IDENTIFICATION

PRODUCT CODE:	MAINDEC-08-DHRKD-D-D
PRODUCT NAME:	RK8E/RK8L DISK FORMATTER PROGRAM
DATE RELEASED:	FEBRUARY, 1977
MAINTAINER:	DIAGNOSTIC ENGINEERING
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1. ABSTRACT

THE RK8E/RK8L DISK FORMATTER PROGRAM IS DESIGNED TO WRITE AND CHECK THE FORMAT OF THE COMPLETE DISK CARTRIDGE.

ONLY STANDARD DEC SURFACE FORMAT IS AVAILABLE (I.E. SECTORS NUMBERED IN THE NORMAL NUMERICAL SEQUENCE Ø, 1, 2, 3, 4, 5, ETC.).

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 IOTØ FOR EXTENDED DRIVES 4-7 WHICH IS NOT AVAILABLE ON THE DW8E.

2.1 HARDWARE

A. PDP-8/E,8/F,8/M OR 8/A COMPUTER
   OTHER FAMILY OF 8 COMPATIBLE COMPUTER WITH NECESSARY
   DW8E BUS ADAPTER FOR RK8E CONTROL ONLY.

B. AT LEAST 4K OF READ/WRITE MEMORY. AT LEAST 8K OF MEMORY
   IS NEEDED FOR OPERATION OF THE CONSOLE PACKAGE.

C. ASR-33 TELETYPE OR EQUIVALENT

D. RK8E DISK CONTROL OR RK8L DISK CONTROL
E. RKØ5J OR RKØ5F DISK DRIVE(S)

NOTE: THE RKØ5F'S DRIVE IS CONSIDERED AS TWO SEPARATE UNITS. WHEN ANSWERING ALL QUESTIONS EACH SERPARATE UNIT MUST BE SPECIFIED: DSKØ?, DSK1?, DSK2?, ETC.

2.2 PROGRAM STORAGE

THE PROGRAM UTILIZES OR OCCUPIES LOCATIONS ØØØØ TO 4177 OF THE CURRENT FIELD.

3. PRELIMINARY PROGRAMS

THE FOLLOWING PROGRAMS SHOULD BE RUN IF THE FORMATTER PROGRAM FAILS TO OPERATE CORRECTLY:

ALL BASIC AND EXTENDED MEMORY DIAGNOSTICS

FOR THE RK8E CONTROL,RUN THE RK8E DISKLESS CONTROL TEST AND THE RK8E DRIVE CONTROL TEST.

FOR THE RK8L CONTROL,RUN THE RK8L INSTRUCTION TEST.

4. OPERATOR AND/OR PROGRAM ACTION

4.1 STANDARD TEST PROCEDURE

A. LOAD THE PROGRAM INTO ANY R/W MEMORY BANK USING THE STANDARD BINARY LOADER TECHNIQUE.

B. TO RUN THE FORMATTER PROGRAM, FOLLOW THE PROCEDURE IN SECTION 4.4.

4.2 RKØ5J DRIVE CARTRIDGE MOUNTING PROCEDURE

THE FOLLOWING IS THE CURRECT CARTRIDGE MOUNTING PROCEDURE FOR THE RKØ5J 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. OPEN ACCESS DOOR.

G. INSERT CARTRIDGE.

H. CLOSE ACCESS DOOR.

I. SET SWITCH LABELED "RUN/LOAD" TO THE "RUN" POSITION.

J. WAIT FOR 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 LIGHT LABELED "WT PROT" GOES OFF.

M. VERIFY THAT LIGHTS LABELED "FAULT", "WT", "RD", AND "LOAD" ARE OFF.

4.3 RKØ5F DRIVE SETUP PROCEDURE

THE FOLLOWING IS THE CURRECT DRIVE SETUP PROCEDURE FOR THE RKØ5F 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 FORMAT PROGRAM

A. MAKE READY ALL DRIVES TO BE FORMATTED:

FOR RK05J DRIVES USE THE RKØ5 DRIVE MOUNTING PROCEDURE
REFER TO SECTION 4.2.

FOR RKØ5F DRIVES USE THE RKØ5 DRIVE SETUP PROCEDURE
REFER TO SECTION 4.3.

B. SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION ON
ALL DRIVES NOT BEING FORMATTED.

C. SET THE SWITCH REGISTER TO Ø200 AND PRESS LOAD ADDRESS.

D. SET THE SWITCH REGISTER TO ØØØØ.

E. IF IT IS DESIRED TO CHANGE THE IOT DEVICE CODES WITHIN
THE PROGRAM (THEY ARE NORMALLY X74X), SET SWITCH REGISTER
BIT 11 TO A "1".

F. IF CHANGE IOT CODES WAS SELECTED, SET SWITCH REGISTER
BITS 3 TO 8 TO THE DESIRED IOT DEVICE CODE.

G. PRESS KEY START (KEY START IS KEY CLEAR AND THEN KEY
CONTINUE ON A PDP8/E, PDP8/F, OR PDP8/M). IF SELECTING A
PDP8/A (PRESS INIT AND THEN PRESS RUN). IF SELECTED,
ALL IOT DEVICE CODES WITHIN THE PROGRAM WILL BE CHANGED.
THE TTY WILL TYPE THE FOLLOWING PROGRAM NAME, INFORMATION,
AND QUESTION.

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RK8E/RK8L DISK FORMATTER PROGRAM
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FOR ALL QUESTIONS ANSWER Y FOR YES OR N FOR NO.
FORMAT DISK 0?

H. IF THE OPERATOR DESIRES TO FORMAT DISK 0, TYPE Y FOR YES, OTHERWISE, N FOR NO, ON THE TTY KEYBOARD. THE FOLLOWING QUESTION WILL THEN BE TYPED ON THE TTY.

FORMAT DISK 1?

I. IF THE OPERATOR DESIRES TO FORMAT DISK 1, TYPE Y FOR YES, OTHERWISE, N FOR NO, ON THE TTY KEYBOARD. THE FOLLOWING QUESTION WILL THEN BE TYPED ON THE TTY.

FORMAT DISK 2?

J. IF THE OPERATOR DESIRES TO FORMAT DISK 2, TYPE Y FOR YES, OTHERWISE, N FOR NO, ON THE TTY KEYBOARD. THE FOLLOWING QUESTION WILL THEN BE TYPED ON THE TTY.

FORMAT DISK 3?

K. IF THE OPERATOR DESIRES TO FORMAT DISK 3, TYPE Y FOR YES, OTHERWISE, N FOR NO, ON THE TTY KEYBOARD. THE FOLLOWING QUESTION WILL THEN BE TYPED ON THE TTY.

FORMAT DISK 4?

L. IF THE OPERATOR DESIRES TO FORMAT DISK 4, TYPE Y FOR YES, OTHERWISE, N FOR NO, ON THE TTY KEYBOARD. THE FOLLOWING QUESTION WILL THEN BE TYPED ON THE TTY.

FORMAT DISK 5?

M. IF THE OPERATOR DESIRES TO FORMAT DISK 5, TYPE Y FOR YES, OTHERWISE, N FOR NO, ON THE TTY KEYBOARD. THE FOLLOWING QUESTION WILL THEN BE TYPED ON THE TTY.

FORMAT DISK 6?

N. IF THE OPERATOR DESIRES TO FORMAT DISK 6, TYPE Y FOR YES, OTHERWISE, N FOR NO, ON THE TTY KEYBOARD. THE FOLLOWING QUESTION WILL THEN BE TYPED ON THE TTY.

FORMAT DISK 7?

O. IF THE OPERATOR DESIRES TO FORMAT DISK 7, TYPE Y FOR YES, OTHERWISE, N FOR NO, ON THE TTY KEYBOARD. THE FOLLOWING QUESTION WILL THEN BE TYPED ON THE TTY.

ARE YOU SURE?

P. TYPING N FOR NO WILL RESULT IN REPEATING ALL THE PREVIOUS QUESTIONS. TYPING Y FOR YES, WILL RESULT IN EXECUTION OF THE OPERATION SELECTED.

Q. PROGRAM EXECUTION IS APROX. 80 SECONDS PER DISK DRIVE. AFTER ALL DISKS SELECTED HAVE BEEN FORMATTED AND CHECKED THE TTY WILL TYPE THE FOLLOWING PASS COMPLETE MESSAGE AND

QUESTION.

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RK8E/RK8L DISK FORMATTER PASS COMPLETE
FORMAT SAME DISK(S) AGAIN?
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R. IF THE OPERATOR DESIRES TO REPEAT THE OPERATION SELECTED, TYPE Y FOR YES. TYPING N FOR NO WILL RESULT IN A REPEAT OF THE INITIAL START-UP QUESTIONS.

4.5 SWITCH REGISTER SETTINGS

SWR11=0	DO NOT CHANGE IOT DEVICE CODES
SWR11=1	CHANGE IOT DEVICE CODES
SWR3-8	DESIRED IOT DEVICE CODE.

5. ERRORS

WHEN A RECOVERABLE ERROR OCCURS THE TTY WILL PRINT AN "ERROR HEADER" AND ERROR INFORMATION PERTAINING TO THE FAILURE.

POSSIBLE ERROR HEADERS ARE AS FOLLOWS.

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

AFTER THE ERROR HEADER MENTIONED ABOVE IS TYPED THE TTY WILL PRINT SOME OF THE FOLLOWING ERROR INFORMATION PERTAINING TO THE FAILURE.

PC:	PROGRAM LOCATION OF FAILURE
GD:	EXPECTED INFORMATION
EX:	EXTENDED DRIVE BIT
CM:	SOFTWARE COMMAND REGISTER
ST:	CONTENTS OF STATUS REGISTER
DA:	SOFTWARE CYLINDER, SURFACE, AND SECTOR REGISTER
CA:	INITIAL CURRENT ADDRESS
AD:	ADDRESS OF DATA BREAK
DT:	DATA FOUND DURING DATA BREAK

AFTER THE ERROR INFORMATION IS TYPED THE TTY WILL TYPE ONE OF THE FOLLOWING QUESTIONS ASKING THE ERROR RECOVERY DESIRED.

A. IF THE ERROR WAS A RECALIBRATE ERROR THE FOLLOWING QUESTION

WILL BE TYPED.

TRY TO RECALIBRATE SAME DISK AGAIN?

TYPING A Y FOR YES WILL RESULT IN A REPEAT OF THE RECALIBRATE SEQUENCE ON THE DISK IN ERROR. TYPING N FOR NO WILL RESULT IN PROGRESSING TO THE NEXT AVAILABLE DISK.

B. IF THE ERROR WAS A WRITE ERROR THE FOLLOWING QUESTION WILL BE TYPED.

TRY TO FORMAT SAME CYLINDER AGAIN?

TYPING Y FOR YES WILL RESULT IN A REPEAT OF THE WRITE SEQUENCE ON THE CURRENT CYLINDER. TYPING N FOR NO WILL WILL IN PROGRESSING TO THE NEXT SEQUENCIAL CYLINDER.

C. IF THE ERROR WAS A READ OR CHECK ERROR THE FOLLOWING QUESTION WILL BE TYPED.

TRY TO CHECK SAME CYLINDER AGAIN?

TYPING A Y FOR YES WILL RESULT IN A REPEAT IN THE READ AND CHECK SEQUENCE ON THE CURRENT CYLINDER. TYPING A N FOR NO WILL RESULT IN PROGRESSING TO THE NEXT SEQUENCIAL CYLINDER.

6. PROGRAM DISCRIPTION

THE FORMATTING IS ACTUALLY A FUNCTION OF THE RK8E OR RK8L CONTROL AND DRIVE LOGIC. THE PROGRAM SIMPLY WRITES DATA ON EVERY SECTOR IN THE "WRITE ALL" MODE, THEN CHECKS THE DATA IN SUCH A WAY IN THE "READ DATA" MODE AS TO VERIFY THAT THE HEADER WORDS WRITTEN ON EVERY SECTOR ARE ALSO CORRECT. THE "READ DATA MODE" AUTOMATICALLY PERFORMS A CHECK HEADER FUNCTION.

THE FIRST TWO WORDS OF EVERY SECTOR ARE SET TO THE ABSOLUTE DISK ADDRESS(I.E. COMMAND REGISTER BITS 9-11 AND CYLINDER, SURFACE, AND SECTOR BITS 0-11, RESPECTIVELY) AND THE REMAINDER OF THE DATA AREA TO ALL ZEROS WHEN THE DATA IS WRITTEN. ONLY THE FIRST TWO WORDS OF EVERY SECTOR(I.E. THE ADDRESSING INFORMATION) ARE CHECKED WHEN DATA IS READ IN THE "READ DATA" MODE.

7. APT-8 HOOKS

7.1 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.

7.2 SETUP

ONLY HARDWARE CONFIGURATION WORD 2, ADDRESS 22, NEED BE ESTABLISHED. THE FOLLOWING INFORMATION MUST BE INDICATED:
1. SINGLE OR MULTIPLE DRIVE TESTING.
2. DRIVE OR DRIVES TO BE TESTED.
3. DIAGNOSTIC RUNNING UNDER APT-8.

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 5 MUST BE SET TO A ZERO (Ø) 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 (Ø) AND FINISHING WITH THE HIGHEST DRIVE INDICATED. IF MULTIPLE DRIVES OTHER THAN CONSECUTIVELY NUMBERED DRIVES BEGINNING WITH DRIVE ZERO (Ø) ARE TO BE DONE, THEY MUST BE DONE AS SINGLE DRIVES AND TESTED INDEPENDENTLY.

THE PROGRAM ALLOWS ONLY DRIVES ZERO (Ø) THROUGH SEVEN (7) TO BE TESTED AT THIS TIME.

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.

7.3 APT-8 INTERFACES

7.3.1. TIMING

APT-8 IS NOTIFIED OF PROGRAM RUN BETWEEN .2 SEC AND 2.Ø 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.

7.3.2. ERRORS

ONLY THE ERROR PC IS REPORTED TO APT-8 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.

8. PROGRAM LISTING

9. CONSOLE PACKAGE ADDENDUM

9.1 DESCRIPTION

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

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 INITIALIZE FOR A ACTIVE CONSOLE PACKAGE.

9.3 INITIALIZATION

FOR A ACTIVE CONSOLE PACKAGE

1.) SET LOCATION 21 BIT0=0 TO INDICATE USE OF 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 AVAILBLE 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

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**************************************************************
SR=0000 4000
        ----
```

UNDER SCORING INDICATES OPERATOR RESPONSE

9.7 END OF PASS

THE NORMAL PROGRAM PASS COMPLETE AS DESCRIBED IN SECTION 4.4 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 4.5 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 LOCATIONS CAN BE CHANGED TO MEET THE SPECIFIC NEED FOR MODIFICATION OF THE DIAGNOSTIC.

3637 IS THE LOCATION SET FOR THE NUMBER OF FILLER CHARACTERS AFTER A CRLF SET TO FOUR (4)

```
                /RK8E/RK8L DISK FORMATTER PROGRAM: MD-Ø8-DHRKD-D
                /MAINDEC-Ø8-DHRKD-D-D
                /
                /
        674Ø    DLSC=674Ø                           /LOAD SECTOR COUNTER
        6741    DSKP=6741                           /SKIP UN TRANSFER DONE OR ERROR
        674Ø2   DCLR=6742                           /CLEAR DISK CONTROL LOGIC
        6743    DLAG=6743                           /LOAD ADDRESS AND GO
        6744    DLCA=6744                           /LOAD CURRENT ADDRESS
        6745    DRST=6745                           /READ STATUS REGISTER
        6746    DLDC=6746                           /LOAD COMMAND REGISTER
        6747    DMAN=6747                           /LOAD MAINTENANCE
                /
        4446    LDSC=JMS I      XXLDSC
        443Ø    IOTCHN=JMS I    XCHANG
        4431    LODTRK=JMS I    XWRTRK
        4432    REDDSK=JMS I    XRDTRK
        4433    RECAL=JMS I     XRESTR
        4434    RECEIV=JMS I    XWAIT
        4435    KILBUF=JMS I    XKLBUF
        4437    ERROR=JMS I     XERRO
        444Ø    RDSTAT=JMS I    XRDST
        4444    LDADD=JMS I     XLDAD
        4441    DSKSKP=JMS I    XSDKP
        4442    LDCMD=JMS I     XLDCM
        4443    LDCUR=JMS I     XLDCA
        4445    CLRALL=JMS I    XCLDR
        4447    PRNTER=JMS I    XPRN
        445Ø    OCTEL=JMS I     XFROCT
        4451    TWOCT=JMS I     XTOCT
        4436    TYPE=JMS I      XPRINT
        4452    CRLF=JMS I      XCRLF
        4424    APT8A=JMS I     XAPT8
        4425    TIME=JMS I      XTIME
        4427    TICK=JMS I      XTICK
        4426    KAERRO=JMS I    XAERRO
                /
        ØØØØ    *Ø
                /
ØØØØ    Ø3Ø4            3Ø4                         /REV D
ØØØ1    5ØØ1            5ØØ1
ØØØ2    ØØØ2            ØØØ2
ØØØ3    ØØØ3            ØØØ3
                /
        ØØ1Ø    *1Ø
                /
ØØ1Ø    ØØØØ    AUTO1Ø, Ø
                /
ØØ11    ØØØØ    AUTO11, Ø
                /
        ØØ2Ø    *2Ø
                /
ØØ2Ø    ØØØØ            ØØØØ                        /PSEUDO SWITCH REGISTER
ØØ21    4ØØØ            4ØØØ                        /CONTRUL WORD 1
ØØ22    ØØØØ            ØØØØ                        /CONTRUL WORD 2
```

```
ØØ23    ØØØØ            ØØØØ                        /RESERVED
ØØ24    1125    XAPT8,  APT8
ØØ25    1557    XTIME,  KTIME
ØØ26    16ØØ    XAERRO, AERRO
ØØ27    153Ø    XTICK,  KTICK
ØØ3Ø    1463    XCHANG, CHANG
ØØ31    Ø6ØØ    XWRTRK, WRTTRK
ØØ32    1ØØØ    XRDTRK, REDTRK
ØØ33    14ØØ    XRESTR, RESTOR
ØØ34    1327    XWAIT,  WAIT
ØØ35    Ø752    XKLBUF, KLBUF
ØØ36    1312    XPRINT, PRINT
ØØ37    Ø436    XERRO,  ERRO
ØØ4Ø    Ø671    XRUST,  RDST
ØØ41    Ø74Ø    XSDKP,  SDKP
ØØ42    Ø72Ø    XLDCM,  LDCM
ØØ43    Ø7ØØ    XLDCA,  LDCA
ØØ44    Ø711    XLUAD,  LOAD
ØØ45    Ø745    XCLDR,  CLDR
ØØ46    Ø733    XXLDSC, XLDSC
ØØ47    1252    XPRN,   PRN
ØØ5Ø    1227    XFROCT, FROCT
ØØ51    12ØØ    XTOCT,  TOCT
ØØ52    1215    XCNLF,  UPONE
ØØ53    22Ø1    XLOTRK, LOTRK
ØØ54    22ØØ    XHITRK, HITRK
ØØ55    22ØØ    BGNBUF, WRKBUF
ØØ56    ØØØØ    AMUUNT, Ø
ØØ57    ØØØØ    SWITCH, Ø
ØØ6Ø    ØØØ3    KØØØ3,  ØØØ3
ØØ61    ØØØ4    K4,     4
ØØ62    ØØØ7    KØØØ7,  ØØØ7
ØØ63    ØØ4Ø    KØØ4Ø,  ØØ4Ø
ØØ64    7465    M313,   -313
ØØ65    Ø277    KØ277,  Ø277
ØØ66    Ø2ØØ    KØ2ØØ,  Ø2ØØ
ØØ67    Ø26Ø    KØ26Ø,  Ø26Ø
ØØ7Ø    4ØØØ    K4ØØØ,  4ØØØ
ØØ71    7735    K7735,  7735
ØØ72    776Ø    K776Ø,  776Ø
ØØ73    Ø4ØØ    KØ4ØØ,  4ØØ
ØØ74    ØØ37    KØØ37,  ØØ37
ØØ75    62Ø1    KCDF,   CDF
ØØ76    7774    M4,     -4
ØØ77    777Ø    M1Ø,    -1Ø
Ø1ØØ    ØØØØ    DRIVNO, Ø
Ø1Ø1    ØØØØ    CHAR,   Ø
Ø1Ø2    ØØØØ    LOWAD,  Ø
Ø1Ø3    ØØØØ    HIGHAD, Ø
Ø1Ø4    ØØØØ    TRKCNT, Ø
Ø1Ø5    ØØØØ    DSKCNT, Ø
Ø1Ø6    ØØØØ    SBCNT1, Ø
Ø1Ø7    ØØØØ    STCNT1, Ø
Ø11Ø    ØØØØ    STCNT2, Ø
Ø111    ØØØØ    STCNT3, Ø
```

```
0112  0000    TCNTR1, 0
0113  0000    TCNTR2, 0
0114  0000    TCNTR3, 0
0115  0000    TCNTR4, 0
0116  0000    TCNTR5, 0
              /
0117  0000    GOREG2, 0
0120  0000    EXBIT,  0
0121  0000    CMREG,  0
0122  0000    STREG,  0
0123  0000    DAREG,  0
0124  0000    CAREG,  0
0125  0000    ADREG,  0
0126  0000    DTREG,  0
0127  0263    BGNTST, FRMDSK
0130  0000    HOMEMA, 0
0131  0000    DATCNT, 0
0132  7776    CLKCNT, -2
              /
0133  1623    XMOVE,  MOVE
0134  0000    LOC8ED, 0
0135  0424    XEND,   ENDTST
0136  0000    SOFT,   0
0137  0140    ADPOT1, DSK0A
0140  0000    DSK0A,  0
0141  0000    DSK1A,  0
0142  0000    DSK2A,  0
0143  0000    DSK3A,  0
0144  0000    DSK4A,  0
0145  0000    DSK5A,  0
0146  0000    DSK6A,  0
0147  0000    DSK7A,  0
0150  0151    ADPOT2, DSK0B
0151  0000    DSK0B,  0
0152  0000    DSK1B,  0
0153  0000    DSK2B,  0
0154  0000    DSK3B,  0
0155  0000    DSK4B,  0
0156  0000    DSK5B,  0
0157  0000    DSK6B,  0
0160  0000    DSK7B,  0
0161  0000    PCOUNT, 0                               /USED ONLY IF ON APT
              /
      0200    *200
              /
0200  6224    BGN,    RIF
0201  3130            DCA     HOMEMA
0202  1130            TAD     HOMEMA
0203  1075            TAD     KCDF                    /MAKE HOMEDF
0204  3205            DCA     .+1
0205  7402            HLT                             /MAKE DF=IF
              /NOW TEST FOR APT SYSTEM
              /IF ON APT TERMINAL MESSAGES ARE SKIP
              /TO AVOID TIMING PROBLEMS WITH THE SYSTEM
0206  4424            APT8A                           /TEST FOR APT SYSTEM
```

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0207  4777'           JMS     XC8PSW                  /GET SR=,
0210  4430            IOTCHN                          /CHANGE DEVICE TO SWR3-8
0211  4452            CRLF
0212  4452            CRLF
0213  4447            PRNTER                          /PRINT "RK8E/RK8L DISK FORMATTER PROGRAM"
0214  2045            MES1                            /MESSAGE 1 POINTER
0215  4452            CRLF
0216  4447            PRNTER                          /PRINT "FOR ALL QUESTIONS"
0217  2066            MES2                            /MESSAGE POINTER 2
0220  1077    ALLAGN, TAD     M10
0221  3107            DCA     STCNT1                  /COUNTER FOR AMOUNT OF DISKS
0222  3134            DCA     LOC8ED
0223  3110            DCA     STCNT2
0224  4452    SAMAGN, CRLF
0225  4447            PRNTER                  /PRINT "FORMAT DISK ? "
0226  2117            MES3                            /MESSAGE POINTER 3
0227  1110            TAD     STCNT2
0230  1067            TAD     K0260
0231  4436            TYPE                            /TYPE DISK NUMBER
0232  1065    QUES1,  TAD     K0277
0233  4436            TYPE                            /TYPE ?
0234  1137            TAD     ADPOT1
0235  1110            TAD     STCNT2
0236  3111            DCA     STCNT3
0237  4434            RECEIV                          /WAIT FOR CHARACTER
0240  5244            JMP     NOTDSK                  /NO NOT THIS DISK
0241  5232            JMP     QUES1                   /NEITHER YES OR NO
0242  2134    WASDSK, ISZ     LOC8ED
0243  7340            CLA CLL CMA
0244  3511    NOTDSK, DCA I   STCNT3                  /YES, WAS CLEAR DISK POINTER
0245  2110            ISZ     STCNT2                  /UPDATE POINTER
0246  2107            ISZ     STCNT1                  /COUNT DISKS
0247  5224            JMP     SAMAGN                  /ASK ABOUT NEXT
              /
0250  4452    DONE,   CRLF
0251  4447            PRNTER                          /PRINT "ARE YOU SURE ?"
0252  2126            MES4                            /MESSAGE POINTER 4
0253  4434            RECEIV                          /WAIT FOR CHARACTER
0254  5220            JMP     ALLAGN                  /NO, START ALL OVER
0255  5250            JMP     DONE                    /NEITHER TYPE ?
0256  1134            TAD     LOC8ED
0257  7041            CIA
0260  7450            SNA                             /ANY DISKS
0261  5200            JMP     BGN                     /NO, OPERATOR ERROR
0262  3134            DCA     LOC8ED                  /YES, AMOUNT LOCATED
              /
              /FIRST RECALIBRATE AND FORMAT IN WRITE ALL MODE
              /ALL DISK DRIVES SELECTED BY OPERATOR,, MAKE THE FIRST
              /TWO WORDS OF EVERY DISK SECTOR EQUAL TO THE
              /ABSOLUTE DISK ADDRESS.
              /
0263  4533    FRMDSK, JMS I   XMOVE                   /MOVE DISK POINTERS
0264  1134            TAD     LOC8ED
0265  3056            DCA     AMOUNT
0266  1056            TAD     AMOUNT
```

```
        0267  3105              DCA     DSKCNT                  /COUNTER FOR AMOUNT OF DISKS
        0270  3115              DCA     TCNTR4
        0271  1150              TAD     ADPOT2
        0272  3116              DCA     TCNTR5                  /A FEW COUNTERS
        0273  1516              TAD I   TCNTR5
        0274  7640              SZA CLA                         /FORMAT THIS DISK
        0275  5302              JMP     FORMAT                  /YES, GO
        0276  2116      NEXFRM, ISZ     TCNTR5                  /NO, TRY NEXT
        0277  2115              ISZ     TCNTR4
        0300  5273              JMP     .-5
        0301  7402              HLT                             /WHAT HAPPENED????
                        /
        0302  1115      FORMAT, TAD     TCNTR4
        0303  0060              AND     K0003                   /MASK OUT
        0304  7104              CLL RAL                         /MAKE DISK NUMBER
        0305  3100              DCA     DRIVNO
        0306  1115              TAD     TCNTR4
        0307  0061              AND     K4
        0310  7640              SZA CLA
        0311  1066              TAD     K0200
        0312  3120              DCA     EXBIT                   /SET EXTENDED DRIVE BIT
        0313  4433              RECAL                           /RECALIBRATE THIS DRIVE
        0314  5335              JMP     RENEX1                  /RECALIBRATE NEXT EXISTING
        0315  3102              DCA     LOWAD                   /SETUP ADDRESS POINTER
        0316  3103              DCA     HIGHAD                  /SETUP ADDRESS POINTER
        0317  1064              TAD     M313
        0320  3104              DCA     TRKCNT                  /COUNTER FOR AMOUNT OF TRACKS
                        /
                        /
        0321  4427      WRTDSK, TICK                            /TIMING FOR APT IF NEEDED.
        0322  7774              -4                              /OTHERWISE BOTH ARE SKIPPED
        0323  4431              LODTRK                          /FORMAT A TRACK
        0324  5335              JMP     RENEX1                  /TO NEXT DISK
        0325  7300              CLA CLL
        0326  1102              TAD     LOWAD
        0327  1063              TAD     K0040
        0330  3102              DCA     LOWAD                   /UPDATE TO NEXT TRACK
        0331  7630              SZL CLA                         /SET EXTENDED BIT
        0332  2103              ISZ     HIGHAD                  /YES
        0333  2104              ISZ     TRKCNT                  /UPDATE TRACK COUNTER
        0334  5321              JMP     WRTDSK                  /DO NEXT TRACK
        0335  2105      RENEX1, ISZ     DSKCNT                  /UPDATE DISK COUNTER
        0336  5276              JMP     NEXFRM                  /DO NEXT DISK
                        /
                        /ROUTINE TO CHECK ADDRESSING INFORMATION ON THE DISK,
                        /THE FIRST TWO WORDS OF EVERY SECTOR SHOULD EQUAL
                        /THE ABSOLUTE DISK ADDRESS. ALL OTHER DATA IS
                        /NOT CHECKED.
                        /
        0337  1056      CHKDSK, TAD     AMOUNT
        0340  3105              DCA     DSKCNT                  /AMOUNT OF DISKS
        0341  3115              DCA     TCNTR4
        0342  1150              TAD     ADPOT2
        0343  3116              DCA     TCNTR5
        0344  1516              TAD I   TCNTR5                  /SOFTWARE INFORMATION
```

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        0345  7640              SZA CLA                         /CHECK THIS DISK
        0346  5353              JMP     CHKDAT                  /CHECK THIS ONE
        0347  2116      NEXCHK, ISZ     TCNTR5                  /UPDATE FOR NEXT DISK
        0350  2115              ISZ     TCNTR4
        0351  5344              JMP     .-5
        0352  7402              HLT                             /WHAT HAPPENED?????
                        /
        0353  1115      CHKDAT, TAD     TCNTR4
        0354  0060              AND     K0003                   /MASK OUT
        0355  7104              CLL RAL                         /MAKE DRIVE NUMBER
        0356  3100              DCA     DRIVNO
        0357  1115              TAD     TCNTR4
        0360  0061              AND     K4
        0361  7640              SZA CLA
        0362  1066              TAD     K0200
        0363  3120              DCA     EXBIT                   /SET EXTENDED DRIVE BIT
        0364  4433              RECAL                           /RECALIBRATE
        0365  5776'             JMP     RENEX2                  /TRY NEXT DRIVE
        0366  3102              DCA     LOWAD
        0367  3103              DCA     HIGHAD                  /SETUP STARTING DISK ADDRESS
        0370  1064              TAD     M313
        0371  3104              DCA     TRKCNT                  /AMOUNT OF TRACKS TO DO
        0372  5775'             JMP     CHECK
                        /
        0375  0400
        0376  0414
        0377  3456
              0400      PAGE
                        /
        0400  4427      CHECK,  TICK                            /TIMING FOR APT IF NEEDED,
        0401  7774              -4                              /SKIPPED IF NOT REQUIRED,
        0402  4432              REDDSK                          /READ AND CHECK ONE CYLINDER
        0403  5214              JMP     RENEX2                  /TO NEXT DISK
        0404  7300              CLA CLL
        0405  1102              TAD     LOWAD
        0406  1063              TAD     K0040
        0407  3102              DCA     LOWAD                   /UPDATE TO NEXT CYLINDER
        0410  7630              SZL CLA                         /TIME TO SET EXTENDED BIT
        0411  2103              ISZ     HIGHAD                  /YES, SET IT
        0412  2104              ISZ     TRKCNT                  /UPDATE CYLINDER COUNTER
        0413  5200              JMP     CHECK                   /CHECK NEXT ONE
        0414  2105      RENEX2, ISZ     DSKCNT                  /UPDATE DISK COUNTER
        0415  5777'             JMP     NEXCHK                  /CHECK NEXT
                        /
                        /
        0416  1022              TAD     22
        0417  0070              AND     K4000                   /TEST FOR APT
        0420  7650              SNA CLA                         /ARE WE?
        0421  5224              JMP     ENDTST                  /NO, NORMAL RUN
        0422  2161              ISZ     PCOUNT                  /INCREMENT PASS COUNT
        0423  5776'             JMP     FRMDSK                  /LOOP PROGRAM
        0424  4452      ENDTST, CRLF
        0425  4447              PRNTER                          /PRINT "PASS COMPLETE"
        0426  2021              TEXEND
        0427  4452              CRLF
        0430  4447             PRNTER                            /PRINT "TRY SAME SEQUENCE"
        0431  2135             MESS
        0432  4434             RECEIV                            /WAIT FOR INPUT FROM OPERATOR
        0433  5775'            JMP     ALLAGN                    /NO, ASK AGAIN
        0434  5227             JMP     .-5
        0435  5776'            JMP     FRMDSK                    /TRY SAME SEQUENCE
                      /
                      /
                      /SUBROUTINE FOR "ERRORS," SCOPE LOOPS, AND
                      /ERROR TYPEOUTS,
                      /
        0436  0000    ERRO,    0
        0437  7301             CLA CLL IAC
        0440  1236             TAD     ERRO                      /GET PC STORED
        0441  3344             DCA     RETRN1                    /STORE FOR RETURN
        0442  4426             KAERRO                            /NOTIFY APT OF ERROR IS NEED BE
        0443  4452             CRLF
        0444  4452             CRLF
        0445  1636             TAD I   ERRO                      /GET TEXT POINTER
        0446  0062             AND     K0007                     /MASK 9-11
        0447  1352             TAD     HEDTAD                    /MAKE ERROR HEADER TAD
        0450  3251             DCA     .+1
        0451  7402             HLT                               /MODIFIED HEADER TAD
        0452  3254             DCA     .+2
        0453  4447             PRNTER                            /MODIFIED HEADER POINTER
        0454  7402             HLT
        0455  4452             CRLF
        0456  4447             PRNTER                            /PRINT PC:
        0457  1642             TEXPC
        0460  1236             TAD     ERRO                      /GET PC POINTER
        0461  4450             OCTEL                             /PRINT PC STORED
        0462  1636             TAD I   ERRO                      /GET TEXT POINTER
        0463  7104             CLL RAL
        0464  7420             SNL
        0465  5274             JMP     NTGD                      /NOT GD: REGISTER
        0466  3236             DCA     ERRO
        0467  4447             PRNTER                            /PRINT GD:
        0470  1644             TEXGD
        0471  1117             TAD     GOREG2
        0472  4450             OCTEL                             /PRINT FOUR OCTAL
        0473  7610             SKP CLA
        0474  3236    NTGD,    DCA     ERRO
        0475  4447             PRNTER
        0476  1646             TEXEX
        0477  1120             TAD     EXBIT
        0500  7640             SZA CLA
        0501  7001             IAC
        0502  4450             OCTEL
        0503  1345             TAD     XTEXT
        0504  3350             DCA     PCNTR2
        0505  1346             TAD     XREG
        0506  3010             UCA     AUTO10
        0507  1357             TAD     K7771
        0510  3347             DCA     PCNTR1                    /COUNTER FOR    # OF HEADS
        0511  7344             CLA CLL CMA RAL
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        0512  3351             DCA     PCNTR3
        0513  1236    STRAUT,  TAD     ERRO                      /GET TEXT POINTER
        0514  7500             SMA
        0515  5336             JMP     NOTEX                     /NOT THIS ONE
        0516  7104             CLL RAL
        0517  3236             DCA     ERRO
        0520  1350             TAD     PCNTR2                    /GET TEXT MESSAGE POINTER
        0521  2350             ISZ     PCNTR2
        0522  2350             ISZ     PCNTR2
        0523  3325             DCA     .+2                       /STORE FOR PRNTER
        0524  4447             PRNTER                            /PRINT XX:
        0525  7402             HLT                               /MODIFIED TEXT POINTER
        0526  1410             TAD I   AUTO10
        0527  4450             OCTEL                             /PRINT FOUR OCTAL
        0530  2351             ISZ     PCNTR3
        0531  7610             SKP CLA
        0532  4452             CRLF
        0533  2347    AGAIN,   ISZ     PCNTR1
        0534  5313             JMP     STRAUT                    /CHECK FOR NEXT XX:
        2535  5744             JMP I   RETRN1                    /RETURN TO QUESTION
        0536  7104    NOTEX,   CLL RAL
        0537  3236             DCA     ERRO
        0540  2350             ISZ     PCNTR2
        0541  2350             ISZ     PCNTR2
        0542  2010             ISZ     AUTO10
        0543  5333             JMP     AGAIN
                      /
        0544  0000    RETRN., 0
        0545  1650    XTEXT,   TEXCM
        0546  0120    XREG,    EXBIT
        0547  0000    PCNTR1, 0
        0550  0000    PCNTR2, 0
        0551  0000    PCNTR3, 0
        0552  1353    HEDTAD, TAD      HEDLST
        0553  1664    HEDLST, ERTX1
        0554  1675             ERTX2
        0555  1705             ERTX3
        0556  1717             ERTX4
        0557  7771    K7771,   7771
                      /
        0575  0220
        0576  0263
        0577  0347
              0600    PAGE
                      /
                      /ROUTINE TO FORMAT CYLINDER
                      /MAKE FIRST TWU WORDS OF EVERY SECTOR
                      /EWUAL TO DISK ADDRESS.
                      /
        0600  0000    WRTTRK, 0
        0601  7330             CLA CLL CML RAR
        0602  3117             DCA     GDREG2                    /SETUP COMPARE REGISTER
        0603  4435             KILBUF                            /CLEAR BUFFER
        0604  1071             TAD     K7735                     /AMOUNT OF SECTORS TO DO
        0605  3112             DCA     TCNTR1                    /SETUP COUNTER
```

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0606  3113              DCA     TCNTR2                  /STARTING WITH 0
0607  1072              TAD     K7760                   /STOPPER
0610  3114              DCA     TCNTR3                  /SECTOR COUNTER POINTER STOP
0611  1113      LODR1,  TAD     TCNTR2
0612  0074              AND     K0037                   /MASK SECTOR BITS
0613  1102              TAD     LOWAD                   /ADD IN CYLINDER
0614  3453              DCA I   XLOTRK                  /SETUP TRACK WORD IN BUFFER
0615  1120              TAD     EXBIT                   /ADD IN EXTENDED BIT
0616  1103              TAD     HIGHAD
0617  1100              TAD     DRIVNO                  /ADD IN DRIVE NUMBER
0620  3454              DCA I   XHITRK                  /SETUP TRACK WORD IN BUFFER
0621  1454              TAD I   XHITRK
0622  0270              AND     K7577
0623  1130              TAD     HOMEMA                  /CURRENT FIELD
0624  1267              TAD     K5000                   /FUNCTION WRITE ALL
0625  4442              LDCMD                           /LOAD COMMAND
0626  1120              TAD     EXBIT
0627  4446              LDSC                            /LOAD EXTENDED DRIVE BIT
0630  7200              CLA                             /CLEAR EXTENDED DRIVE BIT
0631  1055              TAD     BGNBUF
0632  4443              LDCUR                           /LOAD CURRENT ADDRESS
0633  1453              TAD I   XLOTRK
0634  4444              LDADD                           /LOAD TRACK AND GO
0635  4441              DSKSKP                          /SKIP ON FLAG
0636  5235              JMP     .-1                     /WAIT FOR FLAG
0637  4440              RDSTAT                          /READ STATUS
0640  1070              TAD     K4000
0641  7640              SZA CLA                         /WAS STATUS 0?
0642  5254              JMP     LODER                   /ERROR, STATUS ON WRITE ALL
0643  2113              ISZ     TCNTR2
0644  2114              ISZ     TCNTR3                  /COUNT FIRST REVOLUTION
0645  7610              SKP CLA                         /STILL IN FIRST REV.
0646  3113              DCA     TCNTR2                  /SETUP FOR SECTOR "1"
0647  2113              ISZ     TCNTR2
0650  2112              ISZ     TCNTR1                  /UPDATE SECTOR COUNTER
0651  5211              JMP     LODR1                   /TRY NEXT SECTOR
0652  2200              ISZ     WRTTRK
0653  5600              JMP I   WRTTRK                  /THIS CYLINDER DONE
0654  4437      LODER,  ERROR                           /ERROR, STATUS
0655  3602              3602                            /TEXT POINTER
                /
0656  4433              RECAL                           /CLEAR CONTROL AND DRIVE
0657  5600              JMP I   WRTTRK                  /TO NEXT DISK
0660  4452              CRLF
0661  4447              PRNTER                          /PRINT "TRY SAME AGAIN"
0662  1734              ERMES1
0663  4434              RECEIV                          /WAIT FOR YES OR NO
0664  5252              JMP     LODER-2                 /WAS A NO TRY SAME CYLINDER
0665  5260              JMP     .-5                     /WAS NEITHER ASK AGAIN
0666  5201              JMP     WRTTRK +1               /YES, TRY NEXT
0667  5000      K5000,  5000
0670  7577      K7577,  7577
                /
                /
                /SUBROUTINE TO READ STATUS REGISTER
```

```
                /
0671  0000      RDST,   0
0672  6745      IOT5,   DRST                            /READ STATUS IOT
0673  7410              SKP
0674  4777'     ERHLT5, JMS     XC8ERR                  /SKIP TRAP ERROR.
0675  3122              DCA     STREG                   /SAVE RESULTS
0676  1122              TAD     STREG
0677  5671              JMP I   RDST                    /EXIT
                /
                /SUBROUTINE TO LOAD CURRENT ADDRESS REGISTER
                /
0700  0000      LDCA,   0
0701  3125              DCA     ADREG                   /SAVE IN ADDRESS
0702  1125              TAD     ADREG
0703  3124              DCA     CAREG                   /SETUP INITIAL CURRENT ADDRESS
0704  1125              TAD     ADREG
0705  6744      IOT4,   DLCA                           /LOAD CURRENT ADDRESS IOT
0706  5700              JMP I   LDCA                    /EXIT
0707  4777'     ERHLT4, JMS     XC8ERR                  /SKIP TRAP ERROR.
0710  5307              JMP     .-1
                /
                /
                /SUBROUTINE TO LOAD TRACK ADDRESS REGISTER
                /
0711  0000      LDAD,   0
0712  3123              DCA     DAREG                   /SAVE OUTBOUND DATA
0713  1123              TAD     DAREG
0714  6743      IOT3,   DLAG                           /LOAD DISK ADDRESS REGISTER
0715  5711              JMP I   LDAD                    /EXIT
0716  4777'     ERHLT3, JMS     XC8ERR                  /SKIP TRAP ERROR.
0717  5316              JMP     .-1
                /
                /
                /SUBROUTINE TO LOAD COMMAND REGISTER
                /
0720  0000      LDCM,   0
0721  3121              DCA     CMREG                   /SAVE OUTBOUND DATA
0722  3776'             DCA     INMODE
0723  4775'             JMS     XC8CKP                  /CHECK FOR CONTROL CHARACTERS.
0724  7200              CLA
0725  7200              CLA
0726  1121              TAD     CMREG
0727  6746      IOT6,   DLDC                            /LOAD COMMAND REGISTER
0730  5720              JMP I   LDCM                    /EXIT
0731  4777'     ERHLT6, JMS     XC8ERR                  /SKIP TRAP ERROR.
0732  5331              JMP     .-1
                /
                /
                /SUBROUTINE ISSUE "DLSC"
0733  0000      XLDSC,  0
0734  6740      IOT0,   DLSC
0735  5733              JMP I   XLDSC
0736  4777'     ERHLT0, JMS     XC8ERR
0737  5336              JMP     .-1
```

```
                /SUBROUTINE TO ISSUE "DSKP" DISK SKIP IOT
                /
0740  0000      SDKP,   0
0741  6741      IOT1,   DSKP                            /DISK SKIP IOT
0742  7410              SKP                              /DID NOT SKIP
0743  2340              ISZ     SDKP
0744  5740              JMP I   SDKP                     /EXIT
                /
                /SUBROUTINE TO ISSUE "DCLR" CLEAR IOT
                /
0745  0000      CLDR,   0
0746  6742      IOT2,   DCLR                            /DCLR "CLEAR IOT"
0747  5745              JMP I   CLDR                     /EXIT
0750  4777'     ERHLT2, JMS     XC8ERR                   /SKIP TRAP ERROR.
0751  5350              JMP     .-1
                /
                /ROUTINE TO ZERO WORK BUFFER
                /
0752  0000      KLBUF,  0
0753  7340              CLA CLL CMA
0754  1055              TAD     BGNBUF                   /START OF BUFFER -1
0755  3010              DCA     AUTO10                   /SETUP AUTO INDEX
0756  1364              TAD     K7400
0757  3131              DCA     DATCNT                   /SETUP COUNTER
0760  3410              DCA I   AUTO10                   /CLEAR BUFFER
0761  2131              ISZ     DATCNT                   /UPDATE COUNTER
0762  5360              JMP     .-2                      /NOT ALL CLEARED YET
0763  5752              JMP I   KLBUF                    /BUFFER CLEARED
0764  7400      K7400,  7400
                /
0775  3641
0776  3676
0777  4007
      1000      PAGE
                /
                /
                /ROUTINE TO READ AND CHECK A CYLINDER
                /
1000  0000      REDTRK, 0
1001  1071              TAD     K7735
1002  3112              DCA     TCNTR1                   /AMOUNT OF SECTORS TO DO
1003  3113              DCA     TCNTR2                   /STARTING WITH 0
1004  1072              TAD     K7760
1005  3114              DCA     TCNTR3
1006  4435              KILBUF                           /CLEAR BUFFER
1007  7340      CHKR1,  CLA CLL CMA
1010  3136              DCA     SOFT                     /SETUP SOFT ERROR FLAG
1011  1055              TAD     BGNBUF
1012  4443              LDCUR                            /LOAD CURRENT ADDRESS
1013  1103              TAD     HIGHAD                   /EXTENDED CYLINDER BIT
1014  1100              TAD     DRIVNO                   /CURRENT DRIVE
1015  1130              TAD     HOMEMA                   /CURRENT FIELD
1016  4442              LDCMD                            /LOAD COMMAND
1017  1120              TAD     EXBIT                    /LOAD EXTENDED DRIVE BIT
1020  4446              LDSC
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1021  7200              CLA                              /CLEAR EXTENDED DRIVE BIT
1022  1113              TAD     TCNTR2
1023  0074              AND     K0037                    /MASK SECTOR BITS OFF
1024  1102              TAD     LOWAD                    /ADD IN OTHER DISK ADDRESS
1025  4444              LDADD                            /LOAD AND GO
1026  4441              DSKSKP                           /DISK SKIP IOT
1027  5226              JMP     .-1                      /WAIT FOR FLAG
1030  4440              RDSTAT                           /READ STATUS
1031  1070              TAD     K4000                    /ADD IN FUDGE FACTOR
1032  7650              SNA CLA                          /SKIP IF ERROR
1033  5241              JMP     STAOK                    /STATUS O.K.
1034  1122              TAD     STREG                    /GET STATUS READ
1035  0777'             AND     K0010
1036  7650              SNA CLA                          /WAS IT A CRC
1037  5306              JMP     STAER                    /NO, JUST A HARD ERROR
1040  3136              DCA     SOFT                     /CLEAR SOFT ERROR FLAG
1041  1121      STAOK,  TAD     CMREG                    /GET LAST COMMAND
1042  0062              AND     K0007
1043  1120              TAD     EXBIT                    /ADD EXTENDED DRIVE BIT
1044  7041              CIA
1045  1454              TAD I   XHITRK                   /GET WORD READ FROM DISK
1046  7650              SNA CLA                          /SKIP IF ERROR
1047  5256              JMP     FRSTOK                   /FIRST WORD O.K.
1050  1454              TAD I   XHITRK                   /GET WORD
1051  3126              DCA     DTREG                    /SETUP ERROR PRINTER
1052  1121              TAD     CMREG
1053  0062              AND     K0007
1054  3117              DCA     GDREG2                   /SETUP GOOD FOR PRINTER
1055  5303              JMP     DATER                    /NO, DATA ERROR
1056  1453      FRSTOK, TAD I   XLOTRK                   /GET WORD READ
1057  7041              CIA
1060  1123              TAD     DAREG                    /COMPARE TO GOOD
1061  7650              SNA CLA                          /SKIP IF ERROR
1062  5271              JMP     DATOK                    /WORD O.K.
1063  2125              ISZ     ADREG                    /SETUP ERROR PRINTER
1064  1123              TAD     DAREG
1065  3117              DCA     GDREG2                   /SETUP GOOD WORD FOR PRINTER
1066  1453              TAD I   XLOTRK                   /GET WORD READ
1067  3126              DCA     DTREG                    /SETUP FOR PRINTER
1070  5303              JMP     DATER                    /DATA ERROR
1071  1136      DATOK,  TAD     SOFT                     /GET SOFT ERROR FLAG
1072  7650              SNA CLA                          /WAS IT CLEAR
1073  5306              JMP     STAER                    /YES, STATUS ERROR
1074  1113              TAD     TCNTR2
1075  1060              TAD     K0003                    /ADVANCE 3 SECTORS
1076  3113              DCA     TCNTR2
1077  2114              ISZ     TCNTR3
1100  5207              JMP     CHKR1                    /MORE TO FORMAT
1101  2200              ISZ     REDTRK
1102  5600              JMP I   REDTRK                   /EXIT, O.K.
1103  1776'     DATER,  TAD     K7741
1104  3313              DCA     TCHKT                    /SETUP TEXT POINTER
1105  5312              JMP     CHKER                    /ERROR
1106  1775'     STAER,  TAD     K3600
1107  3313              DCA     TCHKT                    /SETUP TEXT POINTER
```

```
        1110  7330                  CLA CLL CML RAR
        1111  3117                  DCA     GOREG2                          /SETUP GOOD STATUS PRINTER
        1112  4437          CHKER,  ERROR                                   /ERROR, READ DATA
        1113  0000          TCHKT,  0                                       /MODIFIED TEXT POINTER
        1114  4433                  RECAL                                   /CLEAR CONTROL AND DRIVE
        1115  5600                  JMP I   REDTRK                          /TO NEXT DISK
        1116  4452                  CRLF
        1117  4447                  PRNTER                                  /PRINT "TRY SAME AGAIN"
        1120  2000                  ERMES3
        1121  4434                  RECEIV
        1122  5301                  JMP     DATER -2                        /CHECK NEXT
        1123  5316                  JMP     .-5                             /RE-PRINT
        1124  5201                  JMP     REDTRK +1                       /TRY SAME AGAIN
                            /
                            /THIS ROUTINE WILL TEST FOR APT AND NOP CONSOLE
                            /PACKAGE IF NEED BE
                            /
        1125  0000          APT8,   0
        1126  1022                  TAD     22
        1127  7700                  SMA CLA
        1130  5725                  JMP I   APT8
        1131  1022                  TAD     22
        1132  0373                  AND     K7377                           /ON APT, NOP CONSOLE PACKAGE
        1133  3022                  DCA     22
        1134  1022                  TAD     22
        1135  0062                  AND     K0007                           /ISOLATE DRIVE NUMBER OR
                                                                            /NUMBER OF DRIVES TO BE DONE
        1136  3107                  DCA     STCNT1
        1137  1022                  TAD     22
        1140  0774'                 AND     K0100
        1141  7650                  SNA CLA                                 /SINGLE DRIVE TESTING
        1142  5353                  JMP     MULDSK                          /NO,SEVERAL TO DO
        1143  1137                  TAD     ADPOT1                          /GET DISK POINTER
        1144  1107                  TAD     STCNT1                          /ESTABLISH DRIVE TO DO
        1145  3107                  DCA     STCNT1
        1146  7340                  CLL CLA CMA                             /-1
        1147  3507                  DCA I   STCNT1
        1150  7340                  CLL CLA CMA                             /ONE DISK TO DO
        1151  3134                  DCA     LOC8ED
        1152  5527                  JMP I   BGNTST
        1153  1107          MULDSK, TAD     STCNT1                          /DRIVE TO BE DONE
        1154  7040                  CMA
        1155  3107                  DCA     STCNT1
        1156  1137                  TAD     ADPOT1                          /GET DISK POINTER
        1157  1110                  TAD     STCNT2                          /ESTABLISH DRIVE TO BE DONE
        1160  3111                  DCA     STCNT3
        1161  2134                  ISZ     LOC8ED
        1162  7340                  CLL CLA CMA
        1163  3511                  DCA I   STCNT3                          /DO THIS DRIVE
        1164  2110                  ISZ     STCNT2
        1165  2107                  ISZ     STCNT1
        1166  5356                  JMP     MULDSK+3                        /MORE TO DO
        1167  1134                  TAD     LOC8ED
        1170  7041                  CIA
        1171  3134                  DCA     LOC8ED          /NUMBER TO BE DONE
```

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        1172  5527                  JMP I   BGNTST
        1173  7377          K7377,  7377
        1174  1556
        1175  1326
        1176  1325
        1177  1324
              1200          PAGE
                            /
                            /SUBROUTINE TO PRINT TWO OCTAL
                            /
        1200  0000          TOCT,   0
        1201  3106                  DCA     SBCNT1                          /SAVE AC
        1202  1106                  TAD     SBCNT1
        1203  7010                  RAR
        1204  7012                  RTR
        1205  0062                  AND     K0007
        1206  1067                  TAD     K0260
        1207  4436                  TYPE                                    /PRINT FIRST BYTE
        1210  1106                  TAD     SBCNT1
        1211  0062                  AND     K0007
        1212  1067                  TAD     K0260
        1213  4436                  TYPE                                    /PRINT SECOND BIT
        1214  5600                  JMP I   TOCT                            /EXIT
                            /
                            /
                            /
                            /ROUTINE TO DO CRLF
                            /
        1215  0000          UPONE,  0
        1216  7300                  CLA CLL
        1217  1225                  TAD     K0215
        1220  4436                  TYPE
        1221  1226                  TAD     K0212
        1222  4436                  TYPE
        1223  4436                  TYPE                                    /TYPE ONE NULL
        1224  5615                  JMP I   UPONE
                            /
        1225  0215          K0215,  0215
        1226  0212          K0212,  0212
                            /
                            /ROUTINE TO PRINT FOUR OCTAL
                            /
        1227  0000          FROCT,  0
        1230  7006                  RTL
        1231  7006                  RTL
        1232  3215                  DCA     UPONE
        1233  1076                  TAD     M4
        1234  3200                  DCA     TOCT
        1235  1215                  TAD     UPONE
        1236  0062                  AND     K0007
        1237  1067                  TAD     K0260
        1240  4436                  TYPE
        1241  1215                  TAD     UPONE
        1242  7006                  RTL
        1243  7004                  RAL
```

```
1244  3215              DCA     UPONE
1245  2200              ISZ     TOCT
1246  5235              JMP     .-11
1247  1321              TAD     K0240
1250  4436              TYPE
1251  5627              JMP I   FROCT
                /
                /SUBROUTINE TO PRINT TEXT
                /
1252  0000      PRN,    0
1253  7300              CLA CLL
1254  1652              TAD I   PRN                     /GET POINTER
1255  2252              ISZ     PRN
1256  3227              DCA     FROCT
1257  1627              TAD I   FROCT
1260  0322              AND     K7700
1261  7450              SNA
1262  5306              JMP     EXIT
1263  7500              SMA
1264  7020              CML
1265  7001              IAC
1266  7012              RTR
1267  7012              RTR
1270  7012              RTR
1271  4436              TYPE
1272  1627              TAD I   FROCT
1273  0323              AND     K0077
1274  7450              SNA
1275  5306              JMP     EXIT
1276  1311              TAD     K3740
1277  7500              SMA
1300  1310              TAD     K4100
1301  1321              TAD     K0240
1302  4436              TYPE
1303  2227              ISZ     FROCT
1304  7300              CLA CLL
1305  5257              JMP     PRN+5
1306  7300      EXIT,   CLA CLL
1307  5652              JMP I   PRN

                /
1310  4100      K4100,  4100
1311  3740      K3740,  3740
                /
                /ROUTINE TO TYPE
                /
1312  0000      PRINT,  0
1313  6046              TLS
1314  6041              TSF
1315  5314              JMP      .-1
1316  6042              TCF
1317  7200              CLA
1320  5712              JMP I    PRINT
1321  0240      K0240,  0240
1322  7700      K7700,  7700
```

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1323  0077      K0077,  0077
1324  0010      K0010,  10
1325  7741      K7741,  7741
1326  3600      K3600,  3600
                /ROUTINE TO WAIT FOR KEY FROM OPERATOR
                /
1327  0000      WAIT,   0
1330  7300              CLA CLL
1331  6032              KCC
1332  6031              KSF
1333  5332              JMP      .-1
1334  6036              KRB
1335  6046              TLS
1336  6041              TSF
1337  5336              JMP      .-1
1340  0370              AND      K0177
1341  1066              TAD      K0200
1342  3101              DCA      CHAR
1343  1101              TAD      CHAR
1344  3777'             DCA      C8CHAR
1345  2776'             ISZ      INMODE
1346  4775'             JMS      XC8CNT             /CHECK FOR CONTROL CHARACTERS.
1347  7200              CLA
1350  7200              CLA
1351  3776'             DCA      INMODE
1352  6032              KCC
1353  6042              TCF
1354  1101              TAD      CHAR
1355  7041              CIA
1356  1371              TAD      K0316
1357  7650              SNA CLA                           /WAS IT A NO
1360  5727              JMP I    WAIT                     /YES
1361  2327              ISZ      WAIT                     /UPDATE RETURN POINTER
1362  1101              TAD      CHAR
1363  7041              CIA
1364  1372              TAD      K0331
1365  7650              SNA CLA                           /WAS IT A YES
1366  2327              ISZ      WAIT                     /WAS A YES
1367  5727              JMP I    WAIT                     /WAS NEITHER
1370  0177      K0177,  0177
1371  0316      K0316,  0316
1372  0331      K0331,  0331
                /

1375  3200
1376  3676
1377  3675
      1400      PAGE
                /
                /
                /ROUTINE TO RECALIBRATE SELECTED DRIVE
                /
1400  0000      RESTOR, 0
1401  7301              CLA CLL IAC                       /ENABLE CLEAR CONTROL
1402  4445              CLRALL                            /CLEAR CONTROL
1403  1100              TAD      DRIVNO                   /CURRENT DRIVE
```

```
1404  1130              TAD     HOMEMA                     /CURRENT FIELD
1405  4442              LDCMD                              /LOAD COMMAND
1406  1120              TAD     EXBIT
1407  4446              LDSC                               /LOAD EXTENDED DRIVE BIT
1410  7330              CLA CLL CML RAR                    /MAYBE EXPECTED STATUS
1411  3117              DCA     GDREG2                     /SETUP COMPARE REGISTER
1412  7326              CLA CLL CML RTL                    /ENABLE RECALIBRATE BIT
1413  4445              CLRALL                             /"RECALIBRATE"
1414  4441              DSKSKP                             /DISK SKIP IOT
1415  5214              JMP     .-1                        /WAIT FOR FIRST DONE FLAG
1416  4440              RDSTAT                             /READ STATUS
1417  1327              TAD     K2000
1420  7450              SNA                                /WAS IT BUSY AND DONE
1421  5225              JMP     RESTA                      /YES, THEN ITS O.K.
1422  1327              TAD     K2000                      /NO, THEN IT MUST BE JUST DONE
1423  7640              SZA CLA                            /WAS IT JUST DONE
1424  5243              JMP     RESTER                     /NO, ERROR
1425  4445      RESTA,  CLRALL                             /CLEAR STATUS
1426  1066              TAD     K0200                      /ENABLE SET SECOND DONE FLAG
1427  1121              TAD     CMREG                      /ORIGINAL COMMAND
1430  4442              LDCMD                              /LOAD COMMAND
1431  4441              DSKSKP                             /DISK SKIP IOT
1432  5231              JMP     .-1                        /WAIT FOR SECOND DONE
1433  4440              RDSTAT                             /READ STATUS
1434  1070              TAD     K4000
1435  7640              SZA CLA                            /WAS IT ONLY DONE FLAG
1436  5243              JMP     RESTER                     /NO, ERROR STATUS
1437  7301              CLA CLL IAC                        /ENABLE CLEAR CONTROL
1440  4445              CLRALL                             /CLEAR CONTROL
1441  2200              ISZ     RESTOR                     /UPDATE FOR GOOD RECALIBRATE
1442  5600              JMP I   RESTOR                     /RETURN
1443  4437      RESTER, ERROR                              /ERROR, STATUS
1444  3603              3603                               /TEXT POINTER
                /
1445  4452              CRLF
1446  4447              PRNTER                             /PRINT "TRY RECALIBRATE"
1447  1756              ERMES2
1450  4434              RECEIV                             /WAIT FOR INPUT
1451  5254              JMP     .+5                        /TRY NEXT EXISTING DISK
1452  5245              JMP     .-5
1453  5201              JMP     RESTOR +1                  /TRY AGAIN
1454  7301              CLA CLL IAC
1455  1056              TAD     AMOUNT                     /GET AMOUNT ON SYSTEM
1456  7450              SNA                                /WAS THERE ONLY 1 LEFT
1457  5535              JMP I   XEND                       /LAST DISK
1460  3056              DCA     AMOUNT                     /MORE TO GO BUT CLEAR THIS ONE
1461  3516              DCA I   TCNTR5                     /CLEAR DISK POINTER
1462  5600              JMP I   RESTOR                     /TRY NEXT ONE
                /
                /
                /ROUTINE TO CHANGE DEVICE CODES
                /
1463  0000      CHANG,  0
1464  4777'             JMS     XC8SW                      /GET SWITCH REGISTER BITS,
1465  7010              RAR
```

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1466  7620              SNL CLA                            /CHANGE DEVICE CODES?
1467  5663              JMP I   CHANG                      /NO.
1470  4777'             JMS     XC8SW                      /GET SWITCHES,
1471  0313              AND     A0770
1472  3314              DCA     CSAVE1                     /SAVE DESIRED
1473  1316              TAD     CCNTR1
1474  3315              DCA     CSAVE2
1475  1317              TAD     CHNPOT
1476  3200              DCA     RESTOR
1477  1600      CHANGR, TAD I   RESTOR                     /GET ADDRESS POINTER
1500  3311              DCA     KWAIT
1501  1711              TAD I   KWAIT                      /GET OLD CODE
1502  0312              AND     A7007                      /MASK
1503  1314              TAD     CSAVE1                     /ADD IN DESIRED
1504  3711              DCA I   KWAIT                      /STORE DESIRED DEVICE CODE
1505  2200              ISZ     RESTOR                     /UPDATE POINTER
1506  2315              ISZ     CSAVE2                     /UPDATE CHANGE COUNTER
1507  5277              JMP     CHANGR
1510  5663              JMP I   CHANG                      /EXIT TO PROGRAM.
                /
1511  0000      KWAIT,  0
1512  7007      A7007,  7007
1513  0770      A0770,  0770
1514  0000      CSAVE1, 0
1515  0000      CSAVE2, 0
1516  7771      CCNTR1, 7771
1517  1520      CHNPOT, CHNPOT +1
1520  0734              IOT0
1521  0741              IOT1
1522  0746              IOT2
1523  0714              IOT3
1524  0705              IOT4
1525  0672              IOT5
1526  0727              IOT6
1527  2000      K2000,  2000
                /
                /THIS ROUTINE WILL GENERATE TIMING IF NEEDED BY THE APT SYSTEM
                /
1530  0000      KTICK,  0
1531  7300              CLL CLA
1532  1022              TAD     22                         /GET HARDWARE CONFIGURATION
1533  0070              AND     K4000
1534  7650              SNA CLA                            /ON APT?
1535  5351              JMP     EXTICK                     /NO
1536  1730              TAD I   KTICK                      /GET TIMING VALUE
1537  3353              DCA     COUNT                      /ESATABLISH TIME
1540  2132              ISZ     CLKCNT
1541  5351              JMP     EXTICK                     /RETURN
1542  1353              TAD     COUNT                      /GET VALUE OF COUNTER
1543  3132              DCA     CLKCNT                     /STORE IT
1544  2354              ISZ     CNT                        /TIMING NEED BE DONE?
1545  5351              JMP     EXTICK
1546  4425              TIME
1547  1355              TAD     KCNT                       /TIMING VALUE
1550  3354              DCA     CNT                        /INIT SECOND COUNTER
```

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1551  2330     EXTICK, ISZ      KTICK                      /MOVE BEYOND TIMING VALUE
1552  5730             JMP I    KTICK

1553  0000     COUNT,  0
1554  7776     CNT,    -2
1555  7776     KCNT,   -2
1556  0100     K0100,  0100
               /
               /
               /ROUTINE TO NOTIFY APT OF USE IF REQUIRED
               /
1557  0000     KTIME,  0
1560  6002             IOF                          /DISABLE INTERUPTS
1561  6214             RDF                          /GET PRESENT DATA FIELD
1562  1075             TAD KCDF
1563  3364             DCA .+1                      /ESTABLISHES CURRENT DATA FIELD
1564  7402             HLT
1565  6272             CIF 70                             /FIELD 7. LOCATION OF UV PROM
1566  4771             JMS I K6500
1567  7300             CLL CLA
1570  5757             JMP I KTIME
               /
1571  6500     K6500,  6500
               /
1577  3062
      1600     PAGE
               /
               /
               /THIS ROUTINE WILL NOTIFY APT OF AN ERROR AND SEND PC TO
               /APT SYSTEM. ALL ERRORS WILL RESULT IN PROGRAM HLT AND A TIME OUT ON
               /APT. APT WILL TAKE OVER FROM THERE.

               /
1600  0000     AERRO,  0
1601  6002             IOF                          /DISABLE INTERUPTS
1602  7200             CLA
1603  1022             TAD      22                  /CHECK FOR APT SYSTEM
1604  7700             SMA CLA
1605  5600             JMP I    AERRO               /RETURN NOT ON APT
1606  1621             TAD I    KERRO               /GET PC
1607  3222             DCA SAVPC
1610  6214             RDF                          /GET CURRENT DATA FIELD
1611  1075             TAD KCDF
1612  3214             DCA .+2
1613  1222             TAD SAVPC
1614  7402             HLT                          /REPLACED WILL CURRENT DATA FIELD
1615  6272             CIF 70                       /CHANGE IF FOR APT RETURN TO FIELD 7
1616  5620             JMP I K6520                  /NOTIFIES APT OF ERROR
1617  7402             HLT
               /
1620  6520     K6520,  6520
1621  0436     KERRO,  ERRO
1622  0000     SAVPC,  0
               /
               /
```

```
               /ROUTINE TO MOVE DISK POINTERS
               /
1623  0000     MOVE,   0
1624  1237             TAD      ADPT1
1625  3010             DCA      AUTO10

1626  1240             TAD      ADPT2
1627  3011             DCA      AUTO11
1630  1077             TAD      M10
1631  3241             DCA      MCNTR1
1632  1410             TAD I    AUTO10                 /FROM HERE
1633  3411             DCA I    AUTO11                 /TO THERE
1634  2241             ISZ      MCNTR1                 /4 POINTERS
1635  5232             JMP      .-5
1636  5623             JMP I    MOVE
               /
1637  0137     ADPT1,  DSK0A -1
1640  0150     ADPT2,  DSK0B -1
1641  0000     MCNTR1, 0
               /
               /
1642  2003     TEXPC,  TEXT     "PC:"
1643  7200
1644  0704     TEXGO,  TEXT     "GO:"
1645  7200
1646  0530     TEXEX,  TEXT     "EX:"
1647  7200
1650  0315     TEXCM,  TEXT     "CM:"
1651  7200
1652  2324     TEXST,  TEXT     "ST:"
1653  7200
1654  0401     TEXDA,  TEXT     "DA:"
1655  7200
1656  0301     TEXCA,  TEXT     "CA:"
1657  7200
1660  0104     TEXAD,  TEXT     "AD:"
1661  7200
1662  0424     TEXDT,  TEXT     "DT:"
1663  7200
               /
1664  2205     ERTX1,  TEXT     "READ STATUS ERROR"
1665  0104
1666  4023
1667  2401
1670  2425
1671  2340
1672  0522
1673  2217
1674  2200
1675  0411     ERTX2,  TEXT     "DISK DATA ERROR"
1676  2313
1677  4004
1700  0124
1701  0140
1702  0522
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1703  2217
1704  2200
1705  2722      ERTX3,  TEXT    "WRITE STATUS ERROR"
1706  1124
1707  0540
1710  2324
1711  0124
1712  2523
1713  4005
1714  2222
1715  1722
1716  0000
1717  2205      ERTX4,  TEXT    "RECALIBRATE STATUS ERROR"
1720  0301
1721  1411
1722  0222
1723  0124
1724  0540
1725  2324
1726  0124
1727  2523
1730  4005
1731  2222
1732  1722
1733  0000
                /
1734  2422      ERMES1, TEXT "TRY TO FORMAT SAME CYLINDER AGAIN?"
1735  3140
1736  2417
1737  4006
1740  1722
1741  1501
1742  2440
1743  2301
1744  1505
1745  4003
1746  3114
1747  1116
1750  0405
1751  2240
1752  0107
1753  0111
1754  1677
1755  0000
1756  2422      ERMES2, TEXT "TRY TO RECALIBRATE SAME DISK AGAIN?"
1757  3140
1760  2417
1761  4022
1762  0503
1763  0114
1764  1102
1765  2201
1766  2405
1767  4023
1770  0115
```

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1771  0540
1772  0411
1773  2313
1774  4001
1775  0701
1776  1116
1777  7700
2000  2422      ERMES3, TEXT "TRY TO CHECK SAME CYLINDER AGAIN?"
2001  3140
2002  2417
2003  4003
2004  1005
2005  0313
2006  4023
2007  0115
2010  0540
2011  0331
2012  1411
2013  1604
2014  0522
2015  4001
2016  0701
2017  1116
2020  7700
                /
2021  2213      TEXEND, TEXT    "RK8E/RK8L DISK FORMATTER PASS COMPLETE"
2022  7005
2023  5722
2024  1370
2025  1440
2026  0411
2027  2313
2030  4006
2031  1722
2032  1501
2033  2424
2034  0522
2035  4020
2036  0123
2037  2340
2040  0317
2041  1520
2042  1405
2043  2405
2044  0000
2045  2213      MES1,   TEXT "RK8E/RK8L DISK FORMATTER PROGRAM"
2046  7005
2047  5722
2050  1370
2051  1440
2052  0411
2053  2313
2054  4006
2055  1722
2056  1501
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        2057  2424
        2060  0522
        2061  4020
        2062  2217
        2063  0722
        2064  0115
        2065  0000
        2066  0617      MES2,   TEXT "FOR ALL QUESTIONS, ANSWER Y FOR YES OR N FOR NO."
        2067  2240
        2070  0114
        2071  1440
        2072  2125
        2073  0523
        2074  2411
        2075  1716
        2076  2354
        2077  4001
        2100  1623
        2101  2705
        2102  2240
        2103  3140
        2104  0617
        2105  2240
        2106  3105
        2107  2340
        2110  1722
        2111  4016
        2112  4006
        2113  1722
        2114  4016
        2115  1756
        2116  0000
        2117  0617      MES3,   TEXT "FORMAT DISK "
        2120  2215
        2121  0124
        2122  4004
        2123  1123
        2124  1340
        2125  0000
        2126  0122      MES4,   TEXT "ARE YOU SURE?"
        2127  0540
        2130  3117
        2131  2540
        2132  2325
        2133  2205
        2134  7700
        2135  0617      MES5,   TEXT "FORMAT SAME DISK(S) AGAIN?"
        2136  2215
        2137  0124
        2140  4023
        2141  0115
        2142  0540
        2143  0411
        2144  2313
        2145  5023
```

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        2146  5140
        2147  0107
        2150  0111
        2151  1677
        2152  0000
                        /
              2200      PAGE
                        /
              2200      WRKBUF=.
                        /
              2200      HITRK=.
              2201      LOTRK=. +1
                        /
              2577      ENDBUF=. +377
                        /


                        /CONSOL SRC -V2-R0- CONSOLE PACKAGE


                        /LAS= CALL C8CKSW OR JMS XC8SW
                        /THIS WILL READ THE SWITCH REGISTER FRUM THE PLACE SPECIFIED
                        /BY LOCATION 20 BIT 0.


                        /THE PROGRAN SHOULD CHECK FOR A CONTROL CHARACTER FRON 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 NUNBER.

                        /C8STRT   THIS IS FOUND IN CNTRL ROUTINE CONTROL R PART
                        /IT IS THE RETURN WHEN CONTROL R IS ENTERED (RESTART PROGRAM)
                        /THE RETURN JUMPS TO XDOSW WHICH CONTAINS C8STRT SO PUT THE LABEL C8STRT
                        /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.


                        /CONSOL=0
              6661              PSKF=   6661
              6662              PCLF=   6662
```

```
          6663          PSKE=   6663
          6664          PSTB=   6664
          6665          PSIE=   6665
          6004          GTF=    6004
          7701          ACL=    7701
          6007          CAF=    6007
          7421          MQL=    7421
          7501          MQA=    7501
                  /
          3000    *3000
                  /
                  /*********************************************************************
                  /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 TU COMPLETE THIS MANY C8PASS TO BE IN THE 1 TO 4 MINUTE
                  /RANGE
                  /       C8PASS=JMS    XC8PAS
                  /EX. OF CALL           C8PASS
                          /              HLT             /HALT IF NON CONSOL PACKAGE
                  /              JMP     START1          /CONTINUE RUNNING THIS PROGRAM


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

                  /CALLS USED BY XC8PAS ARE  CHKCLA-XC8CHLF-XC8OCTA-XC8SW-XC8PNT-XC8INQ-


   3000  0000     XC8PAS, 0
   3001  7200             CLA
   3002  4777'            JMS     CHKCLA          /IS WORD 22 BIT 3 ACTIVE CONSOLE?
   3003  5212             JMP     DOPACK          /IS CLASSIC
   3004  4776'            JMS     C8GET           /GET THE REGISTERS.
   3005  4262             JMS     XC8SW           /DEACTIVE CONSOL CHECK SR SETTING
   3006  0375             AND     (400            /FOR HALT ON END OF C8PASS
   3007  7640             SZA CLA                 /1= HALT 0 CONTINUE
   3010  5600             JMP I   XC8PAS          /GO TO HALT
   3011  5230             JMP     C8BY1           /CONTINUE ON RUNNING PROGRAM
   3012  4232     DOPACK, JMS     CKCOUT          /CLASS CHECK C8PASS COUNT
   3013  5230             JMP     C8BY1           /C8PASS COUNT NOT DONE REDO PROGRAM
   3014  2250             ISZ     PASCNT          /C8PASS COUNT DONE SET C8PASS COUNT
   3015  4774'            JMS     XC8CRLF
   3016  4303             JMS     XC8PNT          /C8PRNT BUFFER
   3017  3053             MESPAS                  /
   3020  1250             TAD     PASCNT          /GET NUMBER
   3021  4773'            JMS     XC8OCTA         /CONVERT IT TO ASCII
   3022  4774'            JMS     XC8CRLF         /DO A CARRIAGE RETURN
   3023  4776'            JMS     C8GET           /GET THE REGISTERS.
   3024  4262             JMS     XC8SW           /CHECK A HALT AT END OF C8PASS
   3025  0375     SETUP2, AND     (400            /MASK BIT
   3026  7640             SZA CLA                 /HALT =1 NO SKIP CONTINUE =0
   3027  4772'            JMS     XC8INQ          /STOP PROGRAM EXECUTION-LOOK FOR INPUT
```

```
   3030  2200     C8BY1,  ISZ     XC8PAS          /BUMP RETURN
   3031  5600             JMP I   XC8PAS
   3032  0000     CKCOUT, 0
   3033  1251             TAD     DOSET           /CHECK IF SET UP NEEDED
   3034  7640             SZA CLA                 /0=SET UP C8PASS COUNT VALUE
                                                  /1=C8PASS COUNT VALUE OK
   3035  5242             JMP     NOSET           /C8PASS COUNT VALUE ON
   3036  1252             TAD     CNTVAL          /GET CUUNT VALUE FOR THIS PROG
   3037  7040             CMA                     /SET TU NEGATIVE
   3040  3247             DCA     DOCNT           /STORE IN HERE
   3041  2251             ISZ     DOSET           /INDICATE VALUE SET UP
   3042  2247     NOSET,  ISZ     DOCNT           /COUNT THE NUMBER OF PASSES
   3043  5230             JMP     C8BY1           /EXIT FOR ANOTHER PASS
   3044  3251             DCA     DOSET           /SET TU C8PRNT C8PASS
   3045  2232             ISZ     CKCOUT          /BUMP RETURN FOR
   3046  5632             JMP I   CKCOUT          /C8PASS C8TYPE OUT
   3047  0000     DOCNT,  0
   3050  0000     PASCNT, 0                       /
   3051  0000     DOSET,  0
   3052  0000     CNTVAL, 0
   3053  0410     MESPAS, TEXT    "DHRKDD  PASS "
   3054  2213
   3055  0404
   3056  4040
   3057  2001
   3060  2323
   3061  4000


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

                  /C8CKSW

                  /THIS ROUTINE CAN BE USED INPLACE OF A READ THE SWITCHES LAS.
                  /ROUTINE THAT WILL CHECK WHERE TO READ THE
                  /C8 SWITCHES FROM IE. FROM PANEL OR PSEUDO SWITCH REGISTER
                  /THE SELECTION IS DETERMINED BY THE STATE OF BIT 0 IN LOCATION 21.

                          /C8CKSW=        JMS XC8SW
                          /EX.    JMS     XC8SW           /READ THE C8SWIT REGISTER
                                                          /RETURN WITH THE CONTENTS OF SWITCH REGISTER

                  /RETURN TO NEXT LOCATION FOLLOWING CALL WITH THE AC= TO VALUE OF C8SWIT SETTING

                  /CALLS USED ARE-XC8CKPA-


   3062  0000     XC8SW,  0
   3063  4771'            JMS     XC8CKPA         /GO CHECK THE IF ANY CONTRL
   3064  7000             NOP
   3065  1021             TAD     21              /GET WD FOR INDICATOR
   3066  7710             SPA CLA                 /CHECK IF FROM PANEL 4000
   3067  7614             7614                    /DO LAS AND SKIP GET FROM PANEL WITH LAS
```

```
3070  1020              TAD     20              /PSEUDU SWITCH
3071  5662              JMP I   XC8SW           /EXIT WITH STATUS BIT IN AC.


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

                /C8TTYI
                /THIS ROUTINE WILL LOOK FOR A INPUT FROM THE TERMINAL
                /AND REMOVE ANT PARITY BITS, THEN MAKE IT 8 BIT ASCI.
                /       C8TTYI= JMS XC8TTY
                /EX.    JMS     XC8TTYI         /READ CHAR FROM THE CONSOL DEVICE
                        /                       /RETURN TO CALL PLUS ONE AC CONTAINS THE CHAR


                /CALLS USED -NONE- BUT C8CHAR IS OFF PAGE AND IN ROUTINE CALLED XC8ECHO

                /
                /
3072  0000      XC8TTY, 0
3073  6031              KSF                     /LOOK FOR KEYBOARD FLAG
3074  5273              JMP     .-1
3075  6036              KRB                     /GET CHAR
3076  0370              AND     (177            /MASK FOR 7 BITS
3077  1367              TAD     (200            /ADD THE EIGTH BIT
3100  3766'             DCA     C8CHAR          /STORE IT
3101  1766'             TAD     C8CHAR
3102  5672              JMP I   XC8TTY          /EXIT


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

                /C8PRNT

                /THIS ROUTINE WILL TYPE THE CONTENTS OF THE C8 PRINT BUFFER, THE LOCATION
                /OF THE BUFFER WILL BE IN THE ADDRS FOLLOWING THE CALL.   PRINTING OF THE BUFFER
                /WILL STOP WHEN A 00 CHAR IS DETECTED, CHARACTERS ARE PACKED 2 PER WORD.

                /       C8PRNT= JMS XC8PNT


                /EX.    JMS     XC8PNT                  /C8PRNT THE CONTENTS OF THE FOLLOWING BUFFER
                /       MESS77                          /LOCATION OF C8PRNT BUFFER

                /C8PRNT WILL USE THE LOCATION FOLLOWING THE CALL AS THE POINTER FOR THE
                /C8PRNT ROUTINE,RETURN TO CALL PLUS TWO WITH AC= 0

                /CALLS USED ARE-XC8TYPE-XC8PNT


3103  0000      XC8PNT, 0
3104  7300              CLA CLL
3105  1703              TAD I   XC8PNT          /GET C8PRNT BUFFERS STARTING LOCATION
3106  3336              DCA     PTSTOR          /STORE IN PTSTOR
```

```
3107  2303              ISZ     XC8PNT          /BUMP RETURN
3110  1736      C8D01,  TAD I   PTSTOR          /GET DATA WORD
3111  0365              AND     (7700           /MASK FOR LEFT BYTE
3112  7450              SNA                     /CHECK IF 00 TERMINATE
3113  5703              JMP I   XC8PNT          /EXIT
3114  7500              SMA                     /IS AC MINUS
3115  7020              CML                     /MAKE CHAR A 300 AFTER ROTATE
3116  7001              IAC                     /MAKE CHAR A 200 AFTER ROTATE
3117  7012              RTR
3120  7012              RTR
3121  7012              RTR                     /PUT CHAR IN BITS 4-11 MAKE IT 8 BIT ASCII
3122  4764'             JMS     XC8TYPE         /C8PRNT IT ON CONSOLE
3123  1736              TAD I   PTSTOR          /GET DATA WORD
3124  0363              AND     (0077           /MASK FOR RIGHT BYTE
3125  7450              SNA                     /CHECK IF 00 TERMINATOR
3126  5703              JMP I   XC8PNT          //EXIT
3127  1362              TAD     (3740           /ADD FUDGE FACTOR TO DETERMINE IF 200
3130  7500              SMA                     /OR 300 IS TO BE ADD TO CHAR
3131  1361              TAD     (100            /ADD 100
3132  1360              TAD     (240            /ADD 200
3133  4764'             JMS     XC8TYPE         /C8TYPE ONLY BITS 4-11
3134  2336              ISZ     PTSTOR          /BUMP POINTER FOR NEXT WORD
3135  5310              JMP     C8D01           /DO AGAIN
3136  0000      PTSTOR, 0                       /STOR FOR C8PRNT BUFFER
                /**************************************************************************

                /C8PAUS
                /THIS ROUTINE WILL CHECK IF THE CONSUL PACKAGE IS ACTIVE,IF ACTIVE
                /IT WILL RETURN TO CALL PLUS ONE AC= 0. AND DO THAT INSTRUCTION.
                /IF THE CONSOL PACKAGE IS NOT ACTIVE THE CALL WILL BE REPLACED
                /WITH A 7402 HALT AND THEN RETURN TO THE HALT.

                /       C8PAUS= JMS XC8PAU
                /
                /
                /EX.            JMS     XC8PAUS         /CHECK IF ON ACTIVE CONSOL IF NOT HALT HERE
                /               ANYTHING                /RETURN HERE IF ON ACTIVE CONSOL
                /
                /

                /CALLS USED ARE -CHKCLA-


3137  0000      XC8PAU, 0
3140  7300              CLA CLL
3141  4777'             JMS     CHKCLA          /CHECK LOC 22 BIT 3 CONSOLE BIT
3142  5350              JMP     C8D03           /GO DO CONSOL PART RETURN CALL +1
3143  7040              CMA                     /DEACTIVE CONSOLE PACKAGE PUT HLT IN CALL
3144  1337              TAD     XC8PAU          /GET CORRECT RETURN ADDRS
3145  3337              DCA     XC8PAU          /SET UP RETURN
3146  1357              TAD     (7402           /GET CODE FOR HLT
3147  3737              DCA I   XC8PAU          /PUT HALT IN CALL LOCATION
3150  5737      C8D03,  JMP I   XC8PAU          /GO TO HALT OR RETURN TO NEXT LOCATION
```

```
     3157  7402
     3160  0240
     3161  0100
     3162  3740
     3163  0077
     3164  3677
     3165  7700
     3166  3675
     3167  0200
     3170  0177
     3171  3641
     3172  3435
     3173  3600
     3174  3623
     3175  0400
     3176  3424
     3177  4000
           3200         PAGE
                        /*********************************************************************


                        /C8CNTR
                        /THIS ROUTINE WILL CHECK FOR THE PRESENCE OF CONTROL CHARACTERS
                        /IT WILL CHECK FOR THE FOLLOWING CHAR C-R-Q-L-S
                        /       C8CNTR= JMS XC8CNT

                        /EX.    JMS     XC8CNTR                  /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
                        /CONTROL CHAR ..THIS WILL PRINT THE CHARACTER AND A ?
                        /CLEAR THE AC AND RETURN CALL+2.

                        /CALLS USED ARE-CHKCLA-XC8TYPE-XC8CRLF-C8GET-UPAROW-XC8TYI-XC8PSW-
                        /
                        /
                        /
     3200  0000         XC8CNT, 0
     3201  3777'                DCA     ACSAVE          /SAVE THE AC
     3202  4776'                JMS     CHKCLA          /CHECK LOC.22 BIT3 FOR CONSOLE BIT
     3203  5206                 JMP     .+3             /ON ACTIVE CONSOLE
     3204  1777'                TAD     ACSAVE          /DEACTIVE CONSOLEGET AC FOR RETURN
     3205  5600                 JMP I   XC8CNT          /EXIT NOT ON ACTIVE CONSOLE
     3206  6004                 GTF
     3207  3775'                DCA     FLSAVE
     3210  7501                 MQA
     3211  3774'                DCA     MQSAVE          /SAVE THE MQ
     3212  3255                 DCA     INDEXA          /SET DISPLACEMENT INTO TABLE B
     3213  1257                 TAD     XTABLA          /GET ADDRS OF TABLE A
```

```
    3214  3256                DCA     GETDAT          /CONTAINS POINTER TO CONTROL CHAR
    3215  1656        REDOA,  TAD I   GETDAT          /GET CONTROL CHAR FROM TABLE
    3216  7450                SNA                     /CHECK FOR A 0 END OF TABLE
    3217  5226                JMP     DONEA           /END OF TABLE NO CONTROL CHAR
    3220  1773'               TAD     C8CHAR          /COMPARE CHAR TO CONTROL CHAR
    3221  7650                SNA CLA                 /0 IF MATCH
    3222  5243                JMP     GOITA           /MATCH
    3223  2255                ISZ     INDEXA          /NO MATCH NOT END OF TABLE REDO
    3224  2256                ISZ     GETDAT          /BUMP INDEX FOR EXIT WHEN CONTROL FOUND
    3225  5215                JMP     REDOA           /BUMP GETDAT FOR COMPARE OF NEXT CNTRL CHAR.
    3226  1772'       DONEA,  TAD     INMODE          /CHECK IF PROGRAM EXPECTS CHAR
    3227  7640                SZA CLA                 /1=CHAR EXPECTED  0= NO CHAR EXPECTED
    3230  5240                JMP     EXITA           /CHAR EXPECTED
    3231  1773'               TAD     C8CHAR          /GET CHAR - NOT CONTROL + NOT EXPECTED
    3232  4771'               JMS     XC8TYPE         /C8PRNT CHAR
    3233  1370                TAD     (277            /GET CODE FOR "?"
    3234  4771'               JMS     XC8TYPE
    3235  4767'               JMS     XC8CRLF
    3236  2200                ISZ     XC8CNT          /BUMP RETURN
    3237  5600                JMP I   XC8CNT          /EXIT CALL+2
    3240  2200        EXITA,  ISZ     XC8CNT          /BUMP RETURN FOR MAIN PROGRAM CHECK OF CHAR
    3241  1773'               TAD     C8CHAR          /PUT CHAR IN AC.
    3242  5600                JMP I   XC8CNT          /EXIT
    3243  1773'       GOITA,  TAD     C8CHAR          /GET THE CONTENTS OF CHAR
    3244  1366                TAD     (100            /ADD 100 TO FORM A GOOD ASCII CHARACTER
    3245  3773'               DCA     C8CHAR          /RESTORE COFFECT CHAR
    3246  1260                TAD     XTABLB          /GET START OF TABLE B
    3247  1255                TAD     INDEXA          /GET HOW FAR INTO TABLE
    3250  3254                DCA     GOTOA           /STORE IT
    3251  1654                TAD I   GOTOA           /GET THE ROUTINE STARTTING ADDRESS
    3252  3254                DCA     GOTOA           /STORE IT IN HERE
    3253  5654                JMP I   GOTOA           /GOTO CONTROL CHAR ROUTINE
    3254  0000        GOTOA,  0000                    /ADD OF CNTRL ROUTINE TO EXECUTE
    3255  0000        INDEXA, 0000                    /DISPLACEMENT INTO CNTRL TABLE
    3256  0000        GETDAT, 0000                    /LOCATION OF ADDRS OF CONTROL CHAR.
    3257  3261        XTABLA, TABLA                   /ADDRS OF TABLEA
    3260  3271        XTABLB, TABLB                   /ADDRS OF TABLEB
    3261  7575        TABLA,  7575                    /CNTRL C BACK TO MONITOR 203
    3262  7564                7564                    /CNTRL L SWITCH ERROR PRINTTING DEVICE 214
    3263  7557                7557                    /CNTRL Q START DISPLAYING CHAR. AGAIN 221
    3264  7556                7556                    /CNTRL R BACK TO BEGINNING OF PROGRAM 222
    3265  7555                7555                    /CNTRL S STOP SENDING CHAR TO DISPLAY WAIT FOR CNTRL Q 223
    3266  7573                7573                    /CNTRL E CONTINUE WITH PROGRAM 205
    3267  7574                7574                    /CONTROL D CHANGE SWITCH REGISTER ON FLY
    3270  0000                0000

    3271  3347        TABLB,  CNTRLC
    3272  3336                CNTRLL
    3273  3300                CNTRLQ
    3274  3311                CNTRLR
    3275  3320                CNTRLS
    3276  3344                CNTRLE
    3277  3400                CNTRLD
                      /
                      /CONTROL Q
```

```
                /START SENDING CHAR. TO THE DISPLAY
                /THIS WILL RETURN CONTROL TO CALL THAT WAS SET BY
                /THE CALL FOR CONTROL S.
                /
 3300  3772'    CNTRLQ, DCA     INMODE          /SET SOFT FLAG FOR UNEXPECTED CHAR
 3301  1334             TAD     C8SETS          /CHECK IF CONTROL S TYPED IN
 3302  7640             SZA CLA
 3303  5306             JMP     BYRETR          /CONTROL S TYPED IN
 3304  4765'            JMS     C8GET           /NO CONTROL S TYPED PREVIOUSLY
 3305  5600             JMP I   XC8CNTR         /LEAVE VIA CNTR ENTRY ADDRESS
 3306  3334     BYRETR, DCA     C8SETS          /CLEAR THE SOFT FLAG
 3307  4765'            JMS     C8GET           /RESTORE REGISTERS
 3310  5735             JMP I   C8RETR          /EXIT TO ADDRESS SET BY CONTROL S
                /
                /
                /CONTROL R
                /GO TO THE QUESTION C8SWIT
 3311  3764'    CNTRLR, DCA     TTYLPT          /CLEAR THE TYPE FLAG SET TO TTY
 3312  3334             DCA     C8SETS          /CLEAR SOFT FLAG FOR CNTRL S
 3313  3772'            DCA     INMODE
 3314  4763'            JMS     UPAROW          /PRINT THE ^ AND C8CHAR
 3315  3762'    C8BY4,  DCA     C8SWST          /CLEAR FLAG FOR CNTRL D OR R
 3316  5717             JMP I   XDOSW           /GO TO ADDRS OF C8SWIT
 3317  0200     XDOSW,  BGN                     /DOSW IS LABEL FOR C8SWIT QUESTION
                /
                /
                /CONTROL S
                /STOP SENDING CHAR. TO DISPLAY UNTIL A ^Q IS RECEIVED
                /
                /
 3320  1334     CNTRLS, TAD     C8SETS          /IF1 DO NOT STORE IN C8RETR
 3321  7640             SZA CLA
 3322  5326             JMP     C8D07           /DONT SET UP C8RETR
 3323  7001             IAC                     /MAKE RETURN CALL PLUS 2
 3324  1200             TAD     XC8CNT          /GET RETURN FOR THIS CALL
 3325  3335             DCA     C8RETR          /STORE IT HERE FOR USE BE CNTROL Q
 3326  2334     C8D07,  ISZ     C8SETS          /SET FLAG TO SAVE CALL
 3327  4761'            JMS     XC8TTYI                 /LOOK FOR THE INPUT
 3330  4765'            JMS     C8GET           /GET REGISTERS
 3331  4200             JMS     XC8CNTR                 /CHECK FOR THE CONTROL CHAR
 3332  7200             CLA
 3333  5320             JMP     CNTRLS          /IF NOT A CNTRL Q R C REASK
 3334  0000     C8SETS, 0
 3335  0000     C8RETR, 0
                /
                /SWITCH OUTPUT FROM ONE OUTPUT DEVICE TO ANOTHER - THE TWO OUTPUTS ARE THE
                /CONSOLE AND THE PRINTER WITH DEVICE CODE 66.
                /
                /
 3336  1764'    CNTRLL, TAD     TTYLPT          /GET PRESENT C8SWIT INDICATOR
 3337  7040             CMA                     /COMPLEMENT IT
 3340  3764'            DCA     TTYLPT          /STOR NEW C8SWIT
 3341  4763'            JMS     UPAROW          /C8PRNT ^ AND CHAR ON NEW DEVICE
 3342  4765'            JMS     C8GET           /RESTORE THE REGISTERS
 3343  5600             JMP I   XC8CNT          /EXIT
```

```
                /
                /CONTROL E
                /CONTINUE RUNNING FROM A INQUIRE OR ERROR
                /
                /
 3344  4763'    CNTRLE, JMS     UPAROW          /PRINT THE CONTROL CHAR
 3345  4765'            JMS     C8GET           /GET THE REGISTERS
 3346  5600             JMP I   XC8CNT          /RETURN TO CALL PLUS ONE
                /

                /CONTROL C
                /RETURN TO MONITOR CONTROL C
 3347  3764'    CNTRLC, DCA     TTYLPT          /CLEAR THE LPT FLAG TO PRINT ON DISPLAY
 3350  4763'            JMS     UPAROW          /C8PRNT A^ AND LETTER IN CHAR
 3351  6203             CDF CIF                 /GO TO 0 FLD
 3352  6007             CAF                     /CLEAR THE WORLD
 3353  5760             JMP I   (7600           /GO TO DIAGNOSTIC MONITOR
                /*****************************************************************
                /
                /
                /
 3360  7600
 3361  3072
 3362  3545
 3363  3415
 3364  3721
 3365  3424
 3366  0100
 3367  3623
 3370  0277
 3371  3677
 3372  3676
 3373  3675
 3374  4123
 3375  4124
 3376  4000
 3377  4122
       3400     PAGE

                /
                        /CONTROL D
                        /CHANGE THE SWITCH REGISTER ANYTIME CNTRL D AND RETURN TO
                        /THE PROGRAM RUNNING.


 3400  4215     CNTRLD, JMS     UPAROW
 3401  1213             TAD     C8SETD          /CHECK IF THE RETURN ADDRS IS SAFE
 3402  7640             SZA CLA
 3403  5207             JMP     C8D011          /DO NOT CHANGE THE RETURN ADDRS
 3404  1777'            TAD     XC8CNT          /GET THE RETURN ADDRS AND SAVE IT
 3405  3214             DCA     C8RETD          /SAVE THE RETURN HERE
 3406  2213             ISZ     C8SETD          /INDICATE RETURN SAVED DONT DISTROY
 3407  4256     C8D011, JMS     XC8PSW                  /GO CHANGE THE SWITCH REGISTER
 3410  3213             DCA     C8SETD          /CLEAR THE FLAG
 3411  4224             JMS     C8GET           /RESTORE THE AC MQ LINK ETC
```

```
3412  5614             JMP I   C8RETD          /RETURN TO THE PROGRAM
                /
3413  0000      C8SETD, 0
3414  0000      C8RETD, 0



                /THIS WILL TYPE A UP ARROW AND THE CHAR IN C8CHAR,

3415  0000      UPAROW, 0                      /C8PRNT THE "^" AND THE CHAR C8TYPED IN
3416  1376             TAD     (336            /CODE FOR ^
3417  4775'            JMS     XC8TYPE
3420  1774'            TAD     C8CHAR          /C8TYPE THE CHAR
3421  4775'            JMS     XC8TYPE
3422  4773'            JMS     XC8CRLF
3423  5615             JMP I   UPAROW          /EXIT



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

3424  0000      C8GET,  0
3425  7200             CLA
3426  1772'            TAD     MQSAVE
3427  7421             MQL                     /RESTORE MQ
3430  1771'            TAD     FLSAVE
3431  7004             RAL                     /RESTORE THE LINK
3432  7200             CLA
3433  1770'            TAD     ACSAVE          /RESTORE THE AC
3434  5624             JMP I   C8GET           /GET THE REGISTERS



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

                /C8INQU
                /C8INQU 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 CHAR AGAIN,

                /       C8INQU =        JMS XC8INQ

                /EX,    JMS     XC8INQ                  /C8 WILL PRINT A WAITINGAND WAIT FOR INPUT
                /       DO ANYTHING                     /RETURN IS CALL PLUS ONE AC =0 CONTINUE

                /CALLS USED ARE -CHKCLA-XC8PNT-XC8TYI-C8GET-XC8CNTR-


3435  0000      XC8INQ, 0
3436  7300             CLA CLL
3437  4767'            JMS     CHKCLA          /CHECK LOC 22 BIT 3 CONSOLE BIT
3440  7410             SKP                     /ACTIVE CONSOLE PACKAGE
3441  5635             JMP I   XC8INQ          /NOT CONSOLE LEAVE
```

```
3442  4766'            JMS     XC8PNT
3443  3451             WATMES                  /INQUIR WAITTING
3444  4765'            JMS     XC8TTYI         /GET CHARACTER
3445  4224             JMS     C8GET
3446  4777'            JMS     XC8CNTR         /CHECK IF CONTROL CHARACTER
3447  5635             JMP I   XC8INQ          /EXIT AND CONTINUE
3450  5236             JMP     XC8INQ+1        /REASK
3451  2701      WATMES, TEXT    "WAITING "
3452  1124
3453  1116
3454  0740
3455  0000


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

                /C8SWIT

                /ROUTINE WILL CHECK IF CONSOL IS ACTIVE IF IT IS ACTIVE DISPLAY
                /SW QUESTION , IN NOT ACTIVE IT WILL NOT PRINT THE SW QUESTION BUT
                /RETURN TO CALL PLUS ONE AC=0,
                /C8SWIT WILL SET UP THE PSEUDO SWITCH
                /REGISTER WITH THE NEW DATA ENTERED
                /
                /       C8SWIT =        JMS XC8PSW

                /EX,            JMS     XC8PSW          /SET UP PSEUDO C8SWIT REGISTER IF
                                                        /ON THE CONSOL PACKAGE. RETURN IS CALL PLUS ONE AC = 0

                /CALLS USED ARE -CHKCLA-XC8PSW-XC8PNT-XC8OCTA-XC8TYPE-


3456  0000      XC8PSW, 0
3457  4767'            JMS     CHKCLA          /CHECK LOC 22 BIT 3 CONSOLE BIT
3460  7410             SKP                     /ACTIVE CONSOLE
3461  5656             JMP I   XC8PSW          /DEACTIVE CONSOLE PACKAGE
                                               /RETURN WITHOUT ASKING PSEUDO SWITCH
3462  1345             TAD     C8SWST          /IS THE SOFT FLAG SET FOR SWITCH?
3463  7640             SZA CLA                 /SKIP IF ONE ENTRY AT ATIME OK
3464  5764'            JMP     C8Y4            /SECOND ENTRY WITH OUT A EXIT GO TO SW QUESTION
3465  2345             ISZ     C8SWST          /FIRST ENTRY SET FLAG
3466  4766'     C8RDPS, JMS    XC8PNT          /C8PRNT SR=
3467  3547             MESA
3470  1020             TAD     20              /GET CONTENTS OF SW
3471  4763'            JMS     XC8OCTA         /CONVERT IT TO ASCII
3472  1362             TAD     (40             /GET SPACE
3473  4775'            JMS     XC8TYPE
3474  2761'            ISZ     INMODE          /SET FLAG FOR CHAR EXECTED
3475  4760'            JMS     XC8ECHO         /LOOK FOR INPUT
3476  4315             JMS     TSTCHA          /NOT CONTROL TEST IT IS LEGAL
3477  1774'            TAD     C8CHAR          /STORE NEW CHAR IN SW REG
3500  3020             DCA     20

3501  1357             TAD     (-3             /GET A MINUS 3
3502  3346             DCA     TMPCNT          /STORE IN TEMP COUNT
```

```
         3503  4760'   GETCH1, JMS     XC8ECHO         /GET NEXT CHAR
         3504  4315            JMS     TSTCHA          /CHECK IF CR + GOOD CHAR
         3505  1020            TAD     20              /GET C8SWIT REGISTER
         3506  7106            RTL CLL                 /ROTATE IT LEFT 3 PLACES           .
         3507  7004            RAL
         3510  1774'           TAD     C8CHAR          /GET CHAR + ADD IT TO PREVIOUS CONTENTS
         3511  3020            DCA     20              /SAVE NEW CONTENTS
         3512  2346            ISZ     TMPCNT          /BUMP COUNT
         3513  5303            JMP     GETCH1          /JMP BACK + GET NEXT CHAR
         3514  5342            JMP     ENDIT           /END 4 CHAR C8TYPED IN
         3515  0000    TSTCHA, 0
         3516  7041            CIA                     /CMPL CHAR IN AC
         3517  1356            TAD     (215            /TEST IF IT IS A CARRIAGE RETURN
         3520  7650            SNA CLA                 /SKIP IN NOT CR.
         3521  5342            JMP     ENDIT           /WAS CARRIAGE RETURN
         3522  1774'           TAD     C8CHAR          /NOT CR, GET CHAR
         3523  1355            TAD     (-260           /CHECK IF IT IS IN RANGE
         3524  7710            SPA CLA                 /IF NOT POSITIVE C8ERR CHAR SMALLER THEN 260
         3525  5336            JMP     ERR1            /C8ERR - CHAR TOO SMALL
         3526  1774'           TAD     C8CHAR          /GET CHAR
         3527  1354            TAD     (-270           /GET A -270 + CHECK IF IT IS LARGER THEN 7
         3530  7700            SMA CLA                 /SKIP IF LESS THEN 7
         3531  5336            JMP     ERR1            /C8ERR ON CHAR NOT IN RANGE
         3532  1774'           TAD     C8CHAR          /GET CHAR
         3533  0353            AND     (7              /MASK FOR RIGHT BYTE
         3534  3774'           DCA     C8CHAR          /STORE IN CHAR
                                                       /GET CHAR IN AC
         3535  5715            JMP I   TSTCHA          /EXIT
         3536  1352    ERR1,   TAD     (277            /C8PRNT
         3537  4775'           JMS     XC8TYPE         /?
         3540  4773'           JMS     XC8CRLF         /
         3541  5266            JMP     C8RDPS          /EXIT + ASK AGAIN
         3542  4773'   ENDIT,  JMS     XC8CRLF         /DO A CR LF
         3543  3345            DCA     C8SWST          /CLEAR THE PSW ENTRY FLAG
         3544  5656            JMP I   XC8PSW          /EXIT ROUTINE
         3545  0000    C8SWST, 0

         3546  0000    TMPCNT, 0
         3547  2322    MESA,   TEXT    "SW= "
         3550  7540
         3551  0000


         3552  0277
         3553  0007
         3554  7510
         3555  7520
         3556  0215
         3557  7775
         3560  3663
         3561  3676
         3562  0040
         3563  3600
         3564  3315
         3565  3072
```

```
         3566  3103
         3567  4000
         3570  4122
         3571  4124
         3572  4123
         3573  3623
         3574  3675
         3575  3677
         3576  0336
         3577  3200
               3600    PAGE

                       /C8OCTA

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


         3600  0000    XC8OCT, 0
         3601  7106            CLL RTL
         3602  7006            RTL                     /POSITION THE FIRST CHAR FOR PRINTING
         3603  3221            DCA     C8TMP1          /SAVE CORRECT POSITIONED WORD HERE
         3604  1377            TAD     (-4
         3605  3222            DCA     C8CKP           /STORE COUNTER IN HERE
         3606  1221    C8DO4,  TAD     C8TMP1          /GET FIRST NUMBER
         3607  0376            AND     (0007           /MASK
         3610  1375            TAD     (260            /ADD THE PRINT CONSTANT
         3611  4277            JMS     XC8TYPE         /TYPE THE NUMBER
         3612  1221            TAD     C8TMP1          /
         3613  7006            RTL
         3614  7004            RAL                     /PUT NEXT NUMBER IN POSITION
         3615  3221            DCA     C8TMP1          /STORE IT
         3616  2222            ISZ     C8CKP           /DONE YET WITH FOUR NUMBERS
         3617  5206            JMP     C8DO4           /NOT YET DO MORE
         3620  5600            JMP I   XC8OCT          /DONE WITH FOUR
         3621  0000            C8TMP1, 0
         3622  0000            C8CKP,  0


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

                       /C8CRLF
                       /C8TYPE CR AND LF WITH FILLERS FOLLOWING EACH LF AND CR
                       /
                       /       C8CRLF= JMS XC8CRL
                       /
                       /EX,    JMS     XC8CRLF         /C8PRNT A CR AND LF WITH FILL
                       /                               /RETURN TO CALL PLUS ONE AC =0
```

```
                    /CALLS USED ARE -XC8TYPE-


        3623  0000      XC8CRLF,0
        3624  7300              CLA CLL
        3625  1374              TAD     (215                    /GET CODE FOR CR
        3626  4277              JMS     XC8TYPE
        3627  1237              TAD     FILLER
        3630  7040              CMA
        3631  3240              DCA     FILCNT                  /STORE FILLER IN HERE
        3632  1373              TAD     (212                    /GET CODE FOR LF
        3633  4277      C8DO2,  JMS     XC8TYPE
        3634  2240              ISZ     FILCNT                  /CHECK ON FILLER CHAR
        3635  5233              JMP     C8DO2                   /TYPE A NON PRINTING CHAR
        3636  5623              JMP I   XC8CRL                  /EXIT
        3637  0004      FILLER, 0004                            /FILLER SET FOR 4 CHAR
        3640  0000      FILCNT, 0                               /COUNTER FOR FILL


                    //*************************************************************
                    /C8CKPA
                    /THIS ROUTINE WILL CHECK IF A CHARACTER WAS ENTERED FROM THE
                    /TERMINAL. IFTHE FLAG IS SET AND THE CONSOLE PACKAGE IS
                    /ACTIVE A CHECK IS MADE TO DETERMIND 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.
                    /A NON CONTROL CHARACTER WILL BE PRINTEDAND A "?" IT WILL RETURN TO
                    /CALL PLUS 2.
                    /IF NO FLAG IS SET OR THE CONSUL IS NOT ACTIVE THE RETURN IS TO
                    /CALL PLUS 1.


                    /       C8CKPA= JMS     XC8CKP


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


                    /CALLS USED ARE -XC8TTYI-XC8CNTR-C8GET-


        3641  0000      XC8CKP, 0
        3642  3772'             DCA     ACSAVE                  /SAVE THE AC
        3643  6004              GTF                             /SAVE THE FLAGS
        3644  3771'             DCA     FLSAVE                  /SAVE THE FLAGS
        3645  7501              MQA                             /PUT MQ IN AC
        3646  3770'             DCA     MQSAVE                  /SACE THE MQ
        3647  6031              KSF                             /CHECK THE KEYBOARD FLAG
        3650  5261              JMP     C8BY3                   /EXIT TO CALL PLUS 1
        3651  4767'             JMS     CHKCLA                  /CHECK LOC 22 BIT 3 CONSOLE BIT
        3652  7410              SKP                             /ACTIVE CONSOLE PACKAGE
```

```
        3653  5261              JMP     C8BY3                   /EXIT TO CALL PLUS 1
        3654  4766'             JMS     XC8TTYI                 /GET THE CHAR
        3655  4765'             JMS     C8GET                   /GET THE FLAGS
        3656  4764'             JMS     XC8CNTR                 /CHECK IF CONTROL  CHAR.
        3657  7000              NOP                             /RETURN IF A CONTINUE CHAR.
        3660  2241              ISZ     XC8CKP                  /BUMP RETURN FOR CALL PLUS 2
        3661  4765'     C8BY3,  JMS     C8GET                   /GET REGISTERS
        3662  5641              JMP I   XC8CKP                  /SAY GOOD BY

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

                    /C8ECHO
                    /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

                    /       C8ECHO =        JMS XC8ECH
                    /EX.    JMS     XC8ECHO                 /LOOK FOR CONSOL CHAR C8PRNT IT
                                                            /RETURN CALL PLUS ONE AC = CHAR C8TYPED IN

                    /CALLS USED ARE -XC8TTYI-XC8CNTR-C8GET-XC8ECH-XC8TTYPE

                    /
        3663  0000      XC8ECH, 0
        3664  4766'             JMS     XC8TTYI                 /WAIT FOR CHAR FROM KEYBOARD
        3665  4765'             JMS     C8GET                   /RESTORE THE REGISTERS
        3666  2276              ISZ     INMODE                  /SET INMODE IDENTIFING THIS AS A EXPECTED CHAR
        3667  4764'             JMS     XC8CNTR                 /GO CHECK IF IT IS A CONTROL CHAR
        3670  5663              JMP I   XC8ECH                  /WAS A CONTROL CHAR - CONTINUE RUNNING
        3671  4277              JMS     XC8TYPE                 /NOT A CONTROL CHAR C8PRNT IT
        3672  3276              DCA     INMODE                  /CLEAR FLAG THAT CHAR EXPECTED
        3673  1275              TAD     C8CHAR                  /GET CHAR IN AC
        3674  5663              JMP I   XC8ECH                  /EXIT
        3675  0000      C8CHAR, 0
        3676  0000      INMODE, 0

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

                    /C8TYPE
                    /THIS ROUTINE WILL C8PRNT ON THE CONSOLE OR THE LPT WITH DEVICE CODE 66.
                    /
                    /       C8TYPE= JMS XC8TYP

                    /EX.    JMS     XC8TYPE                 /C8PRNT THE CHAR IN THE AC.
                            /                               /RETURN CALL PLUS ONE AC =0000
                                                            /DO NOT CLEAR THE LINK IN THIS ROUTINE NEEDED BYC8OCT

                    /CALLS USED ARE -C8HANG-XC8CNTR-XC8PNT-XC8CRLF-XC8INQU-


        3677  0000      XC8TYP, 0
        3700  3320              DCA     PNTBUF                  /STORE CHAR
        3701  1321              TAD     TTYLPT                  /CHECK 0=TTY 7777=LPT
        3702  7640              SZA CLA
        3703  5312              JMP     XDOLPT                  /DO OUT PUT ON LPT
        3704  1320              TAD     PNTBUF
```

```
3705  6046            TLS
3706  6041            TSF
3707  5306            JMP     .-1
3710  6042            TCF
3711  5316            JMP     C8BY5
3712  1320    XDOLPT, TAD     PNTBUF          /GET CHAR
3713  6666            PSTB    PCLF            /C8PRNT IT
3714  4322            JMS     C8HANG          /CHECK KEYBOARD IF HUNG
3715  6662            PCLF                    /CLEAR THE FLAG
3716  7600    C8BY5,  7600                    /CLEAR THE AC
3717  5677            JMP I   XC8TYP          /EXIT
3720  0000    PNTBUF, 0
3721  0000    TTYLPT, 0


3722  0000    C8HANG, 0
3723  7200            CLA             /
3724  1316            TAD     C8BY5           /GET CONSTANT 7600
3725  3320            DCA     PNTBUF          /PNTBUF IS NOW A COUNTER
3726  6661            PSKF                    /SKIP ON PRINTER DONE
3727  7410            SKP                     /NOT DONE YET
3730  5722            JMP I   C8HANG          /SAW FLAG DONE
3731  2345            ISZ     C8CONT          /FIRST COUNTER FAST ONE
3732  5326            JMP     .-4             /CHECK IF FLAG SET YET
3733  2320            ISZ     PNTBUF          /MADE 4096 COUNTS ON FAST COUNTER
3734  5331            JMP     .-3             /KEEP IT UP FOR 5 SEC
3735  1764'           TAD     XC8CNTR         /GET THE RETURN ADDRESS IN CONTROL
3736  3322            DCA     C8HANG          /SAVE IT IN HANG
3737  3321            DCA     TTYLPT          /ALLOW PRINTING ON TTY
3740  4763'           JMS     XC8PNT
3741  3746            MESHANG                 /LPT ERROR
3742  4223            JMS     XC8CRLF
3743  4762'           JMS     XC8INQU         /PRINT WAITING
3744  5722            JMP I   C8HANG          /CONTINUE TO SAVE ADDRESS
3745  0000    C8CONT, 0                       /COUNTER FOR TIMER
3746  1420    MESHANG,TEXT    "LPT ERROR"
3747  2440
3750  0522
3751  2217
3752  2200

3762  3435
3763  3103
3764  3200
3765  3424
3766  3072
3767  4200
3770  4123
3771  4124
3772  4122
3773  0212
3774  0215
3775  0260
3776  0007
3777  7774
```

```
      4000    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 FO A ACTIVE CONSOLE PACKAGE AC=0
              /IF NOT SET THEN TO CALL PLUS ONE FOR A DEACTIVE CONSOLE PACKAGE.


4000  0000    CHKCLA, 0
4001  7200            CLA
4002  1022            TAD     22              /GET THE COTENTA OF LOCATION 22
4003  0377            AND     (400            /MASK FOR BIT 3 (400
4004  7650            SNA CLA                 /
4005  2200            ISZ     CHKCLA          /ACTIVE CONSOLE PACKAGE RETURN
                                              /CALL PLUS ONE (1) FOR ACTIVE
4006  5600            JMP I   CHKCLA          /DEACTIVE CONSOLE PACKAGE RETURN
                                              /CALL PLUS TWO (2)

              /C8ERR
              /THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A C8ERR IS ENCOUNTERED
              /WILL CHECK IF CLASSIC SYSTEM, WILL CHECK C8SWIT REGISTERS.
              /       C8ERR=  JMS XC8ERR
              /EX,    JMS     XC8ERR          /GO TO C8ERR CALL IF NOT CONSOL
              /                               /RETURN IS CALL PLUS ONE AC =0000

              /CALLS USED ARE -CHKCLA-XC8CRLF-XC8SW-XC8INQU-XC8PNT-XC8OCTA-


4007  0000    XC8ERR, 0
4010  6002            IOF
4011  3322            DCA     ACSAVE          /SAVE AC
4012  6004            GTF
4013  3324            DCA     FLSAVE          /SAVE THE FLAGS
4014  7501            MQA
4015  3323            DCA     MQSAVE          /SAVE THE MQ
4016  7340            CLA CLL CMA             /SUBTRACT A 1 FOR TRUE LOCATION
4017  1207            TAD     XC8ERR          /GET RETTURN LOCATION
4020  3321            DCA     PCSAVE          /SAVE ADD OF C8ERR CALL
4021  4200            JMS     CHKCLA          /CHECK LOC.22 BIT 3 CONSOL BIT
4022  7410            SKP                     /ACTIVE CONSOLE PACKAGE
4023  5263            JMP     NTCLAS          /NOT CLASSIC SYSTEM
4024  4776'           JMS     C8GET           /GET THE REGISTERS.
4025  4775'           JMS     XC8SW           /CHECK SWITCH REG FOR BIT THAT INDICATES
                                              /NO ERROR MESSAGE
4026  0374    SETUP1, AND     (0000           /MASK FOR BIT FOR NO ERROR PRINTING
                                              /IF THIS ERROR MESSAGE IS TO ALWAYS
                                              /BE PRINTED LEAVE AND VALUE AT 0000
4027  7640            SZA CLA                 /SKIP IF BIT IS 0 PRINT ERROR MESSAGE
4030  5255            JMP     C8DO10          /DO NOT PRINT
4031  4773'           JMS     XC8CRLF
4032  4772'           JMS     XC8PNT
4033  4075            ERRMES                  /PRINT THE ERROR MESSAGE
4034  4772'           JMS     XC8PNT
```

```
        4035  4105              MESPC                      /PRINT THE PC STSTEMENT
        4036  1321              TAD     PCSAVE
        4037  4771'             JMS     XC8OCTA            /CONVERT 4 DIGIT PC TO ASCII
        4040  4772'             JMS     XC8PNT
        4041  4110              MESAC                      /PRINT THE AC MESS
        4042  1322              TAD     ACSAVE
        4043  4771'             JMS     XC8OCTA
        4044  4772'             JMS     XC8PNT
        4045  4113              MESMQ                      /PRINT MQ
        4046  1323              TAD     MQSAVE
        4047  4771'             JMS     XC8OCTA
        4050  4772'             JMS     XC8PNT
        4051  4116              MESFL                      /PRINT FL
        4052  1324              TAD     FLSAVE
        4053  4771'             JMS     XC8OCTA
        4054  4773'             JMS     XC8CRLF
        4055  4776'     C8D010, JMS     C8GET              /GET THE REGISTERS.
        4056  4775'             JMS     XC8SW              /CHECK SWITCH REGISTER
        4057  7610              SKP CLA                    /SKIP IF BIT 0 SET
        4060  5273              JMP     C8BY2              /LEAVE
        4061  4770'             JMS     XC8INQ             /GO TO THE INQUIRE ROUTINE
        4062  5273              JMP     C8BY2              /LEAVE
        4063  4776'     NTCLAS, JMS     C8GET              /GET THE REGISTERS.
        4064  4775'             JMS     XC8SW              /CHECK PSEUDU SWITCH REGISTER
                                                           /CHECK THE C8SWIT REGISTER
        4065  7610              SKP CLA                    /SKIP IF HALT
        4066  5607              JMP I   XC8ERR             /NO HALT CONTINUE
        4067  1367              TAD     (7402              /CODE FOR HLT
        4070  3721              DCA I   PCSAVE             /PUT IT IN CALL LOC.
        4071  4776'             JMS     C8GET
        4072  5721              JMP I   PCSAVE             /EXIT  TO CALL AND HALT
        4073  4776'     C8BY2,  JMS     C8GET              /GET THE REGISTERS
        4074  5607              JMP I   XC8ERR
        4075  0410      ERRMES, TEXT    "DHRKDD  FAILED "
        4076  2213
        4077  0404
        4100  4040
        4101  0601
        4102  1114
        4103  0504
        4104  4000
        4105  4040      MESPC,  TEXT    "  PC:"
        4106  2003
        4107  7200
        4110  4040      MESAC,  TEXT    "  AC:"
        4111  0103
        4112  7200
        4113  4040      MESMQ,  TEXT    "  MQ:"
        4114  1521
        4115  7200
        4116  4040      MESFL,  TEXT    "  FL:"
        4117  0614
        4120  7200
        4121  7777      PCSAVE, 7777
        4122  7777      ACSAVE, 7777
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        4123  7777      MQSAVE, 7777
        4124  7777      FLSAVE, 7777

                                $$$
        4167  7402
        4170  3435
        4171  3600
        4172  3103
        4173  3623
        4174  0000
        4175  3062
        4176  3424
        4177  0400
```

```
0000  11110000  11000000  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11111111  11111111  11000000  00000000

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11100111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111111  11111111  00000000  00000111

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  11111111  11111000  00000111


1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11100111

1400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11000001

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


2000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2100  11111111  11111111  11111111  11111111  11111111  11100000  00000000  00000000

2200
2300

2400
2500

2600
2700


3000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100  11111111  11111111  11111111  11111111  11111111  10000001  11111111  11111111

3200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3300  11111111  11111111  11111111  11111111  11111111  11110000  11111111  11111111

3400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

3600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3700  11111111  11111111  11111111  11111111  11111111  11100000  00111111  11111111
```

```
4000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4100  11111111  11111111  11111000  00000000  00000000  00000000  00000001  11111111

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
```

```
A0770   1513     CHKCLA  4000     DSK5B   0156     INMODE  3676
A7007   1512     CHKDAT  0353     DSK6A   0146     IOT0    0734
ACL     7701     CHKDSK  0337     DSK6B   0157     IOT1    0741
ACSAVE  4122     CHKER   1112     DSK7A   0147     IOT2    0746
ADPOT1  0137     CHKR1   1007     DSK7B   0160     IOT3    0714
ADPOT2  0150     CHNPOT  1517     DSKCNT  0105     IOT4    0705
ADPT1   1637     CKCOUT  3032     DSKP    6741     IOT5    0672
ADPT2   1640     CLDR    0745     DSKSKP  4441     IOT6    0727
ADREG   0125     CLKCNT  0132     DTREG   0126     IOTCHN  4430
AERRO   1600     CLRALL  4445     ENDBUF  2577     K0003   0060
AGAIN   0533     CMREG   0121     ENDIT   3542     K0007   0062
ALLAGN  0220     CNT     1554     ENDTST  0424     K0010   1324
AMOUNT  0056     CNTRLC  3347     ERHLT0  0736     K0037   0074
APT8    1125     CNTRLD  3400     ERHLT2  0750     K0040   0063
APT8A   4424     CNTRLE  3344     ERHLT3  0716     K0077   1323
AUTO10  0010     CNTRLL  3336     ERHLT4  0707     K0100   1556
AUTO11  0011     CNTRLQ  3300     ERHLT5  0674     K0177   1370
BGN     0200     CNTRLR  3311     ERHLT6  0731     K0200   0066
BGNBUF  0055     CNTRLS  3320     ERMES1  1734     K0212   1226
BGNTST  0127     CNTVAL  3052     ERMES2  1756     K0215   1225
BYRETR  3306     COUNT   1553     ERMES3  2000     K0240   1321
C8BY1   3030     CRLF    4452     ERR1    3536     K0260   0067
C8BY2   4073     CSAVE1  1514     ERRMES  4075     K0277   0065
C8BY3   3661     CSAVE2  1515     ERRO    0436     K0316   1371
C8BY4   3315     DAREG   0123     ERROR   4437     K0331   1372
C8BY5   3716     DATCNT  0131     ERTX1   1664     K0400   0073
C8CHAR  3675     DATER   1103     ERTX2   1675     K2000   1527
C8CKP   3622     DATOK   1071     ERTX3   1705     K3600   1526
C8CONT  3745     DCLR    6742     ERTX4   1717     K3740   1311
C8DO1   3110     DLAG    6743     EXBIT   0120     K4      0061
C8DO10  4055     DLCA    6744     EXIT    1306     K4000   0070
C8DO11  3407     DLDC    6746     EXITA   3240     K4100   1310
C8DO2   3633     DLSC    6740     EXTICK  1551     K5000   0667
C8DO3   3150     DMAN    6747     FILCNT  3640     K6500   1571
C8DO4   3606     DOCNT   3047     FILLER  3637     K6520   1620
C8DO7   3326     DONE    0250     FLSAVE  4124     K7377   1173
C8GET   3424     DONEA   3226     FORMAT  0302     K7400   0764
C8HANG  3722     DOPACK  3012     FRMDSK  0263     K7577   0670
C8RDPS  3466     DOSET   3051     FROCT   1227     K7700   1322
C8RETD  3414     DRIVNO  0100     FRSTOK  1056     K7735   0071
C8RETR  3335     DRST    6745     GOREG2  0117     K7741   1325
C8SETD  3413     DSK0A   0140     GETCH1  3503     K7760   0072
C8SETS  3334     DSK0B   0151     GETDAT  3256     K7771   0557
C8SWST  3545     DSK1A   0141     GOITA   3243     KAERRO  4426
C8TMP1  3621     DSK1B   0152     GOTOA   3254     KCDF    0075
CAF     6007     DSK2A   0142     GTF     6004     KCNT    1555
CAREG   0124     DSK2B   0153     HEDLST  0553     KERRO   1621
CCNTR1  1516     DSK3A   0143     HEDTAD  0552     KILBUF  4435
CHANG   1463     DSK3B   0154     HIGHAD  0103     KLBUF   0752
CHANGR  1477     DSK4A   0144     HITRK   2200     KTICK   1530
CHAR    0101     DSK4B   0155     HOMEMA  0130     KTIME   1557
CHECK   0400     DSK5A   0145     INDEXA  3255     KWAIT   1511
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LDAD    0711     PRNTER  4447     TEXST   1652     XRDST   0040
LDADD   4444     PSIE    6665     TICK    4427     XRDTRK  0032
LDCA    0700     PSKE    6663     TIME    4425     XREG    0546
LDCM    0720     PSKF    6661     TMPCNT  3546     XRESTR  0033
LDCMD   4442     PSTB    6664     TOCT    1200     XSDKP   0041
LDCUR   4443     PTSTOR  3136     TRKCNT  0104     XTABLA  3257
LDSC    4446     QUES1   0232     TSTCHA  3515     XTABLB  3260
LOC8ED  0134     RDST    0671     TTYLPT  3721     XTEXT   0545
LODER   0654     RDSTAT  4440     TWOCT   4451     XTICK   0027
LODR1   0611     RECAL   4433     TYPE    4436     XTIME   0025
LODTRK  4431     RECEIV  4434     UPARUW  3415     XTOCT   0051
LOTRK   2201     REDDSK  4432     UPONE   1215     XWAIT   0034
LOWAD   0102     REDOA   3215     WAIT    1327     XWRTRK  0031
M10     0077     REDTRK  1000     WASDSK  0242     XXLDSC  0046
M313    0064     RENEX1  0335     WATMES  3451
M4      0076     RENEX2  0414     WRKBUF  2200
MCNTR1  1641     RESTA   1425     WRTDSK  0321
MES1    2045     RESTER  1443     WRTTRK  0600
MES2    2066     RESTOR  1400     XAERRO  0026
MES3    2117     RETRN1  0544     XAPT8   0024
MES4    2126     SAMAGN  0224     XC8CKP  3641
MES5    2135     SAVPC   1622     XC8CNT  3200
MESA    3547     SBCNT1  0106     XC8CHL  3623
MESAC   4110     SDKP    0740     XC8ECH  3663
MESFL   4116     SETUP1  4026     XC8ERR  4007
MESHAN  3746     SETUP2  3025     XC8INQ  3435
MESMQ   4113     SOFT    0136     XC8OCT  3600
MESPAS  3053     STAER   1106     XC8PAS  3000
MESPC   4105     STAOK   1041     XC8PAU  3137
MOVE    1623     STCNT1  0107     XC8PNT  3103
MQA     7501     STCNT2  0110     XC8PSW  3456
MQL     7421     STCNT3  0111     XC8SW   3062
MQSAVE  4123     STRAUT  0513     XC8TTY  3072
MULDSK  1153     STREG   0122     XC8TYP  3677
NEXCHK  0347     SWITCH  0057     XCHANG  0030
NEXFRM  0276     TABLA   3261     XCLDR   0045
NOSET   3042     TABLB   3271     XCRLF   0052
NOTDSK  0244     TCHKT   1113     XDOLPT  3712
NOTEX   0536     TCNTR1  0112     XDOSW   3317
NTCLAS  4063     TCNTR2  0113     XEND    0135
NTGD    0474     TCNTR3  0114     XERRO   0037
OCTEL   4450     TCNTR4  0115     XFROCT  0050
PASCNT  3050     TCNTR5  0116     XHITRK  0054
PCLF    6662     TEXAD   1660     XKLBUF  0035
PCNTR1  0547     TEXCA   1656     XLDAD   0044
PCNTR2  0550     TEXCM   1650     XLDCA   0043
PCNTR3  0551     TEXDA   1654     XLDCM   0042
PCOUNT  0161     TEXDT   1662     XLDSC   0733
PCSAVE  4121     TEXEND  2021     XLDTRK  0053
PNTBUF  3720     TEXEX   1646     XMOVE   0133
PRINT   1312     TEXGO   1644     XPRINT  0036
PRN     1252     TEXPC   1642     XPRN    0047
```

```
ERRORS DETECTED: 0

LINKS GENERATED: 132

RUN-TIME:  4 SECONDS

3K CORE USED
```