASH3 /SAVE ADDRESS
2745 0072      AND      A7007 /GET OLD CODE
2746 1776      TAD      LDCM  /MASK OFF OLD CODE
2747 3513      DCA I      TRASH3 /ADD IN DESIRED CODE
2750 2111      ISZ      TRASH1 /RESTORE
2751 2112      ISZ      TRASH2 /UPDATE POINTER
2752 5342      JMP      CHANGR /UPDATE CHANGE COUNTER
2753 4407      CLASIC    /MORE TO CHANGE
2754 4436      C8ERR     /CHECK FOR CLASSIC.
2755 7402      CHNHLT, HLT /ROUTINE TO EXECUTE.
2756 5775      JMP      BGN   /IOTS CHANGED, HIT CONTINUE OR
                               /IF ON CONSOLE PACKAGE
                               /CONTROL Z TO START PROGRAM.

2757 7765      /
                CCNTR1, 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
2778 3000      PAGE
                /
                /ROUTINE TO TYPE STATUS REPORT
                /
3000 0000      TPSTA, 0
3001 4424      CHK22
3002 5600      JMP I      TPSTA
3003 4457      CRLF
3004 4455      PRINTER
3005 3372      MEB7      /PRINT "DISK HARD SOFT COMP"
3006 1107      TAD      M10
3007 3245      DCA      TSAVE1 /MAXIMUM TO DO

```

```

3010 3246      DCA      TSAVE2
3011 3247      DCA      TSAVE3
3012 1246      CHKRES, TAD  TSAVE2 /CLEAR SOME COUNTERS
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      SELCHK
3022 5241      JMP      NOTSTA /LOCATION OF DISK STATUS
3023 4457      CRLF /CHECK RUN POINTER
3024 4431      SPACE /DISK NOT RUNNING
3025 1247      TAD      TSAVE3
3026 1067      TAD      K0260 /SPACE OUT ONE
3027 4445      TYPE /GET DISK NO.
3030 4431      SPACE
3031 4431      SPACE /SPACE OUT ONE
3032 7346      CLA CLL CMA RTL /SPACE OUT ONE
3033 3250      DCA      TSAVE4
3034 1651      TAD I      TSAVE5 /COUNTER FOR FOUR WORDS
3035 4456      OCTEL     /GET STATUS
3036 2251      ISZ      TSAVE5 /TYPE IT
3037 2250      ISZ      TSAVE4
3040 5234      JMP      ,=4
3041 2247      NOTSTA, ISZ  TSAVE3 /UPDATE DRIVE NUMBER
3042 2245      ISZ      TSAVE1
3043 5212      JMP      CHKRES /MORE TO REPORT
3044 5600      JMP I      TPSTA /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 /SAVE DRIVE NUMBER
3055 1077      TAD      K7700
3056 3341      DCA      TIMER2 /SETUP COUNTER
3057 2340      ISZ      TIMER1
3060 5257      JMP      ,=1
3061 2341      ISZ      TIMER2 /WAIT FOR DISK TO COOL OFF!
3062 5257      JMP      ,=3
3063 1200      TAD      TPSTA
3064 4451      LDCMD
3065 7326      CLA CLL CML RTL /CURRENT DRIVE
3066 4454      CLALL     /LOAD COMMAND
3067 4450      DSKSKP   /ENABLE RECALIBRATE BIT
3070 5267      JMP      ,=1 /"RECALIBRATE"
3071 4447      R0STAT   /DISK SKIP IOT
                               /WAIT FOR FIRST DONE FLAG
                               /REAU STATUS

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```

3072 7500      SMA
3073 5311      JMP RESERR
3074 0076      AND K1777
3075 7640      SZA CLA
3076 5311      JMP RESERR
3077 4454      RESTA, CLRALL
3100 1016      TAD K0200
3101 1200      TAD TPSTA
3102 4451      LDCHD
3103 4450      DSKSKP
3104 5303      JMP .-1
3105 4447      RDSTAT
3106 1073      TAD K4000
3107 7650      SNA CLA
3110 5652      JMP I RESTOR
3111 7300      RESERR, 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
/
TIME, 0
3123 0000      ISZ TIMER1
3124 2340      JMP I TIME
3125 5723      ISZ TIMER2
3126 2341      JMP I TIME
3127 5723      INTER1, JMS I BGMHT
3130 4576      /NO INTERRUPT OCCURRED, I GUESS!

/ROUTINE TO COMBINE ERROR HALTS.
/WHEN THE COMPUTER HALTS THE AC
/Will EQUAL THE PC ON THE FAILING
/HALT INSTRUCTION.
/
BIGHT, 0
3131 0000      CLA CLL
3132 7300      TAD BIGHT
3133 1331      CLASIC
3134 4407      CBERR
3135 4436      BIGHTP, HLT
3136 7402      JMP .-5
3137 5332      /NON-RECOVERABLE.

TIMER1, 0
3140 0000      TIMER2, 0
3141 0000      /
/ROUTINE TO TYPE OUT DATA INFORMATION
/
TYPDAT, 0
3142 0000      PRNTER
3143 4455      /PRINT "AS!"

```

```

3144 3235      TEXAS
3145 1131      TAD ASREG
3146 4456      OCTEL
3147 7340      CLA CLL CMA
3148 4455      PRNTER
3149 3237      TEXMA
3150 1132      TAD WAREG
3151 4456      OCTEL
3152 7340      CLA CLL CMA
3153 4455      PRNTER
3154 3241      TEXAD
3155 1133      TAD ADREG
3156 4456      OCTEL
3157 7340      CLA CLL CMA
3158 4455      PRNTER
3159 3243      TEXDG
3160 1134      TAD DBREG
3161 4456      OCTEL
3162 7340      CLA CLL CMA
3163 4455      PRNTER
3164 3245      TEXDB
3165 1135      TAD DBREG
3166 4456      OCTEL
3167 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      TEXTA, TEXT "IA!"
3224 7200
3225 0401      TEXDA, TEXT "DA!"
3226 7200
3227 0301      TEXCA, TEXT "CA!"
3230 7200

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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	D0K00, 0
3513	0000	D0K10, 0
3514	0000	D0K20, 0
3515	0000	D0K30, 0
3516	0000	D0K40, 0
3517	0000	D0K50, 0
3520	0000	D0K60, 0
3521	0000	D0K70, 0

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3544	0000	D0CMP, 0
3545	0000	D1MRD, 0
3546	0000	D1SOF, 0
3547	0000	D1CMP, 0
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3551	0000	D2SOF, 0
3552	0000	D2CMP, 0

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3570 0000 D78OF, 0
3571 0000 D7CMP, 0

3572 0000 FLDPLG, 0
3573 0000 TRKFLG, 0
3574 0000 SECFLG, 0
3575 0000 MLFFLG, 0

3600 /
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3333

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/RK8E/RK8L DATA RELIABILITY PROGRAM: MU=08-DHRKC-H

PAL10

V142A

23-FEB-77

9105

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A0170	0750	C0GET	0624	CONCUR	0715	DAT3	0760
A0770	0071	C0HANG	1122	CONSEC	0147	DAT4	0761
A7007	0072	C0INQU	4437	CONSUL	0000	DAT5	0762
ACDCA	0362	C0OCTA	4432	CRCCNT	0155	DAT6	0763
ACL	7701	C0PASS	4424	CRCPFG	0156	DAT7	0764
ACSAVE	1345	C0PAUS	4441	CRLF	4437	DAT8	0765
ADREG	0133	C0PRNT	4430	D0CMP	3544	DAT9	0766
AERROR	2156	C0RDP8	0606	D0HRU	3542	DATFLG	0157
AGAIN	1346	C0RETD	0614	D0SOP	3543	DATPOT	0151
ALLAGN	0255	C0RETR	0536	D0TM1	3522	DATTRY	0140
AMOUNT	0060	C0SETD	0613	D0TM2	3532	DBREG	0135
APT0	2070	C0SET8	0535	U1CMP	3547	OCLR	6742
ASKNX1	0345	C0SWIT	4431	D1HRU	3545	DGREG	0134
ASKNX2	0406	C0SW8T	0745	U1SOP	3546	DISCON	4430
ASKNX3	0425	C0THP1	1021	D1TM1	3523	DISKGO	4441
ASKNX5	0464	C0TTYI	4426	D1TM2	3533	OLAG	6743
ASKSUR	0513	C0TYPE	4435	U2CMP	3552	OLCA	6744
ASREG	0131	CAF	0007	U2HRU	3550	OLDC	6746
AUTQ10	0010	CAREG	0126	D2SOP	3551	OLSC	6740
AUTQ11	0011	CCNTR1	2757	D2TM1	3524	OCCNT	0247
AUTQ12	0012	CHANG	2750	D2TM2	3534	DOHEAD	1262
BADHLT	1707	CHANGR	2742	U3CMP	3555	DONEA	0426
BGHLT	0176	CHEK22	0523	U3HRU	3553	DOPACK	0212
BGN	0200	CHK22	4424	D3SOP	3554	D0BET	0251
BGNBUF	0146	CHKCLA	1200	D3TM1	3525	DRBT	6745
BIGHLT	3131	CHKPOT	2000	D3TM2	3535	D0K08	3512
BIG8TP	3136	CHKRES	3012	D4CMP	3560	D0K18	3513
BRKRET	0363	CHKSAV	0141	U4HRU	3556	D0K28	3514
BUFPNT	1400	CHKYN	2035	U4SOP	3557	D0K38	3515
BUFTAL	0117	CHNCDF	2254	U4TM1	3526	D0K48	3516
BYRETR	0506	CHNHLY	2755	D4TM2	3536	D0K58	3517
C0BY1	0230	CHNPOT	2760	U5CMP	3563	D0K68	3520
C0BY2	1300	CKCOUT	0232	D5HRU	3561	D0K78	3521
C0BY3	1061	CKTIM	2450	D5SOP	3562	D0KEX	2302
C0BY4	0515	CLAFLD	1404	D5TM1	3527	D0SGO	2200
C0BY5	1116	CLATIC	4407	D5TM2	3537	D0SKP	6741
C0CHAR	1075	CLASIK	1514	U6CMP	3566	D0SKKP	4450
C0CKP	1022	CLDR	0500	D6HRU	3564	DTCMK	1600
C0CKPA	4440	CLKCNT	0150	D6SOP	3565	UTR1	1636
C0CKSH	4425	CLRALL	4454	D6TM1	3550	DUMP	2637
C0CNTR	4427	CLRBAX	0175	D6TM2	3540	ENDIT	0742
C0CON7	1145	CLRTRN	1315	U7CMP	3571	ERFLG	0165
C0CRLF	4433	CHPPOT	2562	D7HRU	3567	ERHLT0	0556
C0D01	0310	CHREG	0123	D7SOP	3570	ERHLT2	0563
C0D010	1262	CNTRLC	0551	U7TM1	3551	ERHLT3	2561
C0D011	0607	CNTRLD	0600	U7TM2	3541	ERHLT5	2544
C0D02	1033	CNTHLE	0545	UAREL6	0125	ERHLT6	0547
C0D03	0350	CNTRLL	0537	DAT1	0756	ERR1	0736
C0D04	1006	CNTRLQ	0500	DAT10	0707	ERRML5	1420
C0D07	0527	CNTRLR	0511	DAT11	0770	ERR0	1200
C0ECMO	4434	CNTRL8	0541	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	UCT1	2400
ERTX3	3264	K0004	0013	MANUAL	0322	UCT4	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	OPRTAL	0116
EXREG	0122	K0077	0102	MES1	3307	PASCNT	0250
EXTICK	1166	K0100	0015	MES10	3414	PCLF	6662
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
FIRTXH	0170	K0316	2057	MES18	3502	POLD3K	0115
FLDFLG	3572	K0331	2056	MES19	3174	POLNEX	1000
FLDMLT	0206	K0400	0017	MES2	3325	PREXIT	2635
FLSAVE	1347	K1000	0075	MES3	3332	PRINT	2620
FNDSUM	0142	K177	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	PSIE	6665
GENDAT	4426	K4100	0074	MES8	3404	PSKE	6663
GETCH1	0703	K5405	0360	MES9	3410	PSKF	6661
GETDAT	0456	K6500	0541	MES1A	0747	PSUB	6664
GNDAT	1737	K6520	2172	MESAC	1533	PTSTOR	0536
GOBAK	2230	K7000	2155	MESFL	1541	RAD1	1773
GOCDF	1646	K7377	2154	MESMAN	1146	RAD2	1774
GOCMK	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	MGL	7421	RANGEN	4440
HEOTAD	1376	KAERRO	0023	MGSAYE	1346	RANJMS	0522
HLFFLG	3575	KCDF	0103	MRPRN	1456	RDLMRL	2324
INDEXA	0455	KROD	0230	MSKER	1714	ROST	2541
INERR	2426	KSKP	0546	MYAC	1317	RDSTA	1105
INMODE	1076	KTICK	4425	MYLAB	1546	RDSTAT	4447
INTCM	0136	KTIME	0530	NEWRU	0727	ROTRY	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
IO70	0554	LOCA	2550	NOERR	1672	RECEIV	4444
IO71	0752	LOCM	0542	NOSET	0242	REDOA	0415
IO72	0561	LOCMO	4451	NOTEX	1363	REFILL	0723
IO73	2557	LOCUR	4452	NOTSTA	3041	REREAD	1063
IO74	2551	LNKDCA	0301	NTCLAS	1270	RERUN	1124
IO75	2542	LODGO	2330	NTERN	1255	RESERR	3111
IO76	0545	M10	0107	NTBOPT	1251	RESRAN	4442

RESTA	3077	TABLB	0471	XC8CHL	1023
RESTOR	3052	TEXAD	3241	XC8ECH	1063
RETRN	2331	TEXAS	3235	XC8EHR	1207
RETURN	2304	TEXCA	3227	XC8ING	0635
REWRT	1047	TEXCM	3221	XC8OCT	1000
RNFLD	0630	TEXDA	3225	XC8PAS	0200
RNRWD	2600	TEXDB	3245	XC8PAU	0337
ROUINS	1302	TEXDG	3243	XC8PNT	0303
ROUTHP	1544	TEXEX	3217	XC8P3W	0656
RSRAN	1761	TEXFW	3233	XC83W	0202
RUN	0600	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	0054
SAVEAC	1545	TIMER2	3141	XCRLT	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	XERNU	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	XLAS	0006
SPAC	1506	TRYTIM	1000	XLOAD	0053
SPACE	4431	TSAVE1	3045	XLOCA	0052
SPBLK	0164	TSAVE2	3046	XLOCM	0051
SPFLD	0160	TSAVE3	3047	XOCT1	0052
SPSEC	0163	TSAVE4	3050	XOCT4	0053
SPTRR1	0161	TSAVE5	3051	XPRINT	0045
SPTRR2	0162	TSTCHA	0715	XPRN	0055
STAPOT	0153	TYLPT	1121	XRDST	0047
STATER	2337	TYPDAT	3142	XREG	1372
STATRY	0137	TYPE	4445	XNESTR	0043
STATUS	2313	UPAROW	0615	XRNDOU	0040
STFLD	2703	UPDATE	0114	XRNHND	0027
STGEN	1753	UPONE	1414	XRSRAN	0042
STPHLT	0603	UPTRY	1120	XSDKP	0050
STRAUT	1325	WAIT	2000	XSPAC	0031
STRBUF	3600	WAIT1	2026	XSTFLD	0055
STREG	0121	WAREG	0132	XSTGEN	0034
STRREL	1151	WASRD	2264	XTAOLA	0457
STRTEX	0224	WATME3	0651	XTABLB	0400
STRWRK	2241	WCREG	0127	XTEAT	0172
SVLWK	0167	WROCHK	1612	XWAIT	0044
SWDAT	2601	WRKDON	2274	YESNU	4437
SWR	0020	XC8CKP	1041		
TABLA	0461	XC8CNT	0400		

ERRORS DETECTED: 0

LINKS GENERATED: 163

RUN-TIME: 6 SECONDS

3K CORE USED