

IDENTIFICATION

PRODUCT CODE:	MAINDEC-08-DHRKD-A-D
PRODUCT NAME:	RK8E DISK FORMATTER PROGRAM
DATE CREATED:	OCTOBER 2, 1972
MAINTAINER:	DIAGNOSTIC GROUP
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1, ABSTRACT

THE RK8E 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 0, 1, 2, 3, 4, 5, ETC.),

2, REQUIREMENTS

2.1 HARDWARE

PDP-8/E COMPUTER
AT LEAST 4K OF READ/WRITE MEMORY
ASR-33 TELETYPE OR EQUIVALENT
RK8E DISK CONTROL
RK05 DISK DRIVE(S)

2.2 PROGRAM STORAGE

THE PROGRAM UTILIZES OR OCCUPIES LOCATIONS 0000 TO 3000 OF THE CURRENT FIELD,

3, PRELIMINARY PROGRAMS

ALL BASIC AND EXTENDED MEMORY DIAGNOSTICS, THE RK8E DISKLESS CONTROL TEST, AND THE RK8E DRIVE CONTROL TEST SHOULD BE RUN IF THIS PROGRAM FAILS TO OPERATE CORRECTLY,

4, OPERATOR AND/OR PROGRAM ACTION

A, IF IT IS DESIRED TO CHANGE THE IOT CODES WITHIN THE PROGRAM, FOLLOW THE PROCEDURE IN SECTION 4.4,

B, TO RUN THE FORMATTER PROGRAM, FOLLOW THE PROCEDURE IN SECTION 4.3,

4.1 GENERAL INFORMATION

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

4.2 RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE

THE FOLLOWING IS THE CORRECT CARTRIDGE MOUNTING PROCEDURE FOR THE RK05 DISK DRIVE, ANY DEVIATION ENCOUNTERED DURING THIS PROCEDURE WILL BE CONSIDERED AN ERROR CONDITION,

A, SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION,

B, SET SWITCH LABELED "ON/OFF" TO THE "ON" POSITION,

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

FORMAT PROGRAM

- A, MAKE READY ALL DRIVES TO BE FORMATTED USING THE RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE SECTION 4,2,
- B, SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION ON ALL DRIVES NOT BEING FORMATTED,
- C, SET SWITCH LABELED "ON/OFF" TO THE "ON" POSITION ON ALL DRIVES NOT BEING FORMATTED,
- D, SET THE SWITCH REGISTER TO 0200 AND PRESS LOAD ADDRESS,
- E, SET THE SWITCH REGISTER TO 0000 AND PRESS KEY START (KEY START IS KEY CLEAR AND THEN KEY CONTINUE ON A PDP8/E, PDP8/F, OR PDP8/M) AND THE TTY SHOULD TYPE THE FOLLOWING PROGRAM NAME, INFORMATION, AND QUESTION,

RK05 DISK FORMATTER PROGRAM
FOR ALL QUESTIONS ANSWER Y FOR YES OR N FOR NO,
FORMAT DISK 0?

- F, 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?

- G, 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?

- H, 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?

I, 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,

ARE YOU SURE?

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

K, 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,

RK8E DISK FORMATTER PASS COMPLETE
FORMAT SAME DISK(S) AGAIN?

L, 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,

4,4 CHANGE PROGRAM DEVICE IOT CODES

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

A, SET THE SWITCH REGISTER TO 0201 AND PRESS LOAD ADDRESS,

B, SET THE SWITCH REGISTER TO 0000, SET SWITCH REGISTER BITS 3-8 TO THE DESIRED DEVICE IOT CODE, AND PRESS KEY START (START IS KEY CLEAR AND THEN KEY CONTINUE ON A PDP8/E, PDP8/F, OR PDP8/M),

C, THE PROGRAM WILL CHANGE THE DEVICE IOT CODES WITHIN THE PROGRAM AND THEN HALT,

D, TO RUN THE REGULAR FORMAT PROGRAM USE SECTION 4,3,

5, ERRORS

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

POSSIBLE ERROR HEADERS ARE AS FOLLOWS,

DISK DATA ERROR
HEAD 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,

PCI PROGRAM LOCATION OF FAILURE

GDI EXPECTED INFORMATION

STI CONTENTS OF THE STATUS REGISTER
 CMI SOFTWARE COMMAND REGISTER
 DAI SOFTWARE CYLINDER, SURFACE, AND SECTOR REGISTER
 ADI ADDRESS OF DATA BREAK
 DTI 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 SEQUENTIAL 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 SEQUENTIAL CYLINDER,

6, TROUBLE SHOOTING INFORMATION

IOT	FUNCTION
6741 DSKP	"SKIP" SKIP IF TRANSFER DONE FLAG OR ERROR FLAG IS SET,
6742 DCLR	"CLEAR" FUNCTION IS REGULATED BY AC BITS 10 AND 11, THE AC IS THEN CLEARED,
AC10 AC11	
0 0	CLEAR THE AC AND STATUS REGISTER,
0 1	CLEAR THE AC, CONTROL, AND MAJOR REGISTERS, THIS INSTRUCTION WILL STOP THE CONTROL EVEN IF IT IS WRITING A HEADER, THIS IS THE ONLY

INSTRUCTION THAT WILL CLEAR
MAINTENANCE MODE,

1 0

CLEAR AC, RECALIBRATE DISK DRIVE,
AND CLEAR STATUS REGISTER,

6743 DLAG

"LOAD DISK ADDRESS AND GO" LOAD THE
DISK CYLINDER, SURFACE, AND SECTOR
FROM THE AC, CLEAR THE AC, AND DO
THE COMMAND IN THE COMMAND REGISTER,

AC

0=6

CYLINDER

7

SURFACE (1= SURFACE 1) (0= SURFACE 0)

8=11

SECTOR

6744 DLCA

"LOAD CURRENT ADDRESS" LOAD THE
CURRENT ADDRESS FROM AC, THE AC
IS THEN CLEARED,

AC

0=11

CURRENT ADDRESS

6745 DPST

"READ STATUS" CLEAR THE AC AND
READ THE CONTENTS OF THE STATUS
REGISTER INTO THE AC,

AC

0

TRANSFER DONE

1

READY TO SEEK, READ, OR WRITE,

2

ENABLE SHIFT TO LOWER DATA REGISTER

3

SEEK FAIL

4

DISK FILE READY

5

CONTROL BUSY ERROR

6

TIME OUT ERROR

7

WRITE LOCK ERROR

8

CRC ERROR

9

DATA RATE ERROR

10

DRIVE STATUS ERROR

11

CYLINDER ADDRESS ERROR

6746 DLDC

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

AC

0=2=0

READ DATA

0=2=1

READ ALL

0=2=2

WRITE LOCK

0=2=3

SEEK ONLY

0=2=4

WRITE DATA

0=2=5

WRITE ALL

0=2=6

NOT USED

0=2=7	NOT USED
3	ENABLE INTERRUPT
4	ENABLE SET TRANSFER DONE ON SEEK DONE
5	HALF BLOCK 128 WORDS
6	EXTENDED MEMORY ADDRESS
7	EXTENDED MEMORY ADDRESS
8	EXTENDED MEMORY ADDRESS
9	UNIT SELECT
10	UNIT SELECT
11	EXTENDED CYLINDER ADDRESS

6747 DMAN "MAINTENANCE IOT" LOAD THE MAINTENANCE REGISTER FROM THE AC, THE FUNCTION IS REGULATED BY THE AC BITS, MAINTENANCE MODE CAN ONLY BE CLEARED BY DCLR "CLEAR CONTROL",

AC

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

7. PROGRAM DISCRIPTION

THE FORMATTING IS ACTUALLY A FUNCTION OF THE RKBE 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 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.

8.

PROGRAM LISTING

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/
/RK8E DISK FORMATTER PROGRAM
/COPYRIGHT 1972, DIGITAL EQUIP. CORP., MAYNARD, MASS.
/
6741 DSKP=6741 /SKIP ON TRANSFER DONE OR ERROR
6742 DCLR=6742 /CLEAR DISK CONTROL LOGIC
6743 DLAG=6743 /LOAD ADDRESS AND GO
6744 DLCA=6744 /LOAD CURRENT ADDRESS
6745 DRST=6745 /READ STATUS REGISTER
6746 DLOC=6746 /LOAD COMMAND REGISTER
6747 DMAN=6747 /LOAD MAINTENANCE
/
5420 IOTCHN=JMS I XCHANG
4421 LODTRK=JMS I XWRTRK
4422 REDOSK=JMS I XRDRTRK
4423 RECAL=JMS I XRESTR
4424 RECEIV=JMS I XWAIT
4425 KILBUF=JMS I XKLBUF
4427 ERROR=JMS I XERRO
4430 RDSTAT=JMS I XRST
4434 LDADD=JMS I XLDDAD
4431 DSKSKP=JMS I XSKKP
4432 LDCMD=JMS I XLDCM
4433 LDCUR=JMS I XLDCA
4435 CLRALL=JMS I XCCLR
4436 PRNTER=JMS I XPRN
4437 OCTEL=JMS I XFROCT
4440 TWOCY=JMS I XTCT
4426 TYPE=JMS I XPRINT
4441 CRLF=JMS I XCRLF
/
0000 *0
/
0000 0000 0
0001 5001 5001
0002 0002 0002
0003 0003 0003
/
0010 *10
/
0010 0000 AUTO10, 0
/
0011 0000 AUTO11, 0
/
0020 *20
/
0020 1730 XCHANG, CHANG
0021 1000 XWRTRK, WRTRK
0022 1200 XRDRTRK, REDTRK
0023 1630 XRESTR, RESTOR
0024 1600 XWAIT, WAIT
0025 1444 XKLBUF, KLBUF
0026 1570 XPRINT, PRINT

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0027 0600 XERRO, ERRO
0030 1400 XRST, RDST
0031 1433 XSKKP, SKKP
0032 1425 XLDCM, LDCM
0033 1407 XLDCA, LDCA
0034 1417 XLDDAD, LDAD
0035 1440 XCCLR, CLDR
0036 1530 XPRN, PRN
0037 1505 XFROCT, FROCT
0040 1436 XTCT, TOCT
0041 1473 XCRLF, UPONE
0042 2401 XLTRK, LTRK
0043 2400 XWRTRK, WRTRK
0044 2400 BKBUF, WRKBUF
0045 0000 AMOUNT, 0
0046 0000 SWITCH, 0
0047 0003 K0003, 0003
0050 0007 K0007, 0007
0051 0010 K0010, 0010
0052 0040 K0040, 0040
0053 0200 K0200, 0200
0054 0260 K0260, 0260
0055 0240 K0240, 0240
0056 0316 K0316, 0316
0057 0331 K0331, 0331
0060 0277 K0277, 0277
0061 4000 K4000, 4000
0062 2000 K2000, 2000
0063 7735 K7735, 7735
0064 7740 K7740, 7740
0065 7700 K7700, 7700
0066 7760 K7760, 7760
0067 0077 K0077, 0077
0070 5000 K5000, 5000
0071 7771 K7771, 7771
0072 0037 K0037, 0037
0073 6201 KCDF, CDF
0074 7400 K7400, 7400
/
DECIMAL
/
0075 7764 M12, =12
/
OCTAL
/
0076 7465 M313, =313
0077 7774 M4, =4
0100 0000 DRIVNO, 0
0101 0000 CHAN, 0
0102 0000 HIGHAD, 0
0103 0000 TRKCNT, 0
0104 0000 DSKCNT, 0
0105 0000 SBCNT, 0
0106 0000 STCNT, 0
0107 0000

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/ PAL10 V141 2=OCT=72 23134 PAGE 1=2

0110 0000 STCNT2, 0
0111 0000 STCNT3, 0
0112 0000 TCNTR1, 0
0113 0000 TCNTR2, 0
0114 0000 TCNTR3, 0
0115 0000 TCNTR4, 0
0116 0000 TCNTR5, 0
/
0117 0000 GOREG1, 0
0120 0000 GOREG2, 0
0121 0000 CRREG1, 0
0122 0000 CRREG2, 0
0123 0000 STREG, 0
0124 0000 DBREG, 0
0125 0000 CMREG, 0
0126 0000 DAREG, 0
0127 0000 CAREG, 0
0130 0000 ADREG, 0
0131 0000 DTREG, 0
0132 0000 HOMEHA, 0
0133 0000 FLDHMA, 0
0134 0000 DATCNT, 0
0135 5371 K5371, 5371
0136 5300 K5300, 5300
/
0137 1711 XMOVE, MOVE
0140 0000 LOC8ED, 0
0141 0400 XEND, ENDTST
0142 0000 SOFT, 0
0143 0144 ADPOT1, DSK0A
0144 0000 DSK0A, 0
0145 0001 DSK1A, 1
0146 0002 DSK2A, 2
0147 0003 DSK3A, 3
0150 0191 ADPOT2, DSK0B
0151 0000 DSK0B, 0
0152 0000 DSK1B, 0
0153 0000 DSK2B, 0
0154 0000 DSK3B, 0
/
0200 *200
/
0200 7610 BGN, SKP CLA /REGULAR START
0201 5420 IOTCHN /CHANGE DEVICE TO SWR3=8
0202 6224 RIF
0203 3132 DCA HOMEHA
0204 1132 YAD HOMEHA
0205 1073 YAD KODF /MAKE HOME0F
0206 3207 DCA ,+1
0207 7402 HLT /MAKE DF=IF
/
0210 4441 CRLF
0211 4441 CRLF
0212 4436 PRNTR /PRINT "RK0E DISK FORMATTER PROGRAM"
0213 2170 MES1 /MESSAGE 1 POINTER

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/ PAL10 V141 2=OCT=72 23134 PAGE 1=3

0214 4441 CRLF
0215 4436 PRNTR /PRINT "FOR ALL QUESTIONS"
0216 2206 MES2 /MESSAGE POINTER 2
0217 1077 ALLAGN, YAD M4
0220 3107 DCA STCNT1 /COUNTER FOR AMOUNT OF DISKS
0221 3140 DCA LOC8ED
0222 3110 DCA STCNT2
0223 4441 SAMAGN, CRLF
0224 4436 PRNTR /PRINT "FORMAT DISK ? "
0225 2237 MES3 /MESSAGE POINTER 3
0226 1110 YAD STCNT2
0227 1054 YAD K0260
0230 4426 TYPE /TYPE DISK NUMBER
0231 1060 QUES1, YAD K0277
0232 4426 TYPE /TYPE ?
0233 1143 YAD ADPOT1
0234 1110 YAD STCNT2
0235 3111 DCA STCNT3
0236 4424 RECEIV /WAIT FOR CHARACTER
0237 5243 JMP NOTDSK /NO NOT THIS DISK
0240 5231 JMP QUES1 /NEITHER YES OR NO
0241 2140 WASDSK, ISZ LOC8ED
0242 7340 CLA CLL CMA
0243 3511 NOTDSK, DCA I STCNT3 /YES, WAS CLEAR DISK POINTER
0244 2110 ISZ STCNT2 /UPDATE POINTER
0245 2107 ISZ STCNT1 /COUNT DISKS
0246 5223 JMP SAMAGN /ASK ABOUT NEXT
0247 5250 JMP DONE /ALL DONE
/
0250 4441 DONE, CRLF
0251 4436 PRNTR /PRINT "ARE YOU SURE ?"
0252 2246 MES4 /MESSAGE POINTER 4
0253 4424 RECEIV /WAIT FOR CHARACTER
0254 5217 JMP ALLAGN /NO, START ALL OVER
0255 5250 JMP DONE /NEITHER TYPE ?
0256 1140 YAD LOC8ED
0257 7041 CIA
0260 7450 SNA /ANY DISKS
0261 5200 JMP BGN /NO, OPERATOR ERROR
0262 3140 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 4537 FRMDSK, JMS I XMOVE /MOVE DISK POINTERS
0264 1140 YAD LOC8ED
0265 3045 DCA AMOUNT
0266 1045 YAD AMOUNT
0267 3105 DCA DSKCNT /COUNTER FOR AMOUNT OF DISKS
0270 3115 DCA TCNTR4
0271 1150 YAD ADPOT2
0272 3116 DCA TCNTR5 /A FEW COUNTERS
0273 1516 YAD I TCNTR5

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/ PAL10 V141 2=OCT=72 23134 PAGE 1=4

0274 7640 SZA CLA /FORMAT THIS DISK
0275 5302 JMP /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 0047 AND K0003 /MASK OUT
0304 7104 CLL RAL /MAKE DISK NUMBER
0305 3100 DCA DRIVNO
0306 4423 RECAL /RECALIBRATE THIS DRIVE
0307 5326 JMP RENEX1 /RECALIBRATE NEXT EXISTING
0310 3102 DCA LOWAD /SETUP ADDRESS POINTER
0311 3103 DCA HIGHAD /SETUP ADDRESS POINTER
0312 1076 TAD M313
0313 3104 DCA TRKCNT /COUNTER FOR AMOUNT OF TRACKS
0314 4421 WRTDSK, LODTRK /FORMAT A TRACK
0315 5326 JMP RENEX1 /TO NEXT DISK
0316 7300 CLA CLL
0317 1102 TAD LOWAD
0320 1052 TAD K0040
0321 3102 DCA LOWAD /UPDATE TO NEXT TRACK
0322 7630 SZA CLA /SET EXTENDED BIT
0323 2103 ISZ HIGHAD /YES
0324 2104 ISZ TRKCNT /UPDATE TRACK COUNTER
0325 5314 JMP WRTDSK /DO NEXT TRACK
0326 2105 RENEX1, ISZ DSKCNT /UPDATE DISK COUNTER
0327 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.

0330 1045 CHKDSK, TAD AMOUNT
0331 3105 DCA DSKCNT /AMOUNT OF DISKS
0332 3115 DCA TCNTR4
0333 1150 TAD ADPOT2
0334 3116 DCA TCNTR5
0335 1516 TAD I TCNTR5 /SOFTWARE INFORMATION
0336 7640 SZA CLA /CHECK THIS DISK
0337 5344 JMP CHKDAT /CHECK THIS ONE
0340 2116 NEXCHK, ISZ TCNTR5 /UPDATE FOR NEXT DISK
0341 2115 ISZ TCNTR4
0342 5335 JMP ,=5
0343 7402 HLT /WHAT HAPPENED????

/
0344 1115 /CHKDAT, TAD TCNTR4
0345 0047 AND K0003 /MASK OUT
0346 7104 CLL RAL /MAKE DRIVE NUMBER
0347 3100 DCA DRIVNO
0350 4423 RECAL /RECALIBRATE
0351 5370 JMP RENEX2 /TRY NEXT DRIVE
0352 3102 DCA LOWAD

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0353 3103 DCA HIGHAD /SETUP STARTING DISK ADDRESS
0354 1076 TAD M313
0355 3104 DCA TRKCNT /AMOUNT OF TRACKS TO DO
0356 4422 CHECK, REDDSK /READ AND CHECK ONE CYLINDER
0357 5370 JMP RENEX2 /TO NEXT DISK
0360 7300 CLA CLL
0361 1102 TAD LOWAD
0362 1052 TAD K0040
0363 3102 DCA LOWAD /UPDATE TO NEXT CYLINDER
0364 7630 SZA CLA /TIME TO SET EXTENDED BIT
0365 2103 ISZ HIGHAD /YES, SET IT
0366 2104 ISZ TRKCNT /UPDATE CYLINDER COUNTER
0367 5356 JMP CHECK /CHECK NEXT ONE
0370 2105 RENEX2, ISZ DSKCNT /UPDATE DISK COUNTER
0371 5340 JMP NEXCHK /CHECK NEXT
0372 5541 JMP I XEND /END OF TEST

/
PAGE
/
0400 4441 /ENDTST, CRLF /PRINT "PASS COMPLETE"
0401 4436 PRNTER
0402 2147 TEXEND
0403 4441 CRLF /PRINT "TRY SAME SEQUENCE"
0404 4436 PRNTER
0405 2255 MESS
0406 4424 RECEIV /WAIT FOR INPUT FROM OPERATOR
0407 5777' JMP ALLAGN /NO, ASK AGAIN
0410 5203 JMP ,=5
0411 5776' JMP FRMDSK /TRY SAME SEQUENCE

0576 0263
0577 0217
0600 PAGE

/
/SUBROUTINE FOR "ERRORS," SCOPE LOOPS, AND
/ERROR TYPEOUTS,
/
0600 0000 ERRO, 0
0601 7301 CLA CLL IAC
0602 1200 TAD ERRO /GET PC STORED
0603 3314 DCA RETRN1 /STORE FOR RETURN
0604 4441 CRLF
0605 4441 CRLF
0606 1600 TAD I ERRO /GET TEXT POINTER
0607 0050 AND K0007 /MASK 9=11
0610 1321 TAD HEDTAD /MAKE ERROR HEADER TAD
0611 3212 DCA ,=1 /MODIFIED HEADER TAD
0612 7402 HLT
0613 3215 DCA ,=2 /MODIFIED HEADER POINTER
0614 4436 PRNTER
0615 7402 HLT
0616 4441 CRLF
0617 4436 PRNTER /PRINT PCI
0620 1766 TEXPC
0621 1200 TAD ERRO /GET PC POINTER

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0622 4437 OCTEL /PRINT PC STORED
0623 1608 TAD I ERRO /GET TEXT POINTER
0624 7104 CLL RAL
0625 7420 SNL
0626 5242 JMP NTGD /NOT GOI REGISTER

0627 3200 DCA ERRO
0630 4436 PRNTER /PRINT GOI
0631 1770 TEXGD
0632 1200 TAD ERRO
0633 7700 SMA CLA /HAS IT A 6 BIT OCTAL BYTE
0634 5237 JMP ,*3 /NO
0635 1117 TAD GDREG1 /GET DATA
0636 4440 TWOCT /PRINT TWO OCTAL
0637 1120 TAD GDREG2
0640 4437 OCTEL /PRINT FOUR OCTAL
0641 7610 SKP CLA
0642 3200 NTGD, DCA ERRO
0643 1200 TAD ERRO /GET TEXT POINTER
0644 7104 CLL RAL
0645 7420 SNL
0646 5257 JMP NTGRG
0647 3200 DCA ERRO
0650 4436 PRNTER /PRINT CRI
0651 1772 TEXCR
0652 1121 TAD CRREG1
0653 4440 TWOCT /PRINT
0654 1122 TAD CRREG2
0655 4437 OCTEL /PRINT FOUR OCTAL
0656 7610 SKP CLA
0657 3200 NTCRC, DCA ERRO
0660 1315 TAD XTEXT
0661 3320 DCA PCNTR2
0662 1316 TAD XREG
0663 3010 DCA AUTO10
0664 1071 TAD K7771
0665 3317 DCA PCNTR1 /COUNTER FOR # OF HEADS
0666 1200 STRAUT, TAD ERRO /GET TEXT POINTER
0667 7500 SMA
0670 5306 JMP NOTEX /NOT THIS ONE
0671 7104 CLL RAL
0672 3200 DCA ERRO
0673 1320 TAD PCNTR2 /GET TEXT MESSAGE POINTER
0674 2320 ISZ PCNTR2
0675 2320 ISZ PCNTR2
0676 3300 DCA ,*2 /STORE FOR PRNTER
0677 4436 PRNTER /PRINT XXI
0700 7402 HLT /MODIFIED TEXT POINTER
0701 1410 TAD I AUTO10 /PRINT FOUR OCTAL
0702 4437 OCTEL
0703 2317 AGAIN, ISZ PCNTR1
0704 5266 JMP STRAUT /CHECK FOR NEXT XXI
0705 5714 JMP I RETRN1 /RETURN TO QUESTION
0706 7104 NOTEX, CLL RAL

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/ PAL10 V141 2*OCT=72 23134 PAGE 1=7

0707 3200 DCA ERRO
0710 2320 ISZ PCNTR2
0711 2320 ISZ PCNTR2
0712 2010 ISZ AUTO10
0713 5303 JMP AGAIN

0714 0000 /RETRN1, 0
0715 1774 XTEXT, TEXTY
0716 0122 XREG, CRREG2
0717 0000 PCNTR1, 0
0720 0000 PCNTR2, 0
0721 1322 HEDTAD, TAD HEDLST
0722 2012 HEDLST, ERTX1
0723 2023 ERTX2
0724 2033 ERTX3
0725 2045 ERTX4

1000 /
PAGE
/
/ROUTINE TO FORMAT CYLINDER
/MAKE FIRST TWO WORDS OF EVERY SECTOR
/EQUAL TO DISK ADDRESS,
/

1000 0000 WRITRK, 0
1001 7330 CLA CLL CML RAR
1002 3120 DCA GDREG2 /SETUP COMPARE REGISTER
1003 4425 KILBUF /CLEAR BUFFER
1004 1063 TAD K7735 /AMOUNT OF SECTORS TO DO
1005 3112 DCA TCNTR1 /SETUP COUNTER
1006 3113 DCA TCNTR2 /STARTING WITH 0
1007 1066 TAD K7760 /STOPPER
1010 3114 DCA TCNTR3 /SECTOR COUNTER POINTER STOP
1011 1113 LODR1, TAD TCNTR2
1012 0072 AND K0037 /MASK SECTOR BITS
1013 1102 TAD LOWAD /ADD IN CYLINDER
1014 3442 DCA I XL0TRK /SETUP TRACK WORD IN BUFFER
1015 1103 TAD HIGHAD
1016 1100 TAD DRIVNO /ADD IN DRIVE NUMBER
1017 3443 DCA I XH1TRK /SETUP TRACK WORD IN BUFFER
1020 1443 TAD I XH1TRK
1021 1132 TAD HOMEMA /CURRENT FIELD
1022 1070 TAD K5000 /FUNCTION WRITE ALL
1023 4432 LDCMD /LOAD COMMAND
1024 1044 TAD BGNBUF
1025 4433 LDCUR /LOAD CURRENT ADDRESS
1026 1442 TAD I XL0TRK
1027 4434 LDADD /LOAD TRACK AND GO
1030 4431 DSKSKP /SKIP ON FLAG
1031 5230 JMP ,*1 /WAIT FOR FLAG
1032 4430 RDSTAT /READ STATUS
1033 1061 TAD K4000
1034 7640 SZA CLA /HAS STATUS 0?
1035 5247 JMP LODER /ERROR, STATUS ON WRITE ALL
1036 2113 ISZ TCNTR2
1037 2114 ISZ TCNTR3 /COUNT FIRST REVOLUTION

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/ PAL10 V141 2=OCT=72 23134 PAGE 1=8

1040 7610 SKP CLA /STILL IN FIRST REV,
1041 3113 DCA TCNTR2 /SETUP FOR SECTOR "1"
1042 2113 ISZ TCNTR2
1043 2112 ISZ TCNTR1 /UPDATE SECTOR COUNTER
1044 5211 JMP LODR1 /TRY NEXT SECTOR
1045 2200 JSE WRTRK
1046 5600 JMP I WRTRK
1047 4427 LODER, ERROR /THIS CYLINDER DONE
1050 5302 /ERROR, STATUS
/ TEXT POINTER

1051 4423 /
1052 5600 RECAL /CLEAR CONTROL AND DRIVE
1053 4441 JMP I WRTRK /TO NEXT DISK
1054 4436 CRLF
1055 2062 PRNTER /PRINT "TRY SAME AGAIN"
1056 4424 ERMES1
1057 5245 RECEIV /WAIT FOR YES OR NO
1060 5253 JMP LODER=2 /WAS A NO TRY SAME CYLINDER
1061 5201 JMP I=5 /WAS NEITHER ASK AGAIN
/ JMP WRTRK *1 /YES, TRY NEXT

/ PAGE
/ 1200
/ /ROUTINE TO READ AND CHECK A CYLINDER
/

1200 0000 REDTRK, 0
1201 1063 TAD K7735
1202 3112 DCA TCNTR1 /AMOUNT OF SECTORS TO DO
1203 3113 DCA TCNTR2 /STARTING WITH 0
1204 1066 TAD K7760
1205 3114 DCA TCNTR3
1206 4425 KILBUF /CLEAR BUFFER
1207 7340 CHKR1, CLA CLL CMA
1210 3142 DCA SOFT /SETUP SOFT ERROR FLAG
1211 1044 TAD BGNBUF
1212 4433 LDCUR /LOAD CURRENT ADDRESS
1213 1103 TAD HIGHAD /EXTENDED CYLINDER BIT
1214 1100 TAD DRIVNO /CURRENT DRIVE
1215 1132 TAD HOMEHA /CURRENT FIELD
1216 4432 LDCMD /LOAD COMMAND
1217 1113 TAD TCNTR2
1220 0072 AND K0037 /MASK SECTOR BITS OFF
1221 1102 TAD LOWAD /ADD IN OTHER DISK ADDRESS
1222 4434 LDADD /LOAD AND GO
1223 4431 DSKSKP /DISK SKIP IOT
1224 5223 JMP I=1 /WAIT FOR FLAG
1225 4430 RDSTAT /READ STATUS
1226 1061 TAD K4000 /ADD IN FUDGE FACTOR
1227 7650 SNA CLA /SKIP IF ERROR
1230 5256 JMP STAOK /STATUS O.K.
1231 1123 TAD STREG /GET STATUS READ
1232 0051 AND K0010
1233 7650 SNA CLA /WAS IT A CRC
1234 5302 JMP STAER /NO, JUST A HARD ERROR
1235 3142 DCA SOFT /CLEAR SOFT ERROR FLAG
1236 1125 STACK, TAD CMREG /GET LAST COMMAND

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/ PAL10 V141 2=OCT=72 23134 PAGE 1=9

1237 0050 AND K0007
1240 7041 CIA
1241 1443 TAD I XHITRK /GET WORD READ FROM DISK
1242 7650 SNA CLA /SKIP IF ERROR
1243 5252 JMP FRSTOK /FIRST WORD O.K.
1244 1443 TAD I XHITRK /GET WORD
1245 3131 DCA DTREG /SETUP ERROR PRINTER
1246 1125 TAD CMREG
1247 0050 AND K0007
1250 3120 DCA GDREG2 /SETUP GOOD FOR PRINTER
1251 5277 JMP DATER /NO, DATA ERROR
1252 1442 FRSTOK, TAD I XLOTRK /GET WORD READ
1253 7041 CIA
1254 1126 TAD DAREG /COMPARE TO GOOD
1255 7650 SNA CLA /SKIP IF ERROR
1256 5265 JMP DATOK /WORD O.K.
1257 2130 ISZ ADREG /SETUP ERROR PRINTER
1260 1126 TAD DAREG
1261 3120 DCA GDREG2 /SETUP GOOD WORD FOR PRINTER
1262 1442 TAD I XLOTRK /GET WORD READ
1263 3131 DCA DTREG /SETUP FOR PRINTER
1264 5277 JMP DATER /DATA ERROR
1265 1142 DATOK, TAD SOFT /GET SOFT ERROR FLAG
1266 7650 SNA CLA /WAS IT CLEAR
1267 5302 JMP STAER /YES, STATUS ERROR
1270 1113 TAD TCNTR2
1271 1047 TAD K0003 /ADVANCE 3 SECTORS
1272 3113 DCA TCNTR2
1273 2114 ISZ TCNTR3
1274 5207 JMP CHKR1 /MORE TO FORMAT
1275 2200 ISZ REDTRK
1276 5600 JMP I REDTRK /EXIT, O.K.
1277 1135 DATER, TAD K5371
1300 3307 DCA TCHKT /SETUP TEXT POINTER
1301 5306 JMP CHKER /ERROR
1302 1136 STAER, TAD K5300
1303 3307 DCA TCHKT /SETUP TEXT POINTER
1304 7330 CLA CLL CML RAR
1305 3120 DCA GDREG2 /SETUP GOOD STATUS PRINTER
1306 4427 CHKER, ERROR /ERROR, READ DATA
1307 0000 TCHKT, 0 /MODIFIED TEXT POINTER
1310 4423 RECAL /CLEAR CONTROL AND DRIVE
1311 5600 JMP I REDTRK /TO NEXT DISK
1312 4441 CRLF
1313 4436 PRNTER /PRINT "TRY SAME AGAIN"
1314 2126 ERMES3
1315 4424 RECEIV
1316 5275 JMP DATER =2 /CHECK NEXT
1317 5312 JMP I=5 /RE=PRINT
1320 5201 JMP REDTRK *1 /TRY SAME AGAIN

/ PAGE
/ /SUBROUTINE TO READ STATUS REGISTER
/

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/ PAL10 V141 2*OCT=72 23134 PAGE 1=10

1400 0000 ROST, 0
1401 6745 IOT5, DRST /READ STATUS IOT
1402 7410 SKP
1403 7402 ERHLT5, HLT /SKIP TRAP
1404 3123 DCA STREG /SAVE RESULTS
1405 1123 TAD STREG
1406 5600 JMP I ROST /EXIT

/
/SUBROUTINE TO LOAD CURRENT ADDRESS REGISTER
/
1407 0000 LDCA, 0
1410 3130 DCA ADREG /SAVE IN ADDRESS
1411 1130 TAD ADREG
1412 3127 DCA CAREG /SETUP INITIAL CURRENT ADDRESS
1413 1130 TAD ADREG
1414 6744 IOT4, DLCA /LOAD CURRENT ADDRESS IOT
1415 5607 JMP I LDCA /EXIT

1416 7402 ERHLT4, HLT /SKIP TRAP
/
/
/SUBROUTINE TO LOAD TRACK ADDRESS REGISTER
/
1417 0000 LOAD, 0
1420 3126 DCA DAREG /SAVE OUTBOUND DATA
1421 1126 TAD DAREG
1422 6743 IOT3, DLAG /LOAD DISK ADDRESS REGISTER
1423 5617 JMP I LOAD /EXIT
1424 7402 ERHLT3, HLT /SKIP TRAP

/
/SUBROUTINE TO LOAD COMMAND REGISTER
/
1425 0000 LDCM, 0
1426 3125 DCA CMREG /SAVE OUTBOUND DATA
1427 1125 TAD CMREG
1428 6746 IOT6, DLDC /LOAD COMMAND REGISTER
1429 5625 JMP I LDCM /EXIT
1432 7402 ERHLT6, HLT /SKIP TRAP

/
/SUBROUTINE TO ISSUE "DSKP" DISK SKIP IOT
/
1433 0000 SDKP, 0
1434 6741 IOT1, DSKP /DISK SKIP IOT
1435 7410 SKP /DID NOT SKIP
1436 2233 ISZ SDKP
1437 5633 JMP I SDKP /EXIT

/
/SUBROUTINE TO ISSUE "DCLR" CLEAR IOT
/
1440 0000 CLDR, 0
1441 6742 IOT2, DCLR /DCLR "CLEAR IOT"
1442 5640 JMP I CLDR /EXIT
1443 7402 ERHLT2, HLT /SKIP TRAP

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/ PAL10 V141 2*OCT=72 23134 PAGE 1=11

/ROUTINE TO ZERO WORK BUFFER
/
1444 0000 KLBUF, 0
1445 7340 CLA CLL CMA
1446 1044 TAD RCNBUF /START OF BUFFER =1
1447 3010 DCA AUTO10 /SETUP AUTO INDEX
1448 1074 TAD K7400
1449 3134 DCA DATCNT /SETUP COUNTER
1450 3410 DCA I AUTO10 /CLEAR BUFFER
1451 2134 ISZ DATCNT /UPDATE COUNTER
1452 5272 JMP ,=2 /NOT ALL CLEARED YET
1453 5644 JMP I KLBUF /BUFFER CLEARED

/
/SUBROUTINE TO PRINT TWO OCTAL
/
1456 0000 TOCT, 0
1457 3106 DCA SBCNT1 /SAVE AC
1458 1106 TAD SBCNT1
1459 7010 RAR
1460 7012 RTR
1461 0050 AND K0007
1462 1054 TAD K0260
1463 4426 TYPE /PRINT FIRST BYTE
1464 1106 TAD SBCNT1
1465 0050 AND K0007
1466 1054 TAD K0260
1467 4426 TYPE /PRINT SECOND BIT
1468 5656 JMP I TOCT /EXIT

/
/ROUTINE TO DO CRLF
/
1473 0000 UPONE, 0
1474 7300 CLA CLL
1475 1303 TAD K0215
1476 4426 TYPE K0212
1477 1304 TAD K0212
1478 4426 TYPE
1479 4426 TYPE /TYPE ONE NULL
1480 5673 JMP I UPONE

1503 0215 K0215, 0215
1504 0212 K0212, 0212

/ROUTINE TO PRINT FOUR OCTAL
/
1505 0000 FROCT, 0
1506 7006 RTL
1507 7006 RTL
1508 3273 DCA UPONE
1509 1077 TAD M4
1510 3256 DCA TOCT
1511 1273 TAD UPONE

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/ PAL10 V141 2=OCT=72 23134 PAGE 1=12
1514 0050 AND K0007
1515 1054 TAD K0260
1516 4426 TYPE
1517 1273 TAD UPONE
1520 7006 RTL
1521 7004 RAL
1522 3273 DCA UPONE
1523 2256 ISZ TOCT
1524 5313 JMP ,=11
1525 1055 TAD K0240
1526 4426 TYPE
1527 5705 JMP I FROCT
/
/SUBROUTINE TO PRINT TEXT
/
1530 0000 PRN, 0
1531 7300 CLA CLL
1532 1730 TAD I PRN /GET POINTER

1533 2330 ISZ PRN
1534 3305 DCA FROCT
1535 1705 TAD I FROCT
1536 0065 AND K7700
1537 7450 SNA
1540 5364 JMP EXIT
1541 7500 SMA
1542 7020 CML
1543 7001 IAC
1544 7012 RTR
1545 7012 RTR
1546 7012 RTR
1547 4426 TYPE
1550 1705 TAD I FROCT
1551 0067 AND K0077
1552 7450 SNA
1553 5364 JMP EXIT
1554 1367 TAD K3740
1555 7500 SMA
1556 1366 TAD K4100
1557 1055 TAD K0240
1560 4426 TYPE
1561 2305 ISZ FROCT
1562 7300 CLA CLL
1563 5335 JMP PRN+5
1564 7300 EXIT, CLA CLL
1565 5730 JMP I PRN

/
1566 4100 K4100, 4100
1567 3740 K3740, 3740
/
/ROUTINE TO TYPE
/
1570 0000 PRINT, 0

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/ PAL10 V141 2=OCT=72 23134 PAGE 1=13
1571 6046 TLS
1572 6041 TSF
1573 5372 JMP ,=1
1574 6042 TCF
1575 7200 CLA
1576 5770 JMP I PRINT

/
PAGE
/ROUTINE TO WAIT FOR KEY FROM OPERATOR
/
1600 0000 WAIT, 0
1601 7300 CLA CLL
1602 6032 KCC
1603 6031 KSF
1604 5203 JMP ,=1
1605 6036 KRB
1606 6046 TLS
1607 6041 TSF
1610 5207 JMP ,=1
1611 3101 DCA CHAR
1612 6032 KCC
1613 6042 TCF
1614 1101 TAD CHAR
1615 7041 CIA
1616 1056 TAD K0316
1617 7650 SNA CLA
1620 5600 JMP I WAIT /WAS IT A NO
1621 2200 ISZ WAIT /YES
1622 1101 TAD CHAR /UPDATE RETURN POINTER
1623 7041 CIA
1624 1057 TAD K0331
1625 7650 SNA CLA /WAS IT A YES
1626 2200 ISZ WAIT /WAS A YES
1627 5600 JMP I WAIT /WAS NEITHER

/ROUTINE TO RECALIBRATE SELECTED DRIVE
/
1630 0000 RESTOR, 0
1631 7301 CLA CLL IAC /ENABLE CLEAR CONTROL
1632 4435 CLRALL /CLEAR CONTROL
1633 1100 TAD DRIVNO /CURRENT DRIVE
1634 1132 TAD HOMEMA /CURRENT FIELD
1635 4432 LDCMD /LOAD COMMAND
1636 7330 CLA CLL CML PAR /MAYBE EXPECTED STATUS
1637 3120 DCA GDREG2 /SETUP COMPARE REGISTER
1640 7326 CLA CLL CML RTL /ENABLE RECALIBRATE BIT
1641 4435 CLRALL /"RECALIBRATE"
1642 4431 DSKSKP /DISK SKIP IOT
1643 5242 JMP ,=1 /WAIT FOR FIRST DONE FLAG
1644 4430 ROSTAT /READ STATUS
1645 1062 TAD K2000
1646 7450 SNA /WAS IT BUSY AND DONE
1647 5253 JMP RESTA /YES, THEN ITS O.K.
1650 1062 TAD K2000 /NO, THEN IT MUST BE JUST DONE

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1651 7640 SEA CLA
1652 5271 JMP RESTER
1653 4435 RESTA, CLRALL
1654 1053 TAD K0200
1655 1125 TAD CMREG
1656 4432 LDCHD
1657 4431 DSKSKP
1658 5257 JMP ,=1
1659 4430 ROSTAT
1660 1061 TAD K4000
1661 7640 SEA CLA
1662 5271 JMP RESTER
1663 7301 CLA CLL IAC
1664 4435 CLRALL
1665 2230 ISZ ROSTOR
1666 5630 JMP I ROSTOR
1667 4427 RESTER, ERROR
1668 5303
/
1673 4441 CRLF
1674 4435 PRNTER
1675 2104 ERMES2
1676 4424 RECEIV
1677 5302 JMP ,=3
1678 5273 JMP ,=5
1679 5231 JMP ROSTOR +1
1680 7301 CLA CLL IAC
1681 1045 TAD AMOUNT
1682 7450 SNA
1683 5541 JMP I XEND
1684 3045 DCA AMOUNT
1685 3516 DCA I TONTR5
1686 5630 JMP I ROSTOR
/
/ROUTINE TO MOVE DISK POINTERS
/
1711 0000 MOVE, 0
1712 1325 TAD ADPT1
1713 3010 DCA AUTO10
1714 1326 TAD ADPT2
1715 3011 DCA AUTO11
1716 1077 TAD M4
1717 3327 DCA MCNTR1
1718 1410 TAD I AUTO10
1719 3411 DCA I AUTO11
1720 2327 ISZ MCNTR1
1721 5320 JMP ,=3
1722 5711 JMP I MOVE
/
1725 0143 ADPT1, DSK0A =1
1726 0150 ADPT2, DSK0B =1
1727 0000 MCNTR1, 0
/
/ROUTINE TO CHANGE DEVICE CODES
/

```

```

/WAS IT JUST DONE
/NO, ERROR
/CLEAR STATUS
/ENABLE SET SECOND DONE FLAG
/ORIGINAL COMMAND
/LOAD COMMAND
/DISK SKIP IOY
/WAIT FOR SECOND DONE
/READ STATUS

/WAS IT ONLY DONE FLAG
/NO, ERROR STATUS
/ENABLE CLEAR CONTROL
/CLEAR CONTROL
/UPDATE FOR GOOD RECALIBRATE
/RETURN
/ERROR, STATUS
/TEXT POINTER

/PRINT "TRY RECALIBRATE"

/WAIT FOR INPUT
/TRY NEXT EXISTING DISK

/TRY AGAIN

/GET AMOUNT ON SYSTEM
/WAS THERE ONLY 1 LEFT
/LAST DISK
/MORE TO GO BUT CLEAR THIS ONE
/CLEAR DISK POINTER
/TRY NEXT ONE

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1730 7604 CHANG, LAS
1731 0353 AND A0770
1732 3354 DCA CSAVE1
1733 1356 TAD CCNTR1
1734 3355 DCA CSAVE2
1735 1357 TAD CHNPOT
1736 3230 DCA ROSTOR
1737 1630 CHANG, TAD I ROSTOR
1738 3311 DCA MOVE
1739 1711 TAD I MOVE
1740 0352 AND A7007
1741 1354 TAD CSAVE1
1742 3711 DCA I MOVE
1743 2230 ISZ ROSTOR
1744 2355 ISZ CSAVE2
1745 5337 JMP CHANGR
1746 7402 HLT
1747 5350 JMP ,=1
/
1752 7007 A7007, 7007
1753 0770 A0770, 0770
1754 0000 CSAVE1, 0
1755 0000 CSAVE2, 0
1756 7772 CCNTR1, 7772
1757 1760 CHNPOT, CHNPOT +1
1760 1434 IOT1
1761 1441 IOT2
1762 1422 IOT3
1763 1414 IOT4
1764 1401 IOT5
1765 1430 IOT6
/
1766 2003 TEXPC, TEXT "PC:"
1767 7200
1770 0704 TEXGD, TEXT "GD:"
1771 7200
1772 0322 TEXCR, TEXT "CR:"
1773 7200
1774 2324 TEXST, TEXT "ST:"
1775 7200
1776 0402 TEXOB, TEXT "DB:"
1777 7200
1778 0315 TEXCM, TEXT "CM:"
1779 7200
1780 0401 TEXDA, TEXT "DA:"
1781 7200
1782 0301 TEXCA, TEXT "CA:"
1783 7200
1784 0104 TEXAD, TEXT "AD:"
1785 7200
1786 0424 TEXDT, TEXT "DT:"
1787 7200
/
1802 2205 ERTX1, TEXT "READ STATUS ERROR"
1803 0104

```

```

/SAVE DESIRED

/GET ADDRESS POINTER

/GET OLD CODE
/MASK
/ADD IN DESIRED
/STORE DESIRED DEVICE CODE
/UPDATE POINTER
/UPDATE CHANGE COUNTER
/DEVICE CODES CHANGED

```

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/ PAL10 V141 2*OCT=72 23134 PAGE 1=16
2014 4023
2015 2401
2016 2425
2017 2340
2020 0522
2021 2217
2022 2200
2023 0411 ERTX2, TEXT "DISK DATA ERROR"
2024 2313
2025 4004
2026 0124
2027 0140
2030 0522
2031 2217
2032 2200
2033 2722 ERTX3, TEXT "WRITE STATUS ERROR"
2034 1124
2035 0540
2036 2324
2037 0124
2040 2523
2041 4005
2042 2222
2043 1722
2044 0000
2045 2205 ERTX4, TEXT "RECALIBRATE STATUS ERROR"
2046 0301
2047 1411
2050 0222
2051 0124
2052 0540
2053 2324
2054 0124
2055 2523
2056 4005
2057 2222
2060 1722
2061 0000

/
2062 2422 ERMES1, TEXT "TRY TO FORMAT SAME CYLINDER AGAIN?"
2063 3140
2064 2417
2065 4006
2066 1722
2067 1501
2070 2440
2071 2301
2072 1505
2073 4003
2074 3114
2075 1116
2076 0405
2077 2240
2100 0107
2101 0111

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/ PAL10 V141 2*OCT=72 23134 PAGE 1=17
2102 1677
2103 0000
2104 2422 ERMES2, TEXT "TRY TO RECALIBRATE SAME DISK AGAIN?"
2105 3140
2106 2417
2107 4022
2110 0503
2111 0114
2112 1102
2113 2201
2114 2405
2115 4023
2116 0115
2117 0540
2120 0411
2121 2313
2122 4001
2123 0701
2124 1116
2125 7700 ERMES3, TEXT "TRY TO CHECK SAME CYLINDER AGAIN?"
2126 2422
2127 3140
2130 2417
2131 4003
2132 1005
2133 0313
2134 4023
2135 0115
2136 0540
2137 0331
2140 1411
2141 1604
2142 0522
2143 4001
2144 0701
2145 1116
2146 7700

/
2147 2213 TEXEND, TEXT "RK0E DISK FORMATTER PASS COMPLETE"
2150 7005
2151 4004
2152 1123
2153 1340
2154 0617
2155 2215
2156 0124
2157 2405
2160 2240
2161 2001
2162 2323
2163 4003
2164 1715
2165 2014
2166 0524
2167 0500

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/ PAL10 V141 2=OCT=72 23134 PAGE 1=18
2170 2213 MES1, TEXT "RK8E DISK FORMATTER PROGRAM"
2171 7005
2172 4004
2173 1123
2174 1340
2175 0617
2176 2215
2177 0124
2200 2405
2201 2240
2202 2022
2203 1707
2204 2201
2205 1500
2206 0617 MES2, TEXT "FOR ALL QUESTIONS, ANSWER Y FOR YES OR N FOR NO,"
2207 2240
2210 0114
2211 1440
2212 2125
2213 0523
2214 2411
2215 1716
2216 2354
2217 4001
2220 1623
2221 2705
2222 2240
2223 3140
2224 0617
2225 2240
2226 3105
2227 2340
2230 1722
2231 4016
2232 4006
2233 1722
2234 4016
2235 1756
2236 0000
2237 0617 MES3, TEXT "FORMAT DISK "
2240 2215
2241 0124
2242 4004
2243 1123
2244 1340
2245 0000
2246 0122 MES4, TEXT "ARE YOU SURE?"
2247 0540
2250 3117
2251 2540
2252 2325
2253 2205
2254 7700
2255 0617 MES5, TEXT "FORMAT SAME DISK(S) AGAIN?"
2256 2215

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/ PAL10 V141 2=OCT=72 23134 PAGE 1=19
2257 0124
2260 4023
2261 0115
2262 0540
2263 0411
2264 2313
2265 5023
2266 5140
2267 0107
2270 0111
2271 1677
2272 0000
2400 /
PAGE
/
2400 WRKBUF=,
/
2400 HTRK=,
2401 LTRK=, +1
/
2777 ENDBUF=, +377
/
$$$

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0000 11110000 11000000 11111111 11111111 11111111 11111111 11111111 11111111
0100 11111111 11111111 11111111 11111111 11111111 11111000 00000000 00000000

0200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
0300 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11100000

0400 11111111 11000000 00000000 00000000 00000000 00000000 00000000 00000000
0500 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000011

0600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
0700 11111111 11111111 11111100 00000000 00000000 00000000 00000000 00000000

1000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11000000
1100 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

1200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1300 11111111 11111111 10000000 00000000 00000000 00000000 00000000 00000000

1400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1500 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111100

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

2000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
2100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

2200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11100000
2300 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

2400
2500

2600
2700

3000
3100

3200
3300

3400
3500

3600
3700

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4000
4100

4200
4300

4400
4500

4600
4700

5000
5100

5200
5300

5400
5500

5600
5700

6000
6100

6200
6300

6400
6500

6600
6700

7000
7100

7200
7300

7400
7500

7600
7700

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PAL10		V141	2=OCT=72	23134	PAGE 1=22			
A0770	1753		DSK3A	0147	K0260	0094	PRN	1530
A7007	1752		DSK3B	0154	K0277	0060	PRINTER	4436
ADPOT1	0143		DSKCNT	0145	K0316	0056	QUES1	0231
ADPOT2	0150		DSKP	6741	K0331	0097	RDST	1400
ADPT1	1725		DSKSKP	4431	K2000	0062	RDSTAT	4430
ADPT2	1726		DTREG	0131	K3740	1567	RECAL	4423
ADREG	0130		ENDBUF	2777	K4000	0061	RECEIV	4424
AGAIN	0703		ENDTST	0400	K4100	1566	REDDSK	4422
ALLAGN	0217		ERHLT2	1443	K5000	0070	REDTRK	1200
AMOUNT	0045		ERHLT3	1424	K5300	0136	RENEK1	0326
AUTO10	0010		ERHLT4	1416	K5371	0135	RENEK2	0370
AUTO11	0011		ERHLT5	1403	K7400	0074	RESTA	1653
BGN	0200		ERHLT6	1432	K7700	0065	RESTER	1671
BGNBUF	0044		ERMES1	2042	K7735	0063	RESTOR	1630
CAREG	0127		ERMES2	2104	K7740	0064	RETRN1	0714
CNCTR1	1756		ERMES3	2126	K7760	0066	SAMAGN	0223
CHANG	1730		ERRO	0600	K7771	0071	SBENT1	0106
CHANGR	1737		ERROR	4427	KCDF	0073	SDKP	1433
CHAR	0101		ERTX1	2012	KILBUF	4425	SOFT	0142
CHECK	0356		ERTX2	2023	KLBUFF	1444	STAE	1302
CHKDAY	0344		ERTX3	2033	LDA0	1417	STAO	1236
CHKOSK	0330		ERTX4	2045	LDA00	4434	STCNT1	0107
CHKER	1306		EXIT	1564	LDCA	1407	STCNT2	0110
CHKR1	1207		FLDMAX	0133	LDSM	1425	STCNT3	0111
CHNPOT	1757		FORMAT	0302	LDSMD	4432	STRAUT	0666
CLDR	1440		FRMOSK	0243	LDCUR	4433	STREG	0123
CLRALL	4435		FROCT	1505	LDCBED	0140	SWITCH	0046
CHREG	0125		FRSTOK	1292	LODER	1047	TCHKT	1307
CLF	4441		GOREG1	0117	LODR1	1011	TGNTR1	0112
CRREG1	0121		GOREG2	0120	LODRK	4421	TGNTR2	0113
CRREG2	0122		HEDLST	0722	LOTRK	2401	TGNTR3	0114
CSAVE1	1754		HEDTAD	0721	LDWAD	0102	TGNTR4	0115
CSAVE2	1755		HIGHAD	0723	M12	0075	TGNTR5	0116
DAREG	0126		HITRK	2400	M313	0076	TEXAD	2006
DATCNT	0134		HOMEMA	0132	M4	0077	TEXCA	2004
DATER	1277		LOT1	1434	MCNTR1	1727	TEXCH	2000
DATOK	1265		LOT2	1441	MES1	2170	TEXCR	1772
DBREG	0124		LOT3	1422	MES2	2206	TEXDA	2002
DCLR	6742		LOT4	1414	MES3	2237	TEXDB	1776
DLG	6743		LOT5	1401	MES4	2246	TEXDT	2010
DLCA	6744		LOT6	1430	MES5	2255	TEXEND	2147
PLDC	6746		LOTCHN	5420	MOVE	1711	TEXGD	1770
DMAN	6747		K0003	0047	NEXCHK	0340	TEXPC	1766
DONE	0250		K0007	0050	NEXFRM	0276	TEXST	1774
DRIVNO	0100		K0010	0051	NOTDSK	0243	TOCT	1456
DRST	6745		K0037	0072	NOTEX	0706	TRKCN	0104
DSK3A	0144		K0040	0052	NTCRC	0657	TWOCT	4440
DSK3B	0151		K0077	0067	NTGD	0642	TYPE	4426
DSK1A	0145		K0200	0093	OCTEL	4437	UPONE	1473
DSK1B	0152		K0212	1504	PCNTR1	0717	WAIT	1600
DSK2A	0146		K0215	1503	PCNTR2	0720	WASDSK	0241
DSK2B	0153		K0240	0055	PRINT	1570	WRKBUF	2400

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WRDTSK	0314
WRTRK	1000
XCHANG	0020
XCLDR	0035
XCLRF	0041
XEND	0141
XERRO	0027
XFROCT	0037
XHITRK	0043
XKLBUFF	0025
XLDAD	0034
XLDCA	0033
XLDCH	0032
XLOTRK	0042
XMOVE	0137
XPRINT	0026
XPRN	0036
XRDST	0030
XRDTRK	0022
XREG	0716
XRFSTR	0023
XSDKP	0031
XTEXT	0715
XTOCT	0040
XWAIT	0024
XWTRK	0021

ERRORS DETECTED: 0
 LINKS GENERATED: 2
 RUN-TIME: 8 SECONDS
 2K CORE USED