

# RK06L

CARTRIDGE FORMATTER  
MD-11-DZR6L-B

EP-DZR6L-B-DL-A

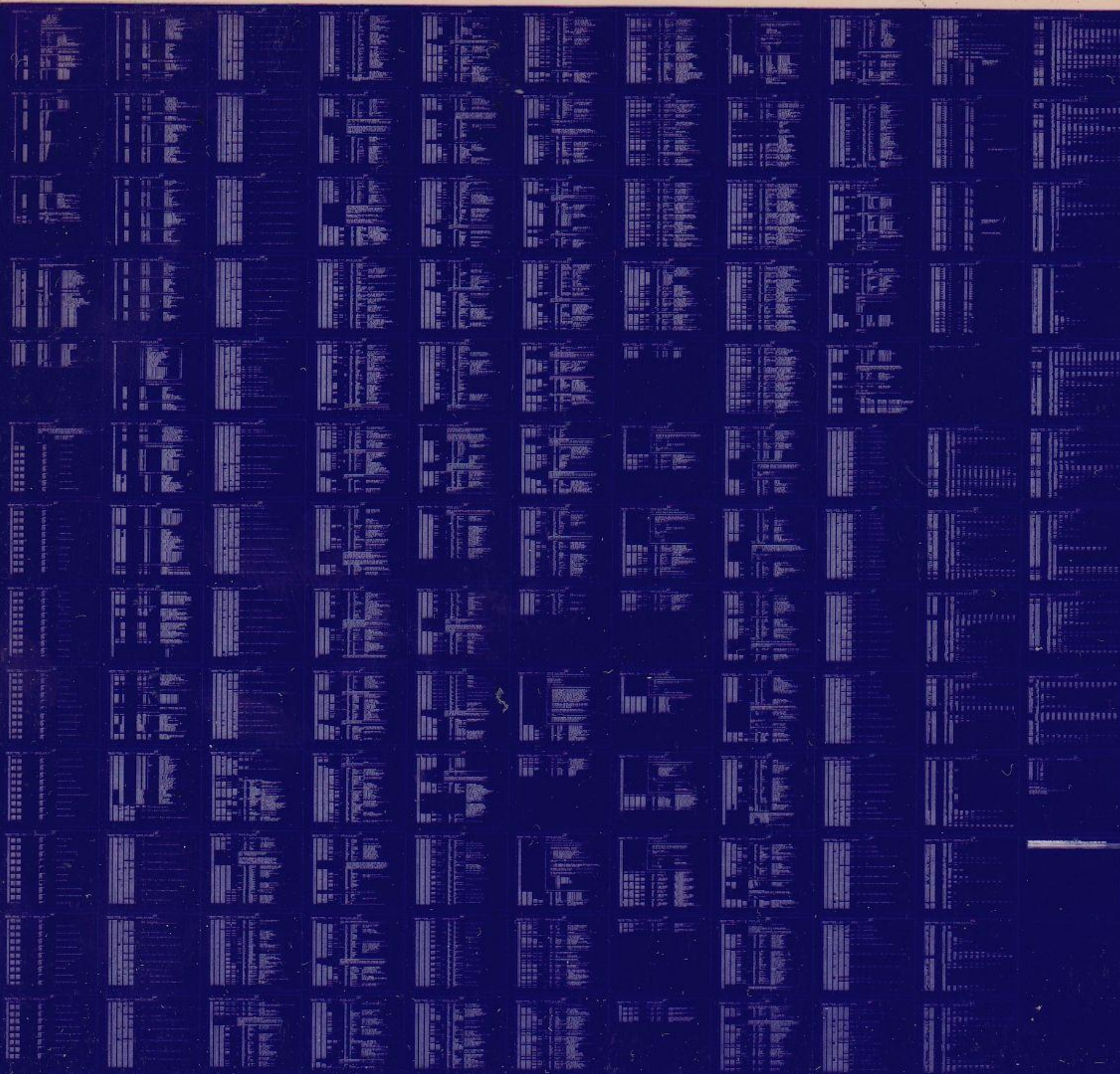
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FICHE 1 OF 1

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**digital**

MADE IN USA





163000

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      .NLIST MC,MD,CND
      .LIST ME
      .ENABL ABS,AMA
      $SWR= 163000
    .TITLE RK06 PACK FORMATTER
    ;*COPYRIGHT (C) 1976
    ;*DIGITAL EQUIPMENT CORP.
    ;*MAYNARD, MASS. 01754
    ;*
    ;*PROGRAM BY MARV TEGROTENHUIS
    ;*
    ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
    ;*PACKAGE (MAINDEC-11-DZQAC-C2), SEPT 14, 1976.
  
```

000001

```

$TN=1
.SBTTL OPERATIONAL SWITCH SETTINGS
;
;      SWITCH      USE
;      -----
;      15          HALT ON ERROR
;      14          LOOP ON TEST
;      13          INHIBIT ERROR TYPEOUTS
;      10          BELL ON ERROR
;      9           LOOP ON ERROR
;      7           PRINT LIST OF BAD SECTORS
;      1           LIMIT DATA COMPARE ERROR REPORTS TO 10
;      0           REPEAT ENTIRE FORMAT OPERATION
.SBTTL BASIC DEFINITIONS
  
```

001100

```

;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
STACK= 1100
.EQUIV ENT,ERROR      ;;BASIC DEFINITION OF ERROR CALL
.EQUIV IOT,SCOPE      ;;BASIC DEFINITION OF SCOPE CALL
  
```

000011

000012

000015

000200

177776

177774

177772

177570

177570

```

;*MISCELLANEOUS DEFINITIONS
AT= 11      ;;CODE FOR HORIZONTAL TAB
LF= 12      ;;CODE FOR LINE FEED
CR= 15      ;;CODE FOR CARRIAGE RETURN
CRLF= 200   ;;CODE FOR CARRIAGE RETURN-LINE FEED
PS= 177776  ;;PROCESSOR STATUS WORD
.EQUIV PS,PSW
STKLMT= 177774 ;;STACK LIMIT REGISTER
PIRQ= 177772  ;;PROGRAM INTERRUPT REQUEST REGISTER
DSWR= 177570  ;;HARDWARE SWITCH REGISTER
DDISP= 177570 ;;HARDWARE DISPLAY REGISTER
  
```

000000

000001

000002

000003

000004

000005

000006

000007

000006

```

;*GENERAL PURPOSE REGISTER DEFINITIONS
R0= %0      ;;GENERAL REGISTER
R1= %1      ;;GENERAL REGISTER
R2= %2      ;;GENERAL REGISTER
R3= %3      ;;GENERAL REGISTER
R4= %4      ;;GENERAL REGISTER
R5= %5      ;;GENERAL REGISTER
R6= %6      ;;GENERAL REGISTER
R7= %7      ;;GENERAL REGISTER
SP= %6      ;;STACK POINTER
  
```

|     |        |                                         |          |                    |
|-----|--------|-----------------------------------------|----------|--------------------|
| 57  | 000007 | PC=                                     | %7       | ::PROGRAM COUNTER  |
| 58  |        |                                         |          |                    |
| 59  |        | .*PRIORITY LEVEL DEFINITIONS            |          |                    |
| 60  | 000000 | PR0=                                    | 0        | ::PRIORITY LEVEL 0 |
| 61  | 000040 | PR1=                                    | 40       | ::PRIORITY LEVEL 1 |
| 62  | 000100 | PR2=                                    | 100      | ::PRIORITY LEVEL 2 |
| 63  | 000140 | PR3=                                    | 140      | ::PRIORITY LEVEL 3 |
| 64  | 000200 | PR4=                                    | 200      | ::PRIORITY LEVEL 4 |
| 65  | 000240 | PR5=                                    | 240      | ::PRIORITY LEVEL 5 |
| 66  | 000300 | PR6=                                    | 300      | ::PRIORITY LEVEL 6 |
| 67  | 000340 | PR7=                                    | 340      | ::PRIORITY LEVEL 7 |
| 68  |        |                                         |          |                    |
| 69  |        | .*"SWITCH REGISTER" SWITCH DEFINITIONS  |          |                    |
| 70  | 000000 | SW15=                                   | 100000   |                    |
| 71  | 040000 | SW14=                                   | 40000    |                    |
| 72  | 020000 | SW13=                                   | 20000    |                    |
| 73  | 010000 | SW12=                                   | 10000    |                    |
| 74  | 004000 | SW11=                                   | 4000     |                    |
| 75  | 002000 | SW10=                                   | 2000     |                    |
| 76  | 001000 | SW09=                                   | 1000     |                    |
| 77  | 000400 | SW08=                                   | 400      |                    |
| 78  | 000200 | SW07=                                   | 200      |                    |
| 79  | 000100 | SW06=                                   | 100      |                    |
| 80  | 000040 | SW05=                                   | 40       |                    |
| 81  | 000020 | SW04=                                   | 20       |                    |
| 82  | 000010 | SW03=                                   | 10       |                    |
| 83  | 000004 | SW02=                                   | 4        |                    |
| 84  | 000002 | SW01=                                   | 2        |                    |
| 85  | 000001 | SW00=                                   | 1        |                    |
| 86  |        | .EQUIV                                  | SW09,SW9 |                    |
| 87  |        | .EQUIV                                  | SW08,SW8 |                    |
| 88  |        | .EQUIV                                  | SW07,SW7 |                    |
| 89  |        | .EQUIV                                  | SW06,SW6 |                    |
| 90  |        | .EQUIV                                  | SW05,SW5 |                    |
| 91  |        | .EQUIV                                  | SW04,SW4 |                    |
| 92  |        | .EQUIV                                  | SW03,SW3 |                    |
| 93  |        | .EQUIV                                  | SW02,SW2 |                    |
| 94  |        | .EQUIV                                  | SW01,SW1 |                    |
| 95  |        | .EQUIV                                  | SW00,SW0 |                    |
| 96  |        |                                         |          |                    |
| 97  |        | .*DATA BIT DEFINITIONS (BIT00 TO BIT15) |          |                    |
| 98  | 100000 | BIT15=                                  | 100000   |                    |
| 99  | 040000 | BIT14=                                  | 40000    |                    |
| 100 | 020000 | BIT13=                                  | 20000    |                    |
| 101 | 010000 | BIT12=                                  | 10000    |                    |
| 102 | 004000 | BIT11=                                  | 4000     |                    |
| 103 | 002000 | BIT10=                                  | 2000     |                    |
| 104 | 001000 | BIT09=                                  | 1000     |                    |
| 105 | 000400 | BIT08=                                  | 400      |                    |
| 106 | 000200 | BIT07=                                  | 200      |                    |
| 107 | 000100 | BIT06=                                  | 100      |                    |
| 108 | 000040 | BIT05=                                  | 40       |                    |
| 109 | 000020 | BIT04=                                  | 20       |                    |
| 110 | 000010 | BIT03=                                  | 10       |                    |
| 111 | 000004 | BIT02=                                  | 4        |                    |
| 112 | 000002 | BIT01=                                  | 2        |                    |

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113      000001      BIT00= 1
114      .EQUIV      BIT09,BIT9
115      .EQUIV      BIT08,BIT8
116      .EQUIV      BIT07,BIT7
117      .EQUIV      BIT06,BIT6
118      .EQUIV      BIT05,BIT5
119      .EQUIV      BIT04,BIT4
120      .EQUIV      BIT03,BIT3
121      .EQUIV      BIT02,BIT2
122      .EQUIV      BIT01,BIT1
123      .EQUIV      BIT00,BIT0
124
125      ;*BASIC "CPU" TRAP VECTOR ADDRESSES
126      000004      ERRVEC= 4      ;;TIME OUT AND OTHER ERRORS
127      000010      RESVEC= 10     ;;RESERVED AND ILLEGAL INSTRUCTIONS
128      000014      TRITVEC=14     ;; "T" BIT
129      000014      TRTVEC= 14     ;;TRACE TRAP
130      000014      BPTVEC= 14     ;;BREAKPOINT TRAP (BPT)
131      000020      IOTVEC= 20     ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
132      000024      PWRVEC= 24     ;;POWER FAIL
133      000030      EMTVEC= 30     ;;EMULATOR TRAP (EMT) **ERROR**
134      000034      TRAPVEC=34     ;; "TRAP" TRAP
135      000060      TKVEC= 60      ;;TTY KEYBOARD VECTOR
136      000064      TPVEC= 64      ;;TTY PRINTER VECTOR
137      000240      PIRQVEC=240    ;;PROGRAM INTERRUPT REQUEST VECTOR
138      .SBTTL      TRAP CATCHER
139
140      000000      .=0
141      ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
142      ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
143      ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
144      000174      .=174
145      000174      000000      DISPREG: .WORD 0      ;;SOFTWARE DISPLAY REGISTER
146      000176      000000      SWREG: .WORD 0      ;;SOFTWARE SWITCH REGISTER
147      .SBTTL      STARTING ADDRESS(ES)
148      000200      000137      016100      JMP      2*START ;;JUMP TO STARTING ADDRESS OF PROGRAM
149      000204      .=204
150      000204      000137      017776      JMP      2*DRINIT

```



**.SBTTL COMMON TAGS**

```

:*****
:THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
:USED IN THE PROGRAM.

```

|          |        |      |       |
|----------|--------|------|-------|
| SCMTAG:  | .      | 1100 |       |
| SPASS:   | .WORD  | 0    |       |
| STSTM:   | .BYTE  | 0    |       |
| SERFLG:  | .BYTE  | 0    |       |
| SICNT:   | .WORD  | 0    |       |
| SLPADR:  | .WORD  | 0    |       |
| SLPERR:  | .WORD  | 0    |       |
| SERTTL:  | .WORD  | 0    |       |
| SITEMB:  | .BYTE  | 0    |       |
| SERMAX:  | .BYTE  | 1    |       |
| SERRPC:  | .WORD  | 0    |       |
| SGDADR:  | .WORD  | 0    |       |
| SBDADR:  | .WORD  | 0    |       |
| SGDDAT:  | .WORD  | 0    |       |
| SBDDAT:  | .WORD  | 0    |       |
|          | .WORD  | 0    |       |
|          | .WORD  | 0    |       |
| SAUTOB:  | .BYTE  | 0    |       |
| SINTAG:  | .BYTE  | 0    |       |
|          | .WORD  | 0    |       |
| SWR:     | .WORD  |      | DSWR  |
| DISPLAY: | .WORD  |      | DDISP |
| \$TKS:   | 177560 |      |       |
| \$TK8:   | 177562 |      |       |
| \$TPS:   | 177564 |      |       |
| \$TP8:   | 177566 |      |       |
| \$NULL:  | .BYTE  | 0    |       |
| \$FILLS: | .BYTE  | 2    |       |
| \$FILLC: | .BYTE  | 12   |       |
| \$TPFLG: | .BYTE  | 0    |       |
| \$REGAD: | .WORD  | 0    |       |
| \$REG0:  | .WORD  | 0    |       |
| \$REG1:  | .WORD  | 0    |       |
| \$REG2:  | .WORD  | 0    |       |
| \$REG3:  | .WORD  | 0    |       |
| \$REG4:  | .WORD  | 0    |       |
| \$REG5:  | .WORD  | 0    |       |
| \$REG6:  | .WORD  | 0    |       |
| \$REG7:  | .WORD  | 0    |       |
| \$REG10: | .WORD  | 0    |       |
| \$REG11: | .WORD  | 0    |       |
| \$REG12: | .WORD  | 0    |       |
| \$REG13: | .WORD  | 0    |       |
| \$REG14: | .WORD  | 0    |       |
| \$REG15: | .WORD  | 0    |       |
| \$REG16: | .WORD  | 0    |       |
| \$REG17: | .WORD  | 0    |       |
| \$REG20: | .WORD  | 0    |       |

```

:: START OF COMMON TAGS
:: CONTAINS PASS COUNT
:: CONTAINS THE TEST NUMBER
:: CONTAINS ERROR FLAG
:: CONTAINS SUBTEST ITERATION COUNT
:: CONTAINS SCOPE LOOP ADDRESS
:: CONTAINS SCOPE RETURN FOR ERRORS
:: CONTAINS TOTAL ERRORS DETECTED
:: CONTAINS ITEM CONTROL BYTE
:: CONTAINS MAX. ERRORS PER TEST
:: CONTAINS PC OF LAST ERROR INSTRUCTION
:: CONTAINS ADDRESS OF 'GOOD' DATA
:: CONTAINS ADDRESS OF 'BAD' DATA
:: CONTAINS 'GOOD' DATA
:: CONTAINS 'BAD' DATA
:: RESERVED--NOT TO BE USED

:: AUTOMATIC MODE INDICATOR
:: INTERRUPT MODE INDICATOR

:: ADDRESS OF SWITCH REGISTER
:: ADDRESS OF DISPLAY REGISTER
:: TTY KBD STATUS
:: TTY KBD BUFFER
:: TTY PRINTER STATUS REG. ADDRESS
:: TTY PRINTER BUFFER REG. ADDRESS
:: CONTAINS NULL CHARACTER FOR FILLS
:: CONTAINS # OF FILLER CHARACTERS REQUIRED
:: INSERT FILL CHARS. AFTER A "LINE FEED"
:: "TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
:: CONTAINS THE ADDRESS FROM
:: WHICH ($REG0) WAS OBTAINED
:: CONTAINS (($REGAD)+0)
:: CONTAINS (($REGAD)+2)
:: CONTAINS (($REGAD)+4)
:: CONTAINS (($REGAD)+6)
:: CONTAINS (($REGAD)+10)
:: CONTAINS (($REGAD)+12)
:: CONTAINS (($REGAD)+14)
:: CONTAINS (($REGAD)+16)
:: CONTAINS (($REGAD)+20)
:: CONTAINS (($REGAD)+22)
:: CONTAINS (($REGAD)+24)
:: CONTAINS (($REGAD)+26)
:: CONTAINS (($REGAD)+30)
:: CONTAINS (($REGAD)+32)
:: CONTAINS (($REGAD)+34)
:: CONTAINS (($REGAD)+36)
:: CONTAINS (($REGAD)+40)

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 02R6LB.P11 03-AUG-76 00:00 COMMON TAGS

|     |        |               |                |                 |                           |
|-----|--------|---------------|----------------|-----------------|---------------------------|
| 207 | 001224 | 000000        | \$REG21: .WORD | 0               | ::CONTAINS ((\$REGAD)+42) |
| 208 | 001226 | 000000        | \$REG22: .WORD | 0               | ::CONTAINS ((\$REGAD)+44) |
| 209 | 001230 | 000000        | \$REG23: .WORD | 0               | ::CONTAINS ((\$REGAD)+46) |
| 210 | 001232 | 000000        | \$REG24: .WORD | 0               | ::CONTAINS ((\$REGAD)+50) |
| 211 | 001234 | 000000        | \$REG25: .WORD | 0               | ::CONTAINS ((\$REGAD)+52) |
| 212 | 001236 | 000000        | \$TMP0: .WORD  | 0               | ::USER DEFINED            |
| 213 | 001240 | 000000        | \$TMP1: .WORD  | 0               | ::USER DEFINED            |
| 214 | 001242 | 000000        | \$TMP2: .WORD  | 0               | ::USER DEFINED            |
| 215 | 001244 | 000000        | \$TMP3: .WORD  | 0               | ::USER DEFINED            |
| 216 | 001246 | 000000        | \$TMP4: .WORD  | 0               | ::USER DEFINED            |
| 217 | 001250 | 000000        | \$TMP5: .WORD  | 0               | ::USER DEFINED            |
| 218 | 001252 | 000000        | \$TMP6: .WORD  | 0               | ::USER DEFINED            |
| 219 | 001254 | 000000        | \$TMP7: .WORD  | 0               | ::USER DEFINED            |
| 220 | 001256 | 000000        | \$TMP10: .WORD | 0               | ::USER DEFINED            |
| 221 | 001260 | 000000        | \$ESCAPE:0     |                 | ::ESCAPE ON ERROR ADDRESS |
| 222 | 001262 | 177607 000377 | \$BELL: .ASCIZ | <207><377><377> | ::CODE FOR BELL           |
| 223 | 001266 | 077           | \$QUES: .ASCII | /?/             | ::QUESTION MARK           |
| 224 | 001267 | 015           | \$CRLF: .ASCII | <15>            | ::CARRIAGE RETURN         |
| 225 | 001270 | 000012        | \$LF: .ASCIZ   | <12>            | ::LINE FEED               |
| 226 |        |               | ;*****         |                 |                           |



GO1

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DZR6LB.P11 03-AUG-76 00:00 ERROR POINTER TABLE

.SBTTL ERROR POINTER TABLE

;\*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.  
;\*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN  
;\*LOCATION \$ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.  
;\*NOTE1: IF \$ITEMB IS 0 THE ONLY PERTINENT DATA IS (\$ERRPC).  
;\*NOTE2: EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:

;\* EM ::POINTS TO THE ERROR MESSAGE  
;\* DH ::POINTS TO THE DATA HEADER  
;\* DT ::POINTS TO THE DATA  
;\* DF ::POINTS TO THE DATA FORMAT

\$ERRTB:

.ERROR 1 ;UNIBUS PARITY ERROR

EM1  
DH100  
DT100  
DF01

.ERROR 2 ;NON-EXISTANT MEMORY

EM2  
DH100  
DT100  
DF01

.ERROR 3 ;NON-EXISTANT DRIVE

EM3  
DH100  
DT100  
DF01

.ERROR 4 ;UNIT FIELD ERROR

EM4  
DH100  
DT100  
DF01

.ERROR 5 ;SUBSYSTEM TIMEOUT

EM5  
DH100  
DT100  
DF02

.ERROR 6 ;SERCON PARITY ERROR

EM6  
DH100  
DT100  
DF03

.ERROR 7 ;DRIVE DETECTED PARITY ERROR

EM7  
DH100  
DT100

227  
228  
229  
230  
231  
232  
233  
234  
235  
236  
237  
238  
239  
240  
241 001272  
242  
243  
244 001272 042462  
245 001274 046203  
246 001276 047502  
247 001300 047600  
248  
249  
250 001302 042512  
251 001304 046203  
252 001306 047502  
253 001310 047600  
254  
255  
256 001312 042550  
257 001314 046203  
258 001316 047502  
259 001320 047600  
260  
261  
262 001322 042605  
263 001324 046203  
264 001326 047502  
265 001330 047600  
266  
267  
268 001332 042632  
269 001334 046203  
270 001336 047502  
271 001340 047624  
272  
273  
274 001342 042660  
275 001344 046203  
276 001346 047502  
277 001350 047654  
278  
279  
280 001352 042713  
281 001354 046203  
282 001356 047502

H01

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 DZR6LB.P11 03-AUG-76 00:00 ERROR POINTER TABLE

|     |        |        |           |                        |
|-----|--------|--------|-----------|------------------------|
| 283 | 001360 | 047654 | DF03      |                        |
| 284 |        |        |           |                        |
| 285 |        |        | :ERROR 10 |                        |
| 286 | 001362 | 042753 | EM10      | :AC LOW                |
| 287 | 001364 | 046203 | DH100     |                        |
| 288 | 001366 | 047502 | DT100     |                        |
| 289 | 001370 | 047624 | DF02      |                        |
| 290 |        |        |           |                        |
| 291 |        |        | :ERROR 11 |                        |
| 292 | 001372 | 042766 | EM11      | :SPEED LOSS            |
| 293 | 001374 | 046203 | DH100     |                        |
| 294 | 001376 | 047502 | DT100     |                        |
| 295 | 001400 | 047624 | DF02      |                        |
| 296 |        |        |           |                        |
| 297 |        |        | :ERROR 12 |                        |
| 298 | 001402 | 043005 | EM12      | :ILLEGAL FUNCTION      |
| 299 | 001404 | 046203 | DH100     |                        |
| 300 | 001406 | 047502 | DT100     |                        |
| 301 | 001410 | 047624 | DF02      |                        |
| 302 |        |        |           |                        |
| 303 |        |        | :ERROR 13 |                        |
| 304 | 001412 | 043040 | EM13      | :PROGRAMMING ERROR     |
| 305 | 001414 | 046203 | DH100     |                        |
| 306 | 001416 | 047502 | DT100     |                        |
| 307 | 001420 | 047600 | DF01      |                        |
| 308 |        |        |           |                        |
| 309 |        |        | :ERROR 14 | :NON-EXISTANT FUNCTION |
| 310 | 001422 | 043066 | EM14      |                        |
| 311 | 001424 | 046203 | DH100     |                        |
| 312 | 001426 | 047502 | DT100     |                        |
| 313 | 001430 | 047624 | DF02      |                        |
| 314 |        |        |           |                        |
| 315 |        |        | :ERROR 15 |                        |
| 316 | 001432 | 043126 | EM15      | :DRIVE TYPE ERROR      |
| 317 | 001434 | 046203 | DH100     |                        |
| 318 | 001436 | 047502 | DT100     |                        |
| 319 | 001440 | 047624 | DF02      |                        |
| 320 |        |        |           |                        |
| 321 |        |        | :ERROR 16 |                        |
| 322 | 001442 | 043153 | EM16      | :FORMAT ERROR          |
| 323 | 001444 | 046203 | DH100     |                        |
| 324 | 001446 | 047502 | DT100     |                        |
| 325 | 001450 | 047624 | DF02      |                        |
| 326 |        |        |           |                        |
| 327 |        |        | :ERROR 17 |                        |
| 328 | 001452 | 043174 | EM17      | :WRITE LOCK ERROR      |
| 329 | 001454 | 046203 | DH100     |                        |
| 330 | 001456 | 047502 | DT100     |                        |
| 331 | 001460 | 047624 | DF02      |                        |
| 332 |        |        |           |                        |
| 333 |        |        | :ERROR 20 |                        |
| 334 | 001462 | 043221 | EM20      | :DRIVE UNSAFE          |
| 335 | 001464 | 046203 | DH100     |                        |
| 336 | 001466 | 047502 | DT100     |                        |
| 337 | 001470 | 047624 | DF02      |                        |
| 338 |        |        |           |                        |

|     |        |        |           |                       |
|-----|--------|--------|-----------|-----------------------|
| 339 |        |        | .ERROR 21 |                       |
| 340 | 001472 | 043250 | EM21      | ;SEEK INCOMPLETE      |
| 341 | 001474 | 046203 | DH100     |                       |
| 342 | 001476 | 047502 | DT100     |                       |
| 343 | 001500 | 047624 | DF02      |                       |
| 344 |        |        |           |                       |
| 345 |        |        | .ERROR 22 |                       |
| 346 | 001502 | 043302 | EM22      | ;CYLINDER OVERFLOW    |
| 347 | 001504 | 046203 | DH100     |                       |
| 348 | 001506 | 047502 | DT100     |                       |
| 349 | 001510 | 047624 | DF02      |                       |
| 350 |        |        |           |                       |
| 351 |        |        | .ERROR 23 |                       |
| 352 | 001512 | 043336 | EM23      | ;ILLEGAL CYLINDER     |
| 353 | 001514 | 046203 | DH100     |                       |
| 354 | 001516 | 047502 | DT100     |                       |
| 355 | 001520 | 047624 | DF02      |                       |
| 356 |        |        |           |                       |
| 357 |        |        | .ERROR 24 |                       |
| 358 | 001522 | 043401 | EM24      | ;DRIVE OFF TRACK      |
| 359 | 001524 | 046203 | DH100     |                       |
| 360 | 001526 | 047502 | DT100     |                       |
| 361 | 001530 | 047624 | DF02      |                       |
| 362 |        |        |           |                       |
| 363 |        |        | .ERROR 25 |                       |
| 364 | 001532 | 043425 | EM25      | ;DRIVE TIMING ERROR   |
| 365 | 001534 | 046203 | DH100     |                       |
| 366 | 001536 | 047502 | DT100     |                       |
| 367 | 001540 | 047624 | DF02      |                       |
| 368 |        |        |           |                       |
| 369 |        |        | .ERROR 26 |                       |
| 370 | 001542 | 043454 | EM26      | ;DATA LATE            |
| 371 | 001544 | 046203 | DH100     |                       |
| 372 | 001546 | 047502 | DT100     |                       |
| 373 | 001550 | 047624 | DF02      |                       |
| 374 |        |        |           |                       |
| 375 |        |        | .ERROR 27 |                       |
| 376 | 001552 | 043500 | EM27      | ;CONTROLLER TIMEOUT   |
| 377 | 001554 | 046203 | DH100     |                       |
| 378 | 001556 | 047502 | DT100     |                       |
| 379 | 001560 | 047624 | DF02      |                       |
| 380 |        |        |           |                       |
| 381 |        |        | .ERROR 30 |                       |
| 382 | 001562 | 043535 | EM30      | ;OPERATION INCOMPLETE |
| 383 | 001564 | 046203 | DH100     |                       |
| 384 | 001566 | 047502 | DT100     |                       |
| 385 | 001570 | 047710 | DF05      |                       |
| 386 |        |        |           |                       |
| 387 |        |        | .ERROR 31 |                       |
| 388 | 001572 | 043574 | EM31      | ;HEADER CRC ERROR     |
| 389 | 001574 | 046203 | DH100     |                       |
| 390 | 001576 | 047502 | DT100     |                       |
| 391 | 001600 | 047740 | DF06      |                       |
| 392 |        |        |           |                       |
| 393 |        |        | .ERROR 32 |                       |
| 394 | 001602 | 043621 | EM32      | ;DATA CHECK ERROR     |



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 DZR6LB.P11 03-AUG-76 00:00 ERROR POINTER TABLE

|     |        |        |           |                                          |
|-----|--------|--------|-----------|------------------------------------------|
| 395 | 001604 | 046203 | DH100     |                                          |
| 396 | 001606 | 047502 | DT100     |                                          |
| 397 | 001610 | 047770 | DF07      |                                          |
| 398 |        |        |           |                                          |
| 399 |        |        | .ERROR 33 |                                          |
| 400 | 001612 | 043646 | EM33      | ;WRITE CHECK ERROR                       |
| 401 | 001614 | 046203 | DH100     |                                          |
| 402 | 001616 | 047502 | DT100     |                                          |
| 403 | 001620 | 050020 | DF10      |                                          |
| 404 |        |        |           |                                          |
| 405 |        |        | .ERROR 34 |                                          |
| 406 | 001622 | 043674 | EM34      | ;DATA MISCOMPARE                         |
| 407 | 001624 | 046777 | DH604     |                                          |
| 408 | 001626 | 047564 | DT601     |                                          |
| 409 | 001630 | 050040 | DF11      |                                          |
| 410 |        |        |           |                                          |
| 411 |        |        | .ERROR 35 |                                          |
| 412 | 001632 | 043720 | EM35      | ;NO DRIVE RESPONSE-UFE & NED             |
| 413 | 001634 | 046203 | DH100     |                                          |
| 414 | 001636 | 047502 | DT100     |                                          |
| 415 | 001640 | 047600 | DF01      |                                          |
| 416 |        |        |           |                                          |
| 417 |        |        | .ERROR 36 |                                          |
| 418 | 001642 | 043760 | EM36      | ;DRIVE ERROR WILL NOT CLEAR              |
| 419 | 001644 | 000000 | 0         |                                          |
| 420 | 001646 | 000000 | 0         |                                          |
| 421 | 001650 | 000000 | 0         |                                          |
| 422 |        |        |           |                                          |
| 423 |        |        | .ERROR 37 |                                          |
| 424 | 001652 | 044017 | EM37      | ;DRIVE STATUS CHANGE WILL NOT CLEAR      |
| 425 | 001654 | 000000 | 0         |                                          |
| 426 | 001656 | 000000 | 0         |                                          |
| 427 | 001660 | 000000 | 0         |                                          |
| 428 |        |        |           |                                          |
| 429 |        |        | .ERROR 40 |                                          |
| 430 | 001662 | 044066 | EM40      | ;ATTENTION BUT NO STATUS CHANGE OR FAULT |
| 431 | 001664 | 046203 | DH100     |                                          |
| 432 | 001666 | 047502 | DT100     |                                          |
| 433 | 001670 | 047624 | DF02      |                                          |
| 434 |        |        |           |                                          |
| 435 |        |        | .ERROR 41 |                                          |
| 436 | 001672 | 044142 | EM41      | ;ATTENTION BUT DRIVE NOT AVAILABLE       |
| 437 | 001674 | 046203 | DH100     |                                          |
| 438 | 001676 | 047502 | DT100     |                                          |
| 439 | 001700 | 047624 | DF02      |                                          |
| 440 |        |        |           |                                          |
| 441 |        |        | .ERROR 42 |                                          |
| 442 | 001702 | 044210 | EM42      | ;ATTENTION WHEN NOT EXPECTED             |
| 443 | 001704 | 046203 | DH100     |                                          |
| 444 | 001706 | 047502 | DT100     |                                          |
| 445 | 001710 | 047624 | DF02      |                                          |
| 446 |        |        |           |                                          |
| 447 |        |        | .ERROR 43 |                                          |
| 448 | 001712 | 044250 | EM43      | ;ERROR WHILE GATHERING DRIVE STATUS      |
| 449 | 001714 | 046203 | DH100     |                                          |
| 450 | 001716 | 047502 | DT100     |                                          |

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|     |        |        |           |                                                |
|-----|--------|--------|-----------|------------------------------------------------|
| 451 | 001720 | 050054 | DF12      |                                                |
| 452 |        |        |           |                                                |
| 453 |        |        | :ERROR 44 |                                                |
| 454 | 001722 | 044576 | EM63      | ;CLEAR CONTROLLER DID NOT CLEAR ERROR          |
| 455 | 001724 | 046203 | DH100     |                                                |
| 456 | 001726 | 047502 | DT100     |                                                |
| 457 | 001730 | 050054 | DF12      |                                                |
| 458 |        |        |           |                                                |
| 459 |        |        | :ERROR 45 |                                                |
| 460 | 001732 | 044647 | EM64      | ;NO ATTENTION IN ATTENTION SUMMARY REG         |
| 461 | 001734 | 046203 | DH100     |                                                |
| 462 | 001736 | 047502 | DT100     |                                                |
| 463 | 001740 | 050054 | DF12      |                                                |
| 464 |        |        |           |                                                |
| 465 |        |        | :ERROR 46 |                                                |
| 466 | 001742 | 044726 | EM65      | ;UNSOLICITED ATTENTION                         |
| 467 | 001744 | 046203 | DH100     |                                                |
| 468 | 001746 | 047502 | DT100     |                                                |
| 469 | 001750 | 050054 | DF12      |                                                |
| 470 |        |        |           |                                                |
| 471 |        |        | :ERROR 47 |                                                |
| 472 | 001752 | 044760 | EM66      | ;UNEXPECTED DATA TYPE ERROR                    |
| 473 | 001754 | 046203 | DH100     |                                                |
| 474 | 001756 | 047502 | DT100     |                                                |
| 475 | 001760 | 050054 | DF12      |                                                |
| 476 |        |        |           |                                                |
| 477 |        |        | :ERROR 50 |                                                |
| 478 | 001762 | 045017 | EM67      | ;ATTENTION DID NOT RESET WITH CLEAR            |
| 479 | 001764 | 046203 | DH100     |                                                |
| 480 | 001766 | 047502 | DT100     |                                                |
| 481 | 001770 | 050054 | DF12      |                                                |
| 482 |        |        |           |                                                |
| 483 |        |        | :ERROR 51 |                                                |
| 484 | 001772 | 045066 | EM70      | ;SUBSYSTEM CLEAR DID NOT CLEAR DRIVE ATTENTION |
| 485 | 001774 | 046203 | DH100     |                                                |
| 486 | 001776 | 047502 | DT100     |                                                |
| 487 | 002000 | 050054 | DF12      |                                                |
| 488 |        |        |           |                                                |
| 489 |        |        | :ERROR 52 |                                                |
| 490 | 002002 | 044317 | EM52      | ;MULTIPLE DRIVE SELECT                         |
| 491 | 002004 | 046203 | DH100     |                                                |
| 492 | 002006 | 047502 | DT100     |                                                |
| 493 | 002010 | 050054 | DF12      |                                                |
| 494 |        |        |           |                                                |
| 495 |        |        | :ERROR 53 |                                                |
| 496 | 002012 | 044351 | EM53      | ;ABREVIATED HCE ERROR                          |
| 497 | 002014 | 046203 | DH100     |                                                |
| 498 | 002016 | 047502 | DT100     |                                                |
| 499 | 002020 | 050100 | DF13      |                                                |
| 500 |        |        |           |                                                |
| 501 |        |        | :ERROR 54 |                                                |
| 502 | 002022 | 043535 | EM30      | ;OPERATION INCOMPLETE ERROR                    |
| 503 | 002024 | 046203 | DH100     |                                                |
| 504 | 002026 | 047502 | DT100     |                                                |
| 505 | 002030 | 050124 | DF14      |                                                |
| 506 |        |        |           |                                                |

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|     |        |        |           |                                        |
|-----|--------|--------|-----------|----------------------------------------|
| 507 |        |        | :ERROR 55 |                                        |
| 508 | 002032 | 043574 | EM31      | ;ABREVIATED HCRC ERROR                 |
| 509 | 002034 | 046203 | DH100     |                                        |
| 510 | 002036 | 047502 | DT100     |                                        |
| 511 | 002040 | 050100 | DF13      |                                        |
| 512 |        |        |           |                                        |
| 513 |        |        | :ERROR 56 |                                        |
| 514 | 002042 | 044402 | EM56      | ;2 TIMEOUT ERROR                       |
| 515 | 002044 | 046203 | DH100     |                                        |
| 516 | 002046 | 047502 | DT100     |                                        |
| 517 | 002050 | 050150 | DF15      |                                        |
| 518 |        |        |           |                                        |
| 519 |        |        | :ERROR 57 | ;2ND LEVEL IN SUBSYSTEM TIMEOUT        |
| 520 | 002052 | 044402 | EM56      |                                        |
| 521 | 002054 | 046203 | DH100     |                                        |
| 522 | 002056 | 047502 | DT100     |                                        |
| 523 | 002060 | 050210 | DF16      |                                        |
| 524 |        |        |           |                                        |
| 525 |        |        | :ERROR 60 |                                        |
| 526 | 002062 | 044430 | EM60      | ;ERROR IN RECAL FOR RECOVERY           |
| 527 | 002064 | 000000 | 0         |                                        |
| 528 | 002066 | 000000 | 0         |                                        |
| 529 | 002070 | 000000 | 0         |                                        |
| 530 |        |        |           |                                        |
| 531 |        |        | :ERROR 61 |                                        |
| 532 | 002072 | 044476 | EM61      | ;ABORT MESSAGE                         |
| 533 | 002074 | 000000 | 0         |                                        |
| 534 | 002076 | 000000 | 0         |                                        |
| 535 | 002100 | 000000 | 0         |                                        |
| 536 |        |        |           |                                        |
| 537 |        |        | :ERROR 62 |                                        |
| 538 | 002102 | 044550 | EM62      | ;HEADER MISCOMPARE                     |
| 539 | 002104 | 046662 | DH601     |                                        |
| 540 | 002106 | 047564 | DT601     |                                        |
| 541 | 002110 | 050250 | DF17      |                                        |
| 542 |        |        |           |                                        |
| 543 |        |        | :ERROR 63 | ;DATA ERROR WORDS                      |
| 544 | 002112 | 000000 | 0         |                                        |
| 545 | 002114 | 000000 | 0         |                                        |
| 546 | 002116 | 047572 | DT602     |                                        |
| 547 | 002120 | 050310 | DF25      |                                        |
| 548 |        |        |           |                                        |
| 549 |        |        | :ERROR 64 |                                        |
| 550 | 002122 | 044576 | EM63      | ;CLEAR CONTROLLER DID NOT CLEAR ERROR  |
| 551 | 002124 | 046203 | DH100     |                                        |
| 552 | 002126 | 047502 | DT100     |                                        |
| 553 | 002130 | 047624 | DF02      |                                        |
| 554 |        |        |           |                                        |
| 555 |        |        | :ERROR 65 |                                        |
| 556 | 002132 | 044647 | EM64      | ;NO ATTENTION IN ATTENTION SUMMARY REG |
| 557 | 002134 | 046203 | DH100     |                                        |
| 558 | 002136 | 047502 | DT100     |                                        |
| 559 | 002140 | 047624 | DF02      |                                        |
| 560 |        |        |           |                                        |
| 561 |        |        | :ERROR 66 |                                        |
| 562 | 002142 | 044726 | EM65      | ;UNSOLICITED ATTENTION                 |

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|     |        |        |           |                                         |
|-----|--------|--------|-----------|-----------------------------------------|
| 563 | 002144 | 046203 | DH100     |                                         |
| 564 | 002146 | 047502 | DT100     |                                         |
| 565 | 002150 | 047624 | DF02      |                                         |
| 566 |        |        |           |                                         |
| 567 |        |        | :ERROR 67 |                                         |
| 568 | 002152 | 044760 | EM66      | ;UNEXPECTED DATA TYPE ERROR             |
| 569 | 002154 | 046203 | DH100     |                                         |
| 570 | 002156 | 047502 | DT100     |                                         |
| 571 | 002160 | 047624 | DF02      |                                         |
| 572 |        |        |           |                                         |
| 573 |        |        | :ERROR 70 |                                         |
| 574 | 002162 | 045017 | EM67      | ;ATTENTION DID NOT RESET WITH CLEAR     |
| 575 | 002164 | 046203 | DH100     |                                         |
| 576 | 002166 | 047502 | DT100     |                                         |
| 577 | 002170 | 047624 | DF02      |                                         |
| 578 |        |        |           |                                         |
| 579 |        |        | :ERROR 71 |                                         |
| 580 | 002172 | 045066 | EM70      | ;SUBSYSTEM CLEAR DID NOT CLEAR ATT      |
| 581 | 002174 | 046203 | DH100     |                                         |
| 582 | 002176 | 047502 | DT100     |                                         |
| 583 | 002200 | 047624 | DF02      |                                         |
| 584 |        |        |           |                                         |
| 585 |        |        | :ERROR 72 |                                         |
| 586 | 002202 | 045150 | EM71      | ;DATA LATE WHEN UNLOADING HEADER        |
| 587 | 002204 | 046203 | DH100     |                                         |
| 588 | 002206 | 047502 | DT100     |                                         |
| 589 | 002210 | 047624 | DF02      |                                         |
| 590 |        |        |           |                                         |
| 591 |        |        | :ERROR 73 |                                         |
| 592 | 002212 | 045214 | EM72      | ;CONTROLLER ERROR DURING DRIVER SERVICE |
| 593 | 002214 | 046203 | DH100     |                                         |
| 594 | 002216 | 047502 | DT100     |                                         |
| 595 | 002220 | 047624 | DF02      |                                         |
| 596 |        |        |           |                                         |
| 597 |        |        | :ERROR 74 |                                         |
| 598 | 002222 | 045267 | EM73      | ;DRIVE DETECTED PARITY ERROR            |
| 599 | 002224 | 046203 | DH100     |                                         |
| 600 | 002226 | 047502 | DT100     |                                         |
| 601 | 002230 | 047624 | DF02      |                                         |
| 602 |        |        |           |                                         |
| 603 |        |        | :ERROR 75 |                                         |
| 604 | 002232 | 045327 | EM74      | ;UNDEFINED ERROR                        |
| 605 | 002234 | 046203 | DH100     |                                         |
| 606 | 002236 | 047502 | DT100     |                                         |
| 607 | 002240 | 047624 | DF02      |                                         |
| 608 |        |        |           |                                         |
| 609 |        |        | :ERROR 76 |                                         |
| 610 | 002242 | 045353 | EM75      | ;MARKING SECTOR BAD MESSAGE             |
| 611 | 002244 | 000000 | 0         |                                         |
| 612 | 002246 | 000000 | 0         |                                         |
| 613 | 002250 | 000000 | 0         |                                         |
| 614 |        |        |           |                                         |
| 615 |        |        | :ERROR 77 |                                         |
| 616 | 002252 | 045407 | EM76      | ;BAD DATA VERIFICATION WITH READ        |
| 617 | 002254 | 047076 | DH605     |                                         |
| 618 | 002256 | 047564 | DT601     |                                         |



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|     |        |        |            |                                        |
|-----|--------|--------|------------|----------------------------------------|
| 619 | 002260 | 050270 | DF21       |                                        |
| 620 |        |        |            |                                        |
| 621 |        |        | :ERROR 100 |                                        |
| 622 | 002262 | 045502 | EM77       | ;RETRY SUCCESSFUL MESSAGE              |
| 623 | 002264 | 047431 | DH800      |                                        |
| 624 | 002266 | 047564 | DT601      |                                        |
| 625 | 002270 | 050300 | DF23       |                                        |
| 626 |        |        |            |                                        |
| 627 |        |        | :ERROR 101 |                                        |
| 628 | 002272 | 045502 | EM77       | ;ANOTHER RETRY SUCCESSFUL MESSAGE      |
| 629 | 002274 | 047431 | DH800      |                                        |
| 630 | 002276 | 047564 | DT601      |                                        |
| 631 | 002300 | 050300 | DF23       |                                        |
| 632 |        |        |            |                                        |
| 633 |        |        | :ERROR 102 |                                        |
| 634 | 002302 | 045527 | EM100      | ;RETRY UNSUCCESSFUL MESSAGE            |
| 635 | 002304 | 047431 | DH800      |                                        |
| 636 | 002306 | 047564 | DT601      |                                        |
| 637 | 002310 | 050300 | DF23       |                                        |
| 638 |        |        |            |                                        |
| 639 |        |        | :ERROR 103 |                                        |
| 640 | 002312 | 045556 | EM101      | ;NO VALID HEADERS IN TRACK JUST READ   |
| 641 | 002314 | 047060 | DH6042     |                                        |
| 642 | 002316 | 047564 | DT601      |                                        |
| 643 | 002320 | 050304 | DF24       |                                        |
| 644 |        |        |            |                                        |
| 645 |        |        | :ERROR 104 |                                        |
| 646 | 002322 | 045640 | EM102      | ;BSE ERROR ON SECTOR NOT LISTED AS BAD |
| 647 | 002324 | 046203 | DH100      |                                        |
| 648 | 002326 | 047502 | DT100      |                                        |
| 649 | 002330 | 047624 | DF02       |                                        |
| 650 |        |        |            |                                        |
| 651 |        |        | :ERROR 105 |                                        |
| 652 | 002332 | 045716 | EM103      | ;WORD COUNT NOT CORRECT TO CONTINUE    |
| 653 | 002334 | 047454 | DH900      |                                        |
| 654 | 002336 | 047572 | DT602      |                                        |
| 655 | 002340 | 050310 | DF25       |                                        |
| 656 |        |        |            |                                        |
| 657 |        |        | :ERROR 106 |                                        |
| 658 | 002342 | 045762 | EM104      | ;DRIVE STATUS NOT VALID                |
| 659 | 002344 | 000000 | 0          |                                        |
| 660 | 002346 | 000000 | 0          |                                        |
| 661 | 002350 | 000000 | 0          |                                        |
| 662 |        |        |            |                                        |
| 663 |        |        | :ERROR 107 |                                        |
| 664 | 002352 | 046047 | EM105      | ;BAD HEADER AREA                       |
| 665 | 002354 | 046777 | DH604      |                                        |
| 666 | 002356 | 047564 | DT601      |                                        |
| 667 | 002360 | 050314 | DF26       |                                        |

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668
669      .SBTTL  RK06 CONTROLLER REGISTER DEFINITION
670
671      000000      RKCS1= 0      ;CONTROL AND STATUS REGISTER 1
672      000002      RKWC= 2      ;WORD COUNT REGISTER
673      000004      RKBA= 4      ;BUS ADDRESS REGISTER
674      000006      RKDA= 6      ;DESIRED TRACK SECTOR REGISTER
675      000010      RKCS2= 10     ;CONTROL AND STATUS REGISTER 2
676      000012      RKDS= 12     ;DRIVE STATUS REGISTER
677      000014      RKER= 14      ;ERROR REGISTER
678      000016      RKASOF= 16    ;ATTENTION SUMMARY AND OFFSET REGISTER
679      000020      RKDC= 20      ;DESIRED CYLINDER REGISTER
680      000020      RKDCYL= 20    ;DESIRED CYLINDER REGISTER
681      000024      RKDB= 24      ;DATA BUFFER
682      000022      RKMR1= 22     ;MAINTENANCE REGISTER 1
683      000034      RKMR2= 34     ;MAINTENANCE REGISTER 2
684      000036      RKMR3= 36     ;MAINTENANCE REGISTER 3
685      000030      RKPOS= 30     ;ECC POSITION INFORMATION
686      000030      RKECPS= 30    ;ECC POSITION INFORMATION
687      000032      RKPAT= 32     ;ECC PATTERN INFORMATION
688      000032      RKECPT= 32    ;ECC PATTERN INFORMATION
689
690      .SBTTL  DRIVE COMMANDS
691
692      000101      SELDRV= 101    ;SELECT DRIVE
693      000103      PACK= 103      ;PACK ACKNOWLEDGE
694      000105      CLEAR= 105     ;DRIVE CLEAR
695      000107      UNLOAD= 107    ;UNLOAD
696      000111      SRTSPL= 111    ;START SPINDLE
697      000113      RECAL= 113    ;RECALIBRATE
698      000115      OFFSET= 115   ;OFFSET
699      000117      SEEK= 117     ;SEEK
700      000121      RDATA= 121    ;READ DATA
701      000123      WRDATA= 123   ;WRITE DATA
702      000125      RDHEAD= 125   ;READ HEADER
703      000127      WRHEAD= 127   ;WRITE HEADER AND DATA
704      000131      WATCHK= 131  ;WRITE CHECK
705
706      ;      THE FOLLOWING ARE NOT DRIVE COMMANDS BUT ARE USED BY THE DRIVER
707      ;      TO SIMULATE A SPECIFIC DESIRED OPERATION
708
709      000140      RELEAS= 140     ;RELEASE DRIVE
710      000141      RDSPT= 141     ;GET ALL STATUS FROM DRIVE
711      000164      RDALHD= 164    ;READ ALL HEADERS
712      000176      CONCLR= 176    ;CONTROLLER CLEAR (BIT 15 OF CS1)
713      000177      SUBCLR= 177   ;SUBSYSTEM CLEAR (BIT 5 OF CS2)
714      000300      INTR= 300      ;GENERATE INTERRUPT TO CPU
715
716      ;      DRIVER ISSUED SERVICE COMMANDS
717
718      000001      DR.SEL= 001     ;DRIVE SELECT
719      000005      DR.CLR= 005     ;DRIVE CLEAR
720
721      .SBTTL  CONTROL AND STATUS REGISTER 1 BITS
722
723      000001      GO= BIT0        ;GO BIT

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|     |        |       |       |                                                      |
|-----|--------|-------|-------|------------------------------------------------------|
| 724 | 000100 | IE=   | BIT6  | ; INTERRUPT ENABLE                                   |
| 725 | 000200 | RDY=  | BIT7  | ; CONTROLLER READY                                   |
| 726 | 000400 | BA16= | BIT8  | ; BUS ADDRESS BIT 16                                 |
| 727 | 001000 | BA17= | BIT9  | ; BUS ADDRESS BIT 17                                 |
| 728 | 002000 | CDT=  | BIT10 | ; CONTROLLER DRIVE TYPE (0=RK06)                     |
| 729 | 004000 | CTO=  | BIT11 | ; CONTROLLER TIMED OUT WAITING FOR<br>DRIVE RESPONSE |
| 731 | 010000 | CFMT= | BIT12 | ; CONTROLLER DRIVE FORMAT (0=22 SECTOR, 1=20 SECTOR) |
| 732 | 020000 | SPAR= | BIT13 | ; DRIVE BUS PARITY ERROR DETECTED BY CONTROLLER      |
| 733 | 040000 | DI=   | BIT14 | ; DRIVE INTERRUPT                                    |
| 734 | 100000 | CERR= | BIT15 | ; CONTROLLER ERROR                                   |
| 735 | 100000 | CCLR= | BIT15 | ; CONTROLLER CLEAR                                   |

; THESE BIT DEFINITIONS ARE USED FOR ADDRESS  
 ; THE HIGH BYTE OF RKCS1

|     |        |         |      |                                                      |
|-----|--------|---------|------|------------------------------------------------------|
| 740 | 000001 | B.BA16= | BIT0 | ; BUS ADDRESS BIT 16                                 |
| 741 | 000002 | B.BA17= | BIT1 | ; BUS ADDRESS BIT 17                                 |
| 742 | 000004 | B.CDT=  | BIT2 | ; CONTROLLER DRIVE TYPE (0=RK06)                     |
| 743 | 000020 | B.CFMT= | BIT4 | ; CONTROLLER DRIVE FORMAT (0=22 SECTOR, 1=20 SECTOR) |

.SBTTL CONTROL AND STATUS REGISTER 2 BITS

|     |        |         |       |                                         |
|-----|--------|---------|-------|-----------------------------------------|
| 747 | 000007 | DRVMSK= | 7     | ; MASK FOR DRIVE SELECTION CODE         |
| 748 | 000010 | DESL=   | BIT3  | ; DESELECT OR RELEASE DRIVE IN BITS 0-2 |
| 749 | 000010 | RLS=    | BIT3  | ; DESELECT OR RELEASE DRIVE IN BITS 0-2 |
| 750 | 000020 | BAI=    | BIT4  | ; BUS ADDRESS INCREMENT INHIBIT         |
| 751 | 000040 | CLR=    | BIT5  | ; CLEAR CONTROLLER AND ALL DRIVES       |
| 752 | 000040 | SCLR=   | BIT5  | ; CLEAR CONTROLLER AND ALL DRIVES       |
| 753 | 000100 | IR=     | BIT6  | ; INPUT READY                           |
| 754 | 000200 | OR=     | BIT7  | ; OUTPUT READY                          |
| 755 | 000400 | UFE=    | BIT8  | ; UNIT FIELD ERROR                      |
| 756 | 001000 | MDS=    | BIT9  | ; MULTIPLE DRIVE SELECT                 |
| 757 | 002000 | PGE=    | BIT10 | ; PROGRAMMING ERROR                     |
| 758 | 004000 | NEM=    | BIT11 | ; NON-EXISTENT MEMORY                   |
| 759 | 010000 | NED=    | BIT12 | ; NON-EXISTENT DRIVE                    |
| 760 | 020000 | UPE=    | BIT13 | ; UNIBUS PARITY ERROR                   |
| 761 | 040000 | WCE=    | BIT14 | ; WRITE CHECK ERROR                     |
| 762 | 100000 | DLT=    | BIT15 | ; DATA LATE ERROR                       |

.SBTTL ERROR REGISTER BIT DEFINITION

|     |        |        |       |                                         |
|-----|--------|--------|-------|-----------------------------------------|
| 766 | 000001 | ILC=   | BIT0  | ; ILLEGAL FUNCTION CODE                 |
| 767 |        | *ILF=  | BIT0  | ; ILLEGAL FUNCTION CODE                 |
| 768 | 000002 | SKI=   | BIT1  | ; SEEK INCOMPLETE                       |
| 769 | 000004 | ILF=   | BIT2  | ; ILLEGAL DRIVE FUNCTION                |
| 770 | 000004 | NXF=   | BIT2  | ; ILLEGAL DRIVE FUNCTION                |
| 771 | 000010 | DRPAR= | BIT3  | ; DRIVE DETECTED DRIVE BUS PARITY ERROR |
| 772 | 000020 | FMTE=  | BIT4  | ; FORMAT ERROR                          |
| 773 | 000040 | DTYPE= | BIT5  | ; DRIVE TYPE ERROR                      |
| 774 | 000100 | ECH=   | BIT6  | ; ECC HARD                              |
| 775 | 000200 | BSE=   | BIT7  | ; BAD SECTOR ERROR                      |
| 776 | 000400 | HCRC=  | BIT8  | ; HEADER CRC ERROR                      |
| 777 | 000400 | HVRC=  | BIT8  | ; HEADER VRC ERROR                      |
| 778 | 001000 | COE=   | BIT9  | ; CYLINDER ADDRESS OVERFLOW ERROR       |
| 779 | 002000 | IDAE=  | BIT10 | ; INVALID DISK ADDRESS ERROR            |

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 DZF6LB.P11 03-AUG-76 00:00 ERROR REGISTER BIT DEFINITION

|     |        |                                                     |       |                                                              |
|-----|--------|-----------------------------------------------------|-------|--------------------------------------------------------------|
| 780 | 004000 | WLE=                                                | BIT11 | ;WRITE LOCK ERROR                                            |
| 781 | 010000 | DTE=                                                | BIT12 | ;DRIVE TIMING ERROR                                          |
| 782 | 020000 | OPI=                                                | BIT13 | ;OPERATION (SEARCH) INCOMPLETE                               |
| 783 | 040000 | UNS=                                                | BIT14 | ;DRIVE UNSAFE                                                |
| 784 | 100000 | DCK=                                                | BIT15 | ;DATA CHECK                                                  |
| 785 |        | .SBTTL STATUS REGISTER BIT DEFINITION               |       |                                                              |
| 786 |        |                                                     |       |                                                              |
| 787 |        |                                                     |       |                                                              |
| 788 | 000001 | DRA=                                                | BIT0  | ;DRIVE AVAILABLE (CONTROLLER IS SET IF<br>THIS BIT IS RESET) |
| 789 |        |                                                     |       |                                                              |
| 790 | 000004 | OFST=                                               | BIT2  | ;DRIVE OFFSET                                                |
| 791 | 000010 | ACLO=                                               | BIT3  | ;AC LOW                                                      |
| 792 | 000020 | SPDLS=                                              | BIT4  | ;SPEED LOSS                                                  |
| 793 | 000020 | DCLO=                                               | BIT4  | ;DC LOW                                                      |
| 794 | 000040 | DROT=                                               | BIT5  | ;DRIVE OFF TRACK                                             |
| 795 | 000100 | VV=                                                 | BIT6  | ;VOLUME VALID                                                |
| 796 | 000200 | DRY=                                                | BIT7  | ;DRIVE READY                                                 |
| 797 | 000200 | DRDY=                                               | BIT7  | ;DRIVE READY                                                 |
| 798 | 000400 | DDT=                                                | BIT8  | ;DRIVE TYPE (0=RK06)                                         |
| 799 | 004000 | WRL=                                                | BIT11 | ;WRITE LOCK                                                  |
| 800 | 020000 | PIP=                                                | BIT13 | ;POSITIONING IN PROGRESS                                     |
| 801 | 040000 | DSC=                                                | BIT14 | ;DRIVE STATUS CHANGE                                         |
| 802 | 100000 | SVAL=                                               | BIT15 | ;STATUS VALID                                                |
| 803 |        | .SBTTL MAINTENANCE REGISTER 1 BIT DEFINITION        |       |                                                              |
| 804 |        |                                                     |       |                                                              |
| 805 |        |                                                     |       |                                                              |
| 806 | 000017 | MESMSK=                                             | 17    | ;MESSAGE MASK                                                |
| 807 |        |                                                     |       |                                                              |
| 808 | 000020 | PAT=                                                | BIT4  | ;FORCE EVEN PARITY ON DRIVE BUS MESSAGE LINES                |
| 809 | 000040 | DMD=                                                | BIT5  | ;DIAGNOSTIC MODE                                             |
| 810 | 000100 | MSP=                                                | BIT6  | ;MAINTENANCE SECTOR PULSE                                    |
| 811 | 000200 | MIND=                                               | BIT7  | ;MAINTENANCE INDEX                                           |
| 812 | 000400 | MCLK=                                               | BIT8  | ;MAINTENANCE CLOCK                                           |
| 813 | 001000 | MERD=                                               | BIT9  | ;MAINTENANCE ENCODED READ DATA                               |
| 814 | 002000 | MEWD=                                               | BIT10 | ;MAINTENANCE ENCODED WRITE DATA                              |
| 815 | 004000 | PCA=                                                | BIT11 | ;PRECOMPENSATION ADVANCE                                     |
| 816 | 010000 | PCD=                                                | BIT12 | ;PRECOMPENSATION DELAY                                       |
| 817 | 020000 | ECCW=                                               | BIT13 | ;ECC WORD IS BEING READ OR WRITTEN                           |
| 818 | 040000 | WRTGAT=                                             | BIT14 | ;WRITE GATE                                                  |
| 819 | 100000 | RDGATE=                                             | BIT15 | ;READ GATE                                                   |
| 820 |        | .SBTTL DEFINITION OF DRIVE STATUS BYTE 00 MESSAGE A |       |                                                              |
| 821 |        |                                                     |       |                                                              |
| 822 |        |                                                     |       |                                                              |
| 823 | 000040 | S.DRA=                                              | BIT5  | ;DRIVE AVAILIABLE                                            |
| 824 | 000100 | S.VV=                                               | BIT6  | ;VOLUME VALID                                                |
| 825 | 000200 | S.DRY=                                              | BIT7  | ;DRIVE READY                                                 |
| 826 | 000400 | S.TYPE=                                             | BIT8  | ;DRIVE TYPE                                                  |
| 827 | 001000 | S.FORM=                                             | BIT9  | ;DRIVE FORMAT                                                |
| 828 | 002000 | S.OFF=                                              | BIT10 | ;OFFSET                                                      |
| 829 | 004000 | S.WRL=                                              | BIT11 | ;WRITE LOCK                                                  |
| 830 | 010000 | S.SPIN=                                             | BIT12 | ;SPINDLE ON                                                  |
| 831 | 020000 | S.PIP=                                              | BIT13 | ;POSITIONING IN PROGRESS                                     |
| 832 | 040000 | S.DSC=                                              | BIT14 | ;DRIVE STATUS CHANGE                                         |
| 833 |        | .SBTTL DEFINITION OF DRIVE STATUS BYTE 00 MESSAGE B |       |                                                              |
| 834 |        |                                                     |       |                                                              |
| 835 |        |                                                     |       |                                                              |

## E02

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 DZR6LB.P11 03-AUG-76 00:00 DEFINITION OF DRIVE STATUS BYTE 00 MESSAGE B

|     |        |               |                                         |
|-----|--------|---------------|-----------------------------------------|
| 836 | 000040 | S.ICYL= BITS  | ; ILLEGAL CYLINDER ADDRESS              |
| 837 | 000100 | S.ACLO= BIT6  | ; AC LOW                                |
| 838 | 000200 | S.FLT= BIT7   | ; DRIVE FAULT                           |
| 839 | 000400 | S.ILF= BIT8   | ; ILLEGAL FUNCTION                      |
| 840 | 001000 | S.PAR= BIT9   | ; DRIVE DETECTED DRIVE BUS PARITY ERROR |
| 841 | 002000 | S.SKI= BIT10  | ; SEEK INCOMPLETE                       |
| 842 | 004000 | S.WLE= BIT11  | ; WRITE LOCK ERROR                      |
| 843 | 010000 | S.SPLS= BIT12 | ; SPEED LOSS                            |
| 844 | 010000 | S.DCLO= BIT12 | ; DC LOW                                |
| 845 | 020000 | S.DROT= BIT13 | ; DRIVE OFF TRACK                       |
| 846 | 040000 | S.UNS= BIT14  | ; DRIVE UNSAFE                          |

## .SBTTL DEFINITION OF DRIVE STATUS BYTE 01 MESSAGE A

|     |        |               |                       |
|-----|--------|---------------|-----------------------|
| 850 | 000020 | S.XDOK= BIT4  | ; TRANSDUCER OK       |
| 851 | 000040 | S.HDHM= BITS  | ; HEADS HOME          |
| 852 | 000100 | S.BRHM= BIT6  | ; BRUSHES HOME        |
| 853 | 000200 | S.DOOR= BIT7  | ; DOOR INTERLOCKED    |
| 854 | 000400 | S.CART= BIT8  | ; CARTRIDGE INTERLOCK |
| 855 | 001000 | S.SPOK= BIT9  | ; SPEED OK            |
| 856 | 002000 | S.FWD= BIT10  | ; FORWARD             |
| 857 | 004000 | S.REV= BIT11  | ; REVERSE             |
| 858 | 010000 | S.LOAD= BIT12 | ; HEADS LOADING       |
| 859 | 020000 | S.RTZ= BIT13  | ; RETURN TO ZERO      |
| 860 | 040000 | S.UNLD= BIT14 | ; HEADS UNLOADING     |

## .SBTTL DEFINITION OF DRIVE STATUS BYTE 01 MESSAGE B

|     |        |               |                                  |
|-----|--------|---------------|----------------------------------|
| 864 | 000020 | S.SECT= BIT4  | ; SECTOR ERROR                   |
| 865 | 000040 | S.WCLK= BITS  | ; WRITE CLOCK AND NO WRITE GATE  |
| 866 | 000100 | S.WGAT= BIT6  | ; WRITE GATE AND NO TRANSISTIONS |
| 867 | 000200 | S.HDFL= BIT7  | ; HEAD FAULT                     |
| 868 | 000400 | S.MHD= BIT8   | ; MULTIPLE HEAD SELECT           |
| 869 | 001000 | S.XERR= BIT9  | ; INDEX ERROR                    |
| 870 | 002000 | S.DIB= BIT10  | ; DIBIT ERROR                    |
| 871 | 004000 | S.PLO= BIT11  | ; PLO ERROR                      |
| 872 | 010000 | S.NMOV= BIT12 | ; SEEK AND NO MOTION             |
| 873 | 020000 | S.LIMD= BIT13 | ; LIMIT DETECT ON SEEK           |
| 874 | 040000 | S.BRKE= BIT14 | ; SERVO-BRAKE                    |

## .SBTTL COMMON MASKS

|     |        |               |                              |
|-----|--------|---------------|------------------------------|
| 878 | 000007 | M.DRV= 7      | ; DRIVE CODE                 |
| 879 | 100000 | M.PAR= BIT15  | ; PARITY                     |
| 880 | 000003 | M.ID= 3       | ; BYTE ID                    |
| 881 | 017760 | M.CDIF= 17760 | ; CYLINDER DIFFERENCE/OFFSET |
| 882 | 017760 | M.CADD= 17760 | ; CYLINDER ADDRESS           |
| 883 | 077770 | M.SER= 77770  | ; DRIVE SERIAL NUMBER        |
| 884 | 000760 | M.SECT= 760   | ; SECTOR COUNT               |
| 885 | 007000 | M.HEAD= 7000  | ; HEAD DECODE                |



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 DZR6LB.P11 03-AUG-76 00:00 PARAMETER BLOCK ALLOCATION

## .SBTTL PARAMETER BLOCK ALLOCATION

```

*****
: * 1 : COMMAND : DRIVE NO.
: * 3 : CYLINDER ADDRESS
: * 5 : TRACK : SECTOR
: * 7 : BA16-17,FORMAT,DRV TYPE: OFFSET
: * 11 : BUS ADDRESS (LOW 16 BITS)
: * 13 : WORD COUNT (2'S COMPLEMENT)
: * 15 : PROGRAM DRIVE STATUS INFORMATION
: * 17 : COMMAND AND STATUS REGISTER 1
: * 21 : COMMAND AND STATUS REGISTER 2
: * 23 : WORD COUNT REGISTER
: * 25 : BUS ADDRESS REGISTER
: * 27 : DESIRED TRACK AND SECTOR
: * 31 : DESIRED CYLINDER
: * 33 : ATTENTION SUMMARY AND DRIVE OFFSET
: * 35 : ERROR REGISTER
: * 37 : STATUS REGISTER
: * 41 : MESSAGE LINE A STATUS BYTE 00
: * 43 : MESSAGE LINE B STATUS BYTE 00
: * 45 : MESSAGE LINE A STATUS BYTE 01
: * 47 : MESSAGE LINE B STATUS BYTE 01
: * 51 : MESSAGE LINE A STATUS BYTE 10
: * 53 : MESSAGE LINE B STATUS BYTE 10
: * 55 : MESSAGE LINE A STATUS BYTE 11
: * 57 : MESSAGE LINE B STATUS BYTE 11
: * 61 : ECC POSITION INFORMATION
: * 63 : ECC PATTERN INFORMATION
: * *****

```

## .SBTTL PARAMETERS PASSED TO THE DRIVER

```

: THE FOLLOWING DEFINITIONS ARE USED TO PASS PARAMETERS
: TO THE RK06 DRIVER

```

|        |            |                                   |
|--------|------------|-----------------------------------|
| 000000 | P.DRVN= 0  | ;DRIVE NUMBER                     |
| 000001 | P.CMND= 1  | ;COMMAND                          |
| 000002 | P.CYLN= 2  | ;CYLINDER ADDRESS                 |
| 000004 | P.SECT= 4  | ;SECTOR                           |
| 000005 | P.TRCK= 5  | ;TRACK                            |
| 000006 | P.OFST= 6  | ;OFFSET                           |
| 000007 | P.CSIH= 7  | ;RKCS1 BITS 8-15                  |
| 000007 | P.BAHI= 7  | ;BUS ADDRESS (BITS 16 AND 17)     |
| 000010 | P.BALO= 10 | ;BUS ADDRESS (BITS 0-15)          |
| 000012 | P.WC= 12   | ;WORD COUNT (2'S COMPLEMENT)      |
| 000014 | P.PRST= 14 | ;PROGRAM DRIVE STATUS INFORMATION |

## .SBTTL PROGRAM DEVICE STATUS REGISTER DEFINITION

|        |              |                                     |
|--------|--------------|-------------------------------------|
| 000001 | DRVUSE= BIT0 | ;DRIVE IN USE                       |
| 000002 | DRVPOS= BIT1 | ;DRIVE POSITIONING                  |
| 000004 | DRVPDT= BIT2 | ;DRIVE POSITIONED FOR DATA TRANSFER |
| 000010 | UEXATT= BIT3 | ;UNEXPECTED ATTENTION               |
| 000020 | DRVHRD= BIT4 | ;DRIVE HAS HARD ERROR               |
| 000040 | DRVDSC= BIT5 | ;DRIVE STATUS CHANGE DID NOT CLEAR  |

## G02

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 DZR6LB.P11 03-AUG-76 00:00 PROGRAM DEVICE STATUS REGISTER DEFINITION

|     |        |               |                                                |
|-----|--------|---------------|------------------------------------------------|
| 942 | 000100 | CMDTO= BIT6   | : NO TERMINATION TO COMMAND FOR AT             |
| 943 |        |               | : LEAST 1 SECOND                               |
| 944 | 000200 | W.WCK= BIT7   | : WRITE FOR WRITE WRITE CHECK                  |
| 945 | 000400 | NOCHK= BIT8   | : NO CHECK, DO NOT SET INTERRUPT ENABLE        |
| 946 | 001000 | PBSVAL= BIT9  | : PARAMETER STATUS WORDS VALID                 |
| 947 |        |               | : (SET WHEN ERROR TERMINATION OR               |
| 948 |        |               | : READ STATUS COMMAND)                         |
| 949 | 002000 | DRPDV= BIT10  | : DROP DRIVE FROM TEST SEQUENCE                |
| 950 | 004000 | NOCS= BIT11   | : ATTENTION SET BUT DCS AND FAULT RESET        |
| 951 | 010000 | DRVSZD= BIT12 | : DRIVE SEIZED BY OTHER PORT                   |
| 952 | 020000 | E.UNLD= BIT13 | : DRIVE UNLOADED DUE TO ERROR                  |
| 953 | 040000 | Q.INIT= BIT14 | : PARAMETER BLOCK ENQUEUED IN INITIATION QUEUE |
| 954 | 100000 | DTBAII= BIT15 | : INHIBIT BUS ADDRESS INCREMENT                |

.SBTTL PARAMETERS PASSED FROM DRIVER TO PROGRAM

; THE FOLLOWING DEFINITIONS ARE USED FOR REGISTER RETURNS  
 ; FROM THE DRIVER TO THE CALLING PROGRAM

|     |        |            |                                     |
|-----|--------|------------|-------------------------------------|
| 961 | 000016 | P.CS1= 16  | : COMMAND AND STATUS REGISTER 1     |
| 962 | 000020 | P.CS2= 20  | : COMMAND AND STATUS REGISTER 2     |
| 963 | 000022 | P.WCR= 22  | : WORD COUNT REGISTER               |
| 964 | 000024 | P.BAR= 24  | : BUS ADDRESS REGISTER              |
| 965 | 000026 | P.DTS= 26  | : DESIRED TRACK SECTOR REGISTER     |
| 966 | 000030 | P.DCYL= 30 | : DESIRED CYLINDER REGISTER         |
| 967 | 000032 | P.ASOF= 32 | : ATTENTION SUMMARY/OFFSET REGISTER |
| 968 | 000034 | P.ER= 34   | : ERROR REGISTER                    |
| 969 | 000036 | P.OS= 36   | : STATUS REGISTER                   |
| 970 | 000040 | P.A00= 40  | : MESSAGE A STATUS BYTE 00          |
| 971 | 000042 | P.B00= 42  | : MESSAGE B STATUS BYTE 00          |
| 972 | 000044 | P.A01= 44  | : MESSAGE A STATUS BYTE 01          |
| 973 | 000046 | P.B01= 46  | : MESSAGE B STATUS BYTE 01          |
| 974 | 000050 | P.A10= 50  | : MESSAGE A STATUS BYTE 10          |
| 975 | 000052 | P.B10= 52  | : MESSAGE B STATUS BYTE 10          |
| 976 | 000054 | P.A11= 54  | : MESSAGE A STATUS BYTE 11          |
| 977 | 000056 | P.B11= 56  | : MESSAGE B STATUS BYTE 11          |
| 978 | 000060 | P.EPOS= 60 | : ECC POSITION INFORMATION          |
| 979 | 000062 | P.EPAT= 62 | : ECC PATTERN INFORMATION           |

.SBTTL PARAMETER BLOCK 0 FOR DRIVE

|     |        |        |                |                                     |
|-----|--------|--------|----------------|-------------------------------------|
| 983 | 002362 | 000    | PARMO: .BYTE 0 | : DRIVE NUMBER                      |
| 984 | 002363 | 000    | .BYTE 0        | : COMMAND                           |
| 985 | 002364 | 000000 | .WORD 0        | : CYLINDER ADDRESS                  |
| 986 | 002366 | 000    | .BYTE 0        | : SECTOR ADDRESS                    |
| 987 | 002367 | 000    | .BYTE 0        | : TRACK ADDRESS                     |
| 988 | 002370 | 000    | .BYTE 0        | : OFFSET VALUE                      |
| 989 | 002371 | 000    | .BYTE 0        | : BUS ADDRESS (BITS 16 AND 17)      |
| 990 | 002372 | 000000 | .WORD 0        | : BUS ADDRESS (BITS 0 - 15)         |
| 991 | 002374 | 000000 | .WORD 0        | : WORD COUNT (2'S COMPLEMENT)       |
| 992 | 002376 | 000000 | .WORD 0        | : PROGRAM DRIVE STATUS INFORMATION  |
| 993 | 002400 | 000000 | .WORD 0        | : COMMAND AND STATUS REGISTER 1     |
| 994 | 002402 | 000000 | .WORD 0        | : COMMAND AND STATUS REGISTER 2     |
| 995 | 002404 | 000000 | .WORD 0        | : WORD COUNT REGISTER               |
| 996 | 002406 | 000000 | .WORD 0        | : BUS ADDRESS REGISTER              |
| 997 | 002410 | 000000 | .WORD 0        | : DESIRED TRACK AND SECTOR REGISTER |

|      |        |        |       |   |                                     |
|------|--------|--------|-------|---|-------------------------------------|
| 998  | 002412 | 000000 | .WORD | 0 | : DESIRED CYLINDER REGISTER         |
| 999  | 002414 | 000000 | .WORD | 0 | : ATTENTION SUMMARY/OFFSET REGISTER |
| 1000 | 002416 | 000000 | .WORD | 0 | : ERROR REGISTER                    |
| 1001 | 002420 | 000000 | .WORD | 0 | : STATUS REGISTER                   |
| 1002 | 002422 | 000000 | .WORD | 0 | : MESSAGE LINE A STATUS BYTE 00     |
| 1003 | 002424 | 000000 | .WORD | 0 | : MESSAGE LINE B STATUS BYTE 00     |
| 1004 | 002426 | 000000 | .WORD | 0 | : MESSAGE LINE A STATUS BYTE 01     |
| 1005 | 002430 | 000000 | .WORD | 0 | : MESSAGE LINE B STATUS BYTE 01     |
| 1006 | 002432 | 000000 | .WORD | 0 | : MESSAGE LINE A STATUS BYTE 10     |
| 1007 | 002434 | 000000 | .WORD | 0 | : MESSAGE LINE B STATUS BYTE 10     |
| 1008 | 002436 | 000000 | .WORD | 0 | : MESSAGE LINE A STATUS BYTE 11     |
| 1009 | 002440 | 000000 | .WORD | 0 | : MESSAGE LINE B STATUS BYTE 11     |
| 1010 | 002442 | 000000 | .WORD | 0 | : ECC POSITION INFORMATION          |
| 1011 | 002444 | 000000 | .WORD | 0 | : ECC PATTERN INFORMATION           |

## .SBTTL PARAMETER BLOCK 1 FOR DRIVE

|      |        |        |              |   |                                     |
|------|--------|--------|--------------|---|-------------------------------------|
| 1012 |        |        |              |   |                                     |
| 1013 |        |        |              |   |                                     |
| 1014 |        |        |              |   |                                     |
| 1015 | 002446 | 000    | PARM1: .BYTE | 0 | : DRIVE NUMBER                      |
| 1016 | 002447 | 000    | .BYTE        | 0 | : COMMAND                           |
| 1017 | 002450 | 000000 | .WORD        | 0 | : CYLINDER ADDRESS                  |
| 1018 | 002452 | 000    | .BYTE        | 0 | : SECTOR ADDRESS                    |
| 1019 | 002453 | 000    | .BYTE        | 0 | : TRACK ADDRESS                     |
| 1020 | 002454 | 000    | .BYTE        | 0 | : OFFSET VALUE                      |
| 1021 | 002455 | 000    | .BYTE        | 0 | : BUS ADDRESS (BITS 16 AND 17)      |
| 1022 | 002456 | 000000 | .WORD        | 0 | : BUS ADDRESS (BITS 0 - 15)         |
| 1023 | 002460 | 000000 | .WORD        | 0 | : WORD COUNT (2'S COMPLEMENT)       |
| 1024 | 002462 | 000000 | .WORD        | 0 | : PROGRAM DRIVE STATUS INFORMATION  |
| 1025 | 002464 | 000000 | .WORD        | 0 | : COMMAND AND STATUS REGISTER 1     |
| 1026 | 002466 | 000000 | .WORD        | 0 | : COMMAND AND STATUS REGISTER 2     |
| 1027 | 002470 | 000000 | .WORD        | 0 | : WORD COUNT REGISTER               |
| 1028 | 002472 | 000000 | .WORD        | 0 | : BUS ADDRESS REGISTER              |
| 1029 | 002474 | 000000 | .WORD        | 0 | : DESIRED TRACK AND SECTOR REGISTER |
| 1030 | 002476 | 000000 | .WORD        | 0 | : DESIRED CYLINDER REGISTER         |
| 1031 | 002500 | 000000 | .WORD        | 0 | : ATTENTION SUMMARY/OFFSET REGISTER |
| 1032 | 002502 | 000000 | .WORD        | 0 | : ERROR REGISTER                    |
| 1033 | 002504 | 000000 | .WORD        | 0 | : STATUS REGISTER                   |
| 1034 | 002506 | 000000 | .WORD        | 0 | : MESSAGE LINE A STATUS BYTE 00     |
| 1035 | 002510 | 000000 | .WORD        | 0 | : MESSAGE LINE B STATUS BYTE 00     |
| 1036 | 002512 | 000000 | .WORD        | 0 | : MESSAGE LINE A STATUS BYTE 01     |
| 1037 | 002514 | 000000 | .WORD        | 0 | : MESSAGE LINE B STATUS BYTE 01     |
| 1038 | 002516 | 000000 | .WORD        | 0 | : MESSAGE LINE A STATUS BYTE 10     |
| 1039 | 002520 | 000000 | .WORD        | 0 | : MESSAGE LINE B STATUS BYTE 10     |
| 1040 | 002522 | 000000 | .WORD        | 0 | : MESSAGE LINE A STATUS BYTE 11     |
| 1041 | 002524 | 000000 | .WORD        | 0 | : MESSAGE LINE B STATUS BYTE 11     |
| 1042 | 002526 | 000000 | .WORD        | 0 | : ECC POSITION INFORMATION          |
| 1043 | 002530 | 000000 | .WORD        | 0 | : ECC PATTERN INFORMATION           |

## .SBTTL TEMPORARY CONTROLLER REGISTER STORAGE

|      |        |        |              |   |                                                       |
|------|--------|--------|--------------|---|-------------------------------------------------------|
| 1044 |        |        |              |   |                                                       |
| 1045 |        |        |              |   |                                                       |
| 1046 |        |        |              |   |                                                       |
| 1047 | 002532 | 000000 | T.CS1: .WORD | 0 | : TEMPORARY STORAGE FOR COMMAND AND STATUS REGISTER 1 |
| 1048 |        |        |              |   |                                                       |
| 1049 | 002534 | 000000 | T.CS2: .WORD | 0 | : TEMPORARY STORAGE FOR COMMAND AND STATUS REGISTER 2 |
| 1050 |        |        |              |   |                                                       |
| 1051 | 002536 | 000000 | T.WCR: .WORD | 0 | : TEMPORARY STORAGE FOR WORD COUNT REGISTER           |
| 1052 | 002540 | 000000 | T.BA: .WORD  | 0 | : TEMPORARY STORAGE FOR BUS ADDRESS REGISTER          |
| 1053 | 002542 | 000000 | T.DA: .WORD  | 0 | : TEMPORARY STORAGE FOR DISK TRACK AND SECTOR         |

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 DZR6LB.P11 03-AUG-76 00:00 TEMPORARY CONTROLLER REGISTER STORAGE

|      |        |        |                          |        |                                                |
|------|--------|--------|--------------------------|--------|------------------------------------------------|
| 1054 | 002544 | 000000 | T.DC: .WORD              | 0      | : TEMPORARY STORAGE FOR DRIVE CYLINDER         |
| 1055 | 002546 | 000000 | T.ASOF: .WORD            | 0      | : TEMPORARY STORAGE FOR ATTENTION SUMMARY      |
| 1056 |        |        |                          |        | : AND OFFSET                                   |
| 1057 | 002550 | 000000 | T.ER: .WORD              | 0      | : TEMPORARY STORAGE FOR ERROR REGISTER         |
| 1058 | 002552 | 000000 | T.OS: .WORD              | 0      | : TEMPORARY STORAGE FOR DRIVE STATUS REGISTER  |
| 1059 | 002554 | 000000 | T.MR1: .WORD             | 0      | : TEMPORARY STORAGE FOR MAINTENANCE REGISTER 1 |
| 1060 | 002556 | 000000 | T.MR2: .WORD             | 0      | : TEMPORARY STORAGE FOR MAINTENANCE REGISTER 2 |
| 1061 | 002560 | 000000 | T.MR3: .WORD             | 0      | : TEMPORARY STORAGE FOR MAINTENANCE REGISTER 3 |
| 1062 | 002562 | 000000 | T.POS: .WORD             | 0      | : TEMPORARY STORAGE FOR ECC POSITION           |
| 1063 | 002564 | 000000 | T.PAT: .WORD             | 0      | : TEMPORARY STORAGE FOR ECC PATTERN            |
| 1064 | 002566 | 000000 | T.DB: .WORD              | 0      | : TEMPORARY STORAGE FOR DATA BUFFER REGISTER   |
| 1065 |        |        |                          |        |                                                |
| 1066 |        |        | .SBTTL DRIVER PARAMETERS |        |                                                |
| 1067 |        |        |                          |        |                                                |
| 1068 | 002570 | 177440 | RKBAS: .WORD             | 177440 | : ADDRESS OF RK611 UNIBUS ADDRESS BLOCK        |
| 1069 | 002572 | 000210 | RKVEC: .WORD             | 210    | : ADDRESS OF R611 VECTOR                       |
| 1070 | 002574 | 000240 | RKPRI: .WORD             | PR5    | : RK611 INTERRUPT PRIORITY                     |
| 1071 | 002576 | 025302 | A.NORM: ERRFRE           |        | : ADDRESS OF NORMAL RETURN FROM DRIVER         |
| 1072 | 002600 | 026240 | A.ABNL: ERRHDL           |        | : ADDRESS OF ABNORMAL RETURN FROM DRIVER       |
| 1073 | 002602 | 025616 | A.CONT: CONERR           |        | : ADDRESS OF CONTROLLER ERROR RETURN           |
| 1074 | 002604 | 000000 | E.CONT: .WORD            | 0      | : CONTROLLER ERROR STATUS                      |
| 1075 |        |        |                          |        | : THIS LOCATION IS CLEARED WHEN EVERY COMMAND  |
| 1076 |        |        |                          |        | : IS INITIATED. IF A CONTROLLER ERROR          |
| 1077 |        |        |                          |        | : OCCURS THE FOLLOWING BIT ASSIGNMENT IS       |
| 1078 |        |        |                          |        | : USED:                                        |
| 1079 |        |        |                          |        |                                                |
| 1080 |        | 000001 | E.CCLR= BIT0             |        | : CLEAR CONTROLLER DID NOT CLEAR ERROR         |
| 1081 |        | 000002 | E.NOAT= BIT1             |        | : NO ATTENTION IN ATTENTION SUMMARY REG        |
| 1082 |        | 000004 | E.UATT= BIT2             |        | : UNSOLICATED ATTENTION (SEQUENTIAL ONLY)      |
| 1083 |        | 000010 | E.UDAT= BIT3             |        | : UNEXPECTED DATA TYPE ERROR                   |
| 1084 |        | 000020 | E.CLAT= BIT4             |        | : ATTENTION DID NOT RESET WITH CLEAR           |
| 1085 |        | 000040 | E.SCLR= BIT5             |        | : SUBSYSTEM CLEAR DID NOT CLEAR DRIVE          |
| 1086 |        |        |                          |        | : ATTENTION                                    |
| 1087 |        | 000100 | E.ILLD= BIT6             |        | : ILLEGAL DRIVER COMMAND                       |
| 1088 |        | 000400 | E.DLT= BIT8              |        | : DATA LATE WHEN UNLOADING HEADER              |
| 1089 |        | 001000 | E.CERR= BIT9             |        | : CONTROLLER ERROR DURING DRIVER SERVICING     |
| 1090 |        | 002000 | E.DPAR= BIT10            |        | : DRIVE DETECTED PARITY ERROR                  |
| 1091 |        | 040000 | E.CMT0= BIT14            |        | : CONTROLLER COMMAND TIME OUT (QUEUED ONLY)    |
| 1092 |        | 100000 | E.MDS= BIT15             |        | : MULTIPLE DRIVE SELECT                        |
| 1093 |        |        |                          |        |                                                |
| 1094 | 002606 | 000000 | O.WAIT: .WORD            | 0      | : PARAMETER BLOCK OF THE DRIVE                 |
| 1095 |        |        |                          |        | : WAITING FOR COMMAND COMPLETION               |
| 1096 | 002610 | 000400 | W.MTIM: .WORD            | 400    | : LOOP COUNTER FOR MILLISECOND SCAN OF DRIVE   |
| 1097 | 002612 | 000400 | W.MILI: .WORD            | 400    | : 16 MILLISECOND TIME FOR PROGRAM              |
| 1098 |        |        |                          |        |                                                |
| 1099 |        |        |                          |        |                                                |
| 1100 |        |        |                          |        |                                                |
| 1101 |        |        |                          |        |                                                |
| 1102 |        |        |                          |        |                                                |
| 1103 |        |        |                          |        |                                                |
| 1104 |        |        |                          |        |                                                |
| 1105 |        |        |                          |        |                                                |
| 1106 |        |        |                          |        |                                                |
| 1107 |        |        |                          |        |                                                |
| 1108 |        |        |                          |        |                                                |
| 1109 |        |        |                          |        |                                                |

| CPU | VALUE |
|-----|-------|
| --- | ----  |

|       |     |
|-------|-----|
| 11/05 | 100 |
| 11/10 |     |
| 11/20 |     |
| 11/34 |     |
| 11/40 |     |
| 11/45 | 400 |
| 11/50 |     |
| 11/70 |     |

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|      |        |        |               |                                     |                                                  |
|------|--------|--------|---------------|-------------------------------------|--------------------------------------------------|
| 1110 | 002614 | 000100 | W.SEC: .WORD  | 100                                 | ; SECOND COUNT COUNT FOR ALL COMMANDS            |
| 1111 |        |        |               |                                     | ; EXCEPT START SPINDLE                           |
| 1112 | 002616 | 001000 | W.8SEC: .WORD | 1000                                | ; 8 SECOND FOR DRIVE CYCLE DOWN                  |
| 1113 | 002620 | 010000 | W.MIN: .WORD  | 10000                               | ; MINUTE TIME FOR START SPINDLE                  |
| 1114 | 002622 | 000000 | HDR.AD: .WORD | 0                                   | ; ADDRESS USED FOR READ ALL HEADERS              |
| 1115 | 002624 | 000000 | HDR.CT: .WORD | 0                                   | ; NUMBER OF HEADERS LEFT TO READ FOR READ        |
| 1116 |        |        |               |                                     | ; ALL HEADERS                                    |
| 1117 | 002626 | 000    | I.ISRL: .BYTE | 0                                   | ; INTERRUPT OR RELEASED COMMAND ISSUED           |
| 1118 | 002627 | 002    | H.HEAD: .BYTE | 2,4,10                              | ; HEAD DECODES                                   |
| 1119 | 002632 | 000    | W.TIME: .BYTE | 0                                   | ; DRIVES BEING WATCH-DOG TIMED                   |
| 1120 |        |        |               |                                     |                                                  |
| 1121 |        |        | .SBTTL        | INTERRUPT MASKS                     |                                                  |
| 1122 |        |        |               |                                     |                                                  |
| 1123 | 002633 | 000    | INTMSK: .BYTE | 0                                   | ; INTERRUPT MASKS FOR DRIVE IN PARAMETER BLOCK   |
| 1124 |        |        |               |                                     |                                                  |
| 1125 |        |        |               | INTERRUPT MASK TABLE                |                                                  |
| 1126 |        |        |               |                                     |                                                  |
| 1127 | 002634 | 001    | I.DRV: .BYTE  | 1                                   | ; INTERRUPT MASK FOR DRIVE 0                     |
| 1128 | 002635 | 002    | .BYTE         | 2                                   | ; INTERRUPT MASK FOR DRIVE 1                     |
| 1129 | 002636 | 004    | .BYTE         | 4                                   | ; INTERRUPT MASK FOR DRIVE 2                     |
| 1130 | 002637 | 010    | .BYTE         | 10                                  | ; INTERRUPT MASK FOR DRIVE 3                     |
| 1131 | 002640 | 020    | .BYTE         | 20                                  | ; INTERRUPT MASK FOR DRIVE 4                     |
| 1132 | 002641 | 040    | .BYTE         | 40                                  | ; INTERRUPT MASK FOR DRIVE 5                     |
| 1133 | 002642 | 100    | .BYTE         | 100                                 | ; INTERRUPT MASK FOR DRIVE 6                     |
| 1134 | 002643 | 200    | .BYTE         | 200                                 | ; INTERRUPT MASK FOR DRIVE 7                     |
| 1135 |        |        |               |                                     |                                                  |
| 1136 |        |        | .SBTTL        | PARAMETER BLOCK TABLE               |                                                  |
| 1137 |        |        |               |                                     |                                                  |
| 1138 | 002644 | 002362 | PBLKT: PARM0  |                                     | ; ADDRESS OF PARAMETER BLOCK GIVEN WITH          |
| 1139 |        |        |               |                                     | ; DRIVE CALL. MUST BE LOADED INTO PBLKT          |
| 1140 |        |        |               |                                     |                                                  |
| 1141 |        |        |               |                                     |                                                  |
| 1142 |        |        | .SBTTL        | TIME FOR WATCH-DOG TIMER            |                                                  |
| 1143 |        |        |               |                                     |                                                  |
| 1144 | 002646 | 000000 | W.DRV: .WORD  | 0                                   | ; TIME FOR INSTRUCTION IN PARAMETER BLOCK        |
| 1145 |        |        | .SBTTL        | PROGRAM SPECIFIC RESERVED LOCATIONS |                                                  |
| 1146 | 002650 | 000    | DERCNT: .BYTE | 0                                   | ; DATA ERROR COUNT                               |
| 1147 | 002651 | 000    | OPCOMP: .BYTE | 0                                   | ; OPERATION COMPLETE FLAG                        |
| 1148 | 002652 | 000    | DONE: .BYTE   | 0                                   | ; DONE SWITCH                                    |
| 1149 | 002653 | 000    | TYPFMT: .BYTE | 0                                   | ; DRIVE TYPE & FORMAT CONTROL                    |
| 1150 | 002654 | 000    | ERRCNT: .BYTE | 0                                   | ; ERROR COUNT                                    |
| 1151 | 002655 | 004    | ERRLMT: .BYTE | 4                                   | ; ERROR LIMIT                                    |
| 1152 | 002656 | 000    | OPCONT: .BYTE | 0                                   | ; OPERATION CONTROL SWITCHES                     |
| 1153 |        | 000001 | WHDSW=BIT0    |                                     | ; WRITE HEADER & DATA SWITCH                     |
| 1154 |        | 000002 | VHDSW=BIT1    |                                     | ; VERIFY HEADERS SWITCH                          |
| 1155 |        | 000004 | WCDASW=BIT2   |                                     | ; WRITE CHECK DATA SWITCH                        |
| 1156 |        | 000010 | RCDASW=BIT3   |                                     | ; READ CHECK DATA SWITCH                         |
| 1157 |        | 000020 | OREQSW=BIT4   |                                     | ; OFFSET REQUIRED SWITCH                         |
| 1158 |        | 000040 | PSDBSF= BITS  |                                     | ; SAVE SOFTWARE DETECTED BAD SECTOR FILES SWITCH |
| 1159 |        | 002660 | .EVEN         |                                     |                                                  |
| 1160 |        |        |               |                                     |                                                  |
| 1161 | 002660 | 000400 | RDBUF: .BLKW  | 10256                               | ; READ BUFFER                                    |
| 1162 | 003660 | 000400 | BSSOFT: .BLKW | 10256                               | ; RECORD OF BAD SECTORS FROM SOFTWARE            |
| 1163 | 004660 | 000400 | BSFACT: .BLKW | 10256                               | ; RECORD OF BAD SECTORS FROM FACTORY             |
| 1164 | 005660 | 000006 | COMSTR: .BLKW | 6                                   | ; COMMAND STORAGE                                |
| 1165 | 005674 | 000102 | BUFF0: .BLKW  | 1066                                | ; OUTPUT BUFFER 1                                |

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|      |        |        |        |        |                |                                                               |  |                                 |
|------|--------|--------|--------|--------|----------------|---------------------------------------------------------------|--|---------------------------------|
| 1166 | 006100 | 000102 |        |        | BUFF1: .BLKW   | 1066                                                          |  | ; OUTPUT BUFFER 2               |
| 1167 | 006304 | 000000 |        |        | BUFPRT: .WORD  | 0                                                             |  | ; BUFFER POINTER                |
| 1168 | 006306 | 000000 |        |        | TKWDCT: .WORD  | 0                                                             |  | ; FULL TRACK WORD COUNT STORAGE |
| 1169 | 006310 | 000006 |        |        | INITTP: .WORD  | 6                                                             |  | ; DEFAULT DRIVE TYPE            |
| 1170 | 006312 | 000000 |        |        | INITDR: .WORD  | 0                                                             |  | ; DEFAULT DRIVE                 |
| 1171 | 006314 | 000026 |        |        | INITSE: .WORD  | 26                                                            |  | ; DEFAULT SECTOR/TRACK          |
| 1172 | 006316 | 000002 |        |        | INITMD: .WORD  | 2                                                             |  | ; DEFAULT MODE                  |
| 1173 | 006320 | 135143 |        |        | INITWE: .WORD  | 135143                                                        |  | ; DEFAULT DATA FOR EVEN CYL     |
| 1174 | 006322 | 072307 |        |        | INITWO: .WORD  | 072307                                                        |  | ; DEFAULT DATA FOR ODD CYL      |
| 1175 | 006324 | 000000 |        |        | INITST: .WORD  | 0                                                             |  | ; DEFAULT STARTING TRACK        |
| 1176 | 006326 | 000002 |        |        | INITET: .WORD  | 2                                                             |  | ; DEFAULT ENDING TRACK          |
| 1177 | 006330 | 000000 |        |        | INITSC: .WORD  | 0                                                             |  | ; DEFAULT STARTING CYLINDER     |
| 1178 | 006332 | 000632 |        |        | INITEC: .WORD  | 632                                                           |  | ; DEFAULT END CYLINDER          |
| 1179 | 006334 | 000000 |        |        | INITOF: .WORD  | 0                                                             |  | ; DEFAULT OFFSET (+0)           |
| 1180 | 006336 | 000000 |        |        | TPINUS: .WORD  | 0                                                             |  | ; DRIVE TYPE IN USE             |
| 1181 | 006340 | 000000 |        |        | DRINUS: .WORD  | 0                                                             |  | ; DRIVE IN USE                  |
| 1182 | 006342 | 000000 |        |        | SEINUS: .WORD  | 0                                                             |  | ; SECTOR/TRACK IN USE           |
| 1183 | 006344 | 000000 |        |        | MDINUS: .WORD  | 0                                                             |  | ; MODE IN USE                   |
| 1184 | 006346 | 000000 |        |        | WEINUS: .WORD  | 0                                                             |  | ; DATA IN USE FOR EVEN CYL      |
| 1185 | 006350 | 000000 |        |        | WOINUS: .WORD  | 0                                                             |  | ; DATA IN USE FOR ODD CYL       |
| 1186 | 006352 | 000000 |        |        | STINUS: .WORD  | 0                                                             |  | ; STARTING TRACK IN USE         |
| 1187 | 006354 | 000000 |        |        | ETINUS: .WORD  | 0                                                             |  | ; ENDING TRACK IN USE           |
| 1188 | 006356 | 000000 |        |        | SCINUS: .WORD  | 0                                                             |  | ; STARTING CYLINDER IN USE      |
| 1189 | 006360 | 000000 |        |        | ECINUS: .WORD  | 0                                                             |  | ; END CYLINDER IN USE           |
| 1190 | 006362 | 000000 |        |        | OFINUS: .WORD  | 0                                                             |  | ; OFFSET VALUE IN USE           |
| 1191 | 006364 | 000000 |        |        | RECODE: .WORD  | 0                                                             |  | ; RECOVERY CODE WORD            |
| 1192 | 006366 | 000000 |        |        | CTINUS: .WORD  | 0                                                             |  | ; CURRENT TRACK IN USE          |
| 1193 | 006370 | 000000 |        |        | CCINUS: .WORD  | 0                                                             |  | ; CURRENT CYLINDER IN USE       |
| 1194 | 006372 | 000000 |        |        | ERRCOM: .WORD  | 0                                                             |  | ; ERROR COMMAND                 |
| 1195 |        | 000002 |        |        | BSERR=BIT1     |                                                               |  | ; BSE ERROR                     |
| 1196 |        | 000004 |        |        | HVRCER=BIT2    |                                                               |  | ; HVRC ERROR                    |
| 1197 |        | 000010 |        |        | OPIERR=BIT3    |                                                               |  | ; OPI ERROR                     |
| 1198 |        | 000020 |        |        | DCKERR=BIT4    |                                                               |  | ; DATA CHECK ERROR              |
| 1199 |        | 000040 |        |        | ECCNC=BIT5     |                                                               |  | ; ECC NON-CORRECTABLE           |
| 1200 |        | 000100 |        |        | WCERR=BIT6     |                                                               |  | ; WRITE CHECK ERROR             |
| 1201 |        | 000200 |        |        | ABORT=BIT7     |                                                               |  | ; ABORT                         |
| 1202 |        | 000400 |        |        | LEV2ER=BIT8    |                                                               |  | ; LEVEL TWO ERROR               |
| 1203 |        | 001000 |        |        | BADSEC=BIT9    |                                                               |  | ; BAD SECTOR FLAG               |
| 1204 |        | 002000 |        |        | TWOTOS=BIT10   |                                                               |  | ; TWO TIME OUTS                 |
| 1205 |        | 004000 |        |        | RCLREQ=BIT11   |                                                               |  | ; RECALIBRATE REQUIRED          |
| 1206 |        | 100000 |        |        | ANYDER=BIT15   |                                                               |  | ; ANY ERROR DETECTED FLAG       |
| 1207 |        |        |        |        |                |                                                               |  |                                 |
| 1208 | 006374 | 037477 | 000    |        | QUES: .ASCII   | /??/                                                          |  |                                 |
| 1209 | 006377 | 015    | 044012 | 046105 | HELPFL: .ASCII | <15><12>/HELP FILE/<15><12><12>                               |  |                                 |
| 1210 | 006404 | 020120 | 044506 | 042514 |                |                                                               |  |                                 |
| 1211 | 006412 | 005015 | 012    |        |                |                                                               |  |                                 |
| 1212 | 006415 | 115    | 052517 | 052116 | .ASCII         | /MOUNT AN RK06K DISK CARTRIDGE/<15><12>                       |  |                                 |
| 1213 | 006422 | 040440 | 020116 | 045522 |                |                                                               |  |                                 |
| 1214 | 006430 | 033060 | 020113 | 044504 |                |                                                               |  |                                 |
| 1215 | 006436 | 045523 | 041440 | 051101 |                |                                                               |  |                                 |
| 1216 | 006444 | 051124 | 042111 | 042507 |                |                                                               |  |                                 |
| 1217 | 006452 | 005015 |        |        |                |                                                               |  |                                 |
| 1218 | 006454 | 042522 | 042523 | 020124 | .ASCII         | /RESET WRITE LOCK IF WRITE HEADERS OR DATA OPERATION/<15><12> |  |                                 |
| 1219 | 006462 | 051127 | 052111 | 020105 |                |                                                               |  |                                 |
| 1220 | 006470 | 047514 | 045503 | 044440 |                |                                                               |  |                                 |
| 1221 | 006476 | 020106 | 051127 | 052111 |                |                                                               |  |                                 |



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|      |        |        |        |        |
|------|--------|--------|--------|--------|
| 1222 | 006504 | 020105 | 042510 | 042101 |
| 1223 | 006512 | 051105 | 020123 | 051117 |
| 1224 | 006520 | 042040 | 052101 | 020101 |
| 1225 | 006526 | 050117 | 051105 | 052101 |
| 1226 | 006534 | 047511 | 006516 | 012    |
| 1227 | 006541 | 122    | 051505 | 047520 |
| 1228 | 006546 | 042116 | 052040 | 020117 |
| 1229 | 006554 | 044124 | 020105 | 047506 |
| 1230 | 006562 | 046114 | 053517 | 047111 |
| 1231 | 006570 | 020107 | 040520 | 040522 |
| 1232 | 006576 | 042515 | 042524 | 020122 |
| 1233 | 006604 | 042522 | 052521 | 051505 |
| 1234 | 006612 | 051524 | 041040 | 035131 |
| 1235 | 006620 | 005015 | 047503 | 052116 |
| 1236 | 006626 | 047522 | 020114 | 020132 |
| 1237 | 006634 | 057050 | 024532 | 024040 |
| 1238 | 006642 | 051103 | 020051 | 047524 |
| 1239 | 006650 | 040440 | 046114 | 053517 |
| 1240 | 006656 | 040440 | 046114 | 047440 |
| 1241 | 006664 | 020122 |        |        |
| 1242 | 006666 | 042522 | 040515 | 047111 |
| 1243 | 006674 | 047111 | 020107 | 040520 |
| 1244 | 006702 | 040522 | 042515 | 042524 |
| 1245 | 006710 | 051522 | 052040 | 020117 |
| 1246 | 006716 | 042504 | 040506 | 046125 |
| 1247 | 006724 | 006524 | 012    |        |
| 1248 | 006727 | 103    | 051101 | 044522 |
| 1249 | 006734 | 043501 | 020105 | 042522 |
| 1250 | 006742 | 052524 | 047122 | 052040 |
| 1251 | 006750 | 020117 | 042504 | 040506 |
| 1252 | 006756 | 046125 | 020124 | 044124 |
| 1253 | 006764 | 052101 | 051440 | 042520 |
| 1254 | 006772 | 044503 | 044506 | 020103 |
| 1255 | 007000 | 040520 | 040524 | 042515 |
| 1256 | 007006 | 042524 | 006522 | 012    |
| 1257 | 007013 | 103    | 047117 | 051124 |
| 1258 | 007020 | 046117 | 041440 | 024040 |
| 1259 | 007026 | 041536 | 020051 | 047524 |
| 1260 | 007034 | 051040 | 052105 | 051125 |
| 1261 | 007042 | 020116 | 047524 | 043040 |
| 1262 | 007050 | 051111 | 052123 | 050040 |
| 1263 | 007056 | 051101 | 046501 | 052105 |
| 1264 | 007064 | 051105 | 051040 | 050505 |
| 1265 | 007072 | 042525 | 052123 | 005015 |
| 1266 | 007100 | 047503 | 052116 | 047522 |
| 1267 | 007106 | 020114 | 020103 | 057050 |
| 1268 | 007114 | 024503 | 040440 | 051514 |
| 1269 | 007122 | 020117 | 041101 | 051117 |
| 1270 | 007130 | 051524 | 052040 | 042510 |
| 1271 | 007136 | 050040 | 047522 | 051107 |
| 1272 | 007144 | 046501 | 047440 | 041516 |
| 1273 | 007152 | 020105 |        |        |
| 1274 | 007154 | 047506 | 046522 | 052101 |
| 1275 | 007162 | 044524 | 043516 | 044040 |
| 1276 | 007170 | 051501 | 051440 | 040524 |
| 1277 | 007176 | 052122 | 042105 | 005015 |

.ASCII /RESPOND TO THE FOLLOWING PARAMETER REQUESTS BY:/

.ASCII <15><12>/CONTROL Z (↑Z) (CR) TO ALLOW ALL OR /

.ASCII /REMAINING PARAMETERS TO DEFAULT/<15><12>

.ASCII /CARRIAGE RETURN TO DEFAULT THAT SPECIFIC PARAMETER/<15><12>

.ASCII /CONTROL C (↑C) TO RETURN TO FIRST PARAMETER REQUEST/<15><12>

.ASCII /CONTROL C (↑C) ALSO ABORTS THE PROGRAM ONCE /

.ASCII /FORMATTING HAS STARTED/<15><12><12>

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|      |        |        |        |        |                                                            |
|------|--------|--------|--------|--------|------------------------------------------------------------|
| 1278 | 007204 | 012    |        |        |                                                            |
| 1279 | 007205 | 117    | 006522 | 005012 | .ASCII /OR/<15><12><12>                                    |
| 1280 | 007212 | 047105 | 042524 | 020122 | .ASCII /ENTER THE DESIRED PARAMETER OPTION SELECTED /      |
| 1281 | 007220 | 044124 | 020105 | 042504 |                                                            |
| 1282 | 007226 | 044523 | 042522 | 020104 |                                                            |
| 1283 | 007234 | 040520 | 040522 | 042515 |                                                            |
| 1284 | 007242 | 042524 | 020122 | 050117 |                                                            |
| 1285 | 007250 | 044524 | 047117 | 051440 |                                                            |
| 1286 | 007256 | 046105 | 041505 | 042524 |                                                            |
| 1287 | 007264 | 020104 |        |        |                                                            |
| 1288 | 007266 | 051106 | 046517 | 052040 | .ASCII /FROM THE LIST BELOW./<15><12>                      |
| 1289 | 007274 | 042510 | 046040 | 051511 |                                                            |
| 1290 | 007302 | 020124 | 042502 | 047514 |                                                            |
| 1291 | 007310 | 027127 | 005015 |        |                                                            |
| 1292 | 007314 | 046101 | 020114 | 040526 | .ASCII /ALL VALUES TO BE ENTERED ARE OCTAL/<15><12><12>    |
| 1293 | 007322 | 052514 | 051505 | 052040 |                                                            |
| 1294 | 007330 | 020117 | 042502 | 042440 |                                                            |
| 1295 | 007336 | 052116 | 051105 | 042105 |                                                            |
| 1296 | 007344 | 040440 | 042522 | 047440 |                                                            |
| 1297 | 007352 | 052103 | 046101 | 005015 |                                                            |
| 1298 | 007360 | 012    |        |        |                                                            |
| 1299 | 007361 | 104    | 044522 | 042526 | .ASCII /DRIVE TYPE=(0 - 7) DEFAULTS TO 6 FOR RK06/<15><12> |
| 1300 | 007366 | 052040 | 050131 | 036505 |                                                            |
| 1301 | 007374 | 030050 | 026440 | 033440 |                                                            |
| 1302 | 007402 | 020051 | 042504 | 040506 |                                                            |
| 1303 | 007410 | 046125 | 051524 | 052040 |                                                            |
| 1304 | 007416 | 020117 | 020066 | 047506 |                                                            |
| 1305 | 007424 | 020122 | 045522 | 033060 |                                                            |
| 1306 | 007432 | 005015 |        |        |                                                            |
| 1307 | 007434 | 051104 | 053111 | 020105 | .ASCII /DRIVE NUM=(0-7) DEFAULTS TO 0/<15><12><12>         |
| 1308 | 007442 | 052516 | 036515 | 030050 |                                                            |
| 1309 | 007450 | 033455 | 020051 | 042504 |                                                            |
| 1310 | 007456 | 040506 | 046125 | 051524 |                                                            |
| 1311 | 007464 | 052040 | 020117 | 006460 |                                                            |
| 1312 | 007472 | 005012 |        |        |                                                            |
| 1313 | 007474 | 042523 | 052103 | 051117 | .ASCII &SECTORS/TRACK=(24,26) DEFAULTS TO 26&<15><12><12>  |
| 1314 | 007502 | 027523 | 051124 | 041501 |                                                            |
| 1315 | 007510 | 036513 | 031050 | 026064 |                                                            |
| 1316 | 007516 | 033062 | 020051 | 042504 |                                                            |
| 1317 | 007524 | 040506 | 046125 | 051524 |                                                            |
| 1318 | 007532 | 052040 | 020117 | 033062 |                                                            |
| 1319 | 007540 | 005015 | 012    |        |                                                            |
| 1320 | 007543 | 115    | 042117 | 036505 | .ASCII /MODE=(0-4) DEFAULTS TO 2/<15><12>                  |
| 1321 | 007550 | 030050 | 032055 | 020051 |                                                            |
| 1322 | 007556 | 042504 | 040506 | 046125 |                                                            |
| 1323 | 007564 | 051524 | 052040 | 020117 |                                                            |
| 1324 | 007572 | 006462 | 012    |        |                                                            |
| 1325 | 007575 | 040    | 020040 | 030040 | .ASCII / 0=WRITE HEADERS & DATA/<15><12>                   |
| 1326 | 007602 | 053475 | 044522 | 042524 |                                                            |
| 1327 | 007610 | 044040 | 040505 | 042504 |                                                            |
| 1328 | 007616 | 051522 | 023040 | 042040 |                                                            |
| 1329 | 007624 | 052101 | 006501 | 012    |                                                            |
| 1330 | 007631 | 040    | 020040 | 030440 | .ASCII / 1=WRITE HEADERS & DATA; VERIFY HEADERS/<15><12>   |
| 1331 | 007636 | 053475 | 044522 | 042524 |                                                            |
| 1332 | 007644 | 044040 | 040505 | 042504 |                                                            |
| 1333 | 007652 | 051522 | 023040 | 042040 |                                                            |

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|      |        |        |        |        |
|------|--------|--------|--------|--------|
| 1334 | 007660 | 052101 | 035501 | 053040 |
| 1335 | 007666 | 051105 | 043111 | 020131 |
| 1336 | 007674 | 042510 | 042101 | 051105 |
| 1337 | 007702 | 006523 | 012    |        |
| 1338 | 007705 | 040    | 020040 | 031040 |
| 1339 | 007712 | 053475 | 044522 | 042524 |
| 1340 | 007720 | 023040 | 053040 | 051105 |
| 1341 | 007726 | 043111 | 020131 | 042510 |
| 1342 | 007734 | 042101 | 051105 | 020123 |
| 1343 | 007742 | 020046 | 040504 | 040524 |
| 1344 | 007750 | 005015 |        |        |
| 1345 | 007752 | 020040 | 020040 | 036463 |
| 1346 | 007760 | 042526 | 044522 | 054506 |
| 1347 | 007766 | 044040 | 040505 | 042504 |
| 1348 | 007774 | 051522 | 005015 |        |
| 1349 | 010000 | 020040 | 020040 | 036464 |
| 1350 | 010006 | 042526 | 044522 | 054506 |
| 1351 | 010014 | 044040 | 040505 | 042504 |
| 1352 | 010022 | 051522 | 040440 | 042116 |
| 1353 | 010030 | 053040 | 051105 | 043111 |
| 1354 | 010036 | 020131 | 040504 | 040524 |
| 1355 | 010044 | 005015 | 012    |        |
| 1356 | 010047 | 105    | 042526 | 020116 |
| 1357 | 010054 | 054503 | 044514 | 042116 |
| 1358 | 010062 | 051105 | 050040 | 052101 |
| 1359 | 010070 | 042524 | 047122 | 024075 |
| 1360 | 010076 | 040504 | 040524 | 053440 |
| 1361 | 010104 | 051117 | 024504 | 042040 |
| 1362 | 010112 | 043105 | 052501 | 052114 |
| 1363 | 010120 | 020123 | 047524 | 030440 |
| 1364 | 010126 | 032463 | 032061 | 006463 |
| 1365 | 010134 | 012    |        |        |
| 1366 | 010135 | 117    | 042104 | 041440 |
| 1367 | 010142 | 046131 | 047111 | 042504 |
| 1368 | 010150 | 020122 | 040520 | 052124 |
| 1369 | 010156 | 051105 | 036516 | 042050 |
| 1370 | 010164 | 052101 | 020101 | 047527 |
| 1371 | 010172 | 042122 | 020051 | 042504 |
| 1372 | 010200 | 040506 | 046125 | 051524 |
| 1373 | 010206 | 052040 | 020117 | 033460 |
| 1374 | 010214 | 031462 | 033460 | 005015 |
| 1375 | 010222 | 051124 | 041501 | 020113 |
| 1376 | 010230 | 044514 | 044515 | 051524 |
| 1377 | 010236 | 036440 | 024040 | 026460 |
| 1378 | 010244 | 026062 | 026460 | 024462 |
| 1379 | 010252 | 042040 | 043105 | 052501 |
| 1380 | 010260 | 052114 | 020123 | 047524 |
| 1381 | 010266 | 030040 | 031054 | 005015 |
| 1382 | 010274 | 054503 | 044514 | 042116 |
| 1383 | 010302 | 051105 | 046040 | 046511 |
| 1384 | 010310 | 052111 | 020123 | 020075 |
| 1385 | 010316 | 030050 | 033055 | 031063 |
| 1386 | 010324 | 030054 | 033055 | 031063 |
| 1387 | 010332 | 020051 | 042504 | 040506 |
| 1388 | 010340 | 046125 | 051524 | 052040 |
| 1389 | 010346 | 020117 | 026060 | 031466 |

.ASCII / 2=WRITE & VERIFY HEADERS & DATA/<15><12>

.ASCII / 3=VERIFY HEADERS/<15><12>

.ASCII / 4=VERIFY HEADERS AND VERIFY DATA/<15><12><12>

.ASCII /EVEN CYLINDER PATTERN=(DATA WORD) DEFAULTS TO 135143/<15><12>

.ASCII /ODD CYLINDER PATTERN=(DATA WORD) DEFAULTS TO 072307/<15><12>

.ASCII /TRACK LIMITS = (0-2,0-2) DEFAULTS TO 0,2/<15><12>

.ASCII /CYLINDER LIMITS = (0-632,0-632) DEFAULTS TO 0,632/<15><12><12>

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 PROGRAM SPECIFIC RESERVED LOCATIONS

|      |        |        |        |        |
|------|--------|--------|--------|--------|
| 1390 | 010354 | 035462 | 005012 |        |
| 1391 | 010360 | 043117 | 051506 | 052105 |
| 1392 | 010366 | 024075 | 041517 | 040524 |
| 1393 | 010374 | 020114 | 043117 | 051506 |
| 1394 | 010402 | 052105 | 053040 | 046101 |
| 1395 | 010410 | 042525 | 020051 | 042504 |
| 1396 | 010416 | 040506 | 046125 | 051524 |
| 1397 | 010424 | 052040 | 020117 | 020060 |
| 1398 | 010432 | 030050 | 047440 | 043106 |
| 1399 | 010440 | 042523 | 024524 | 005015 |
| 1400 | 010446 | 020040 | 020040 | 020040 |
| 1401 | 010454 | 030060 | 020060 | 047101 |
| 1402 | 010462 | 020104 | 030061 | 020060 |
| 1403 | 010470 | 020075 | 047502 | 044124 |
| 1404 | 010476 | 040440 | 042522 | 055040 |
| 1405 | 010504 | 051105 | 020117 | 043117 |
| 1406 | 010512 | 051506 | 052105 | 005015 |
| 1407 | 010520 | 020040 | 020040 | 020040 |
| 1408 | 010526 | 033061 | 020060 | 020075 |
| 1409 | 010534 | 030455 | 030062 | 020060 |
| 1410 | 010542 | 044515 | 051103 | 020117 |
| 1411 | 010550 | 047111 | 044103 | 051505 |
| 1412 | 010556 | 005015 |        |        |
| 1413 | 010560 | 020040 | 020040 | 020040 |
| 1414 | 010566 | 033060 | 020060 | 020075 |
| 1415 | 010574 | 030453 | 030062 | 020060 |
| 1416 | 010602 | 044515 | 051103 | 020117 |
| 1417 | 010610 | 047111 | 044103 | 051505 |
| 1418 | 010616 | 005015 |        |        |
| 1419 | 010620 | 020040 | 020040 | 020040 |
| 1420 | 010626 | 040505 | 044103 | 041440 |
| 1421 | 010634 | 052517 | 052116 | 044440 |
| 1422 | 010642 | 020123 | 047101 | 047440 |
| 1423 | 010650 | 043106 | 042523 | 020124 |
| 1424 | 010656 | 047111 | 051103 | 046505 |
| 1425 | 010664 | 047105 | 020124 | 043117 |
| 1426 | 010672 | 031040 | 020065 | 044515 |
| 1427 | 010700 | 051103 | 020117 | 047111 |
| 1428 | 010706 | 044103 | 051505 | 005015 |
| 1429 | 010714 | 012    |        |        |
| 1430 | 010715 | 101    | 054516 | 051440 |
| 1431 | 010722 | 041505 | 047524 | 051522 |
| 1432 | 010730 | 052040 | 020117 | 042502 |
| 1433 | 010736 | 043040 | 040514 | 042507 |
| 1434 | 010744 | 020104 | 040502 | 037504 |
| 1435 | 010752 | 024040 | 054524 | 042520 |
| 1436 | 010760 | 054440 | 047440 | 020122 |
| 1437 | 010766 | 024516 | 005015 |        |
| 1438 | 010772 | 020040 | 020040 | 020040 |
| 1439 | 011000 | 043111 | 047040 | 044440 |
| 1440 | 011006 | 020123 | 054524 | 042520 |
| 1441 | 011014 | 026104 | 052040 | 042510 |
| 1442 | 011022 | 043040 | 051117 | 040515 |
| 1443 | 011030 | 020124 | 050117 | 051105 |
| 1444 | 011036 | 052101 | 047511 | 020116 |
| 1445 | 011044 | 051511 | 044440 | 044516 |

.ASCII / OFFSET=(OCTAL OFFSET VALUE) DEFAULTS TO C (0 OFFSET)/<15><12>

.ASCII / 000 AND 100 = BOTH ARE ZERO OFFSET/<15><12>

.ASCII / 160 = -1200 MICRO INCHES/<15><12>

.ASCII / 060 = +1200 MICRO INCHES/<15><12>

.ASCII / EACH COUNT IS AN OFFSET INCREMENT OF 25 MICRO INCHES/<15><12><12>

.ASCII / ANY SECTORS TO BE FLAGED BAD? (TYPE Y OR N)/<15><12>

.ASCII / IF N IS TYPED, THE FORMAT OPERATION IS INITIALIZED/<15><12>

|      |        |        |        |        |                                                                   |
|------|--------|--------|--------|--------|-------------------------------------------------------------------|
| 1446 | 011052 | 044524 | 046101 | 055111 |                                                                   |
| 1447 | 011060 | 042105 | 005015 |        |                                                                   |
| 1448 | 011064 | 020040 | 020040 | 020040 | .ASCII / AND ONLY THOSE SECTORS FOUND BAD BY THE FORMAT/(15)'12>  |
| 1449 | 011072 | 047101 | 020104 | 047117 |                                                                   |
| 1450 | 011100 | 054514 | 052040 | 047510 |                                                                   |
| 1451 | 011106 | 042523 | 051440 | 041505 |                                                                   |
| 1452 | 011114 | 047524 | 051522 | 043040 |                                                                   |
| 1453 | 011122 | 052517 | 042116 | 041040 |                                                                   |
| 1454 | 011130 | 042101 | 041040 | 020131 |                                                                   |
| 1455 | 011136 | 044124 | 020105 | 047506 |                                                                   |
| 1456 | 011144 | 046522 | 052101 | 005015 |                                                                   |
| 1457 | 011152 | 020040 | 020040 | 020040 | .ASCII / PROGRAM AND THOSE LISTED IN THE FACTORY TABLE/(15)<12>   |
| 1458 | 011160 | 051120 | 043517 | 040522 |                                                                   |
| 1459 | 011166 | 020115 | 047101 | 020104 |                                                                   |
| 1460 | 011174 | 044124 | 051517 | 020105 |                                                                   |
| 1461 | 011202 | 044514 | 052123 | 042105 |                                                                   |
| 1462 | 011210 | 044440 | 020116 | 044124 |                                                                   |
| 1463 | 011216 | 020105 | 040506 | 052103 |                                                                   |
| 1464 | 011224 | 051117 | 020131 | 040524 |                                                                   |
| 1465 | 011232 | 046102 | 006505 | 012    |                                                                   |
| 1466 | 011237 | 040    | 020040 | 020040 | .ASCII / ARE FLAGED BAD. IF Y IS TYPED, THE USER HAS THE/(15)<12> |
| 1467 | 011244 | 040440 | 042522 | 043040 |                                                                   |
| 1468 | 011252 | 040514 | 042507 | 020104 |                                                                   |
| 1469 | 011260 | 040502 | 027104 | 044440 |                                                                   |
| 1470 | 011266 | 020106 | 020131 | 051511 |                                                                   |
| 1471 | 011274 | 052040 | 050131 | 042105 |                                                                   |
| 1472 | 011302 | 020054 | 044124 | 020105 |                                                                   |
| 1473 | 011310 | 051525 | 051105 | 044040 |                                                                   |
| 1474 | 011316 | 051501 | 052040 | 042510 |                                                                   |
| 1475 | 011324 | 005015 |        |        |                                                                   |
| 1476 | 011326 | 020040 | 020040 | 020040 | .ASCII / CAPABILITY OF INSTRUCTING THE FORMATTER TO FLAG/(15)<12> |
| 1477 | 011334 | 040503 | 040520 | 044502 |                                                                   |
| 1478 | 011342 | 044514 | 054524 | 047440 |                                                                   |
| 1479 | 011350 | 020106 | 047111 | 052123 |                                                                   |
| 1480 | 011356 | 052522 | 052103 | 047111 |                                                                   |
| 1481 | 011364 | 020107 | 044124 | 020105 |                                                                   |
| 1482 | 011372 | 047506 | 046522 | 052101 |                                                                   |
| 1483 | 011400 | 042524 | 020122 | 047524 |                                                                   |
| 1484 | 011406 | 043040 | 040514 | 006507 |                                                                   |
| 1485 | 011414 | 012    |        |        |                                                                   |
| 1486 | 011415 | 040    | 020040 | 020040 | .ASCII / SPECIFIED SECTORS AS BAD. THE PROGRAM WILL/(15)<12>      |
| 1487 | 011422 | 051440 | 042520 | 044503 |                                                                   |
| 1488 | 011430 | 044506 | 042105 | 051440 |                                                                   |
| 1489 | 011436 | 041505 | 047524 | 051522 |                                                                   |
| 1490 | 011444 | 040440 | 020123 | 040502 |                                                                   |
| 1491 | 011452 | 027104 | 052040 | 042510 |                                                                   |
| 1492 | 011460 | 050040 | 047522 | 051107 |                                                                   |
| 1493 | 011466 | 046501 | 053440 | 046111 |                                                                   |
| 1494 | 011474 | 006514 | 012    |        |                                                                   |
| 1495 | 011477 | 040    | 020040 | 020040 | .ASCII / DIRECT THE USER IN HOW THIS IS DONE./(15)<12><12>        |
| 1496 | 011504 | 042040 | 051111 | 041505 |                                                                   |
| 1497 | 011512 | 020124 | 044124 | 020105 |                                                                   |
| 1498 | 011520 | 051525 | 051105 | 044440 |                                                                   |
| 1499 | 011526 | 020116 | 047510 | 020127 |                                                                   |
| 1500 | 011534 | 044124 | 051511 | 044440 |                                                                   |
| 1501 | 011542 | 020123 | 047504 | 042516 |                                                                   |

|      |        |        |        |        |                                                                       |
|------|--------|--------|--------|--------|-----------------------------------------------------------------------|
| 1502 | 011550 | 006456 | 005012 |        |                                                                       |
| 1503 | 011554 | 051120 | 051505 | 051105 | .ASCII / PRESERVE SOFTWARE BAD SECTOR FILE?(TYPE Y OR N)(CR)/(15)(12) |
| 1504 | 011562 | 042526 | 051440 | 043117 |                                                                       |
| 1505 | 011570 | 053524 | 051101 | 020105 |                                                                       |
| 1506 | 011576 | 040502 | 020104 | 042523 |                                                                       |
| 1507 | 011604 | 052103 | 051117 | 043040 |                                                                       |
| 1508 | 011612 | 046111 | 037505 | 052050 |                                                                       |
| 1509 | 011620 | 050131 | 020105 | 020131 |                                                                       |
| 1510 | 011626 | 051117 | 047040 | 024051 |                                                                       |
| 1511 | 011634 | 051103 | 006451 | 012    |                                                                       |
| 1512 | 011641 | 011    | 043111 | 054440 | .ASCII / IF Y IS TYPED, THE FORMATTER WILL PRESERVE THE/(15)(12)      |
| 1513 | 011646 | 044440 | 020123 | 054524 |                                                                       |
| 1514 | 011654 | 042520 | 026104 | 052040 |                                                                       |
| 1515 | 011662 | 042510 | 043040 | 051117 |                                                                       |
| 1516 | 011670 | 040515 | 052124 | 051105 |                                                                       |
| 1517 | 011676 | 053440 | 046111 | 020114 |                                                                       |
| 1518 | 011704 | 051120 | 051505 | 051105 |                                                                       |
| 1519 | 011712 | 042526 | 052040 | 042510 |                                                                       |
| 1520 | 011720 | 005015 |        |        |                                                                       |
| 1521 | 011722 | 040411 | 050120 | 044514 | .ASCII / APPLICABLE BAD SECTOR FILE, MARKING THE SECTORS/(15)(12)     |
| 1522 | 011730 | 040503 | 046102 | 020105 |                                                                       |
| 1523 | 011736 | 040502 | 020104 | 042523 |                                                                       |
| 1524 | 011744 | 052103 | 051117 | 043040 |                                                                       |
| 1525 | 011752 | 046111 | 026105 | 046440 |                                                                       |
| 1526 | 011760 | 051101 | 044513 | 043516 |                                                                       |
| 1527 | 011766 | 052040 | 042510 | 051440 |                                                                       |
| 1528 | 011774 | 041505 | 047524 | 051522 |                                                                       |
| 1529 | 012002 | 005015 |        |        |                                                                       |
| 1530 | 012004 | 041011 | 042101 | 052040 | .ASCII / BAD THAT ARE LISTED IN THE FILE. ANY ADDITIONAL/(15)(12)     |
| 1531 | 012012 | 040510 | 020124 | 051101 |                                                                       |
| 1532 | 012020 | 020105 | 044514 | 052123 |                                                                       |
| 1533 | 012026 | 042105 | 044440 | 020116 |                                                                       |
| 1534 | 012034 | 044124 | 020105 | 044506 |                                                                       |
| 1535 | 012042 | 042514 | 020056 | 047101 |                                                                       |
| 1536 | 012050 | 020131 | 042101 | 044504 |                                                                       |
| 1537 | 012056 | 044524 | 047117 | 046101 |                                                                       |
| 1538 | 012064 | 005015 |        |        |                                                                       |
| 1539 | 012066 | 051411 | 041505 | 047524 | .ASCII / SECTORS FOUND BAD BY THE PROGRAM ARE APPENDED/(15)(12)       |
| 1540 | 012074 | 051522 | 043040 | 052517 |                                                                       |
| 1541 | 012102 | 042116 | 041040 | 042101 |                                                                       |
| 1542 | 012110 | 041040 | 020131 | 044124 |                                                                       |
| 1543 | 012116 | 020105 | 051120 | 043517 |                                                                       |
| 1544 | 012124 | 040522 | 020115 | 051101 |                                                                       |
| 1545 | 012132 | 020105 | 050101 | 042520 |                                                                       |
| 1546 | 012140 | 042116 | 042105 | 005015 |                                                                       |
| 1547 | 012146 | 052011 | 020117 | 044124 | .ASCII / TO THE FILE. IF N IS TYPED THE BAD SECTOR FILE/(15)(12)      |
| 1548 | 012154 | 020105 | 044506 | 042514 |                                                                       |
| 1549 | 012162 | 020056 | 043111 | 047040 |                                                                       |
| 1550 | 012170 | 044440 | 020123 | 054524 |                                                                       |
| 1551 | 012176 | 042520 | 020104 | 044124 |                                                                       |
| 1552 | 012204 | 020105 | 040502 | 020104 |                                                                       |
| 1553 | 012212 | 042523 | 052103 | 051117 |                                                                       |
| 1554 | 012220 | 043040 | 046111 | 006505 |                                                                       |
| 1555 | 012226 | 012    |        |        |                                                                       |
| 1556 | 012227 | 011    | 051511 | 041440 | .ASCII / IS CLEARED BEFORE THE PROGRAM BEGINS./(15)(12)(12)           |
| 1557 | 012234 | 042514 | 051101 | 042105 |                                                                       |



|      |        |        |        |        |
|------|--------|--------|--------|--------|
| 1558 | 012242 | 041040 | 043105 | 051117 |
| 1559 | 012250 | 020105 | 044124 | 020105 |
| 1560 | 012256 | 051120 | 043517 | 040522 |
| 1561 | 012264 | 020115 | 042502 | 044507 |
| 1562 | 012272 | 051516 | 006456 | 005012 |
| 1563 | 012300 | 042523 | 020124 | 053523 |
| 1564 | 012306 | 052111 | 044103 | 033440 |
| 1565 | 012314 | 052040 | 020117 | 051120 |
| 1566 | 012322 | 047111 | 020124 | 020101 |
| 1567 | 012330 | 044514 | 052123 | 047440 |
| 1568 | 012336 | 020106 | 046101 | 020114 |
| 1569 | 012344 | 040502 | 020104 | 042523 |
| 1570 | 012352 | 052103 | 051117 | 027123 |
| 1571 | 012360 | 005015 | 012    |        |
| 1572 | 012363 | 123    | 052105 | 051440 |
| 1573 | 012370 | 044527 | 041524 | 020110 |
| 1574 | 012376 | 020061 | 047524 | 043040 |
| 1575 | 012404 | 051117 | 042503 | 051040 |
| 1576 | 012412 | 050105 | 051117 | 044524 |
| 1577 | 012420 | 043516 | 047440 | 020106 |
| 1578 | 012426 | 046101 | 020114 | 040504 |
| 1579 | 012434 | 040524 | 044440 | 020116 |
| 1580 | 012442 | 051105 | 047522 | 006522 |
| 1581 | 012450 | 005012 |        |        |
| 1582 | 012452 | 042523 | 020124 | 053523 |
| 1583 | 012460 | 052111 | 044103 | 030040 |
| 1584 | 012466 | 052040 | 020117 | 042522 |
| 1585 | 012474 | 042520 | 052101 | 052040 |
| 1586 | 012502 | 042510 | 042440 | 052116 |
| 1587 | 012510 | 051111 | 020105 | 047506 |
| 1588 | 012516 | 046522 | 052101 | 047440 |
| 1589 | 012524 | 042520 | 040522 | 044524 |
| 1590 | 012532 | 047117 | 005015 | 012    |
| 1591 | 012537 | 111    | 020106 | 044124 |
| 1592 | 012544 | 020105 | 047523 | 052106 |
| 1593 | 012552 | 040527 | 042522 | 051440 |
| 1594 | 012560 | 044527 | 041524 | 020110 |
| 1595 | 012566 | 042522 | 044507 | 052123 |
| 1596 | 012574 | 051105 | 044440 | 020123 |
| 1597 | 012602 | 047111 | 052440 | 042523 |
| 1598 | 012610 | 020054 | 005015 |        |
| 1599 | 012614 | 054524 | 044520 | 043516 |
| 1600 | 012622 | 041440 | 047117 | 051124 |
| 1601 | 012630 | 046117 | 043440 | 024040 |
| 1602 | 012636 | 043536 | 020051 | 040503 |
| 1603 | 012644 | 051525 | 051505 | 052040 |
| 1604 | 012652 | 042510 | 050040 | 047522 |
| 1605 | 012660 | 051107 | 046501 | 005015 |
| 1606 | 012666 | 047524 | 051040 | 050505 |
| 1607 | 012674 | 042525 | 052123 | 047040 |
| 1608 | 012702 | 053505 | 051440 | 051127 |
| 1609 | 012710 | 051440 | 052105 | 044524 |
| 1610 | 012716 | 043516 | 005015 | 012    |
| 1611 | 012723 | 105    | 042116 | 044040 |
| 1612 | 012730 | 046105 | 020120 | 044506 |
| 1613 | 012736 | 042514 | 005015 | 000012 |

.ASCII /SET SWITCH 7 TO PRINT A LIST OF ALL BAD SECTORS./&lt;15&gt;&lt;12&gt;&lt;12&gt;

.ASCII /SET SWITCH 1 TO FORCE REPORTING OF ALL DATA IN ERROR/&lt;15&gt;&lt;12&gt;&lt;12&gt;

.ASCII /SET SWITCH 0 TO REPEAT THE ENTIRE FORMAT OPERATION/&lt;15&gt;&lt;12&gt;&lt;12&gt;

.ASCII /IF THE SOFTWARE SWITCH REGISTER IS IN USE, /&lt;15&gt;&lt;12&gt;

.ASCII /TYPING CONTROL G (↑G) CAUSES THE PROGRAM/&lt;15&gt;&lt;12&gt;

.ASCII /TO REQUEST NEW SWR SETTING/&lt;15&gt;&lt;12&gt;&lt;12&gt;

.ASCII /END HELP FILE/&lt;15&gt;&lt;12&gt;&lt;12&gt;



## F03

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|      |        |        |        |                    |
|------|--------|--------|--------|--------------------|
| 1614 | 012744 | 020040 | 000    | SPACE2: .ASCIZ / / |
| 1615 |        |        |        |                    |
| 1616 | 012747 | 015    | 025012 | 020052             |
| 1617 | 012754 | 045522 | 033060 | 020113             |
| 1618 | 012762 | 040503 | 052122 | 044522             |
| 1619 | 012770 | 043504 | 020105 | 047506             |
| 1620 | 012776 | 046522 | 052101 | 051105             |
| 1621 | 013004 | 025040 | 006452 | 012                |
| 1622 | 013011 | 115    | 044501 | 042116             |
| 1623 | 013016 | 041505 | 030455 | 026461             |
| 1624 | 013024 | 055104 | 033122 | 026514             |
| 1625 | 013032 | 006502 | 000012 |                    |
| 1626 | 013036 | 054524 | 042520 | 044040             |
| 1627 | 013044 | 046105 | 020120 | 047506             |
| 1628 | 013052 | 020122 | 050117 | 051105             |
| 1629 | 013060 | 052101 | 047111 | 020107             |
| 1630 | 013066 | 047111 | 047506 | 020054             |
| 1631 | 013074 | 046105 | 042523 | 041440             |
| 1632 | 013102 | 006522 | 000012 |                    |
| 1633 | 013106 | 051104 | 053111 | 020105             |
| 1634 | 013114 | 054524 | 042520 | 030075             |
| 1635 | 013122 | 051104 | 053111 | 020105             |
| 1636 | 013130 | 052516 | 036515 | 000                |
| 1637 | 013135 | 123    | 041505 | 047524             |
| 1638 | 013142 | 027522 | 051124 | 041501             |
| 1639 | 013150 | 036513 | 000    |                    |
| 1640 | 013153 | 115    | 042117 | 036505             |
| 1641 | 013160 | 000    |        |                    |
| 1642 | 013161 | 105    | 042526 | 020116             |
| 1643 | 013166 | 054503 | 044514 | 042116             |
| 1644 | 013174 | 051105 | 050040 | 052101             |
| 1645 | 013202 | 042524 | 047122 | 000075             |
| 1646 | 013210 | 042117 | 020104 | 054503             |
| 1647 | 013216 | 044514 | 042116 | 051105             |
| 1648 | 013224 | 050040 | 052101 | 042524             |
| 1649 | 013232 | 047122 | 000075 |                    |
| 1650 | 013236 | 051124 | 041501 | 020113             |
| 1651 | 013244 | 044514 | 044515 | 051524             |
| 1652 | 013252 | 000075 |        |                    |
| 1653 | 013254 | 054503 | 044514 | 042116             |
| 1654 | 013262 | 051105 | 046040 | 046511             |
| 1655 | 013270 | 052111 | 036523 | 000                |
| 1656 | 013275 | 117    | 043106 | 042523             |
| 1657 | 013302 | 036524 | 000    |                    |
| 1658 | 013305 | 120    | 042522 | 042523             |
| 1659 | 013312 | 053122 | 020105 | 047523             |
| 1660 | 013320 | 052106 | 040527 | 042522             |
| 1661 | 013326 | 041040 | 042101 | 051440             |
| 1662 | 013334 | 041505 | 047524 | 020122             |
| 1663 | 013342 | 044506 | 042514 | 037523             |
| 1664 | 013350 | 052050 | 050131 | 020105             |
| 1665 | 013356 | 020131 | 051117 | 047040             |
| 1666 | 013364 | 024051 | 051103 | 000051             |
| 1667 | 013372 | 047523 | 052106 | 040527             |
| 1668 | 013400 | 042522 | 042040 | 052105             |
| 1669 | 013406 | 041505 | 042524 | 020104             |

PROGID: .ASCII <15><12>/\*\* RK06K CARTRIDGE FORMATER \*/<15><12>

.ASCIZ /MAINDEC-11-DZR6L-B/<15><12>

HELPQ: .ASCIZ /TYPE HELP FOR OPERATING INFO, ELSE CR/<15><12>

TPQ: .ASCIZ /DRIVE TYPE=/  
 DRVQ: .ASCIZ /DRIVE NUM=/  
 SECTQ: .ASCIZ &SECTOR/TRACK=&  
 MODEQ: .ASCIZ /MODE=/  
 WDEQ: .ASCIZ /EVEN CYLINDER PATTERN=/  
 WOOD: .ASCIZ /ODD CYLINDER PATTERN=/  
 TRKLIM: .ASCIZ /TRACK LIMITS=/  
 CYLLIM: .ASCIZ /CYLINDER LIMITS=/  
 OFFSETQ: .ASCIZ /OFFSET=/  
 PSDQ: .ASCIZ /PRESERVE SOFTWARE BAD SECTOR FILES?(TYPE Y OR N)(CR)/  
 SDBSFP: .ASCIZ /SOFTWARE DETECTED BAD SECTOR FILES /

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|      |        |        |        |        |
|------|--------|--------|--------|--------|
| 1670 | 013414 | 040502 | 020104 | 042523 |
| 1671 | 013422 | 052103 | 051117 | 043040 |
| 1672 | 013430 | 046111 | 051505 | 000040 |
| 1673 | 013436 | 051120 | 051505 | 051105 |
| 1674 | 013444 | 042526 | 006504 | 000012 |
| 1675 | 013452 | 047516 | 020124 | 051120 |
| 1676 | 013460 | 051505 | 051105 | 042526 |
| 1677 | 013466 | 006504 | 000012 |        |
| 1678 | 013472 | 047101 | 020131 | 042523 |
| 1679 | 013500 | 052103 | 051117 | 020123 |
| 1680 | 013506 | 047524 | 041040 | 020105 |
| 1681 | 013514 | 046106 | 043501 | 042105 |
| 1682 | 013522 | 041040 | 042101 | 020077 |
| 1683 | 013530 | 052050 | 050131 | 020105 |
| 1684 | 013536 | 020131 | 051117 | 047040 |
| 1685 | 013544 | 024051 | 051103 | 000051 |
| 1686 | 013552 | 047105 | 042524 | 020122 |
| 1687 | 013560 | 041517 | 040524 | 020114 |
| 1688 | 013566 | 042101 | 051104 | 051505 |
| 1689 | 013574 | 020123 | 047524 | 041040 |
| 1690 | 013602 | 020105 | 046106 | 043501 |
| 1691 | 013610 | 042105 | 041040 | 042101 |
| 1692 | 013616 | 044440 | 020116 | 047506 |
| 1693 | 013624 | 046522 | 052101 | 041440 |
| 1694 | 013632 | 041503 | 052054 | 051454 |
| 1695 | 013640 | 006523 | 000012 |        |
| 1696 | 013644 | 047105 | 042524 | 020122 |
| 1697 | 013652 | 042101 | 051104 | 051505 |
| 1698 | 013660 | 020123 | 051117 | 024040 |
| 1699 | 013666 | 051103 | 020051 | 047524 |
| 1700 | 013674 | 052040 | 051105 | 044515 |
| 1701 | 013702 | 040516 | 042524 | 005015 |
| 1702 | 013710 | 000    |        |        |
| 1703 | 013711 | 111    | 053116 | 046101 |
| 1704 | 013716 | 042111 | 042440 | 052116 |
| 1705 | 013724 | 054522 | 005015 | 000    |
| 1706 | 013731 | 111    | 053116 | 020104 |
| 1707 | 013736 | 042523 | 052103 | 051117 |
| 1708 | 013744 | 047040 | 046525 | 042502 |
| 1709 | 013752 | 006522 | 000012 |        |
| 1710 | 013756 | 047111 | 042126 | 051440 |
| 1711 | 013764 | 040524 | 052122 | 047111 |
| 1712 | 013772 | 020107 | 051117 | 042440 |
| 1713 | 014000 | 042116 | 047111 | 020107 |
| 1714 | 014006 | 040520 | 045503 | 040440 |
| 1715 | 014014 | 042104 | 042522 | 051523 |
| 1716 | 014022 | 005015 | 000    |        |
| 1717 | 014025 | 111    | 053116 | 020104 |
| 1718 | 014032 | 054503 | 044514 | 042116 |
| 1719 | 014040 | 051105 | 047040 | 046525 |
| 1720 | 014046 | 042502 | 020122 | 005015 |
| 1721 | 014054 | 000    |        |        |
| 1722 | 014055 | 111    | 053116 | 020104 |
| 1723 | 014062 | 051124 | 041501 | 020113 |
| 1724 | 014070 | 052516 | 041115 | 051105 |
| 1725 | 014076 | 006440 | 000012 |        |

PRSV: .ASCIZ /PRESERVED/&lt;15&gt;&lt;12&gt;

NPRSV: .ASCIZ /NOT PRESERVED/&lt;15&gt;&lt;12&gt;

UBSQ: .ASCIZ /ANY SECTORS TO BE FLAGED BAD? (TYPE Y OR N)(CR)/

UBSFMT: .ASCIZ /ENTER OCTAL ADDRESS TO BE FLAGED BAD IN FORMAT CCC,T,SS/&lt;15&gt;&lt;12&gt;

NEXTQ: .ASCIZ /ENTER ADDRESS OR (CR) TO TERMINATE/&lt;15&gt;&lt;12&gt;

BADENT: .ASCIZ /INVALID ENTRY/&lt;15&gt;&lt;12&gt;

ILLSEC: .ASCIZ /INVD SECTOR NUMBER/&lt;15&gt;&lt;12&gt;

INVDSE: .ASCIZ /INVD STARTING OR ENDING PACK ADDRESS/&lt;15&gt;&lt;12&gt;

INVD CY: .ASCIZ /INVD CYLINDER NUMBER /&lt;15&gt;&lt;12&gt;

INVDTK: .ASCIZ /INVD TRACK NUMBER /&lt;15&gt;&lt;12&gt;

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|      |        |        |        |        |                                                                             |
|------|--------|--------|--------|--------|-----------------------------------------------------------------------------|
| 1726 | 014102 | 047111 | 042126 | 042040 | INVDDR: .ASCIZ /INVD DRIVE NUMBER/<15><12>                                  |
| 1727 | 014110 | 044522 | 042526 | 047040 |                                                                             |
| 1728 | 014116 | 046525 | 042502 | 006522 |                                                                             |
| 1729 | 014124 | 000012 |        |        |                                                                             |
| 1730 | 014126 | 047111 | 042126 | 042040 | INVDTP: .ASCIZ /INVD DRIVE TYPE/<15><12>                                    |
| 1731 | 014134 | 044522 | 042526 | 052040 |                                                                             |
| 1732 | 014142 | 050131 | 006505 | 000012 |                                                                             |
| 1733 | 014150 | 047111 | 042126 | 046440 | INVDMD: .ASCIZ /INVD MODE SELECTION (MAX OF 4)/<15><12>                     |
| 1734 | 014156 | 042117 | 020105 | 042523 |                                                                             |
| 1735 | 014164 | 042514 | 052103 | 047511 |                                                                             |
| 1736 | 014172 | 020116 | 046450 | 054101 |                                                                             |
| 1737 | 014200 | 047440 | 020106 | 024464 |                                                                             |
| 1738 | 014206 | 005015 | 000    |        |                                                                             |
| 1739 | 014211 | 111    | 053116 | 020104 | INVD0F: .ASCIZ /INVD OFFSET VALUE/<15><12>                                  |
| 1740 | 014216 | 043117 | 051506 | 052105 |                                                                             |
| 1741 | 014224 | 053040 | 046101 | 042525 |                                                                             |
| 1742 | 014232 | 005015 | 000    |        |                                                                             |
| 1743 | 014235 | 120    | 042514 | 051501 | SWLREQ: .ASCIZ /PLEASE SET WRITE LOCK FOR VERIFY OPERATIONS/<15><12>        |
| 1744 | 014242 | 020105 | 042523 | 020124 |                                                                             |
| 1745 | 014250 | 051127 | 052111 | 020105 |                                                                             |
| 1746 | 014256 | 047514 | 045503 | 043040 |                                                                             |
| 1747 | 014264 | 051117 | 053040 | 051105 |                                                                             |
| 1748 | 014272 | 043111 | 020131 | 050117 |                                                                             |
| 1749 | 014300 | 051105 | 052101 | 047511 |                                                                             |
| 1750 | 014306 | 051516 | 005015 | 000    |                                                                             |
| 1751 | 014313 | 120    | 042514 | 051501 | RWLREQ: .ASCIZ /PLEASE RESET WRITE LOCK FOR FORMAT OPERATIONS/<15><12>      |
| 1752 | 014320 | 020105 | 042522 | 042523 |                                                                             |
| 1753 | 014326 | 020124 | 051127 | 052111 |                                                                             |
| 1754 | 014334 | 020105 | 047514 | 045503 |                                                                             |
| 1755 | 014342 | 043040 | 051117 | 043040 |                                                                             |
| 1756 | 014350 | 051117 | 040515 | 020124 |                                                                             |
| 1757 | 014356 | 050117 | 051105 | 052101 |                                                                             |
| 1758 | 014364 | 047511 | 051516 | 005015 |                                                                             |
| 1759 | 014372 | 000    |        |        |                                                                             |
| 1760 | 014373 | 120    | 042522 | 051523 | CONREQ: .ASCIZ /PRESS CONTINUE WHEN READY/<15><12>                          |
| 1761 | 014400 | 041440 | 047117 | 044524 |                                                                             |
| 1762 | 014406 | 052516 | 020105 | 044127 |                                                                             |
| 1763 | 014414 | 047105 | 051040 | 040505 |                                                                             |
| 1764 | 014422 | 054504 | 005015 | 000    |                                                                             |
| 1765 | 014427 | 103    | 047101 | 047516 | BAD632: .ASCIZ /CANNOT READ BAD SECTOR TRACK/<15><12>                       |
| 1766 | 014434 | 020124 | 042522 | 042101 |                                                                             |
| 1767 | 014442 | 041040 | 042101 | 051440 |                                                                             |
| 1768 | 014450 | 041505 | 047524 | 020122 |                                                                             |
| 1769 | 014456 | 051124 | 041501 | 006513 |                                                                             |
| 1770 | 014464 | 000012 |        |        |                                                                             |
| 1771 | 014466 | 047523 | 052106 | 040527 | TDMSOF: .ASCIZ /SOFTWARE BAD SECTOR FILE NOT FORMATTED PROPERLY OR/<15><12> |
| 1772 | 014474 | 042522 | 041040 | 042101 |                                                                             |
| 1773 | 014502 | 051440 | 041505 | 047524 |                                                                             |
| 1774 | 014510 | 020122 | 044506 | 042514 |                                                                             |
| 1775 | 014516 | 047040 | 052117 | 043040 |                                                                             |
| 1776 | 014524 | 051117 | 040515 | 052124 |                                                                             |
| 1777 | 014532 | 042105 | 050040 | 047522 |                                                                             |
| 1778 | 014540 | 042520 | 046122 | 020131 |                                                                             |
| 1779 | 014546 | 051117 | 005015 | 000    |                                                                             |
| 1780 | 014553 | 106    | 046111 | 020105 | TDMSUF: .ASCIZ /FILE IS TOO LARGE FOR THE PROGRAM ( >100 ENTRIES)/<15><12>  |
| 1781 | 014560 | 051511 | 052040 | 047517 |                                                                             |

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|      |        |        |        |        |
|------|--------|--------|--------|--------|
| 1782 | 014566 | 046040 | 051101 | 042507 |
| 1783 | 014574 | 043040 | 051117 | 052040 |
| 1784 | 014602 | 042510 | 050040 | 047522 |
| 1785 | 014610 | 051107 | 046501 | 024040 |
| 1786 | 014616 | 037040 | 030061 | 020060 |
| 1787 | 014624 | 047105 | 051124 | 042511 |
| 1788 | 014632 | 024523 | 005015 | 000    |
| 1789 | 014637 | 106    | 041501 | 047524 |
| 1790 | 014644 | 054522 | 041040 | 042101 |
| 1791 | 014652 | 051440 | 041505 | 047524 |
| 1792 | 014660 | 020122 | 044506 | 042514 |
| 1793 | 014666 | 047040 | 052117 | 043040 |
| 1794 | 014674 | 051117 | 040515 | 052124 |
| 1795 | 014702 | 042105 | 050040 | 047522 |
| 1796 | 014710 | 042520 | 046122 | 020131 |
| 1797 | 014716 | 051117 | 005015 | 000    |
| 1798 | 014723 | 103    | 051101 | 051124 |
| 1799 | 014730 | 042111 | 042507 | 051440 |
| 1800 | 014736 | 051105 | 040511 | 020114 |
| 1801 | 014744 | 052516 | 041115 | 051105 |
| 1802 | 014752 | 025040 | 025052 | 025052 |
| 1803 | 014760 | 020040 | 000    |        |
| 1804 | 014763 | 103    | 051101 | 051124 |
| 1805 | 014770 | 042111 | 042507 | 046440 |
| 1806 | 014776 | 052517 | 052116 | 042105 |
| 1807 | 015004 | 044440 | 020123 | 047101 |
| 1808 | 015012 | 040440 | 044514 | 047107 |
| 1809 | 015020 | 042515 | 052116 | 041440 |
| 1810 | 015026 | 051101 | 051124 | 042111 |
| 1811 | 015034 | 042507 | 006456 | 012    |
| 1812 | 015041 | 106    | 051117 | 040515 |
| 1813 | 015046 | 020124 | 051511 | 040440 |
| 1814 | 015054 | 047502 | 052122 | 042105 |
| 1815 | 015062 | 005015 | 000012 |        |
| 1816 | 015066 | 047516 | 042040 | 052101 |
| 1817 | 015074 | 020101 | 044103 | 041505 |
| 1818 | 015102 | 020113 | 047440 | 020116 |
| 1819 | 015110 | 042523 | 052103 | 051117 |
| 1820 | 015116 | 052040 | 040510 | 020124 |
| 1821 | 015124 | 044527 | 046114 | 047040 |
| 1822 | 015132 | 052117 | 050040 | 051501 |
| 1823 | 015140 | 020123 | 051127 | 052111 |
| 1824 | 015146 | 020105 | 044103 | 041505 |
| 1825 | 015154 | 006513 | 000012 |        |
| 1826 | 015160 | 040504 | 040524 | 041440 |
| 1827 | 015166 | 042510 | 045503 | 042440 |
| 1828 | 015174 | 051122 | 051117 | 044440 |
| 1829 | 015202 | 020116 | 051127 | 052111 |
| 1830 | 015210 | 027105 | 044440 | 050115 |
| 1831 | 015216 | 051517 | 044523 | 046102 |
| 1832 | 015224 | 020505 | 020441 | 005015 |
| 1833 | 015232 | 000    |        |        |
| 1834 | 015233 | 105    | 041503 | 041440 |
| 1835 | 015240 | 051117 | 042522 | 052103 |
| 1836 | 015246 | 041101 | 042514 | 005015 |
| 1837 | 015254 | 000    |        |        |

TDMFAC: .ASCIZ /FACTORY BAD SECTOR FILE NOT FORMATTED PROPERLY OR/<15><12>

SERNUM: .ASCIZ /CARTRIDGE SERIAL NUMBER \*\*\*\*\* /

ALNPAC: .ASCII /CARTRIDGE MOUNTED IS AN ALIGNMENT CARTRIDGE./<15><12>

.ASCIZ /FORMAT IS ABORTED/<15><12><12>

IMPER2: .ASCIZ /NO DATA CHECK ON SECTOR THAT WILL NOT PASS WRITE CHECK/<15><12>

IMPERR: .ASCIZ /DATA CHECK ERROR IN WRITE. IMPOSSIBLE!!!/<15><12>

CORABL: .ASCIZ /ECC CORRECTABLE/<15><12>

|      |        |        |        |        |                                                                                 |
|------|--------|--------|--------|--------|---------------------------------------------------------------------------------|
| 1838 | 015255 | 012    | 025052 | 020040 | PRGRS1: .ASCIZ <12>/** WRITE OPERATION COMPLETE **/<15><12><12>                 |
| 1839 | 015262 | 051127 | 052111 | 020105 |                                                                                 |
| 1840 | 015270 | 050117 | 051105 | 052101 |                                                                                 |
| 1841 | 015276 | 047511 | 020116 | 047503 |                                                                                 |
| 1842 | 015304 | 050115 | 042514 | 042524 |                                                                                 |
| 1843 | 015312 | 020040 | 025052 | 005015 |                                                                                 |
| 1844 | 015320 | 000012 |        |        |                                                                                 |
| 1845 | 015322 | 025012 | 020052 | 053040 | PRGRS2: .ASCIZ <12>/** VERIFY OPERATION COMPLETE **/<15><12><12>                |
| 1846 | 015330 | 051105 | 043111 | 020131 |                                                                                 |
| 1847 | 015336 | 050117 | 051105 | 052101 |                                                                                 |
| 1848 | 015344 | 047511 | 020116 | 047503 |                                                                                 |
| 1849 | 015352 | 050115 | 042514 | 042524 |                                                                                 |
| 1850 | 015360 | 020040 | 025052 | 005015 |                                                                                 |
| 1851 | 015366 | 000012 |        |        |                                                                                 |
| 1852 | 015370 | 020040 | 025052 | 025052 | STARS: .ASCIZ / *****/<15><12>                                                  |
| 1853 | 015376 | 006452 | 000012 |        |                                                                                 |
| 1854 | 015402 | 042412 | 051122 | 051117 | BSWERR: .ASCIZ <12>/ERROR WRITING SOFTWARE DETECTED BAD SECTOR TABLES./<15><12> |
| 1855 | 015410 | 053440 | 044522 | 044524 |                                                                                 |
| 1856 | 015416 | 043516 | 051440 | 043117 |                                                                                 |
| 1857 | 015424 | 053524 | 051101 | 020105 |                                                                                 |
| 1858 | 015432 | 042504 | 042524 | 052103 |                                                                                 |
| 1859 | 015440 | 042105 | 041040 | 042101 |                                                                                 |
| 1860 | 015446 | 051440 | 041505 | 047524 |                                                                                 |
| 1861 | 015454 | 020122 | 040524 | 046102 |                                                                                 |
| 1862 | 015462 | 051505 | 006456 | 000012 |                                                                                 |
| 1863 | 015470 | 042523 | 052103 | 051117 | SECINE: .ASCIZ /SECTOR IN ERROR =/                                              |
| 1864 | 015476 | 044440 | 020116 | 051105 |                                                                                 |
| 1865 | 015504 | 047522 | 020122 | 000075 |                                                                                 |
| 1866 | 015512 | 041012 | 042101 | 051440 | BSWTFI: .ASCIZ <12>/BAD SECTOR TABLE WRITTEN./<15><12>                          |
| 1867 | 015520 | 041505 | 047524 | 020122 |                                                                                 |
| 1868 | 015526 | 040524 | 046102 | 020105 |                                                                                 |
| 1869 | 015534 | 051127 | 052111 | 042524 |                                                                                 |
| 1870 | 015542 | 027116 | 005015 | 000    |                                                                                 |
| 1871 | 015547 | 012    | 044124 | 020105 | BSHEAD: .ASCIZ <12>/THE BAD SECTORS FOR THIS CARTRIDGE IN /                     |
| 1872 | 015554 | 040502 | 020104 | 042523 |                                                                                 |
| 1873 | 015562 | 052103 | 051117 | 020123 |                                                                                 |
| 1874 | 015570 | 047506 | 020122 | 044124 |                                                                                 |
| 1875 | 015576 | 051511 | 041440 | 051101 |                                                                                 |
| 1876 | 015604 | 051124 | 042111 | 042507 |                                                                                 |
| 1877 | 015612 | 044440 | 020116 | 000    |                                                                                 |
| 1878 | 015617 | 040    | 042523 | 052103 | BSTAIL: .ASCIZ / SECTOR FORMAT ARE:/<15><12>                                    |
| 1879 | 015624 | 051117 | 043040 | 051117 |                                                                                 |
| 1880 | 015632 | 040515 | 020124 | 051101 |                                                                                 |
| 1881 | 015640 | 035105 | 005015 | 000    |                                                                                 |
| 1882 | 015645 | 012    | 040502 | 020104 | FBSLAB: .ASCIZ <12>/BAD SECTORS IN FACTORY TABLE:/<15><12>                      |
| 1883 | 015652 | 042523 | 052103 | 051117 |                                                                                 |
| 1884 | 015660 | 020123 | 047111 | 043040 |                                                                                 |
| 1885 | 015666 | 041501 | 047524 | 054522 |                                                                                 |
| 1886 | 015674 | 052040 | 041101 | 042514 |                                                                                 |
| 1887 | 015702 | 006472 | 000012 |        |                                                                                 |
| 1888 | 015706 | 005015 | 040502 | 020104 | SBSLAB: .ASCIZ <15><12>/BAD SECTORS IN SOFTWARE TABLE:/<15><12>                 |
| 1889 | 015714 | 042523 | 052103 | 051117 |                                                                                 |
| 1890 | 015722 | 020123 | 047111 | 051440 |                                                                                 |
| 1891 | 015730 | 043117 | 053524 | 051101 |                                                                                 |
| 1892 | 015736 | 020105 | 040524 | 046102 |                                                                                 |
| 1893 | 015744 | 035105 | 005015 | 000    |                                                                                 |

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|      |        |        |        |        |         |        |                                                  |
|------|--------|--------|--------|--------|---------|--------|--------------------------------------------------|
| 1894 | 015751 | 116    | 047117 | 006505 | NONE:   | .ASCIZ | /NONE/<15><12>                                   |
| 1895 | 015756 | 000012 |        |        | TWENTY: | .ASCIZ | /20/                                             |
| 1896 | 015760 | 030062 | 000    |        | TWENT2: | .ASCIZ | /22/                                             |
| 1897 | 015763 | 062    | 000062 |        | COLHD:  | .ASCIZ | / CYLNR TRACK SECTOR/<15><12>                    |
| 1898 | 015766 | 020040 | 020040 | 054503 |         |        |                                                  |
| 1899 | 015774 | 047114 | 051104 | 020040 |         |        |                                                  |
| 1900 | 016002 | 051124 | 041501 | 020113 |         |        |                                                  |
| 1901 | 016010 | 020040 | 042523 | 052103 |         |        |                                                  |
| 1902 | 016016 | 051117 | 005015 | 000    |         |        |                                                  |
| 1903 | 016023 | 040    | 020040 | 000040 | SPACE4: | .ASCIZ | / /                                              |
| 1904 | 016030 | 020040 | 000040 |        | SPACE3: | .ASCIZ | / /                                              |
| 1905 | 016034 | 005015 | 036440 | 052040 | TOTMES: | .ASCIZ | <15><12>/ = TOTAL NUMBER OF BAD SECTORS/<15><12> |
| 1906 | 016042 | 052117 | 046101 | 047040 |         |        |                                                  |
| 1907 | 016050 | 046525 | 042502 | 020122 |         |        |                                                  |
| 1908 | 016056 | 043117 | 041040 | 042101 |         |        |                                                  |
| 1909 | 016064 | 051440 | 041505 | 047524 |         |        |                                                  |
| 1910 | 016072 | 051522 | 005015 | 000    |         |        |                                                  |
| 1911 |        |        |        |        |         |        |                                                  |
| 1912 |        | 016100 |        |        |         |        |                                                  |
| 1913 | 016100 |        |        |        |         |        |                                                  |
| 1914 |        |        |        |        |         |        |                                                  |
| 1915 |        |        |        |        |         |        |                                                  |
| 1916 | 016100 | 012706 | 001100 |        |         |        |                                                  |
| 1917 | 016104 | 005026 |        |        |         |        |                                                  |
| 1918 | 016106 | 022706 | 001140 |        |         |        |                                                  |
| 1919 | 016112 | 001374 |        |        |         |        |                                                  |
| 1920 | 016114 | 012706 | 001100 |        |         |        |                                                  |
| 1921 |        |        |        |        |         |        |                                                  |
| 1922 | 016120 | 012737 | 040350 | 000030 |         |        |                                                  |
| 1923 | 016126 | 012737 | 000340 | 000072 |         |        |                                                  |
| 1924 | 016134 | 012737 | 042400 | 000094 |         |        |                                                  |
| 1925 | 016142 | 012737 | 000340 | 000036 |         |        |                                                  |
| 1926 | 016150 | 012737 | 042030 | 000024 |         |        |                                                  |
| 1927 | 016156 | 012737 | 000340 | 000026 |         |        |                                                  |
| 1928 | 016164 | 005037 | 001260 |        |         |        |                                                  |
| 1929 | 016170 | 112737 | 000001 | 001115 |         |        |                                                  |
| 1930 |        |        |        |        |         |        |                                                  |
| 1931 |        |        |        |        |         |        |                                                  |
| 1932 | 016176 | 013746 | 000004 |        |         |        |                                                  |
| 1933 | 016202 | 012737 | 016236 | 000004 |         |        |                                                  |
| 1934 | 016210 | 012737 | 177570 | 001140 |         |        |                                                  |
| 1935 | 016216 | 012737 | 177570 | 001142 |         |        |                                                  |
| 1936 | 016224 | 022777 | 177777 | 162706 |         |        |                                                  |
| 1937 | 016232 | 001012 |        |        |         |        |                                                  |
| 1938 |        |        |        |        |         |        |                                                  |
| 1939 | 016234 | 000403 |        |        |         |        |                                                  |
| 1940 | 016236 | 012716 | 016244 |        |         |        |                                                  |
| 1941 | 016242 | 000002 |        |        |         |        |                                                  |
| 1942 | 016244 | 012737 | 000176 | 001140 |         |        |                                                  |
| 1943 | 016252 | 012737 | 000174 | 001142 |         |        |                                                  |
| 1944 | 016260 | 012637 | 000004 |        |         |        |                                                  |
| 1945 |        |        |        |        |         |        |                                                  |
| 1946 | 016264 | 004737 | 040520 |        |         |        |                                                  |
| 1947 | 016270 | 013701 | 002572 |        |         |        |                                                  |
| 1948 | 016274 | 012721 | 032232 |        |         |        |                                                  |
| 1949 | 016300 | 012711 | 000340 |        |         |        |                                                  |

```

.EVEN
START:
.SBTL INITIALIZE THE COMMON TAGS
;;CLEAR THE COMMON TAGS ($CMTAG) AREA
MOV     $CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
CLR     (R6)+          ;;CLEAR MEMORY LOCATION
CMP     $SWR,R6 ;;DONE?
BNE     -6              ;;LOOP BACK IF NO
MOV     $STACK,SP      ;;SETUP THE STACK POINTER
;;INITIALIZE A FEW VECTORS
MOV     $ERROR,$EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
MOV     $340,$EMTVEC+2 ;;LEVEL 7
MOV     $STRAP,$TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
MOV     $340,$TRAPVEC+2 ;;LEVEL 7
MOV     $SPWRDN,$PWRVEC ;;POWER FAILURE VECTOR
MOV     $340,$PWRVEC+2 ;;LEVEL 7
CLR     $ESCAPE        ;;CLEAR THE ESCAPE ON ERROR ADDRESS
MOV     $1,$SERMAX     ;;ALLOW ONE ERROR PER TEST
;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
;;EQUAL TO A "-1" SETUP FOR A SOFTWARE SWITCH REGISTER.
MOV     $ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
MOV     $64,$ERRVEC   ;;SET UP ERROR VECTOR
MOV     $DSWR,$SWR    ;;SETUP FOR A HARDWARE SWICH REGISTER
MOV     $DDISP,$DISPLAY ;;AND A HARDWARE DISPLAY REGISTER
CMP     #-1,$SWR      ;;TRY TO REFERENCE HARDWARE SWR
BNE     66$           ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
;;AND THE HARDWARE SWR IS NOT = -1
BR      65$          ;;BRANCH IF NO TIMEOUT
64$:    MOV     $65$,(SP) ;;SET UP FOR TRAP RETURN
RTI
65$:    MOV     $SWREG,$SWR ;;POINT TO SOFTWARE SWR
MOV     $DISPREG,$DISPLAY
66$:    MOV     (SP)+,$ERRVEC ;;RESTORE ERROR VECTOR
JSR     PC,$TKINT     ;;INIT KEYBOARD
MOV     $RKVEC,$R1    ;;GET ADDRESS OF VECTOR STORAGE
MOV     $I,$INTR,(R1)+ ;;SET IT TO INTERRUPT HNDLR
MOV     $PR7,(R1)     ;;SET INTERRUPT HANDLER PR7

```



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|      |        |        |        |        |         |             |                          |
|------|--------|--------|--------|--------|---------|-------------|--------------------------|
| 1950 | 016304 | 013746 | 000000 |        | MOV     | 0, -(SP)    | ;; PUT NEW PS ON STACK   |
| 1951 | 016310 | 012746 | 016316 |        | MOV     | #67\$,-(SP) | ;; PUT NEW PC ON STACK   |
| 1952 | 016314 | 000002 |        |        | RTI     |             | ;; POP NEW PC AND PS     |
| 1953 | 016316 |        |        | 67\$:  |         |             |                          |
| 1954 | 016316 | 104401 | 012747 |        | TYPE    | ,PROGID     | ;; TYPE IDENTIFICATION   |
| 1955 | 016322 | 104401 | 013036 |        | TYPE    | ,HELPO      | ;; TYPE HELP QUESTION    |
| 1956 | 016326 | 104410 |        |        | RDLIN   |             | ;; GET ANSWER TO HELP Q. |
| 1957 | 016330 | 012601 |        |        | MOV     | (SP)+,R1    | ;; GET ADDRESS OF ANSWER |
| 1958 | 016332 | 105711 |        |        | TSTB    | (R1)        | ;; TEST FIRST CHAR       |
| 1959 | 016334 | 001402 |        |        | BEQ     | STPARM      |                          |
| 1960 | 016336 | 104401 | 006377 |        | TYPE    | ,HELPL      | ;; TYPE HELP FILE        |
| 1961 |        |        |        |        |         |             |                          |
| 1962 |        |        |        |        |         |             |                          |
| 1963 |        |        |        |        |         |             |                          |
| 1964 |        |        |        |        |         |             |                          |
| 1965 |        |        |        |        |         |             |                          |
| 1966 |        |        |        |        |         |             |                          |
| 1967 |        |        |        |        |         |             |                          |
| 1968 |        |        |        |        |         |             |                          |
| 1969 |        |        |        |        |         |             |                          |
| 1970 |        |        |        |        |         |             |                          |
| 1971 |        |        |        |        |         |             |                          |
| 1972 |        |        |        |        |         |             |                          |
| 1973 |        |        |        |        |         |             |                          |
| 1974 | 016342 | 012702 | 006310 |        | STPARM: | MOV         | #INITP,R2                |
| 1975 | 016346 | 012703 | 006336 |        |         | MOV         | #TPINUS,R3               |
| 1976 | 016352 | 104401 | 013106 |        |         | TYPE        | TPQ                      |
| 1977 | 016356 | 004437 | 017610 |        |         | JSR         | R4,GETANS                |
| 1978 | 016362 | 104401 | 013122 |        |         | TYPE        | DRVQ                     |
| 1979 | 016366 | 004437 | 017610 |        |         | JSR         | R4,GETANS                |
| 1980 | 016372 | 104401 | 013135 |        |         | TYPE        | SECTQ                    |
| 1981 | 016376 | 004437 | 017610 |        |         | JSR         | R4,GETANS                |
| 1982 | 016402 | 104401 | 013153 |        | PARAM3: | TYPE        | MODEQ                    |
| 1983 | 016406 | 004437 | 017610 |        |         | JSR         | R4,GETANS                |
| 1984 | 016412 | 104401 | 013161 |        |         | TYPE        | WDEQ                     |
| 1985 | 016416 | 004437 | 017610 |        |         | JSR         | R4,GETANS                |
| 1986 | 016422 | 104401 | 013210 |        |         | TYPE        | WDD                      |
| 1987 | 016426 | 004437 | 017610 |        |         | JSR         | R4,GETANS                |
| 1988 | 016432 | 104401 | 013236 |        | PARAM5: | TYPE        | TAKLIM                   |
| 1989 | 016436 | 004437 | 017610 |        |         | JSR         | R4,GETANS                |
| 1990 | 016442 | 104401 | 013254 |        |         | TYPE        | CYLLIM                   |
| 1991 | 016446 | 004437 | 017610 |        |         | JSR         | R4,GETANS                |
| 1992 | 016452 | 104401 | 013275 |        | PARAM6: | TYPE        | OFSETO                   |
| 1993 | 016456 | 004437 | 017610 |        |         | JSR         | R4,GETANS                |
| 1994 | 016462 | 023727 | 006336 | 000007 | DONEPR: | CMP         | TPINUS,#7                |
| 1995 | 016470 | 001405 |        |        |         | BEQ         | 4\$                      |
| 1996 | 016472 | 023727 | 006336 | 000006 |         | CMP         | TPINUS,#6                |
| 1997 | 016500 | 001401 |        |        |         | BEQ         | 4\$                      |
| 1998 | 016502 | 000473 |        |        |         | BR          | IVDTP                    |
| 1999 | 016504 | 023737 | 006360 | 006356 | 4\$:    | CMP         | ECINUS,SCINUS            |
| 2000 | 016512 | 002447 |        |        |         | BLT         | RSTADD                   |
| 2001 | 016514 | 023737 | 006354 | 006352 |         | CMP         | ETINUS,STINUS            |
| 2002 | 016522 | 002443 |        |        |         | BLT         | RSTADD                   |
| 2003 | 016524 | 023727 | 006360 | 000632 |         | CMP         | ECINUS,#632              |
| 2004 | 016532 | 003042 |        |        |         | BGT         | IVDCYL                   |
| 2005 | 016534 | 105037 | 002653 |        |         | CLRB        | TYPFMT                   |

;\*\*\*\*\*  
 ;SBTTL PARAMETER REQUEST & CHECK ROUTINE  
 ;\*ENTRY: AUTOMATIC AT START OF PROGRAM.  
 ;\*EXIT: GO TO MODE DECODE.  
 ;\*  
 ;\*THIS ROUTINE REQUESTS EACH PARAMETER IN TURN AND CALLS  
 ;\*THE GETANS SUBROUTINE TO HANDLE THE ANSWERS AND STORE  
 ;\*THEM. IT THEN CHECKS THE PARAMETERS FOR LEGALITY AND  
 ;\*VALIDITY AND, IF AN ERROR IS FOUND, REQUESTS THE  
 ;\*PARAMETERS AGAIN, STARTING WITH THE PARAMETER IN ERROR.  
 ;\*\*\*\*\*

; STARTING ADDRESS OF DEF. PARAM  
 ; STARTING ADD OF ACTIVE PARAMS  
 ; TYPE DRIVE TYPE QUESTION  
 ; TYPE DRIVE QUESTION  
 ; GO GET PARAM  
 ; TYPE SECTOR/TRACK QUESTION  
 ; GO GET PARAM  
 ; TYPE MODE QUES  
 ; GO GET PARAM  
 ; TYPE TRACK LIMITS QUESTION  
 ; GO GET PARAM  
 ; TYPE CYLINDER LIMITS QUESTION  
 ; GO GET PARAM  
 ; TYPE OFFSET QUESTION  
 ; TEST IF DRIVE TYPE IS  
 ; 6 OR 7  
 ; IF NOT TYPE ERROR  
 ; COMP START & END CYL  
 ; NG-GET PARAM AGAIN  
 ; COMP START & END TRK  
 ; NG-GET PARAM AGAIN  
 ; TEST IF VALID CYL  
 ; TOO BIG-BRANCH  
 ; CLEAR TYPE-FORMAT SWITCH



# MO3

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|      |        |        |        |        |         |      |                         |                                      |
|------|--------|--------|--------|--------|---------|------|-------------------------|--------------------------------------|
| 2006 | 016540 | 023727 | 006336 | 000006 |         | CMP  | TPINUS, #6              | ;TEST IF TRACK PARAMETERS ARE        |
| 2007 | 016546 | 001410 |        |        |         | BEQ  | 2\$                     | ;VALID FOR THE DRIVE TYPE            |
| 2008 | 016550 | 152737 | 000004 | 002653 |         | BISB | #B.CDT, TYPFMT          |                                      |
| 2009 | 016556 | 023727 | 006354 | 000004 |         | CMP  | ETINUS, #4              | ;SPECIFIED.                          |
| 2010 | 016564 | 003030 |        |        |         | BGT  | IVDTRK                  |                                      |
| 2011 | 016566 | 000404 |        |        |         | BR   | 3\$                     |                                      |
| 2012 | 016570 | 023727 | 006354 | 000002 | 2\$:    | CMP  | ETINUS, #2              |                                      |
| 2013 | 016576 | 003023 |        |        |         | BGT  | IVDTRK                  |                                      |
| 2014 | 016600 |        |        |        | 3\$:    |      |                         |                                      |
| 2015 | 016600 | 023727 | 006340 | 000007 |         | CMP  | DRINUS, #7              | ;TEST IF VALID DRIVE                 |
| 2016 | 016606 | 003026 |        |        |         | BGT  | IVDDRV                  | ;TOO BIG-BRANCH                      |
| 2017 | 016610 | 023727 | 006344 | 000004 |         | CMP  | MDINUS, #4              | ;TEST IF VALID MODE                  |
| 2018 | 016616 | 003030 |        |        |         | BGT  | IVDMOD                  | ;ERROR IN MODE SELECTION             |
| 2019 | 016620 | 023727 | 006362 | 000160 |         | CMP  | OFINUS, #160            | ;TEST IF VALID OFFSET                |
| 2020 | 016626 | 003033 |        |        |         | BGT  | IVDOF                   | ;TO BIG, ERROR                       |
| 2021 | 016630 | 000441 |        |        |         | BR   | GETOUT                  | ;YES-BR TO EXIT                      |
| 2022 | 016632 | 104401 | 013756 |        | RSTADD: | TYPE | INVDSE                  | ;TYPE ERROR MESSAGE                  |
| 2023 | 016636 | 000405 |        |        |         | BR   | SETR                    |                                      |
| 2024 | 016640 | 104401 | 014025 |        | IVDCYL: | TYPE | INVDCT                  | ;TYPE ERROR                          |
| 2025 | 016644 | 000402 |        |        |         | BR   | SETR                    |                                      |
| 2026 | 016646 | 104401 | 014055 |        | IVDTRK: | TYPE | INVDTK                  | ;TYPE ERROR                          |
| 2027 | 016652 | 012702 | 006324 |        | SETR:   | MOV  | #INITST, R2             | ;RESET REGISTERS TO REENTER ALL      |
| 2028 | 016656 | 012703 | 006352 |        |         | MOV  | #STINUS, R3             | ;START & END ADDRESSES               |
| 2029 | 016652 | 000663 |        |        |         | BR   | PARAM5                  | ;GO GET NEW START & END ADD          |
| 2030 | 016664 | 104401 | 014102 |        | IVDDRV: | TYPE | INVDOR                  |                                      |
| 2031 | 016670 | 000624 |        |        |         | BR   | STPARM                  | ;GO GET ALL PARAM AGAIN              |
| 2032 | 016672 | 104401 | 014126 |        | IVDTP:  | TYPE | INVDTP                  |                                      |
| 2033 | 016676 | 000621 |        |        |         | BR   | STPARM                  |                                      |
| 2034 | 016700 | 104401 | 014150 |        | IVDMOD: | TYPE | INVDMD                  |                                      |
| 2035 | 016704 | 012702 | 006316 |        |         | MOV  | #INITMD, R2             | ;RESET REGISTERS FOR RE-REQUEST      |
| 2036 | 016710 | 012703 | 006344 |        |         | MOV  | #MDINUS, R3             | ;OF MODE                             |
| 2037 | 016714 | 000632 |        |        |         | BR   | PARAM3                  | ;RETURN TO MODE REQUEST              |
| 2038 | 016716 | 104401 | 014211 |        | IVDOF:  | TYPE | INVDOF                  | ;TYPE INVALID OFFSET MESSAGE         |
| 2039 | 016722 | 012702 | 006334 |        |         | MOV  | #INITOF, R2             | ;SET UP R2 AND R3 TO REDO OFFSET     |
| 2040 | 016726 | 012703 | 006362 |        |         | MOV  | #OFINUS, R3             | ;PARAMETER                           |
| 2041 | 016732 | 000647 |        |        |         | BR   | PARAM6                  | ;GO GET OFFSET                       |
| 2042 | 016734 | 105037 | 002656 |        | GETOUT: | CLRB | OPCONT                  | ;CLEAR OPERATION CONTROL SWITCHES    |
| 2043 | 016740 | 023727 | 006342 | 000026 |         | CMP  | SEINUS, #26             | ;TEST IF 26 SECTOR FORMAT            |
| 2044 | 016746 | 001412 |        |        |         | BEQ  | 3\$                     | ;YES-SKIP                            |
| 2045 | 016750 | 012737 | 000024 | 006342 |         | MOV  | #24, SEINUS             | ;FORCE TO 24 SECTORS/TRACK           |
| 2046 | 016756 | 152737 | 000020 | 002653 |         | BISB | #B.CFMT, TYPFMT         | ;SET BIT FOR FORMAT &                |
| 2047 | 016764 | 012737 | 012000 | 006306 |         | MOV  | #12000, TKWDCT          | ;SET WORD COUNT                      |
| 2048 | 016772 | 000403 |        |        |         | BR   | 4\$                     |                                      |
| 2049 | 016774 | 012737 | 013000 | 006306 | 3\$:    | MOV  | #13000, TKWDCT          | ;ELSE SET FOR 22 SECTOR WORD COUNT   |
| 2050 | 017002 | 005437 | 006306 |        | 4\$:    | NEG  | TKWDCT                  | ;MAKE IT NEG FOR RK611               |
| 2051 | 017006 | 023737 | 006362 | 006334 |         | CMP  | OFINUS, INITOF          | ;TEST IF OFFSET REQUIRED             |
| 2052 | 017014 | 001403 |        |        |         | BEQ  | 5\$                     | ;NO-SKIP                             |
| 2053 | 017016 | 152737 | 000020 | 002656 |         | BISB | #OREQSW, OPCONT         | ;ELSE SET SWITCH                     |
| 2054 | 017024 | 023727 | 006344 | 000004 | 5\$:    | CMP  | MDINUS, #4              | ;IF MODE 4,                          |
| 2055 | 017032 | 001004 |        |        |         | BNE  | 6\$                     | ;NO-SKIP                             |
| 2056 | 017034 | 152737 | 000012 | 002656 |         | BISB | #RCDASW, VFHDSW, OPCONT | ;ELSE SET READ CHECK & HEADER VERIFY |
| 2057 | 017042 | 000433 |        |        |         | BR   | 10\$                    |                                      |
| 2058 | 017044 | 023727 | 006344 | 000003 | 6\$:    | CMP  | MDINUS, #3              | ;IF MODE 3                           |
| 2059 | 017052 | 001004 |        |        |         | BNE  | 7\$                     | ;NO-SKIP                             |
| 2060 | 017054 | 152737 | 000002 | 002656 |         | BISB | #VFHDSW, OPCONT         | ;SET VERIFY HEADER                   |
| 2061 | 017062 | 000423 |        |        |         | BR   | 10\$                    |                                      |

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2062 017064 023727 006344 000002 7$: CMP MDINUS,#2 ;IF MODE 2
2063 017072 001004 BNE 8$ ;NO-SKIP
2064 017074 152737 000007 002656 BISB #WHDSW!VFHDSW!WCDASW,OPCONT ;SET WRITE HEADER & DATA VERIFY HEADER,
2065 ;AND WRITE CHECK DATA SWITCHES
2066 017102 000413 BR 10$
2067 017104 023727 006344 000001 8$: CMP MDINUS,#1 ;IF MODE 1
2068 017112 001004 BNE 9$ ;NO-SKIP
2069 017114 152737 000003 002656 BISB #WHDSW!VFHDSW,OPCONT ;SET VERIFY HEADER &
2070 ;SET WRITE HEADER & DATA SWITCH
2071 017122 000403 BR 10$ ;NO-SKIP
2072 017124 152737 000001 002656 9$: BISB #WHDSW,OPCONT ;SET WRITE HDR & DATA SWITCH
2073 017132 000137 017136 10$: JMP GETUBS ;GET USER BAD SECTORS
2074
2075 ;*****
2076 ;SBTTL USER BAD SECTORS INPUT ROUTINE
2077 ;*THIS ROUTINE PROVIDES THE CAPABILITY TO INDICATE SPECIFIC PACK
2078 ;*ADDRESSES THAT ARE TO BE FLAGED AS SOFTWARE BAD SECTORS. THE USER
2079 ;*IS DIRECTED IN HOW TO ENTER THE ADDRESSES AND HOW TO END THE
2080 ;*OPERATION.
2081 ;*****
2082 017136 132737 000001 002656 GETUBS: BITB #WHDSW,OPCONT ;TEST IF WRITING IS TO BE DONE
2083 017144 001566 BEQ 14$ ;NO - SKIP OUT
2084 017146 012700 000400 MOV #400,R0 ;SET UP TO CLEAR BSSOFT FILE
2085 017152 012701 003660 MOV #BSSOFT,R1 ;TO ALL ONES
2086 017156 012721 177777 1$: MOV #177777,(R1)+
2087 017162 005300 DEC R0
2088 017164 001374 BNE 1$
2089 017166 012701 002660 MOV #RDBUF,R1 ;GET ADDRESS OF READ BUFFER
2090 017172 012700 000400 MOV #400,R0 ;SET COUNT FOR CLEAR
2091 017176 012721 177777 21$: MOV #177777,(R1)+ ;CLEAR TO ALL ONES
2092 017202 005300 DEC R0 ;DECREMENT COUNT
2093 017204 001374 BNE 21$ ;LOOP UNTIL 0
2094 017206 104401 013472 TYPE ,UBSQ ;ASK USER BAD SECTOR QUESTION
2095 017212 104410 RDLIN ;GET ANSWER
2096 017214 012601 MOV (SP)+,R1
2097 017216 121127 000032 CMPB (R1),#032 ;TEST IF 12
2098 017222 001002 BNE 3$ ;NO - SKIP
2099 017224 000137 017776 JMP DRINIT ;ELSE GO START PROGRAM
2100 017230 105711 3$: TSTB (R1) ;TEST IF CR (NULL)
2101 017232 001531 BEQ 15$ ;YES - EXIT TEST
2102 017234 121127 000116 CMPB (R1),#N ;TEST IF "NO"
2103 017240 001526 BEQ 15$ ;YES - EXIT TEST
2104 017242 012700 002660 MOV #RDBUF,R0 ;SET POINTER TO FIRST WORD
2105 017246 104401 013552 4$: TYPE ,UBSFMT ;TYPE USER BAD SECTOR FORMAT
2106 017252 104401 013644 TYPE ,NEXTQ ;TYPE NEXT ENTRY REQUEST
2107 017256 104410 12$: RDLIN ;GET BAD SECTOR ENTRY
2108 017260 012601 MOV (SP)+,R1
2109 017262 105711 TSTB (R1) ;TEST IF CR (NULL)
2110 017264 001512 BEQ 13$ ;YES - EXIT TEST
2111 017266 010146 MOV R1,-(SP) ;SET TO CONVERT TO BINARY
2112 017270 004737 037426 JSR PC,OCTBIN
2113 017274 017474 30$ ;ERROR RETURN
2114 017276 021637 006360 CMP (SP),ECINUS ;TEST IF CYLINDER VALID
2115 017302 003003 BGT 16$ ;YES - SKIP
2116 017304 021637 006356 CMP (SP),SCINUS ;TEST IF CYLINDER VALID
2117 017310 002004 BGE 5$ ;YES - SKIP

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|      |        |        |        |       |      |               |                                                                |
|------|--------|--------|--------|-------|------|---------------|----------------------------------------------------------------|
| 2118 | 017312 | 104401 | 014025 | 16\$: | TYPE | INVD CY       | :INVALID CYLINDER MESSAGE                                      |
| 2119 | 017316 | 005726 |        |       | TST  | (SP)+         | :CLEAN STACK                                                   |
| 2120 | 017320 | 000752 |        |       | BR   | 4\$           | :GO TYPE FORMAT MESSAGE                                        |
| 2121 | 017322 | 012620 |        | 5\$:  | MOV  | (SP)+, (R0)+  | :STORE CYLINDER                                                |
| 2122 | 017324 | 121127 | 000054 | 6\$:  | CMPB | (R1), 6'      | :LOOP TO BUMP R1 PAST CYLINDER ENTRY                           |
| 2123 | 017330 | 001406 |        |       | BEQ  | 7\$           | :LOOK FOR COMMA BUT RESTART                                    |
| 2124 | 017332 | 105721 |        |       | TSTB | (R1)+         | :THIS ENTRY IF CR (NULL) IS                                    |
| 2125 | 017334 | 001373 |        |       | BNE  | 6\$           | :IS FOUND                                                      |
| 2126 | 017336 | 005740 |        |       | TST  | -(R0)         | :RESET POINTER                                                 |
| 2127 | 017340 | 104401 | 013711 |       | TYPE | BADENT        | :TYPE BAD ENTRY MESSAGE                                        |
| 2128 | 017344 | 000740 |        |       | BR   | 4\$           | :GO TYPE ENTRY FORMAT MESSAGE                                  |
| 2129 | 017346 | 105721 |        | 7\$:  | TSTB | (R1)+         | :BUMP PAST COMMA                                               |
| 2130 | 017350 | 010146 |        |       | MOV  | R1, -(SP)     | :GO CONVERT TRACK TO BINARY                                    |
| 2131 | 017352 | 004737 | 037426 |       | JSR  | PC, OCTBIN    |                                                                |
| 2132 | 017356 | 017474 |        |       | 30\$ |               | :ERROR RETURN                                                  |
| 2133 | 017360 | 012603 |        |       | MOV  | (SP)+, R3     | :STORE TRACK                                                   |
| 2134 | 017362 | 121127 | 000054 | 8\$:  | CMPB | (R1), 6'      | :LOOP TO BUMP R1 PAST                                          |
| 2135 | 017366 | 001406 |        |       | BEQ  | 9\$           | :TRACK ENTRY. LOOK FOR COMMA                                   |
| 2136 | 017370 | 105721 |        |       | TSTB | (R1)+         | :BUT RESTART THIS ENTRY IF CR                                  |
| 2137 | 017372 | 001373 |        |       | BNE  | 8\$           | : (NULL) IS FOUND                                              |
| 2138 | 017374 | 005740 |        |       | TST  | -(R0)         | :RESET POINTER                                                 |
| 2139 | 017376 | 104401 | 013711 |       | TYPE | BADENT        | :TYPE BAD ENTRY MESSAGE                                        |
| 2140 | 017402 | 000721 |        |       | BR   | 4\$           | :AND TYPE FORMAT MESSAGE                                       |
| 2141 | 017404 | 105721 |        | 9\$:  | TSTB | (R1)+         | :BUMP PAST COMMA                                               |
| 2142 | 017406 | 010146 |        |       | MOV  | R1, -(SP)     | :GO CONVERT SECTOR TO BINARY                                   |
| 2143 | 017410 | 004737 | 037426 |       | JSR  | PC, OCTBIN    |                                                                |
| 2144 | 017414 | 017474 |        |       | 30\$ |               | :ERROR RETURN                                                  |
| 2145 | 017416 | 012604 |        |       | MOV  | (SP)+, R4     | :STORE SECTOR                                                  |
| 2146 | 017420 | 020337 | 006354 |       | CMP  | R3, ETINUS    | :TEST IF TRACK VALID                                           |
| 2147 | 017424 | 003003 |        |       | BGT  | 17\$          | :YES - SKIP                                                    |
| 2148 | 017426 | 020337 | 006352 |       | CMP  | R3, STINUS    | :TEST IF TRACK VALID                                           |
| 2149 | 017432 | 002004 |        |       | BGE  | 10\$          | :YES - SKIP                                                    |
| 2150 | 017434 | 104401 | 014055 | 17\$: | TYPE | INVD TK       | :TYPE INVALID TRACK MESSAGE                                    |
| 2151 | 017440 | 005740 |        |       | TST  | -(R0)         | :RESET POINTER                                                 |
| 2152 | 017442 | 000701 |        |       | BR   | 4\$           | :RESTART ENTRY                                                 |
| 2153 | 017444 | 020437 | 006342 | 10\$: | CMP  | R4, SEINUS    | :TEST IF SECTOR VALID                                          |
| 2154 | 017450 | 002404 |        |       | BLT  | 11\$          | :YES - SKIP                                                    |
| 2155 | 017452 | 104401 | 013731 |       | TYPE | ILLSEC        | :TYPE ILLEGAL SECTOR MESSAGE                                   |
| 2156 | 017456 | 005740 |        |       | TST  | -(R0)         | :RESET POINTER                                                 |
| 2157 | 017460 | 000672 |        |       | BR   | 4\$           | :GO RESTART ENTRY                                              |
| 2158 | 017462 | 110420 |        | 11\$: | MOVB | R4, (R0)+     | :INSERT SECTOR NUMBER                                          |
| 2159 | 017464 | 110320 |        |       | MOVB | R3, (R0)+     | :INSERT TRACK NUMBER                                           |
| 2160 | 017466 | J4401  | 013644 |       | TYPE | NEXTQ         | :TYPE NEXT QUESTION                                            |
| 2161 | 017472 | 000671 |        |       | BR   | 12\$          | :GO GET NEXT ENTRY                                             |
| 2162 | 017474 | 104401 | 006374 | 30\$: | TYPE | QUES          | :TYPE BAD ENTRY LINE                                           |
| 2163 | 017500 | 104401 | 041674 |       | TYPE | STTYIN        |                                                                |
| 2164 | 017504 | 104401 | 001267 |       | TYPE | SCRLF         |                                                                |
| 2165 | 017510 | 000656 |        |       | BR   | 4\$           | :GET LINE AGAIN                                                |
| 2166 | 017512 | 012710 | 177777 | 13\$: | MOV  | #177777, (R0) | :MAKE SURE THE WORD AFTER THE LAST                             |
| 2167 |        |        |        |       |      |               | :VALID ENTRY IS ALL ONES.                                      |
| 2168 | 017516 | 000137 | 017526 | 15\$: | JMP  | CKPRES        | :GO CHECK IF PRESERVE SDBSF                                    |
| 2169 | 017522 | 000137 | 017776 | 14\$: | JMP  | DRINIT        | :GO INITIALIZE DRIVE                                           |
| 2170 |        |        |        |       |      |               | :*****                                                         |
| 2171 |        |        |        |       |      |               | :SDBTL PRESERVE SDBSF QUESTION ROUTINE                         |
| 2172 |        |        |        |       |      |               | :* THIS ROUTINE DETERMINES IF SOFTWARE BAD SECTOR FILES ARE TO |
| 2173 |        |        |        |       |      |               | :* BE PRESERVED                                                |

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2174
2175 017526 104401 013305 C: PRES: TYPE ,PSDQ ;TYPE PRESERVE SDBSF QUESTION
2176 017532 104410 RDLIN ;GET ANSWER
2177 017534 012601 MOV (SP)+,R1 ;GET POINTER TO ANSWER
2178 017536 104401 013372 TYPE SDBSF ;TYPE START OF PRESERVE MESSAGE
2179 017542 121127 000032 CMPB (R1),#032 ;TEST IF 1Z
2180 017546 001001 BNE 2$ ;NO - SKIP
2181 017550 000405 BR 1$ ;ELSE SET BIT AND GO FORMAT
2182 017552 105711 2$: TSTB (R1) ;TEST IF NULL
2183 017554 001403 BEQ 1$ ;YES - EXIT
2184 017556 121127 000116 CMPB (R1),#N ;TEST IF "N"
2185 017562 001406 BEQ 3$ ;YES EXIT
2186 017564 152737 000040 002656 1$: BISB #PSDBSF,OPCONT ;SET FLAG TO PRESERVE SDBSF
2187 017572 104401 013436 TYPE PRSVD ;REPORT PRESERVED
2188 017576 000402 BR 4$ ;SKIP
2189 017600 104401 013452 3$: TYPE NPRSVD ;REPORT NOT PRESERVED
2190 017604 000137 017776 4$: JMP DRINIT
2191
2192 ;*****
2193 ;SBTTL GET ANSWER (PARAMETER ENTRY) SUBROUTINE
2194 ;*ENTRY JSR R4,GETANS WITH R2 POINTING TO THE DEFAULT PARAM
2195 ;* R3 POINTING TO THE ACTIVE PARAM
2196 ;*
2197 ;*RETURN RTS R4
2198 ;*
2199 ;*THIS ROUTINE RECEIVES THE PARAMETER ENTRY AND ALTERS THE
2200 ;*APPROPRIATE ACTIVE PARAMETER. IF THE ENTRY IS NULL THE DEFAULT
2201 ;*VALUE IS PLACED IN THE ACTIVE ENTRY. THE CONTROL C & Z
2202 ;*(1C & 1Z) ARE DECODED AND THE APPROPRIATE ACTION TAKEN. SOME
2203 ;*PARAMETER CHECKING IS DONE. ALL NUMERICS ARE TESTED TO
2204 ;*INSURE THEY ARE OCTAL.
2205 ;*****
2206
2207 017610 GETANS:
2208 017610 104410 RDLIN ;READ ANSWER
2209 017612 012601 MOV (SP)+,R1 ;GET START ADDR OF MESSAGE
2210 017614 121127 000032 CMPB (R1),#032 ;TEST FOR CONTROL Z
2211 017620 001434 BEQ 11$ ;YES-BRANCH
2212 017622 105711 TSTB (R1) ;TEST FOR NULL
2213 017624 001002 BNE 4$
2214 017630 000405 BR 5$
2215 017632 010146 4$: MOV (R2),(R3) ;GET DEFAULT FOR THIS PARAM
2216 017634 004737 037426 JSR PC,OCTBIN ;PUT ADDRESS OF PARAM IN CN STACK
2217 017640 017730 30$ ;CALL CONVERSION
2218 017642 012613 MOV (SP)+,(R3) ;ERROR RETURN
2219 017644 022703 006352 5$: CMP #STINUS,R3 ;STORE RESULTS
2220 017650 001403 BEQ 6$ ;START TRACK PARAM
2221 017652 022703 006356 CMP #SCINUS,R3 ;YES-BRANCH
2222 017656 001010 BNE 9$ ;STARTING CYL PARAM
2223 017660 022223 6$: CMP (R2)+,(R3)+ ;NO-GO TO EXIT
2224 017662 105711 7$: TSTB (R1) ;BUMP R2 & R3
2225 017664 001404 BEQ 8$ ;CHECK IF NULL
2226 017666 122127 000054 CMPB (R1)+,#' ;YES-GO STORE DEFAULT & EXIT
2227 017672 001373 BNE 7$ ;TEST IF COMMA
2228 017674 000756 BR 4$ ;NO-LOOP
2229 017676 011213 8$: MOV (R2),(R3) ;YES-GO BACK TO CONVERT PARAM
;STORE DEFAULT

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RAD6 PACK FORMATTER MACY11 27 (1006) 03-NOV-76 16:15 PAGE 43  
 DZR6LB.P11 03-AUG-76 00:00 GET ANSWER (PARAMETER ENTRY) SUBROUTINE

|      |        |        |        |       |      |              |                                  |
|------|--------|--------|--------|-------|------|--------------|----------------------------------|
| 2230 | 017700 | 022223 |        | 9\$:  | CMP  | (R2)+,(R3)+  | :BUMP R2 & R3                    |
| 2231 | 017702 | 000204 |        |       | RTS  | R4           | :RETURN                          |
| 2232 | 017704 | 012704 | 016342 | 10\$: | MOV  | #STPARM,R4   | :DUMMY R4 TO RESTART PARAM       |
| 2233 | 017710 | 000204 |        |       | RTS  | R4           | :RETURN                          |
| 2234 | 017712 | 012223 |        | 11\$: | MOV  | (R2)+,(R3)+  | :MOV IN DEFAULT                  |
| 2235 | 017714 | 020327 | 006364 |       | CMP  | R3,#OFINUS+2 | :LAST PARAM SET?                 |
| 2236 | 017720 | 001374 |        |       | BNE  | 11\$         | :NO-LOOP                         |
| 2237 | 017722 | 012704 | 016462 |       | MOV  | #DONEPR,R4   | :DUMMY RETURN FOR PARAM COMPLETE |
| 2238 | 017726 | 000204 |        |       | RTS  | R4           | :RETURN                          |
| 2239 | 017730 | 104401 | 006374 | 30\$: | TYPE | ,QUES        | :TYPE QUESTION MARK              |
| 2240 | 017734 | 104401 | 041674 |       | TYPE | ,STTYIN      | :TYPE BAD LINE                   |
| 2241 | 017740 | 104401 | 001267 |       | TYPE | ,SCRLF       |                                  |
| 2242 | 017744 | 020327 | 006354 |       | CMP  | R3,#ETINUS   | :IS THIS ENDING TRACK?           |
| 2243 | 017750 | 001403 |        |       | BEQ  | 31\$         | :YES-BRANCH                      |
| 2244 | 017752 | 020327 | 006360 |       | CMP  | R3,#ECINUS   | :IS THIS ENDING CYLINDER?        |
| 2245 | 017756 | 001004 |        |       | BNE  | 32\$         | :NO-BRANCH                       |
| 2246 | 017760 | 162702 | 000002 | 31\$: | SUB  | #2,R2        | :BACK UP REGISTERS TO REDO       |
| 2247 | 017764 | 162703 | 000002 |       | SUB  | #2,R3        | :PARAM REQUEST                   |
| 2248 | 017770 | 162704 | 000010 | 32\$: | SUB  | #10,R4       | :BACK UP TO REREQUEST PARAM      |
| 2249 | 017774 | 000204 |        |       | RTS  | R4           | :RETURN                          |

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;*****
;SBTTL DRIVE INITIALIZE ROUTINE
;BEFORE FORMATTING BEGINS, THIS ROUTINE INITIALIZES
;THE SUBSYSTEM, RECALIBRATES THE DRIVE, AND SETS VOLUME
;VALID. IT THEN CHECKS DRIVE STATUS TO INSURE IT IS
;AVAILABLE, READY, AND VALID. WRITE LOCK IS CHECKED TO
;VERIFY IT IS RESET.
;
;REGISTER 5 IS LOADED WITH THE ADDRESS OF THE
;PARAMETER BLOCK. R5 WILL CONTAIN THIS ADDRESS FOR
;THE ENTIRE PROGRAM.
;
;THE DRIVE NUMBER PARAMETER IN THE PARAMETER
;BLOCK IS SET TO THE SELECTED DRIVE. THIS ALSO REMAINS
;VALID FOR THE DURATION OF THE PROGRAM.
;*****

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|      |        |        |        |        |      |                    |                                     |
|------|--------|--------|--------|--------|------|--------------------|-------------------------------------|
| 2250 |        |        |        |        |      |                    |                                     |
| 2251 |        |        |        |        |      |                    |                                     |
| 2252 |        |        |        |        |      |                    |                                     |
| 2253 |        |        |        |        |      |                    |                                     |
| 2254 |        |        |        |        |      |                    |                                     |
| 2255 |        |        |        |        |      |                    |                                     |
| 2256 |        |        |        |        |      |                    |                                     |
| 2257 |        |        |        |        |      |                    |                                     |
| 2258 |        |        |        |        |      |                    |                                     |
| 2259 |        |        |        |        |      |                    |                                     |
| 2260 |        |        |        |        |      |                    |                                     |
| 2261 |        |        |        |        |      |                    |                                     |
| 2262 |        |        |        |        |      |                    |                                     |
| 2263 |        |        |        |        |      |                    |                                     |
| 2264 |        |        |        |        |      |                    |                                     |
| 2265 |        |        |        |        |      |                    |                                     |
| 2266 |        |        |        |        |      |                    |                                     |
| 2267 |        |        |        |        |      |                    |                                     |
| 2268 | 017776 |        |        |        |      |                    |                                     |
| 2269 | 017776 | 012706 | 001100 |        | MOV  | #STACK,SP          | :RESET THE STACK                    |
| 2270 | 020002 | 012737 | 017776 | 001110 | MOV  | #DRINIT,\$LPERR    | :SET UP TO LOOP ON ERROR            |
| 2271 | 020010 | 012737 | 026240 | 002600 | MOV  | #ERRHDL,A.ABNL     | :SET UP FOR ERROR HANDLING          |
| 2272 | 020016 | 012737 | 025302 | 002576 | MOV  | #ERRFRE,A.NORM     | :SET UP FOR NO ERROR DRIVER RETURNS |
| 2273 | 020024 | 105037 | 002654 |        | CLRB | ERRCNT             | :CLEAR ERROR COUNT                  |
| 2274 | 020030 | 005037 | 006364 |        | CLR  | RECODE             | :CLEAR RECOVERY CODE                |
| 2275 | 020034 | 012703 | 002446 |        | MOV  | #PARM1,R3          | :SET UP PARAMETER BLOCK 1 FOR       |
| 2276 | 020040 | 113763 | 006340 | 000000 | MOVB | DRINUS,P.DRVN(R3)  | :ADDITIONAL INFO RECOVERY IF        |
| 2277 | 020046 | 153763 | 002653 | 000007 | BISB | TYPFMT,P.CS1P(R3)  | :NEEDED IN ERROR PROCESSING         |
| 2278 | 020054 | 013702 | 002570 |        | MOV  | RKBAS,R2           | :SET R2 FOR RKBASE ADDRESS          |
| 2279 | 020060 | 012705 | 002362 |        | MOV  | #PARM0,R5          | :GET PARAMETER BLOCK ADDRESS        |
| 2280 | 020064 | 005065 | 000014 |        | CLR  | P.PRST(R5)         | :CLEAR PROGRAM STATUS REG           |
| 2281 | 020070 | 112765 | 000177 | 000001 | MOVB | #SUBCLR,P.CMND(R5) | :DO SUBSYSTEM CLEAR                 |
| 2282 | 020076 | 004737 | 025220 |        | JSR  | PC,DRVCL           |                                     |
| 2283 | 020102 | 113765 | 006340 | 000000 | MOVB | DRINUS,P.DRVN(R5)  | :LOAD DRIVE NUMBER                  |
| 2284 | 020110 | 112765 | 000113 | 000001 | MOVB | #RECAL,P.CMND(R5)  | :DO RECALIBRATE                     |
| 2285 | 020116 | 004737 | 025220 |        | JSR  | PC,DRVCL           |                                     |

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|      |        |        |        |        |       |      |                                                          |
|------|--------|--------|--------|--------|-------|------|----------------------------------------------------------|
| 2286 | 020122 | 112765 | 000103 | 000001 |       | MOVB | #PACK,P.CMND(R5) ;DO PACK ACK                            |
| 2287 | 020130 | 004737 | 025220 |        |       | JSR  | PC,DRVCAL                                                |
| 2288 | 020134 | 112765 | 000141 | 000001 |       | MOVB | #R0STAT,P.CMND(R5) ;DO RD STAT                           |
| 2289 | 020142 | 004737 | 025220 |        |       | JSR  | PC,DRVCAL                                                |
| 2290 | 020146 | 023727 | 0C6344 | 000003 |       | CMP  | MDINUS,#3 ;TEST IF ANY WRITE TO BE DONE                  |
| 2291 | 020154 | 002415 |        |        |       | BLT  | 1\$ ;NO-GO TEST WRITE LOCK ON                            |
| 2292 | 020156 | 032765 | 004000 | 000040 |       | BIT  | #5,WRL,P.ADD(R5) ;ELSE TEST IF WRITE LOCK OFF            |
| 2293 | 020164 | 001026 |        |        |       | BNE  | 2\$ ;IF WRONG - TYPE MESSAGE                             |
| 2294 | 020166 | 104401 | 014235 |        |       | TYPE | ,SWLREQ ;AND WAIT FOR RESPONSE                           |
| 2295 | 020172 | 104401 | 014373 |        |       | TYPE | ,CONREQ                                                  |
| 2296 | 020176 | 042762 | 000100 | 000000 |       | BIC  | #IE,RKCS1(R2) ;PREVENT INTERRUPT WHEN WRITE LOCK CHANGED |
| 2297 | 020204 | 000000 |        |        |       | HALT | WRITE LOCK IS TESTED AGAIN                               |
| 2298 | 020206 | 000673 |        |        |       | BR   | DRINIT ;FOR CORRECT SETTING                              |
| 2299 | 020210 | 032765 | 004000 | 000040 | 1\$:  | BIT  | #5,WRL,P.ADD(R5)                                         |
| 2300 | 020216 | 001411 |        |        |       | BEQ  | 2\$                                                      |
| 2301 | 020220 | 104401 | 014313 |        |       | TYPE | ,RWLREQ                                                  |
| 2302 | 020224 | 104401 | 014373 |        |       | TYPE | ,CONREQ                                                  |
| 2303 | 020230 | 042762 | 000100 | 000000 |       | BIC  | #IE,RKCS1(R2) ;PREVENT INTERRUPT WHEN WRITE LOCK CHANGE  |
| 2304 | 020236 | 000000 |        |        |       | HALT |                                                          |
| 2305 | 020240 | 000656 |        |        |       | BR   | DRINIT                                                   |
| 2306 | 020242 | 112765 | 000117 | 000001 | 2\$:  | MOVB | #SEEK,P.CMND(R5) ;DO SEEK                                |
| 2307 | 020250 | 012765 | 000632 | 000002 |       | MOV  | #632,P.CYLN(R5) ;TO CYL 410                              |
| 2308 | 020256 | 112765 | 000002 | 000005 |       | MOVB | #2,P.TRCK(R5) ;TRACK 2                                   |
| 2309 | 020264 | 004737 | 025220 |        |       | JSR  | PC,DRVCAL                                                |
| 2310 | 020270 | 012765 | 004660 | 000010 |       | MOV  | #BSFACT,P.BALO(R5) ;SET BUFFER ADDRESS FOR BAD SECTORS   |
| 2311 | 020275 | 005000 |        |        |       | CLR  | R0                                                       |
| 2312 | 020300 | 012703 | 000011 |        |       | MOV  | #11,R3 ;SET UP MAX SECTOR VALUE                          |
| 2313 | 020304 | 112765 | 000121 | 000001 | 8\$:  | MOVB | #R0DATA,P.CMND(R5) ;DO READ DATA FROM 0 THRU ?           |
| 2314 | 020312 | 012765 | 000400 | 000012 |       | MOV  | #400,P.WC(R5) ;READ ENTIRE SECTOR                        |
| 2315 | 020320 | 005465 | 000012 |        |       | NEG  | P.WC(R5)                                                 |
| 2316 | 020324 | 142765 | 000020 | 000007 |       | BICB | #8,CFMT,P.CS1H(R5) ;SET TO 22 SECTOR FORMAT              |
| 2317 | 020332 | 132737 | 000020 | DC2653 |       | BITB | #8,CFMT,TYPFMT ;TEST IF PACK TO BE FORMATTED 20 SECTOR   |
| 2318 | 020340 | 001401 |        |        |       | BEQ  | 3\$ ;NO-BR. LEAVE R0=0                                   |
| 2319 | 020342 | 005200 |        |        |       | INC  | R0 ;SET R0=1                                             |
| 2320 | 020344 | 110065 | 000004 |        | 3\$:  | MOVB | R0,P.SECT(R5) ;PUT IN BLOCK                              |
| 2321 | 020350 | 004737 | 025220 |        |       | JSR  | PC,DRVCAL                                                |
| 2322 | 020354 | 032737 | 100000 | 006364 |       | BIT  | #ANYDER,RECODE ;TEST IF ERROR                            |
| 2323 | 020362 | 001410 |        |        |       | BEQ  | 4\$ ;NO-GET A GOOD SECTOR READ                           |
| 2324 | 020364 | 062700 | 000002 |        |       | ADD  | #2,R0 ;BUMP TO NEXT SECTOR                               |
| 2325 | 020370 | 020003 |        |        |       | CMP  | R0,R3 ;CHECK IF STILL IN                                 |
| 2326 | 020372 | 003764 |        |        |       | BLE  | 3\$ ;BAD SECTOR. IF YES, DO IT AGAIN                     |
| 2327 | 020374 | 104401 | 014427 |        |       | TYPE | ,BAD632 ;TYPE MESSAGE                                    |
| 2328 | 020400 | 000000 |        |        |       | HALT |                                                          |
| 2329 | 020402 | 000776 |        |        |       | BR   | .-2                                                      |
| 2330 | 020404 | 132737 | 000001 | 002656 | 4\$:  | BITB | #WHDSW,OPCONT ;WILL THIS PASS WRITE?                     |
| 2331 | 020412 | 001404 |        |        |       | BEQ  | 17\$ ;NO - SKIP                                          |
| 2332 | 020414 | 132737 | 000040 | 002656 |       | BITB | #PSDBSF,OPCONT ;TEST IF PRESEPV FILE FLAG SET            |
| 2333 | 020422 | 001413 |        |        |       | BEQ  | 7\$ ;NO SKIP                                             |
| 2334 | 020424 | 020027 | 000011 |        | 17\$: | CMP  | R0,#11 ;TEST IF R0 GREATER THAN 11                       |
| 2335 | 020430 | 003010 |        |        |       | BGT  | 7\$ ;IF YES, WE ALREADY HAVE A GOOD READ                 |
| 2336 | 020432 | 012765 | 003660 | 000010 |       | MOV  | #BSOFT,P.BALO(R5) ;ELSE SET UP TO READ SOFTWARE FILE     |
| 2337 | 020440 | 012703 | 000025 |        |       | MOV  | #25,R3 ;SET UP MAX SECTOR VALUE                          |
| 2338 | 020444 | 012700 | 000012 |        |       | MOV  | #12,R0 ;SET UP STARTING SECTOR                           |
| 2339 | 020450 | 000715 |        |        |       | BR   | 8\$ ;GO READ FILE                                        |
| 2340 | 020452 | 104401 | 014723 |        | 7\$:  | TYPE | ,SERNUM ;TYPE OUT SERIAL NUMBER                          |
| 2341 | 020456 | 012746 | 0C4660 |        |       | MOV  | #BSFACT,-(SP) ;OF CARTRIDGE TO BE FORMATTED              |



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|      |        |        |        |        |         |                |                                        |
|------|--------|--------|--------|--------|---------|----------------|----------------------------------------|
| 2342 | 020462 | 004737 | 040002 |        | JSR     | PC,2#3DB20     | : CONVERT SERIAL NUMBER TO ASCII       |
| 2343 | 020466 | 012637 | 020474 |        | MOV     | (SP)+,63       | : GET RESULT                           |
| 2344 | 020472 | 104401 |        |        | TYPE    |                | : PRINT IT                             |
| 2345 | 020474 | 000000 |        | 65:    | WORD    |                | : ADDRESS OF RESULT GOES HERE          |
| 2346 | 020476 | 104401 | 015370 |        | TYPE    | STARTS         |                                        |
| 2347 | 020502 | 005737 | 004666 |        | TST     | BSFACT+6       | : TEST IF 3RD WORD ALL ZEROS           |
| 2348 | 020506 | 001404 |        |        | BEQ     | 105            | : IF YES - SKIP                        |
| 2349 | 020510 | 104401 | 014763 |        | TYPE    | ,ALNPAC        | : ELSE TYPE ALIGNMENT PACK MESSAGE     |
| 2350 |        |        |        |        |         |                | : AND ABORT                            |
| 2351 | 020514 | 000137 | 016100 |        | JMP     | START          | : JUMP TO START IF CONTINUE            |
| 2352 | 020520 | 153765 | 002653 | 000007 | 105:    | BISB           | TYPE, P.C51H(R5)                       |
| 2353 | 020526 | 132737 | 000001 | 002656 |         | BITB           | #WHD SW,OPCONT                         |
| 2354 | 020534 | 001441 |        |        | BEQ     | 195            | : TEST IF WE WILL BE WRITING           |
| 2355 | 020536 | 012700 | 003670 |        | MOV     | #BSSOFT+10,R0  | : NO - SKIP BSSOFT INIT                |
| 2356 | 020542 | 012701 | 000200 |        | MOV     | #200,R1        | : ELSE SET POINTER TO BAD SECTOR DATA  |
| 2357 | 020546 | 132737 | 000040 | 002656 | BITB    | #PSOBSF,OPCONT | : SET A COUNT                          |
| 2358 | 020554 | 001413 |        |        | BEQ     | 255            | : TEST IF PRESERVE FLAG SET            |
| 2359 | 020556 | 005720 |        | 205:   | TST     | (R0)+          | : NO - SKIP                            |
| 2360 | 020560 | 100410 |        |        | BMI     | 215            | : TEST IF ALL ONES                     |
| 2361 | 020562 | 005301 |        |        | DEC     | R1             | : YES - SKIP                           |
| 2362 | 020564 | 001374 |        |        | BNE     | 205            | : DECREMENT COUNT TO CHECK IT DOES NOT |
| 2363 | 020566 | 104401 | 014466 |        | TYPE    | ,TDM SOF       | : OVERFLOW THE BUFFER                  |
| 2364 | 020572 | 104401 | 014553 |        | TYPE    | ,TDM SUF       | : MESSAGE CAUSED BY OVERFLOW           |
| 2365 | 020576 | 000137 | 016100 |        | JMP     | START          | : RESTART THE PROGRAM                  |
| 2366 | 020602 | 005740 |        | 215:   | TST     | -(R0)          | : REPOSITION POINTER                   |
| 2367 | 020604 | 012703 | 002660 |        | 255:    | MOV            | #RDBUF,R3                              |
| 2368 | 020610 | 012320 |        | 225:   | MOV     | (R3)+,(R0)+    | : SET POINTER TO SECTOR ENTERED AS BAD |
| 2369 | 020612 | 100412 |        |        | BMI     | 195            | : MOV IN THE ADDRESS                   |
| 2370 | 020614 | 012320 |        |        | MOV     | (R3)+,(R0)+    | : IF NEGATIVE, MOVE IS DONE            |
| 2371 | 020616 | 024141 |        |        | CMP     | -(R1),-(R1)    | : ELSE GET SECOND WORD                 |
| 2372 | 020620 | 005701 |        |        | TST     | R1             | : DEC COUNT BY 2                       |
| 2373 | 020622 | 100372 |        |        | BPL     | 225            | : CHECK IT DIDN'T OVERFLOW             |
| 2374 | 020624 | 104401 | 014466 |        | TYPE    | ,TDM SOF       | : NOT YET - LOOP                       |
| 2375 | 020630 | 104401 | 014553 |        | TYPE    | ,TDM SUF       | : ELSE TYPE MESSAGE                    |
| 2376 | 020634 | 000137 | 016100 |        | JMP     | START          | : RESTART TEST                         |
| 2377 | 020640 | 012700 | 003660 | 195:   | MOV     | #BSSOFT,R0     | : GET ADDRESS OF BSSOFT                |
| 2378 | 020644 | 013720 | 004660 |        | MOV     | BSFACT,(R0)+   | : GET FIRST WORD                       |
| 2379 | 020650 | 013720 | 004662 |        | MOV     | BSFACT+2,(R0)+ | : GET SECOND WORD                      |
| 2380 | 020654 | 005020 |        |        | CLR     | (R0)+          | : CLEAR NEXT TWO WORDS                 |
| 2381 | 020656 | 005020 |        |        | CLR     | (R0)+          | : AS REQUIRED                          |
| 2382 | 020660 | 012701 | 000200 |        | MOV     | #200,R1        | : SET COUNT                            |
| 2383 | 020664 | 012700 | 004670 |        | MOV     | #BSFACT+10,R0  | : GET ADDR OF START OF BAD SECTORS     |
| 2384 | 020670 | 005720 |        | 245:   | TST     | (R0)+          | : TEST IF NEGATIVE                     |
| 2385 | 020672 | 100410 |        |        | BMI     | 235            | : YES - SKIP                           |
| 2386 | 020674 | 005301 |        |        | DEC     | R1             | : ELSE DEC COUNT                       |
| 2387 | 020676 | 100374 |        |        | BPL     | 245            | : IF NOT YET ZERO - LOOP               |
| 2388 | 020700 | 104401 | 014637 |        | TYPE    | ,TDM FAC       | : MESSAGE REPORT                       |
| 2389 | 020704 | 104401 | 014553 |        | TYPE    | ,TDM SUF       |                                        |
| 2390 | 020710 | 000137 | 016100 |        | JMP     | START          | : GO RESTART PROGRAM                   |
| 2391 | 020714 | 000137 | 020720 |        | 235:    | JMP            | DSPTCH                                 |
| 2392 |        |        |        |        |         |                | : GO TO DISPATCHER                     |
| 2393 |        |        |        |        |         |                | : *****                                |
| 2394 |        |        |        |        |         |                | : SBTTL DISPATCH ROUTINE               |
| 2395 | 020720 |        |        |        |         |                | : *****                                |
| 2396 | 020720 | 132737 | 000001 | 002656 | DSPTCH: | BITB           | #WHD SW,OPCONT                         |
| 2397 | 020726 | 001404 |        |        | BEQ     | 15             | : TEST IF HDRS & DATA TO BE WRITTEN    |



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2398 020730 004737 021642      JSR    PC,WRTOP      ;GO TO WRITE HEADERS & DATA
2399 020734 104401 015255      TYPE   ,PRGRS1     ;TYPE PROGRESS 1 MESSAGE
2400
2401 020740 132737 000016 002656 1$: BITB    #VFHDSW!WCDASW!RCDASW,OPCONT ;ANY OTHER OPERATION?
2402 020746 001030          BNE     3$          ;YES-SKIP
2403 020750 104401 015322          TYPE   ,PRGRS2     ;TYPE DONE MESSAGE
2404 020754 132737 000001 002656 4$: BITB    #WHDSW,OPCONT ;TEST IF HEADERS AND DATA WERE WRITTEN
2405 020762 001402          BEQ     5$          ;NO - DON'T WRITE BAD SECTOR FILES
2406 020764 004737 031452      JSR    PC,BDSTWT     ;GO WRITE BAD SECTOR TABLES
2407 020770 032777 000200 160142 5$: BIT     #SW7,ASWR ;TEST IF BAD SECTOR REPORT REQUESTED
2408 020776 001402          BEQ     2$          ;
2409 021000 004737 031652      JSR    PC,BSREPT     ;GO REPORT BAD SECTORS
2410 021004 012706 001100          MOV     #STACK,SP ;RESET STACK
2411 021010 032777 000001 160122 2$: BIT     #SW0,ASWR ;TEST IF LOOP ON PROGRAM
2412 021016 001402          BEQ     6$          ;NO - GO GET NEXT PARAMETERS
2413 021020 000137 017776          JMP     DRINIT    ;ELSE RESTART OPERATION
2414 021024 000137 016342          JMP     STPARM    ;GO GET NEXT PARAM SET
2415 021030 004737 022642      3$: JSR    PC,VEROP   ;GO TO VERIFY HEADERS AND/OR DATA
2416 021034 000745          BR      4$          ;
2417
2418      ;*****
2419      ;SBTTL TRACK INCREMENT ROUTINE
2420      ;*****
2420 021036 032777 040000 160074 TRKINC: BIT     #SW14,ASWR ;TEST IF LOOP ON OPERATION
2421 021044 001011          BNE     2$          ;YES - BYPASS INCREMENT
2422 021046 020027 000632          CMP     R0,#632    ;CHECK IF NEXT INCREMENT WOULD
2423 021052 001007          BNE     1$          ;SELECT LAST TRACK ON THE
2424 021054 020127 000001          CMP     R1,#1     ;PACK. IF SO-DO NOT
2425 021060 001004          BNE     1$          ;INCREMENT
2426 021062 112737 000377 002651 3$: MOV     #377,OPCOMP ;SET DONE
2427 021070 000207          RTS     PC             ;& EXIT
2428 021072 005201          1$: INC     R1         ;ELSE INCREMENT TRACK
2429 021074 020137 006354          CMP     R1,ETINUS ;IF THIS BUMP DOES NOT
2430 021100 003773          BLE     2$          ;EXCEED THE SELECTED PACK
2431 021102 013701 006352          MOV     STINUS,R1 ;ADDRESS FORMAT-EXIT
2432 021106 005200          INC     R0           ;IF IT DOES, SET THE TRACK TO
2433 021110 020037 006360          CMP     R0,ECINUS ;THE STARTING TRACK VALUES AND
2434 021114 003765          BLE     2$          ;BUMP THE CYLINDER TEST THAT
2435 021116 000761          BR      3$          ;THE NEW CYLINDER DOES NOT EXCEED
2436                                     ;THE DESIRED LIMIT. IF NOT SET DONE
2437                                     ;ELSE RETURN.
2438      ;*****
2439      ;SBTTL BUILD HEADERS ROUTINE
2440      ;*****
2440 BLDHDR:
2441 021120          SAVREG
2442 021120 104411          MOV     #26,R3          ;PRESET FOR 22 SECTOR FORMAT
2443 021122 012703 000026          MOV     #BUFF0,R2 ;GET BUFFER ADDRESS
2444 021126 012702 005674          ASL     R1         ;SHIFT TO ALIGN FOR HEADER
2445 021132 006301          ASL     R1
2446 021134 006301          ASL     R1
2447 021136 006301          ASL     R1
2448 021140 006301          ASL     R1
2449 021142 006301          ASL     R1
2450 021144 052701 140000          BIS     #140000,R1 ;SET GOOD SECTOR BITS
2451 021150 132737 000020 002653 BITB    #B.CFMT,TYPFMT ;TEST IF 20 SET FORMAT
2452 021156 001404          BEQ     1$          ;NO-SKIP
2453 021160 052701 001000          BIS     #BIT9,R1 ;ELSE SET FORMAT BIT

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2454 021164 012703 000024      MOV    #24,R3      ;ADJUST SECTOR COUNT
2455 021170 010022      1$: MOV    R0,(R2)+    ;INSERT CYLINDER WORD
2456 021172 010122      MOV    R1,(R2)+    ;INSERT TRK/SECT WORD
2457 021174 010004      MOV    R0,R4      ;COMPUTE VRC
2458 021176 010105      MOV    R1,R5
2459 021200 040005      BIC    R0,R5
2460 021202 040104      BIC    R1,R4
2461 021204 050504      BIS    R5,R4
2462 021206 010422      MOV    R4,(R2)+    ;INSERT VRC
2463 021210 005201      INC    R1      ;BUMP SECTOR COUNT
2464 021212 005303      DEC    R3      ;DEC COUNT
2465 021214 001365      BNE    1$      ;EXIT BUILD IF DONE
2466 021216 104412      RESREG
2467 021220 012737 100000 001250 MOV    #BIT15,$TMP5 ;SET BIT TO BE BAD SECTOR INDICATOR
2468 021225 012737 004660 021240 MOV    #BSFACT,2$ ;SET TABLE TO BE SEARCHED
2469 021234 004437 021334      3$: JSR    R4,$RHTBS ;GO SEARCH TABLE FOR BAD SECTORS
2470 021240 000000      2$: .WORD
2471 021242 012603      MOV    (SP)+,R3 ;GET BAD SECTOR COUNT
2472 021244 001417      BEQ    4$      ;IF NO BAD SECTORS GO TEST BSSOFT
2473 021246 011602      6$: MOV    (SP),R2 ;GET BAD SECTOR #
2474 021250 006302      ASL    R2      ;MULTIPLY BAD SECTOR # BY 6
2475 021252 006302      ASL    R2      ;AND ADD 2 TO GET INDEX
2476 021254 061602      ADD    (SP),R2 ;TO TRK/SEC WORD OF HEADER OF
2477 021256 062602      ADD    (SP)+,R2 ;BAD SECTOR
2478 021260 062702 000002      ADD    #2,R2
2479 021264 043762 001250 005674 BIC    $TMP5,BUFF0(R2) ;CLEAR BIT TO INDICATE BAD SECTOR
2480 021272 043762 001250 005676 BIC    $TMP5,BUFF0+2(R2) ;CLEAR BIT IN VRC FOR BAD SECTOR
2481 021300 005303      DEC    R3      ;DEC # OF BAD SECTOR COUNTER
2482 021302 001361      BNE    6$      ;IF 0
2483 021304 023727 021240 003660 4$: CMP    2$,#BSSOFT ;TEST IF BAD SECTOR SOFTWARE
2484 021312 001407      BEQ    5$      ;HAS BEEN TESTED. IF NOT, GO
2485 021314 012737 040000 001250 MOV    #BIT14,$TMP5
2486 021322 012737 003660 021240 MOV    #BSSOFT,2$ ;SET TABLE TO BE SEARCHED
2487 021330 000741      BR     3$
2488 021332      5$: ;ELSE EXIT
2489 021332 000207      RTS    PC
2490 ;*****
2491 ;SBTTL SEARCH BAD SECTOR TABLES ROUTINE
2492 ;*THIS ROUTINE RETURNS A LIST OF BAD SECTORS FOUND IN
2493 ;*THE SPECIFIC TABLE (BAD SECTOR SOFTWARE OR BAD SECTOR FACTORY)
2494 ;*FOR THE SPECIFIC CYLINDER AND TRACK DESIRED. R0 AND R1 MUST
2495 ;*CONTAIN THE CYLINDER AND TRACK, RESPECTIVELY.
2496 ;*
2497 ;*THE LIST OF BAD SECTORS IS FOUND ON THE STACK WHEN THE ROUTINE
2498 ;*RETURNS TO THE CALLER. THE FIRST ENTRY ON THE STACK WILL BE THE
2499 ;*NUMBER OF BAD SECTORS FOUND FOR THIS CYLINDER AND TRACK.
2500 ;*****
2501 021334 010237 001242      $RHTBS: MOV    R2,$TMP2
2502 021340 010337 001244      MOV    R3,$TMP3
2503 021344 012637 001246      MOV    (SP)+,$TMP4 ;STORE RETURN CONTENTS OF R4
2504 021350 011402      MOV    (R4),R2 ;GET ADDRESS OF BAD SECTOR TABLE TO SEARCH
2505 021352 012437 001240      MOV    (R4)+,$TMP1 ;SETUP FOR LENGTH OF BAD SECTOR TABLE
2506 021356 062737 001000 001240 ADD    #1000,$TMP1
2507 021364 005003      CLR    R3      ;CLEAR R3 FOR COUNT
2508 021366 062702 000010      ADD    #10,R2 ;SET R2 FOR POINTER TO CYLINDER ENTRY
2509 021372 005712      1$: TST    (R2) ;TEST IF ALL ONES
  
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2510 021374 100430 BMI 5$ ;YES-DONE
2511 021376 020012 CMP R0,(R2) ;TEST IF BAD SECTOR IN PRESENT CYL
2512 021400 001406 BEQ 3$ ;YES-GO CHECK TRACK
2513 021402 062702 000004 ADD #4,R2 ;ELSE BUMP POINTER
2514 021406 020237 0C1240 CMP R2,$TMP1 ;TEST IF OUT OF TABLE
2515 021412 002021 BGE 5$ ;YES-EXIT
2516 021414 000766 BR 1$ ;LOOP
2517 021416 005722 3$: TST (R2)+ ;TRACK CHECK - PUT POINTER AT TRK/SEC BYTE
2518 021420 011237 001256 MOV (R2),$TMP10 ;GET TRK/SEC WORD
2519 021424 042737 174377 001256 BIC #174377,$TMP10 ;CLEAR ALL BUT TRACK
2520 021432 123701 001257 CMPB $TMP10+1,R1 ;CHECK IF BAD SECTOR IN THIS TRACK
2521 021436 001402 BEQ 4$ ;YES - GO PUT SECTOR NUMBER ON STACK
2522 021440 005722 TST (R2)+ ;ELSE BUMP POINTER TO NEXT CYL WORD
2523 021442 000753 BR 1$ ;GO TEST NEXT CYL
2524 021444 005203 4$: INC R3 ;BUMP BAD SECTOR COUNT
2525 021446 012246 MOV (R2)+,-(SP) ;PUT TRK/SEC WORD ON STACK
2526 021450 042716 177700 BIC #177700,(SP) ;CLEAR ALL BUT SECTOR NUMBER
2527 021454 000746 BR 1$ ;GO CHECK REST OF FILE
2528 021456 010346 5$: MOV R3,-(SP) ;EXIT - PUT NUMBER OF BAD
2529 021460 013702 001242 MOV $TMP2,R2 ;SECTORS ON STACK-RESTORE
2530 021464 013703 001244 MOV $TMP3,R3 ;REGISTERS
2531 021470 013746 001246 MOV $TMP4,-(SP) ;PUT RETURN ON STACK
2532 021474 000204 RTS R4 ;RETURN
2533 ;*****
2534 ;SBTTL BAD SECTOR CHECK ROUTINE
2535 ;THIS ROUTINE WILL SEARCH BOTH TABLES TO DETERMINE IF A
2536 ;SPECIFIC SECTOR IS LISTED AS BAD. IF THE SECTOR IS LISTED IN THE
2537 ;TABLES THE ROUTINE SETS THE "BADSEC" FLAG AND RETURNS. IF THE SECTOR
2538 ;IS NOT LISTED THE FLAG IS RESET.
2539 ;*****
2540 021476 104411 BDSRCK: SAVREG
2541 021500 012737 004660 021512 MOV #BSFACT,1$ ;SET TABLE TO SEARCH
2542 021506 004437 021334 2$: JSR R4,$RHTBS ;GO SEARCH IT
2543 021512 000000 1$: .WORD ;TABLE ADDRESS GOES HERE
2544 021514 012603 MOV (SP)+,R3 ;GET NUMBER OF BAD SECTORS, IF ANY
2545 021516 001015 BNE 6$ ;IF ANY, GO TEST WHICH ONES
2546 021520 023727 021512 003660 7$: CMP 1$,#BSSOFT ;ELSE TEST IF OTHER TABLE ALREADY SEARCHED
2547 021526 001404 BEQ 3$ ;IF YES-EXIT
2548 021530 012737 003660 021512 MOV #BSSOFT,1$ ;SET OTHER TABLE FOR SEARCH
2549 021536 000763 BR 2$ ;GO SEARCH IT
2550 021540 042737 001000 006364 3$: BIC #BADSEC,RECODE ;CLEAR BAD SECTOR BIT
2551 021546 104412 4$: RESREG
2552 021550 000207 RTS PC ;RETURN
2553 021552 022602 6$: CMP (SP)+,R2 ;THIS SECTOR IN TABLE?
2554 021554 001403 BEQ 8$ ;YES-GO SET BIT & EXIT
2555 021556 005303 DEC R3 ;DECREMENT BAD SECTOR COUNT
2556 021560 001374 BNE 6$ ;IF NOT ZERO-CHECK NEXT ENTRY
2557 021562 000756 BR 7$ ;ELSE GO SEARCH OTHER TABLE
2558 021564 052737 001000 006364 8$: BIS #BADSEC,RECODE ;SET BAD SECTOR BIT
2559 021572 005303 9$: DEC R3 ;CLEAR STACK OF OTHER BAD SECTOR
2560 021574 001764 BEQ 4$ ;NUMBER
2561 021576 005726 TST (SP)+
2562 021600 000774 BR 9$ ;EXIT
2563 ;*****
2564 ;SBTTL INSERT BAD SECTOR IN BAD SECTOR SOFTWARE TABLE ROUTINE
2565 ;*****

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|      |        |        |        |        |                                        |                                                    |
|------|--------|--------|--------|--------|----------------------------------------|----------------------------------------------------|
| 2566 | 021602 | 104411 |        |        | BSSINS: SAVREG                         |                                                    |
| 2567 | 021604 | 012704 | 003670 |        | MOV                                    | #BSSOFT+10,R4 ; GET ADDRESS OF BAD SOFTWARE        |
| 2568 | 021610 | 005724 |        |        | 1\$: TST                               | (R4)+ ; SECTOR TABLE. FIND FIRST                   |
| 2569 | 021612 | 100376 |        |        | BPL                                    | 1\$ ; EMPTY ENTRY                                  |
| 2570 | 021614 | 005744 |        |        | TST                                    | -(R4) ; BACK UP POINTER                            |
| 2571 | 021616 | 010024 |        |        | MOV                                    | R0,(R4)+ ; INSERT CYLINDER                         |
| 2572 | 021620 | 012703 | 000010 |        | MOV                                    | #10,R3 ; SET COUNT FOR SHIFT TO ALIGN              |
| 2573 | 021624 | 006301 |        |        | 2\$: ASL                               | R1 ; SHIFT TRACK TO ALIGN FOR ENTRY                |
| 2574 | 021626 | 005303 |        |        | DEC                                    | R3 ; DEC SHIFT COUNT                               |
| 2575 | 021630 | 001375 |        |        | BNE                                    | 2\$ ; TEST IF SHIFT DONE                           |
| 2576 | 021632 | 050201 |        |        | ADD                                    | R2,R1 ; ADD IN SECTOR NUMBER                       |
| 2577 | 021634 | 010114 |        |        | MOV                                    | R1,(R4) ; INSERT TRACK/SECTOR                      |
| 2578 | 021636 | 104412 |        |        | RESREG                                 |                                                    |
| 2579 | 021640 | 000207 |        |        | RTS                                    | PC                                                 |
| 2580 |        |        |        |        | ;*****                                 |                                                    |
| 2581 |        |        |        |        | .SBTTL WRITE OPERATION CONTROL ROUTINE |                                                    |
| 2582 |        |        |        |        | ;*****                                 |                                                    |
| 2583 | 021642 | 105037 | 002651 |        | WRTOP: CLR                             | OPCOMP ; CLEAR DONE FLAG                           |
| 2584 | 021646 | 012737 | 021724 | 001110 | MOV                                    | #WERROR,\$LPERR ; SETUP FOR LOOP ON ERROR          |
| 2585 | 021654 | 013700 | 006356 |        | MOV                                    | SCINUS,R0 ; GET STARTING ADDRESS                   |
| 2586 | 021660 | 013701 | 006352 |        | MOV                                    | STINUS,R1                                          |
| 2587 | 021664 | 010037 | 006370 |        | WRTLUP: MOV                            | R0,CCINUS ; STORE CURRENT CYL                      |
| 2588 | 021670 | 010137 | 006366 |        | MOV                                    | R1,CTINUS ; STORE CURRENT TRACK                    |
| 2589 | 021674 | 032777 | 001000 | 157236 | BIT                                    | #SW9,\$SWR ; TEST IF LOOP ON ERROR                 |
| 2590 | 021702 | 001002 |        |        | 1\$                                    | IF YES - DO NOT CLEAR ERROR FLAG                   |
| 2591 | 021704 | 105037 | 001103 |        | CLR                                    | \$ERFLG ; ELSE CLEAR FLAG                          |
| 2592 | 021710 | 004737 | 021120 |        | 1\$: JSR                               | PC,BLDHDR ; GO BUILD HEADERS                       |
| 2593 | 021714 | 004737 | 021764 |        | JSR                                    | PC,WTHDR ; GO WRITE HEADERS                        |
| 2594 | 021720 | 004737 | 022070 |        | JSR                                    | PC,WTRTK ; GO WRITE DATA                           |
| 2595 | 021724 | 032777 | 001000 | 157206 | WERROR: BIT                            | #SW9,\$SWR ; TEST IF LOOP ON ERROR                 |
| 2596 | 021732 | 001406 |        |        | BEQ                                    | 2\$ ; IF NO - SKIP ERROR FLAG TEST                 |
| 2597 | 021734 | 105737 | 001103 |        | TST                                    | \$ERFLG ; ELSE TEST ERROR FLAG                     |
| 2598 | 021740 | 001403 |        |        | BEQ                                    | 2\$ ; NO - SKIP                                    |
| 2599 | 021742 | 004737 | 031126 |        | JSR                                    | PC,PREPLP ; GO PREPARE FOR LOOP                    |
| 2600 | 021746 | 000746 |        |        | BR                                     | WRTLUP ; GO TO LOOP                                |
| 2601 | 021750 | 004737 | 021036 |        | 2\$: JSR                               | PC,TRKINC ; BUMP TO NEXT ADDRESS                   |
| 2602 | 021754 | 105737 | 002651 |        | TST                                    | OPCOMP ; WRITE OPERATION DONE?                     |
| 2603 | 021760 | 001741 |        |        | BEQ                                    | WRTLUP ; NO-LOOP                                   |
| 2604 | 021762 | 000207 |        |        | RTS                                    | PC ; ELSE RETURN TO DISPATCH                       |
| 2605 |        |        |        |        | ;*****                                 |                                                    |
| 2606 |        |        |        |        | .SBTTL WRITE HEADERS ROUTINE           |                                                    |
| 2607 |        |        |        |        | ;*****                                 |                                                    |
| 2608 | 021764 |        |        |        | WTHDR: SAVREG                          |                                                    |
| 2609 | 021764 | 104411 |        |        | CLR                                    | P.PRST(R5) ; CLEAR PROG STATUS REGISTER            |
| 2610 | 021766 | 005065 | 000014 |        | MOVB                                   | #WHEAD,P.CMND(R5) ; LOAD PARAMETER BLOCK WITH      |
| 2611 | 021772 | 112765 | 000127 | 000001 | MOV                                    | #BUFF0,P.BALO(R5) ; VALUES TO DO THE WRITE HEADER. |
| 2612 | 022000 | 012765 | 005674 | 000010 | MOV                                    | R0,P.CYLN(R5)                                      |
| 2613 | 022006 | 010065 | 000002 |        | MOV                                    | #102,P.WC(R5) ; LOAD THE WORD COUNT WITH           |
| 2614 | 022012 | 012765 | 000102 | 000012 | BIT                                    | #B.CFMT,TYPFMT ; THE PROPER VALUE FOR THE FORMAT   |
| 2615 | 022020 | 132737 | 000020 | 002653 | BEQ                                    | 1\$ ; TYPE                                         |
| 2616 | 022026 | 001403 |        |        | MOV                                    | #74,P.WC(R5)                                       |
| 2617 | 022030 | 012765 | 000074 | 000012 | 1\$: NEG                               | P.WC(R5)                                           |
| 2618 | 022036 | 005465 | 000012 |        | MOVB                                   | R1,P.TRCK(R5)                                      |
| 2619 | 022042 | 110165 | 000005 |        | JSR                                    | PC,DRVCAL ; CALL DRIVER                            |
| 2620 | 022046 | 004737 | 025220 |        | BIT                                    | #ANYDER,RECODE ; TEST FOR ANY DATA ERRORS          |
| 2621 | 022052 | 032737 | 100000 | 006364 |                                        |                                                    |

K04

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|      |        |        |        |        |  |                                                       |                            |                                            |
|------|--------|--------|--------|--------|--|-------------------------------------------------------|----------------------------|--------------------------------------------|
| 2622 | 022060 | 001401 |        |        |  | BEQ                                                   | 2\$                        |                                            |
| 2623 |        |        |        |        |  | ;INSERT CODE FOR ANY DATA TYPE ERROR ON WRITE HEADERS |                            |                                            |
| 2624 | 022062 | 000000 |        |        |  | HALT                                                  |                            |                                            |
| 2625 | 022064 | 104412 |        |        |  | 2\$: RESREG                                           |                            |                                            |
| 2626 | 022066 | 000207 |        |        |  | RTS                                                   | PC                         | ;RETURN                                    |
| 2627 |        |        |        |        |  | ;*****                                                |                            |                                            |
| 2628 |        |        |        |        |  | .SBTTL WRITE ONE TRACK ROUTINE                        |                            |                                            |
| 2629 |        |        |        |        |  | ;*****                                                |                            |                                            |
| 2630 | 022070 |        |        |        |  | WRITRK:                                               |                            |                                            |
| 2631 | 022070 | 104411 |        |        |  | SAVREG                                                |                            |                                            |
| 2632 | 022072 | 105037 | 002650 |        |  | 8\$: CLRB                                             | DERCNT                     | ;CLEAR ERROR COUNT                         |
| 2633 | 022076 | 013765 | 006306 | 000012 |  | MOV                                                   | TKWDCT,P.WC(R5)            | ;SET WORD COUNT FOR ONE TRACK              |
| 2634 | 022104 | 105065 | 000004 |        |  | CLRB                                                  | P.SECT(R5)                 | ;SET SECTOR ZERO                           |
| 2635 | 022110 | 012765 | 006346 | 000010 |  | 4\$: MOV                                              | #WEINUS,P.BALO(R5)         | ;SET BUFFER ADDRESS TO ODD                 |
| 2636 | 022116 | 032700 | 000001 |        |  | BIT                                                   | #BITO,R0                   | ;OR EVEN CYLINDER DATA DEPENDING           |
| 2637 | 022122 | 001403 |        |        |  | BEQ                                                   | 1\$                        | ;ON THE CYLINDER NUMBER                    |
| 2638 | 022124 | 012765 | 006350 | 000010 |  | MOV                                                   | #WOINUS,P.BALO(R5)         |                                            |
| 2639 | 022132 | 010065 | 000002 |        |  | 1\$: MOV                                              | R0,P.CYLN(R5)              | ;SET UP THE PARAMETER BLOCK                |
| 2640 | 022136 | 110165 | 000005 |        |  | MOVB                                                  | R1,P.TRCK(R5)              | ;TO WRITE THE ENTIRE TRACK                 |
| 2641 | 022142 | 112765 | 000123 | 000001 |  | MOVB                                                  | #WRDATA,P.CMND(R5)         |                                            |
| 2642 | 022150 | 005065 | 000014 |        |  | CLR                                                   | P.PRST(R5)                 |                                            |
| 2643 | 022154 | 052765 | 100000 | 000014 |  | BIS                                                   | #DTBAII,P.PRST(R5)         |                                            |
| 2644 | 022162 | 004737 | 025220 |        |  | JSR                                                   | PC,DRVCL                   | ;CALL DRIVER                               |
| 2645 | 022166 | 032737 | 100000 | 006364 |  | BIT                                                   | #ANYDER,RECODE             | ;ANY DATA ERROR?                           |
| 2646 | 022174 | 001002 |        |        |  | BNE                                                   | 12\$                       | ;YES - PROCESS ERROR                       |
| 2647 | 022176 | 000137 | 022636 |        |  | JMP                                                   | 7\$                        | ;NO-WRITE A-OK, EXIT                       |
| 2648 | 022202 | 032737 | 000016 | 006364 |  | 12\$: BIT                                             | #HVRCE!OPIERR!BSERR,RECODE | ;VRC OR OPI ERROR                          |
| 2649 | 022210 | 001002 |        |        |  | BNE                                                   | 14\$                       | ;YES-SKIP                                  |
| 2650 | 022212 | 000137 | 022624 |        |  | JMP                                                   | 6\$                        | ;GO PRINT FUNNY MESSAGE                    |
| 2651 | 022216 | 016537 | 000026 | 001252 |  | 14\$: MOV                                             | P.DTS(R5),STMP6            | ;STORE TRK/SEC                             |
| 2652 | 022224 | 042737 | 174377 | 001252 |  | BIC                                                   | #174377,STMP6              | ;CLEAR ALL BUT TRACK                       |
| 2653 | 022232 | 113701 | 001253 |        |  | MOVB                                                  | STMP6+1,R1                 | ;STORE TRACK                               |
| 2654 | 022236 | 016537 | 000022 | 001252 |  | MOV                                                   | P.WC(R5),STMP6             | ;STORE WORD COUNT                          |
| 2655 | 022244 | 042737 | 000377 | 001252 |  | BIC                                                   | #377,STMP6                 | ;CLEAR PARTIAL COUNT                       |
| 2656 | 022252 | 062737 | 000400 | 001252 |  | ADD                                                   | #400,STMP6                 | ;BUMP COUNT TO NEXT SECTOR                 |
| 2657 | 022260 | 016502 | 000026 |        |  | MOV                                                   | P.DTS(R5),R2               | ;GET BAD SECTOR                            |
| 2658 | 022264 | 042702 | 177740 |        |  | BIC                                                   | #177740,R2                 |                                            |
| 2659 | 022270 | 032737 | 000002 | 006364 |  | BIT                                                   | #BSERR,RECODE              | ;TEST IF BAD SECTOR                        |
| 2660 | 022276 | 001076 |        |        |  | BNE                                                   | 3\$                        | ;GO SET UP TO WRITE REMAINDER IF TRACK     |
| 2661 | 022300 | 105237 | 002650 |        |  | 2\$: INCB                                             | DERCNT                     | ;BUMP ERROR COUNT                          |
| 2662 | 022304 | 112765 | 000123 | 000001 |  | MOVB                                                  | #WRDATA,P.CMND(R5)         | ;SET UP PARAM BLOCK                        |
| 2663 | 022312 | 012765 | 177400 | 000012 |  | MOV                                                   | #177400,P.WC(R5)           | ;TO WRITE ONE SECTOR                       |
| 2664 | 022320 | 010065 | 000002 |        |  | MOV                                                   | R0,P.CYLN(R5)              | ;THIS IS THE RETRY                         |
| 2665 | 022324 | 110165 | 000005 |        |  | MOVB                                                  | R1,P.TRCK(R5)              |                                            |
| 2666 | 022330 | 110265 | 000004 |        |  | MOVB                                                  | R2,P.SECT(R5)              |                                            |
| 2667 | 022334 | 052765 | 100000 | 000014 |  | BIS                                                   | #DTBAII,P.PRST(R5)         |                                            |
| 2668 | 022342 | 004737 | 025220 |        |  | JSR                                                   | PC,DRVCL                   |                                            |
| 2669 | 022346 | 032737 | 100000 | 006364 |  | BIT                                                   | #ANYDER,RECODE             | ;ERROR IN RETRY?                           |
| 2670 | 022354 | 001441 |        |        |  | BEQ                                                   | 5\$                        | ;NO-GO PRINT RETRY SUCCESSFUL              |
| 2671 | 022356 | 122737 | 000007 | 002650 |  | CMPB                                                  | #7,DERCNT                  | ;TEST IF ERROR COUNT TO BIG                |
| 2672 | 022364 | 002345 |        |        |  | BGE                                                   | 2\$                        | ;IF NO - GO RETRY AGAIN                    |
| 2673 | 022366 | 005037 | 001174 |        |  | CLR                                                   | \$REG5                     |                                            |
| 2674 | 022372 | 113737 | 002650 | 001174 |  | MOVB                                                  | DERCNT,\$REG5              |                                            |
| 2675 | 022400 | 104102 |        |        |  | ERROR                                                 | 102                        |                                            |
| 2676 | 022402 | 004737 | 021476 |        |  | JSR                                                   | PC,BDSRCK                  | ;GO TEST IF THIS SECTOR ALREADY MARKED BAD |
| 2677 | 022406 | 032737 | 001000 | 006364 |  | BIT                                                   | #BADSEC,RECODE             | ;TEST RESULTS OF TEST                      |

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2678 022414 001411      BEQ      11$      ;NOT BAD BEFORE - SKIP
2679 022416 010037 001174  MOV      R0,$REG5    ;SET UP TO PRINT ERROR
2680 022422 010137 001176  MOV      R1,$REG6
2681 022426 010237 001200  MOV      R2,$REG7
2682 022432 104107      ERROR    107      ;ERROR- BAD HEADER AREA
2683 022434 000137 016100  JMP      START
2684 022440 104076      11$:  ERROR    76      ;REPORT MARKING SECTOR BAD
2685 022442 004737 021602  JSR      PC,BSSINS    ;INSERT BAD SECTOR IN BSSOFT
2686 022446 004737 021120  JSR      PC,BLDHDR    ;BUILD NEW HEADERS
2687 022452 004737 021764  JSR      PC,WRTHDR    ;WRITE NEW HEADERS
2688 022456 000605      BR       8$      ;RESTART WRITE TRACK
2689 022460 005037 001174  5$:  CLR      $REG5    ;CLEAR REG 5 FOR COUNT
2690 022464 113737 002650 001174  MOVB     DERCNT,$REG5 ;INSERT RETRY COUNT
2691 022472 104101      ERROR    101    ;PRINT RETRY SUCCESSFUL
2692 022474 005202      3$:  INC      R2      ;THIS CODE SETS UP THE
2693 022476 020237 006342  CMP      R2,SEINUS    ;PARAMETER BLOCK TO PICK
2694 022502 002055      BGE      7$      ;UP THE TRACK WRITE
2695 022504 010265 000004  MOV      R2,P.SECT(R5) ;AFTER THE BAD SECTOR
2696 022510 012704 000010  MOV      #10,R4
2697
2698      ;THE FOLLOWING BLOCK OF CODE CHECKS THAT THE WORD COUNT IS
2699      ;CORRECTLY ADJUSTED TO PICK UP THE OPERATION AFTER THE SECTOR
2700      ;THAT IS CAUSING THE ERROR IS PROCESSED. IF THE WORD COUNT
2701      ;SOMEHOW GETS SCREWED UP THE PROGRAM HALTS. CONTINUE CAN BE
2702      ;DEPRESSED TO CAUSE THE WORD COUNT TO BE CORRECTED AND THE
2703      ;PROGRAM ADJUSTS THE COUNT AND CONTINUES THE OPERATION.
2704 022514 006302      9$:  ASL      R2
2705 022516 005304      DEC      R4
2706 022520 001375      BNE      9$
2707 022522 012704 013000  MOV      #13000,R4
2708 022526 023727 006342 000026  CMP      SEINUS,#26    ;ARE WE IN 26 SECTOR FORMAT?
2709 022534 001402      BEQ      13$      ;YES - SKIP
2710 022536 012704 012000  MOV      #12000,R4    ;ELSE CHANGE VALUE FOR 24 SECTOR FORMAT
2711 022542 160204      13$:  SUB      R2,R4
2712 022544 005404      NEG      R4
2713 022546 016502 000004  MOV      P.SECT(R5),R2
2714 022552 020437 001252  CMP      R4,$TMP6
2715 022556 001413      BEQ      10$
2716 022560 010437 001204  MOV      R4,$REG11
2717 022564 013737 001252 001206  MOV      $TMP6,$REG12
2718 022572 010237 001202  MOV      R2,$REG10
2719 022576 104105      ERROR    105
2720 022600 000000      HALT
2721 022602 010437 001252  MOV      R4,$TMP6
2722
2723      ;END OF BLOCK OF CODE TO CHECK WORD COUNT
2724
2725 022606 013765 001252 000012 10$:  MOV      $TMP6,P.WC(R5)
2726 022614 105037 002650      CLRB     DERCNT
2727 022620 000137 022110      JMP      4$
2728 022624 104401 015160  6$:  TYPE      ,IMPERR    ;TYPE IMPOSSIBLE ERROR
2729 022630 000000      HALT      ;HALT
2730 022632 000137 016100      JMP      START
2731 022636 104412  7$:  RESREG
2732 022640 000207      RTS      PC
2733      ;*****

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2734 .SBTTL VERIFY OPERATION CONTROL ROUTINE
2735 ;*****
2736 VEROP: MOV #VERROR,$LPERR ;SET UP TO LOOP ON ERROR
2737 MOV SCINUS,R0 ;GET STARTING CYLINDER
2738 MOV STINUS,R1 ;AND TRACK
2739 CLRB OPCOMP
2740 VERLUP: MOV R0,CCINUS ;STORE CURRENT CYL
2741 MOV R1,CTINUS ;STORE CURRENT TRACK
2742 BIT #SW9,$SWR ;TEST IF LOOP ON ERROR
2743 BNE 1$ ;IF YES - DON'T CLEAR ERROR FLAG
2744 CLRB $ERFLG
2745 JSR PC,RDHDRS
2746 JSR PC,BLDHDR
2747 JSR PC,HDRCMP
2748 BITB #RCDASW,OPCONT
2749 BEQ 2$
2750 JSR PC,RDOP ;GO DO READ FOR DATA VERIFICATION
2751 BR VERROR
2752 BITB #WCDASW,OPCONT ;CHECK IF WRITE CHECK DATA
2753 BEQ VERROR ;IF NO - SKIP WRITE CHECK
2754 JSR PC,WCOPI ;ELSE GO DO WRITE CHECK FOR DATA VERIF.
2755 BIT #SW9,$SWR ;TEST IF LOOP ON ERROR
2756 BEQ 4$ ;IF NO - GO DO NEXT TRACK
2757 TSTB $ERFLG ;ELSE CHECK ERROR FLAG
2758 BEQ 4$ ;NO SKIP
2759 JSR PC,PREPLP ;GO PREPARE FOR LOOPING
2760 BR VERLUP ;LOOP
2761 JSR PC,TRKINC
2762 TSTB OPCOMP
2763 BEQ VERLUP
2764 RTS PC
2765 ;*****
2766 .SBTTL READ HEADERS ROUTINE
2767 ;*THE HEADERS FOR A GIVEN CYLINDER AND TRACK (SPECIFIED IN R0 AND R1,
2768 ;*RESPECTIVELY) ARE READ IN AND SORTED INTO THE REQUIRED SEQUENCE.
2769 ;*****
2770 RDHDRS: SAVREG
2771 JSR PC,POSOFF ;GO POSITION AND OFFSET
2772 MOV #RDBUF,P.BALO(R5) ;LOAD ADDRESS FOR HEADERS
2773 CLR P.PRST(R5) ;CLEAR PROGRAM STATUS
2774 MOV R0,P.CYLN(R5) ;SET UP TO READ HEADER
2775 MOV R1,P.TRCK(R5) ;OF DESIRED TRACK & CYLINDER
2776 CLRB $STKS ;TURN OFF INTERRUPTS FROM KEYBOARD
2777 MOVB #RDALHD,P.CMND(R5)
2778 JSR PC,DRVCAL ;DO IT
2779 MOV #100,$STKS ;TURN ON KEYBOARD
2780 MOV #204,$TMP0 ;SET UP TEMP STORE FOR THE NUMBER OF
2781 CMP SEINUS,#26 ;HEADER WORDS THAT MUST BE STORED FOR
2782 BEQ 9$ ;THE FORMAT IN USE.
2783 MOV #170,$TMP0
2784 CLRB R3
2785 CMP RDBUF(R3),R0 ;TEST IF FIRST HEADER WORD IS RIGHT CYL
2786 BNE 3$ ;NO - GO BUMP TO NEXT
2787 MOV RDBUF+2(R3),R4 ;GET TRACK/SECTOR WORD
2788
2789

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|      |        |        |        |        |         |                |                                               |
|------|--------|--------|--------|--------|---------|----------------|-----------------------------------------------|
| 2790 | 023132 | 042704 | 177437 |        | BIC     | #177437,R4     | ;CLEAR ALL BUT TRACK BITS                     |
| 2791 | 023136 | 006204 |        |        | ASR     | R4             | ;SHIFT TRACK TO ALIGN FOR TESTING             |
| 2792 | 023140 | 006204 |        |        | ASR     | R4             |                                               |
| 2793 | 023142 | 006204 |        |        | ASR     | R4             |                                               |
| 2794 | 023144 | 006204 |        |        | ASR     | R4             |                                               |
| 2795 | 023146 | 006204 |        |        | ASR     | R4             |                                               |
| 2796 | 023150 | 020401 |        |        | CMP     | R4,R1          | ;CHECK IF TRACK IS CORRECT                    |
| 2797 | 023152 | 001014 |        |        | BNE     | 3\$            | ;NO - GO BUMP TO NEXT HEADER                  |
| 2798 | 023154 | 016304 | 002662 |        | MOV     | RDBUF+2(R3),R4 | ;GET SECOND WORD                              |
| 2799 | 023160 | 016302 | 002660 |        | MOV     | RDBUF(R3),R2   | ;GET FIRST WORD                               |
| 2800 | 023164 | 046304 | 002660 |        | BIC     | RDBUF(R3),R4   | ;COMPUTE VRC OF HEADER                        |
| 2801 | 023170 | 046302 | 002662 |        | BIC     | RDBUF+2(R3),R2 |                                               |
| 2802 | 023174 | 050402 |        |        | BIS     | R4,R2          |                                               |
| 2803 | 023176 | 026302 | 002664 |        | CMP     | RDBUF+4(R3),R2 | ;CHECK IF VRC IS CORRECT                      |
| 2804 | 023202 | 001414 |        |        | BEQ     | 5\$            | ;YES - SKIP BUMP TO NEXT HEADER               |
| 2805 | 023204 | 062703 | 000006 | 3\$:   | ADD     | #5,R3          | ;BUMP TO NEXT HEADER                          |
| 2806 | 023210 | 020337 | 001236 |        | CMP     | R3,\$TMP0      | ;TEST IF END OF HEADERS REACHED               |
| 2807 | 023214 | 003741 |        |        | BLE     | 4\$            | ;NO - GO TEST NEXT HEADER                     |
| 2808 | 023216 | 010037 | 001202 |        | MOV     | R0,\$REG!0     | ;SET UP CYLINDER AND TRACK FOR REPORT         |
| 2809 | 023222 | 010137 | 001204 |        | MOV     | R1,\$REG!1     |                                               |
| 2810 | 023226 | 104103 |        |        | ERRCR   | 103            | ;REPORT ERROR                                 |
| 2811 | 023230 | 000137 | 016100 |        | JMP     | START          |                                               |
| 2812 | 023234 | 016304 | 002662 | 5\$:   | MOV     | RDBUF+2(R3),R4 | ;GET TRACK/SECTOR AGAIN                       |
| 2813 | 023240 | 042704 | 177740 |        | BIC     | #177740,R4     | ;CLEAR ALL BUT SECTOR                         |
| 2814 | 023244 | 020437 | 006342 |        | CMP     | R4,SEINUS      | ;TEST IF A VALID SECTOR NUMBER                |
| 2815 | 023250 | 002355 |        |        | BGE     | 3\$            | ;NO - GO BUMP TO NEXT SECTOR                  |
| 2816 | 023252 | 013702 | 006342 |        | MOV     | SEINUS,R2      | ;INITIALIZE COUNTER FOR MOV                   |
| 2817 | 023256 | 010401 |        |        | MOV     | R4,R1          | ;SET THE INDEX VALUE BY MULT SECTOR READ BY 6 |
| 2818 | 023260 | 006304 |        |        | ASL     | R4             |                                               |
| 2819 | 023262 | 006304 |        |        | ASL     | R4             |                                               |
| 2820 | 023264 | 060104 |        |        | ADD     | R1,R4          |                                               |
| 2821 | 023266 | 060104 |        |        | ADD     | R1,R4          |                                               |
| 2822 | 023270 | 016364 | 002660 | 006100 | 6\$:    | MOV            | RDBUF(R3),BUFF1(R4) ;MOV WORD ONE             |
| 2823 | 023276 | 016364 | 002662 | 006102 |         | MOV            | RDBUF+2(R3),BUFF1+2(R4) ;MOV WORD TWO         |
| 2824 | 023304 | 016364 | 002664 | 006104 |         | MOV            | RDBUF+4(R3),BUFF1+4(R4) ;MOV WORD THREE       |
| 2825 | 023312 | 005302 |        |        | DEC     | R2             | ;DECREMENT COUNT                              |
| 2826 | 023314 | 001415 |        |        | BEQ     | 8\$            | ;COUNT ZERO MOVE DONE, EXIT                   |
| 2827 | 023316 | 062704 | 000005 |        | ADD     | #6,R4          | ;BUMP INDEX POINTERS TO NEXT HEADER           |
| 2828 | 023322 | 062703 | 000006 |        | ADD     | #6,R3          |                                               |
| 2829 | 023326 | 020337 | 001236 |        | CMP     | R3,\$TMP0      | ;TEST IF END OF RDBUF REACHED                 |
| 2830 | 023332 | 002401 |        |        | BLT     | 7\$            | ;NO - SKIP RESET TO START OF BUFFER           |
| 2831 | 023334 | 005003 |        |        | CLR     | R3             | ;ELSE RESET R3                                |
| 2832 | 023336 | 020437 | 001236 | 7\$:   | CMP     | R4,\$TMP0      | ;SAME TEST FOR BUFF1                          |
| 2833 | 023342 | 002752 |        |        | BLT     | 6\$            | ;IF NOT END OF BUFFER, GO DO NEXT MOVE        |
| 2834 | 023344 | 005004 |        |        | CLR     | R4             | ;ELSE RESET R4 TO START OF BUFFER             |
| 2835 | 023346 | 000750 |        |        | BR      | 6\$            | ;THEN GO DO NEXT MOVE                         |
| 2836 | 023350 | 104412 |        | 8\$:   | RESREG  |                |                                               |
| 2837 | 023352 | 000207 |        |        | RTS     | PC             |                                               |
| 2838 |        |        |        |        |         |                | *****                                         |
| 2839 |        |        |        |        |         |                | SBTTL HEADER COMPARE ROUTINE                  |
| 2840 |        |        |        |        |         |                | *****                                         |
| 2841 | 023354 |        |        |        | HDRCMP: |                |                                               |
| 2842 | 023354 | 104411 |        |        | SAVREG  |                |                                               |
| 2843 | 023356 | 005002 |        |        | CLR     | R2             |                                               |
| 2844 | 023360 | 013704 | 006342 |        | MOV     | SEINUS,R4      | ;GET NUM OF SECTORS                           |
| 2845 | 023364 | 025262 | 005674 | 006100 | 1\$:    | CMP            | BUFF0(R2),BUFF1(R2) ;COMPARE HDR WORD 1       |

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2846 023372 001015      BNE      2$
2847 023374 026262 005676 006102      CMP      BUFF0+2(R2),BUFF1+2(R2) ;COMPARE HDR WORD 2
2848 023402 001011      BNE      2$
2849 023404 026262 005700 006104      CMP      BUFF0+4(R2),BUFF1+4(R2) ;COMPARE HDR WORD 3
2850 023412 001005      BNE      2$
2851 023414 062702 000006      3$:      ADD      #6,R2          ;BUMP INDEX
2852 023420 005304      DEC      R4          ;DEC COUNT
2853 023422 001360      BNE      1$          ;LOOP UNTIL ZERO
2854 023424 000420      BR       4$          ;EXIT
2855 023426 012703 001174      2$:      MOV      #REG5,R3      ;SET UP FOR ERROR REPORT
2856 023432 016223 005674      MOV      BUFF0(R2),(R3)+
2857 023436 016223 005676      MOV      BUFF0+2(R2),(R3)+
2858 023442 016223 005700      MOV      BUFF0+4(R2),(R3)+
2859 023446 016223 006100      MOV      BUFF1(R2),(R3)+
2860 023452 016223 005102      MOV      BUFF1+2(R2),(R3)+
2861 023456 016223 006104      MOV      BUFF1+4(R2),(R3)+
2862 023462 104062      ERROR     62          ;REPORT ERROR
2863 023464 000753      BR       3$          ;GO TEST NEXT HEADER
2864 023466 104412      4$:      RESREG      ;EXIT
2865 023470 000207      RTS      PC
2866                                     ;*****
2867                                     ;SBTTL DATA VERIFY WITH WRITE CHECK OPERATION ROUTINE
2868                                     ;*****
2869 023472                                     WCOF:
2870 023472 104411      SAVREG
2871 023474 013765 006306 000012 12$:      MOV      TKWDCI,P.WC(R5) ;SET WORD COUNT FOR 1 TRACK
2872 023502 005037 002650      CLR      DERCNT      ;CLEAR ERROR COUNT
2873 023506 105065 000004      CLRB     P.SECT(R5)    ;SET TO SECTOR 0
2874 023512 004737 031040      5$:      JSR      PC,PCOFF      ;GO POSITION AND OFFSET
2875 023516 012765 006346 000010      MOV      #WEINUS,P.BALO(R5) ;SET UP FOR EVEN OR ODD
2876 023524 032700 000001      BIT      #BIT0,R0      ;CYLINDER DATA
2877 023530 001403      BEQ      1$
2878 023532 012765 006350 000010      MOV      #WOINUS,P.BALO(R5)
2879
2880 023540 010065 000002      1$:      MOV      R0,P.CYLN(R5) ;SET UP PARAMETER BLOCK
2881 023544 110165 000005      MOV      R1,P.TRCK(R5) ;FOR 1 TRACK WRITE CHECK
2882 023550 005065 000014      CLR      P.PRST(R5)
2883 023554 052765 100000 000014      BIS      #DTBAII,P.PRST(R5)
2884 023562 112765 000131 000001      MOV      #WRTCHK,P.CMND(R5)
2885 023570 004737 025220      JSR      PC,DRVCL
2886 023574 032737 100000 006364      BIT      #ANYDER,RECODE ;TEST IF ANY ERROR
2887 023602 001002      BNE      16$
2888 023604 000137 024344      JMP      15$
2889 023610 016503 000022      16$:      MOV      P.WCR(R5),R3 ;STORE WORD COUNT & SECTOR
2890 023614 016502 000026      MOV      P.DTS(R5),R2 ;NUMBER AT ERROR TIME
2891 023620 042702 177740      BIC      #177740,R2 ;CLEAR ALL BUT SECTOR NUMBER
2892 023624 042703 000377      BIC      #377,R3 ;MAKE THE WORD COUNT
2893                                     ;MODULO 400
2894 023630 032737 000016 006364      BIT      #OPIERR!HVRGER!BSERR,RECODE ;TEST IF OPI OR HVRG
2895 023636 001013      BNE      4$          ;IF YES-SKIP
2896 023640 032737 000020 006364      BIT      #DCKERR,RECODE ;TEST IF DATA CHECK
2897 023646 001402      BEQ      2$          ;IF NO, WD COUNT IS NOW CORRECT-SKIP
2898 023650 162703 000400      SUB      #400,R3 ;ELSE INCREASE WORD COUNT
2899 023654 005702      2$:      TEST      R2 ;TEST IF SECTOR NOW ZERO
2900 023656 001002      BNE      3$          ;IF NO-GO DECREMENT IT
2901 023660 013702 006342      MOV      SEINUS,R2 ;ELSE GET MAX SECTOR +1 VALUE

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## C05

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|      |        |        |               |      |       |                    |                                      |
|------|--------|--------|---------------|------|-------|--------------------|--------------------------------------|
| 2902 | 023664 | 005302 |               | 35:  | DEC   | R2                 | ;NOW DECREMENT IT                    |
| 2903 | 023666 | 032737 | 000002 006364 | 45:  | BIT   | #BERR,RECODE       | ;TEST IF BAD SECTOR                  |
| 2904 | 023674 | 001453 |               |      | BEQ   | 65                 | ;IF YES - GO CONTINUE TRACK          |
| 2905 | 023676 | 005202 |               | 85:  | INC   | R2                 | ;ELSE BLMP TO NEXT SECTOR            |
| 2906 | 023700 | 020237 | 006342        |      | CMP   | R2,SEINUS          | ;IF NOT AT LAST SECTOR -             |
| 2907 | 023704 | 002402 |               |      | BLT   | 195                | ;GO TO EXIT IF LAST SECTOR IN ERROR  |
| 2908 | 023706 | 000137 | 024344        |      | JMP   | 155                |                                      |
| 2909 | 023712 | 105037 | 002650        | 195: | CLRB  | DERCNT             | ;CLEAR ERROR COUNT                   |
| 2910 | 023716 | 010265 | 000004        |      | MOV   | R2,P.SECT(R5)      | ;SET UP FOR CONTINUE OF WC           |
| 2911 | 023722 | 062703 | 000400        |      | ADD   | #400,R3            | ;BUMP COUNT TO NEXT SECTOR           |
| 2912 | 023726 | 012704 | 000010        |      | MOV   | #10,R4             |                                      |
| 2913 |        |        |               |      |       |                    |                                      |
| 2914 |        |        |               |      |       |                    |                                      |
| 2915 |        |        |               |      |       |                    |                                      |
| 2916 |        |        |               |      |       |                    |                                      |
| 2917 |        |        |               |      |       |                    |                                      |
| 2918 |        |        |               |      |       |                    |                                      |
| 2919 |        |        |               |      |       |                    |                                      |
| 2920 | 023732 | 006302 |               | 175: | ASL   | R2                 |                                      |
| 2921 | 023734 | 005304 |               |      | DEC   | R4                 |                                      |
| 2922 | 023736 | 001375 |               |      | BNE   | 175                |                                      |
| 2923 | 023740 | 012704 | 013000        |      | MOV   | #13000,R4          |                                      |
| 2924 | 023744 | 023727 | 006342 000026 |      | CMP   | SEINUS,#26         | ;TEST IF WE ARE IN 26 SECTOR FORMAT  |
| 2925 | 023752 | 001402 |               |      | BEQ   | 205                | ;YES - SKIP                          |
| 2926 | 023754 | 012704 | 012000        |      | MOV   | #12000,R4          | ;ELSE SET COUNT FOR 24 SECTOR FORMAT |
| 2927 | 023760 | 160204 |               | 205: | SUB   | R2,R4              |                                      |
| 2928 | 023762 | 005404 |               |      | NEG   | R4                 |                                      |
| 2929 | 023764 | 016502 | 000004        |      | MOV   | P.SECT(R5),R2      |                                      |
| 2930 | 023770 | 020403 |               |      | CMP   | R4,R3              |                                      |
| 2931 | 023772 | 001411 |               |      | BEQ   | 185                |                                      |
| 2932 | 023774 | 010437 | 001204        |      | MOV   | R4,\$REG11         |                                      |
| 2933 | 024000 | 010337 | 001206        |      | MOV   | R3,\$REG12         |                                      |
| 2934 | 024004 | 010237 | 001202        |      | MOV   | R2,\$REG10         |                                      |
| 2935 | 024010 | 104105 |               |      | ERROR | 105                |                                      |
| 2936 | 024012 | 000000 |               |      | HALT  |                    |                                      |
| 2937 | 024014 | 010403 |               |      | MOV   | R4,R3              |                                      |
| 2938 |        |        |               |      |       |                    |                                      |
| 2939 |        |        |               |      |       |                    |                                      |
| 2940 |        |        |               |      |       |                    |                                      |
| 2941 | 024016 | 010365 | 000012        | 185: | MOV   | R3,P.WC(R5)        | ;AT NEXT SECTOR                      |
| 2942 | 024022 | 000633 |               |      | BR    | 55                 | ;GO DO IT                            |
| 2943 | 024024 | 105237 | 002650        | 65:  | INCB  | DERCNT             | ;RETRY SEQUENCE-                     |
| 2944 | 024030 | 004737 | 031040        |      | JSR   | PC,POSOFF          | ;GO POSITION AND OFFSET              |
| 2945 | 024034 | 112765 | 000131 000001 |      | MOVB  | #WATCH,P.CMND(R5)  | ;COUNT THE ERROR                     |
| 2946 | 024042 | 010065 | 000002        |      | MOV   | R0,P.CYLN(R5)      | ;SET UP PARAM BLOCK                  |
| 2947 | 024046 | 110165 | 000005        |      | MOVB  | R1,P.TRCK(R5)      |                                      |
| 2948 | 024052 | 110265 | 000004        |      | MOVB  | R2,P.SECT(R5)      |                                      |
| 2949 | 024056 | 012765 | 177400 000012 |      | MOV   | #177400,P.WC(R5)   |                                      |
| 2950 | 024064 | 052765 | 100000 000014 |      | BIS   | #OTBAIL,P.PRST(R5) |                                      |
| 2951 | 024072 | 004737 | 025220        |      | JSR   | PC,DRVCL           |                                      |
| 2952 | 024076 | 032737 | 100000 006364 |      | BIT   | #ANYERR,RECODE     | ;TEST IF ANY ERROR                   |
| 2953 | 024104 | 001507 |               |      | BEQ   | 145                | ;GO TYPE RETRY SUCCESSFUL IF NO      |
| 2954 | 024106 | 022737 | 000007 002650 |      | CMP   | #7,DERCNT          | ;ELSE TEST IF ENOUGH RETRIES         |
| 2955 | 024114 | 002343 |               |      | BGE   | 65                 | ;NO-LOOP                             |
| 2956 | 024116 | 032737 | 000100 006364 |      | BIT   | #WCERR,RECODE      | ;TEST IF WCE, IF                     |
| 2957 | 024124 | 001446 |               |      | BEQ   | 105                | ;NO GO CHECK FOR DATA CHECK          |

;END OF CODE TO CHECK WORD COUNT

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2958 024126 004737 031040 JSR PC, POSOFF ;GO POSITION AND OFFSET
2959 024132 112765 000121 000001 MOVB #RDATA, P. CMND(R5) ;ELSE DO A READ OF SECTOR
2960 024140 012765 177400 000012 MOV #177400, P. WC(R5) ;IN ERROR
2961 024146 010065 000002 MOV R0, P. CYLN(R5)
2962 024152 110165 000005 MOVB R1, P. TRACK(R5)
2963 024156 110265 000004 MOVB R2, P. SECT(R5)
2964 024162 005065 000014 CLR P. PRST(R5) ;CLEAR PROGRAM STATUS WORD (BAII)
2965 024166 012765 002660 000010 MOV #RDBUF, P. BALC(R5)
2966 024174 004737 025220 JSR PC, DRVCAL
2967 024200 032737 100000 006364 BIT #ANYDER, RECODE ;IF NO ERROR ON READ
2968 024206 001442 BEQ 13$
2969 024210 032737 000020 006364 BIT #DCKERR, RECODE ;OR NO DATA CHECK
2970 024216 001436 BEQ 13$ ;GO PRINT FUNNY MESSAGE
2971 024220 004737 024350 JSR PC, DACOMP ;ELSE COMPARE DATA & PRINT ERRORS
2972 024224 032737 000040 006364 9$: BIT #ECCNC, RECODE ;CHECK IF NON-CORRECTABLE
2973 024232 001007 BNE 11$ ;IF YES-GO TO BAD SECTOR PROCESSING
2974 024234 104401 015233 TYPE , CORABL ;ELSE TYPE CORRECTABLE MESSAGE
2975 024240 000616 BR 8$ ;& GO WC REST OF TRACK
2976 024242 032737 000020 006364 10$: BIT #DCKERR, RECODE ;THIS IS TEST IF DAK WITH NO WCE
2977 024250 001365 BNE 9$ ;IF YES-GO TEST FOR CORRECTABLE
2978 024252 005037 001174 11$: CLR $REGS
2979 024256 113737 002650 001174 MOVB DERCNT, $REGS
2980 024264 104102 ERROR 102
2981 024266 104076 ERROR 76 ;REPORT MARKING SECTOR BAD
2982 024270 004737 021602 JSR PC, BSSINS ;PUT BAD SECTOR IN BAD SECTOR
2983 024274 004737 021120 JSR PC, BLDHDR ;TABLE, COMPUTE NEW HEADERS,
2984 024300 004737 021764 JSR PC, WRTHDR ;WRITE THEM, REWRITE THE
2985 024304 004737 022070 JSR PC, WRTRK ;TRACK
2986 024310 000137 023474 JMP 12$ ;& REDO THE WRITE CHECK
2987 024314 104401 015066 13$: TYPE , IMPER2 ;TYPE FUNNY MESSAGE
2988 024320 000137 023474 JMP 12$ ;GO RESTART THE WRITE CHECK
2989 024324 005037 001174 14$: CLR $REGS
2990 024330 113737 002650 001174 MOVB DERCNT, $REGS ;GET RETRY COUNT
2991 024336 104101 ERROR 101 ;RETRY SUCCESSFUL MESSAGE
2992 024340 000137 023676 JMP 8$
2993 024344 104412 15$: RESREG ;EXIT
2994 024346 000207 RTS PC
2995 ;*****
2996 ;SBTTL DATA COMPARE ROUTINE
2997 ;*****
2998 DACOMP: SAVREG
2999 024350 104411 CLR R5 ;CLEAR R5 FOR ERROR COUNTING
3000 024352 005005 MOV #WEINUS, R3 ;GET THE WORD THAT SHOULD BE
3001 024354 012703 006346 BIT #BIT0, R0 ;WRITTEN THROUGHOUT THE CYLINDER
3002 024360 032700 000001 BEQ 1$
3003 024364 001402 MOV #WOINUS, R3
3004 024366 012703 006350 1$: MOV #RDBUF, R4 ;SET POINTER TO READ DATA
3005 024372 012704 002660 MOV R0, $REG5 ;STORE PACK ADDRESS FOR REPORT
3006 024376 010037 001174 MOV R1, $REG6
3007 024402 010137 001176 MOV R2, $REG7
3008 024406 010237 001200 MOV #1, R1 ;PRESET REGISTERS
3009 024412 012701 000001 MOV #1, R2 ;FOR COUNTING
3010 024416 012702 000001 MOV #400, R0
3011 024422 012700 000400 2$: CMP (R3), (R4)+ ;COMPARE DATA
3012 024426 021324 BNE 3$ ;GO REPORT IF NOT EQUAL
3013 024430 001005

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 RAD6 PACK FORMATTER MACY11 27(1006) 03-NOV-76 16:15 PAGE 57  
 DZR6LB.P11 03-AUG-76 00:00 DATA COMPARE ROUTINE

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3014 024432 005202          5$: INC R2 ;ELSE BUMP COUNTERS
3015 024434 005300          DEC R0
3016 024436 001373          BNE 2$ ;LOOP UNTIL DONE
3017 024440 104412          6$: RESREG
3018 024442 000207          RTS PC
3019 024444 005205          3$: INC R5 ;BUMP ERROR COUNT
3020 024446 005301          DEC R1 ;BUMP R1 TO ZERO
3021 024450 011337 001202    MOV (R3), $REG10 ;STORE GOOD, BAD, & WORD NUM
3022 024454 014437 001204    MOV -(R4), $REG11
3023 024460 010237 001206    MOV R2, $REG12
3024 024464 005724          TST (R4)+ ;BUMP R4 TO NEXT DATA WORD
3025 024466 005701          TST R1 ;TEST R1 SWITCH
3026 024470 001001          BNE 4$ ;IF NOT ZERO, THIS IS NOT FIRST PASS
3027 024472 104034          ERROR 34 ;TYPE HEADING
3028 024474 032777 000002 154436 4$: BIT #SW1, $SWR ;TEST IF NO LIMIT ON ERRORS
3029 024502 001003          BNE 7$ ;SWITCH 1 OFF - LIMIT TO 10
3030 024504 020527 000010    CMP R5, #10 ;ELSE TEST IF 10 ERRORS REPORTED
3031 024510 001753          BEQ 6$ ;YES - EXIT
3032 024512 104063          7$: ERROR 63 ;TYPE DATA
3033 024514 000746          BR 5$ ;GO CONTINUE COMPARE
3034                                     ;*****
3035 .SBTTL DATA VERIFY WITH READ OPERATION ROUTINE
3036                                     ;*****
3037 RDOP:
3038 024516 104411          SAVREG
3039 024520 105065 000004    CLRB P.SECT(R5) ;SET UP TO READ A FULL TRACK
3040 024524 105037 002650    CLRB DERCNT ;WITH BUS INCREMENT INHIBIT
3041 024530 013765 006306 000012    MOV TKWDC, P.WC(R5)
3042 024536 004737 031040          JSR PC, POSOFF ;GO POSITION AND OFFSET
3043 024542 010065 000002    MOV R0, P.CYLN(R5)
3044 024546 110165 000005    MOV R1, P.TRCK(R5)
3045 024552 005065 000014    CLR P.PRST(R5)
3046 024556 052765 100000 000014    BIS #DTBARI, P.PRST(R5)
3047 024564 112765 000121 000001    MOV #RDDATA, P.CMND(R5)
3048 024572 004737 025220          JSR PC, DF ;DO IT
3049 024576 032737 100000 006364    BIT #ANY RECODE ;TEST IF ANY DATA ERROR
3050 024604 001002          BNE 11$ ;READ A-OK, EXIT
3051 024606 000137 025214          JMP BS
3052 024612 016537 000022 001254 11$: MOV P.WCR(R5), $TMP7 ;STORE WORD COUNT AT ERROR
3053 024620 016502 000026          MOV P.DTS(R5), R2 ;STORE SECTOR & TRACK
3054 024624 042702 177400          BIC #177400, R2 ;CLEAR ALL BUT SECTOR
3055 024630 062737 000400 001254    ADD #400, $TMP7 ;BUMP STORED WORD COUNT BY 1 SECTOR
3056 024636 032737 000002 006364    BIT #BSERR, RECODE ;CHECK IF BAD SECTOR
3057 024644 001106          BNE 5$ ;YES - GO CONTINUE READ
3058 024646 032737 000020 006364    BIT #DCKERR, RECODE ;CHECK IF DATA CHECK
3059 024654 001410          BEQ 3$ ;IF YES, DECREMENT SECTOR COUNT BY
3060 024656 005702          TST R2 ;1 TO GET SECTOR IN ERROR BUT BE
3061 024660 001002          BNE 1$ ;SURE SECTOR COUNT IS NOT ZERO
3062 024662 013702 006342          MOV SEINUS, R2
3063 024666 005302          1$: DEC R2
3064 024670 162737 000400 001254    SUB #400, $TMP7 ;IF DCK, ADD WORD COUNT BACK IN
3065 024676 105237 002650          3$: INCB DERCNT ;BUMP ERROR COUNT
3066 024702 004737 031040          JSR PC, POSOFF ;GO POSITION AND OFFSET
3067 024706 112765 000121 000001    MOV #RDDATA, P.CMND(R5) ;ELSE SET UP TO RETRY
3068 024714 010065 000002          MOV R0, P.CYLN(R5)
3069 024720 110165 000005          MOV R1, P.TRCK(R5)

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## F05

RK06 PACK FORMATTER MACY11 27(1006) 03-NOV-76 16:15 PAGE 58  
 DZREL8.P11 03-AUG-76 00:00 DATA VERIFY WITH READ OPERATION ROUTINE

|      |        |        |        |        |         |                                     |                                        |
|------|--------|--------|--------|--------|---------|-------------------------------------|----------------------------------------|
| 3070 | 024724 | 110265 | 000004 |        | MOV     | R2,P.SECT(R5)                       |                                        |
| 3071 | 024730 | 012765 | 177400 | 000012 | MOV     | #177400,P.WC(R5)                    |                                        |
| 3072 | 024736 | 012765 | 001240 | 000010 | MOV     | #STMP1,P.BALO(R5)                   |                                        |
| 3073 | 024744 | 052765 | 100000 | 000014 | BIS     | #DTBAIT,P.PRST(R5)                  |                                        |
| 3074 | 024752 | 004737 | 025220 |        | JSR     | PC,DRVCAL                           |                                        |
| 3075 | 024756 | 032737 | 100000 | 006364 | BIT     | #ANYDER,RECODE                      | ;ANY DATA ERROR IN RETRY?              |
| 3076 | 024764 | 001504 |        |        | BEQ     | 7\$                                 | ;NO-GO TYPE RETRY SUCCESSFUL           |
| 3077 | 024766 | 122737 | 000007 | 002650 | CMPB    | #7,DERCNT                           | ;ELSE CHECK IF ERROR COUNT TO BIG      |
| 3078 | 024774 | 002340 |        |        | BGE     | 3\$                                 | ;IF YES-TYPE UNSUCCESSFUL              |
| 3079 | 024776 | 005037 | 001174 |        | CLR     | \$REG5                              |                                        |
| 3080 | 025002 | 113737 | 002650 | 001174 | MOVB    | DERCNT,\$REG5                       |                                        |
| 3081 | 025010 | 104102 |        |        | ERROR   | 102                                 |                                        |
| 3082 | 025012 | 032737 | 000020 | 006364 | BIT     | #DCKERR,RECODE                      | ;TEST IF THIS IS A DATA ERROR          |
| 3083 | 025020 | 001420 |        |        | BEQ     | 5\$                                 | ;IF NO - SKIP ECC PRINTOUT             |
| 3084 | 025022 | 016537 | 000060 | 001174 | MOV     | P.EPOS(R5),\$REG5                   | ;STORE ECC PATTERN AND POSITION        |
| 3085 | 025030 | 016537 | 000062 | 001176 | MOV     | P.EPAT(R5),\$REG6                   | ;FOR ERROR REPORT                      |
| 3086 | 025036 | 005037 | 001200 |        | CLR     | \$REG7                              | ;SET \$REG7 FOR ECC UNCORRECTABLE      |
| 3087 | 025042 | 032737 | 000040 | 006364 | BIT     | #ECCNC,RECODE                       | ;WAS THAT CORRECT?                     |
| 3088 | 025050 | 001003 |        |        | BNE     | 4\$                                 | ;YES - GO REPORT                       |
| 3089 | 025052 | 052737 | 000001 | 001200 | BIS     | #1,\$REG7                           | ;NO - SET FOR CORRECTABLE              |
| 3090 | 025060 | 104077 |        |        | ERROR   | 77                                  | ;REPORT ERROR                          |
| 3091 | 025062 | 005202 |        |        | INC     | R2                                  | ;SET UP TO CONTINUE ON NEXT SECTOR     |
| 3092 | 025064 | 020237 | 006342 |        | CMP     | R2,SEINUS                           | ;CHECK IF ERROR SECTOR WAS LAST SECTOR |
| 3093 | 025070 | 002051 |        |        | BGE     | 8\$                                 | ;EXIT IF YES                           |
| 3094 | 025072 | 010265 | 000004 |        | MOV     | R2,P.SECT(R5)                       | ;READ OF REST OF TRACK BY              |
| 3095 | 025076 | 012704 | 000010 |        | MOV     | #10,R4                              |                                        |
| 3096 | 025102 | 006302 |        |        | ASL     | R2                                  |                                        |
| 3097 | 025104 | 005304 |        |        | DEC     | R4                                  |                                        |
| 3098 | 025106 | 001375 |        |        | BNE     | 9\$                                 |                                        |
| 3099 | 025110 | 012704 | 013000 |        | MOV     | #13000,R4                           |                                        |
| 3100 | 025114 | 160204 |        |        | SUB     | R2,R4                               |                                        |
| 3101 | 025116 | 005404 |        |        | NEG     | R4                                  |                                        |
| 3102 | 025120 | 016502 | 000004 |        | MOV     | P.SECT(R5),R2                       |                                        |
| 3103 | 025124 | 020437 | 001254 |        | CMP     | R4,STMP7                            |                                        |
| 3104 | 025130 | 001413 |        |        | BEQ     | 10\$                                |                                        |
| 3105 | 025132 | 010437 | 001204 |        | MOV     | R4,\$REG11                          |                                        |
| 3106 | 025136 | 013737 | 001254 | 001206 | MOV     | STMP7,\$REG12                       |                                        |
| 3107 | 025144 | 010237 | 001202 |        | MOV     | R2,\$REG10                          |                                        |
| 3108 | 025150 | 104105 |        |        | ERROR   | 10\$                                |                                        |
| 3109 | 025152 | 000000 |        |        | HALT    |                                     |                                        |
| 3110 | 025154 | 010437 | 001254 |        | MOV     | R4,STMP7                            |                                        |
| 3111 | 025160 | 013765 | 001254 | 000012 | MOV     | STMP7,P.WC(R5)                      | ;BUMPING TO THE NEXT SECTOR            |
| 3112 | 025166 | 105037 | 002650 |        | CLRB    | DERCNT                              | ;INSERTING THE WORD COUNT &            |
| 3113 | 025172 | 000137 | 024536 |        | JMP     | 6\$                                 | ;GO START RD DATA                      |
| 3114 | 025176 | 005037 | 001174 |        | CLR     | \$REG5                              | ;CLEAR REG 5 FOR RETRY COUNT BYTE      |
| 3115 | 025202 | 113737 | 002650 | 001174 | MOVB    | DERCNT,\$REG5                       | ;GET RETRY COUNT                       |
| 3116 | 025210 | 104101 |        |        | ERROR   | 101                                 | ;REPORT RETRY SUCCESSFUL               |
| 3117 | 025212 | 000723 |        |        | BR      | 5\$                                 |                                        |
| 3118 | 025214 | 104412 |        |        | RESREG  |                                     |                                        |
| 3119 | 025216 | 000207 |        |        | RTS     | PC                                  |                                        |
| 3120 |        |        |        |        |         |                                     | *****                                  |
| 3121 |        |        |        |        | SBTTL   | CALL DRIVER ROUTINE                 |                                        |
| 3122 |        |        |        |        | *ENTRY  | JSR PC,DRVCAL                       |                                        |
| 3123 |        |        |        |        | *       | WITH R5 POINTING TO PARAMETER BLOCK |                                        |
| 3124 |        |        |        |        | *RETURN | RTS PC                              |                                        |
| 3125 |        |        |        |        | *       |                                     |                                        |



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3126      ;*THIS ROUTINE IS USED TO INITIATE A SUBSYSTEM OPERATION BY
3127      ;*CALLING THE DRIVER. THE PARAMETER BLOCK MUST BE SET UP
3128      ;*BY THE CALLER AND R5 MUST POINT TO THE PARAMETER
3129      ;*BLOCK WHEN THE ROUTINE IS CALLED.
3130      ;*
3131      ;*THIS ROUTINE WAITS FOR THE OPERATION TO BE COMPLETED.
3132      ;*WHILE WAITING THE WATCHDOG TIMER IS CALLED TO PREVENT
3133      ;*SILENT DEATH IN CASE THE SUBSYSTEM DOES NOT PROVIDE AN
3134      ;*INTERRUPT. THE TERMINATION HANDLER ROUTINES WILL SET THE DONE
3135      ;*FLAG WHICH KEYS THE ROUTINE TO RETURN TO THE CALLER.
3136      ;*****
3137      025220 105037 002652  DRVCAL: CLRB     DONE           ;CLEAR DONE FLAG
3138      025224 010146          MOV     R1,-(SP)       ;STORE REGS
3139      025226 010546          MOV     R5,-(SP)
3140      025230 012701 005660  MOV     #COMSTR,R1      ;GET ADDRESS OF COMMAND STORAGE
3141      025234 012521          MOV     (R5)+,(R1)+    ;STORE PARAMETER VALUES
3142      025236 012521          MOV     (R5)+,(R1)+    ;IN COMMAND STORAGE
3143      025240 012521          MOV     (R5)+,(R1)+
3144      025242 012521          MOV     (R5)+,(R1)+
3145      025244 012521          MOV     (R5)+,(R1)+
3146      025246 012521          MOV     (R5)+,(R1)+
3147      025250 012605          MOV     (SP)+,R5
3148      025252 012601          MOV     (SP)+,R1
3149      025254 010537 025264  MOV     R5,1$          ;GET PARAM BLOCK ADDRESS
3150      025260 004737 035532  JSR     PC,C.INIT      ;CALL DRIVER
3151      025264 000000          JSR     .WORD          ;P.B. ADDRESS GOES HERE
3152      025266 004737 032102  JSR     PC,W.WTCH      ;CALL WATCH DOG
3153      025272 105737 002652  TSTB    DONE         ;DONE SET?
3154      025276 001773          BEQ     2$            ;NO-LOOP
3155      025300 000207          RTS     PC             ;YES-RETURN
3156      ;*****
3157      ;SBTTL DRIVE ERROR FREE RETURN ROUTINE
3158      ;*THIS ROUTINE IS CALLED BY THE DRIVER WHEN NO ERROR
3159      ;*HAS BEEN DETECTED IN THE OPERATION. THE ROUTINE SETS THE
3160      ;*DONE FLAG THAT IS TESTED IN THE DRIVER CALLING
3161      ;*ROUTINE.
3162      ;*****
3163      025302 152737 000377 002652  ERRFRE: BISB    #377,DONE      ;SET THE DONE FLAG
3164      025310 032737 100000 006364  BIT     #ANYDER,RECODE    ;TEST IF ANY DATA ERROR
3165      025316 001403          BEQ     2$            ;IF NO - DO ERROR RECOVERY PRINT TEST
3166      025320 105037 002654          CLRB    ERRCNT      ;CLEAR ERROR COUNT
3167      025324 000413          BR      1$            ;EXIT
3168      025326 105737 002654  2$:  TSTB    ERRCNT      ;CHECK IF ANY ERRORS HAVE OCCURRED
3169      025332 001410          BEQ     1$            ;NO - SKIP TO EXIT
3170      025334 005037 001174          CLR     $REGS
3171      025340 113737 002654 001174  MOVB    ERRCNT,$REGS    ;GET RETRY COUNT
3172      025346 104101          ERROR   101          ;PRINT RETRY SUCCESSFUL MESSAGE
3173      025350 105037 002654          CLRB    ERRCNT      ;CLEAR ERROR COUNT
3174      025354 005037 006364  1$:  CLR     RECODE      ;CLEAR RECOVERY FLAGS
3175      025360 000207          RTS     PC             ;RETURN
3176      ;*****
3177      ;SBTTL TYPE ERROR ROUTINE
3178      ;*ENTRY JSR PC,TYP ERR
3179      ;*RETURN RTS PC
3180      ;*
3181      ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH

```



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3182 ;*ERROR IS TO BE REPORTED. IT THEN USES THE "ERROR TABLE" ($ERRTB)
3183 ;*ENTRY TO DEFINE WHAT INFORMATION IS TO BE REPORTED CONCERNING
3184 ;*THE ERROR.
3185 ;*****
3186 025362 104411 TYPERR: SAVREG
3187 025364 032777 020000 153546 BIT #SW13,DSWR ;INHIBIT ERROR TYPEOUTS?
3188 025372 001107 BNE 20$ ;YES-BRANCH
3189 025374 113700 001114 MOV $ITEMB,RO ;ENTER ERROR NUMBER
3190 025400 042700 177400 BIC #177400,RO ;CLEAR UPPER BITS
3191 025404 005300 DEC RO ;FORM INDEX FOR ERROR TABLE
3192 025406 006300 ASL RO
3193 025410 006300 ASL RO
3194 025412 006300 ASL RO
3195 025414 062700 001272 1$: ADD $ERRTB,RO ;FORM ADDRESS OF ERROR ENTRY
3196 025420 012037 025434 MOV (RO)+,2$ ;GET EM POINTER
3197 025424 001404 BEQ 3$ ;BRANCH IF THERE ISN'T ONE
3198 025426 104401 001267 TYPE ,SCRLF ;TYPE CARRIAGE RETURN LINE FEED
3199 025432 104401 TYPE ;TYPE ERROR MESSAGE (EM)
3200 025434 000000 2$: .WORD 0 ;EM POINTER GOES HERE
3201 025436 012037 025452 3$: MOV (RO)+,4$ ;GET DH POINTER
3202 025442 001404 BEQ 5$ ;BRANCH IF THERE ISN'T ONE
3203 025444 104401 001267 TYPE ,SCRLF ;TYPE CR-LF
3204 025450 104401 TYPE ;TYPE DATA HEADER
3205 025452 000000 4$: .WORD 0 ;DH POINTER GOES HERE
3206 025454 012001 5$: MOV (RO)+,R1 ;GET DT POINTER
3207 025456 001455 BEQ 20$ ;BRANCH IF THERE ARE NONE
3208 025460 005004 CLR R4 ;SET INDENT SWITCH
3209 025462 012000 MOV (RO)+,RO ;GET DF POINTER
3210 025464 012002 MOV (RO)+,R2 ;STORE NUMBER OF DH'S
3211 025466 001446 BEQ 17$ ;DH NUM IS 0-BRANCH
3212 025470 005104 COM R4 ;NO INDENT
3213 025472 104401 001267 TYPE ,SCRLF
3214 025476 112003 10$: MOV (RO)+,R3 ;GET & STORE NUMBER OF DATA WORDS
3215 025500 105720 TSTB (RO)+ ;BUMP PAST FORMAT WORD
3216 025502 005703 TST R3 ;TEST IF ANY DATA FOR THIS HEADER
3217 025504 001407 BEQ 14$ ;NO - SKIP DATA PRINT
3218 025506 013146 11$: MOV @R1+,-(SP) ;PUT FIRST DATA WORD ON STACK
3219 025510 104402 TYPOC ;TYPE IT
3220 025512 005303 DEC R3 ;MORE DATA WORDS
3221 025514 001403 BEQ 14$ ;NO-BRANCH
3222 025516 104401 012744 TYPE ,SPACE2 ;TYPE SEPARATORS
3223 025522 000771 BR 11$ ;LOOP

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|      |        |        |        |        |       |                |                    |  |                                    |
|------|--------|--------|--------|--------|-------|----------------|--------------------|--|------------------------------------|
| 3224 | 025524 | 005302 |        |        | 14\$: | DEC            | R2                 |  | ;MORE DH'S?                        |
| 3225 | 025526 | 003431 |        |        |       | BLE            | 20\$               |  | ;NO-BRANCH                         |
| 3226 | 025530 | 104401 | 001267 |        |       | TYPE           | \$CRLF             |  |                                    |
| 3227 | 025534 | 005760 | 000002 |        |       | TST            | 2(R0)              |  | ;ONLY A DH IN THIS REQUEST?        |
| 3228 | 025540 | 001404 |        |        |       | BEQ            | 15\$               |  | ;YES-BRANCH BYPASS INDENT          |
| 3229 | 025542 | 005104 |        |        |       | COM            | R4                 |  | ;INDENT?                           |
| 3230 | 025544 | 001002 |        |        |       | BNE            | 15\$               |  | ;NO-BRANCH                         |
| 3231 | 025546 | 104401 | 012744 |        |       | TYPE           | SPACE2             |  | ;YES-TYPE SPACES                   |
| 3232 | 025552 | 012037 | 025560 |        | 15\$: | MOV            | (R0)+,16\$         |  | ;GET NEXT DH POINTER               |
| 3233 | 025556 | 104401 |        |        |       | TYPE           |                    |  | ;TYPE DH                           |
| 3234 | 025560 | 000000 |        |        | 16\$: | .WORD          | 0                  |  | ;DH POINTER GOES HERE              |
| 3235 | 025562 | 105710 |        |        |       | TSTB           | (R0)               |  | ;TYPE A DT?                        |
| 3236 | 025564 | 001003 |        |        |       | BNE            | 21\$               |  | ;YES-BRANCH                        |
| 3237 | 025566 | 062700 | 000002 |        |       | ADD            | #2,R0              |  | ;INCREMENT OF POINTER              |
| 3238 | 025572 | 000754 |        |        |       | BR             | 14\$               |  | ;SEE IF END OF DF BLOCK            |
| 3239 | 025574 | 104401 | 001267 |        | 21\$: | TYPE           | \$CRLF             |  |                                    |
| 3240 | 025600 | 005704 |        |        |       | TST            | R4                 |  | ;INDENT?                           |
| 3241 | 025602 | 001335 |        |        |       | BNE            | 10\$               |  | ;NO-BRANCH                         |
| 3242 | 025604 | 104401 | 012744 |        | 17\$: | TYPE           | SPACE2             |  | ;YES-TYPE SPACES                   |
| 3243 | 025610 | 000732 |        |        |       | BR             | 10\$               |  | ;LOOP                              |
| 3244 | 025612 | 104412 |        |        | 20\$: | RESREG         |                    |  |                                    |
| 3245 | 025614 | 000207 |        |        |       | RTS            | PC                 |  |                                    |
| 3246 |        |        |        |        |       |                |                    |  |                                    |
| 3247 |        |        |        |        |       |                |                    |  |                                    |
| 3248 |        |        |        |        |       |                |                    |  |                                    |
| 3249 |        |        |        |        |       |                |                    |  |                                    |
| 3250 |        |        |        |        |       |                |                    |  |                                    |
| 3251 |        |        |        |        |       |                |                    |  |                                    |
| 3252 |        |        |        |        |       |                |                    |  |                                    |
| 3253 |        |        |        |        |       |                |                    |  |                                    |
| 3254 |        |        |        |        |       |                |                    |  |                                    |
| 3255 |        |        |        |        |       |                |                    |  |                                    |
| 3256 |        |        |        |        |       |                |                    |  |                                    |
| 3257 | 025616 | 104411 |        |        |       |                |                    |  |                                    |
| 3258 | 025620 | 152737 | 000377 | 002652 |       | CONERR: SAVREG |                    |  |                                    |
| 3259 | 025626 | 105237 | 002654 |        |       | BISB           | #377,DONE          |  | ;SET DONE FLAG                     |
| 3260 | 025632 | 032765 | 001000 | 000014 |       | INCB           | ERRCNT             |  | ;BUMP ERROR COUNTER                |
| 3261 | 025640 | 001403 |        |        |       | BIT            | #PBSVAL,P.PRST(R5) |  | ;TEST IF STATUS VALID              |
| 3262 | 025642 | 004737 | 026060 |        |       | BEQ            | 12\$               |  | ;YES - SKIP                        |
| 3263 | 025646 | 000402 |        |        |       | JSR            | PC,REPSUP          |  | ;CALL FOR GETTING STATUS           |
| 3264 | 025650 | 004737 | 030336 |        |       | BR             | 13\$               |  |                                    |
| 3265 | 025654 | 032737 | 000001 | 002604 | 12\$: | JSR            | PC,TOPROC          |  | ;LOAD RK REGS INTO \$REGS          |
| 3266 | 025662 | 001402 |        |        | 13\$: | BIT            | #BIT0,E.CONT       |  | ;ERROR 0?                          |
| 3267 | 025664 | 104064 |        |        |       | BEQ            | 1\$                |  | ;NO-BRANCH                         |
| 3268 | 025666 | 000463 |        |        |       | ERROR          | 64                 |  | ;CLEAR CONT DID NOT CLEAR ERROR    |
| 3269 | 025670 | 032737 | 000002 | 002604 | 1\$:  | BR             | 7\$                |  |                                    |
| 3270 | 025676 | 001402 |        |        |       | BIT            | #BIT1,E.CONT       |  | ;ERROR 1?                          |
| 3271 | 025700 | 104065 |        |        |       | BEQ            | 2\$                |  | ;NO-BRANCH                         |
| 3272 | 025702 | 000455 |        |        |       | ERROR          | 65                 |  | ;NO ATTENTION IN ATTENTION SUM REG |
| 3273 | 025704 | 032737 | 000004 | 002604 | 2\$:  | BR             | 7\$                |  |                                    |
| 3274 | 025712 | 001402 |        |        |       | BIT            | #BIT2,E.CONT       |  | ;ERROR 2?                          |
| 3275 | 025714 | 104066 |        |        |       | BEQ            | 3\$                |  | ;NO-BRANCH                         |
| 3276 | 025716 | 000447 |        |        |       | ERROR          | 66                 |  | ;UNSOLICITED ATTENTION             |
|      |        |        |        |        |       | BR             | 7\$                |  |                                    |

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3277 025720 032737 000010 002604 3$: BIT #BIT3,E.CONT ;ERROR 3?
3278 025726 001402 BEQ 4$ ;NO-BRANCH
3279 025730 104067 ERROR 67 ;UNEXPECTED DATA TYPE ERROR
3280 025732 000441 BR 7$
3281 025734 032737 000020 002604 4$: BIT #BIT4,E.CONT ;ERROR 4?
3282 025742 001402 BEQ 5$ ;NO-BRANCH
3283 025744 104070 ERROR 70 ;ATTENTION DID NOT RESET WITH CLEAR
3284 025746 000433 BR 7$
3285 025750 032737 000040 002604 5$: BIT #BIT5,E.CONT ;ERROR 5?
3286 025756 001402 BEQ 6$ ;NO-BRANCH
3287 025760 104071 ERROR 71 ;SUBSYS CLEAR DIDN'T CLEAR DRIVE ATTENTION
3288 025762 000425 BR 7$
3289 025764 032737 000400 002604 6$: BIT #BIT8,E.CONT
3290 025772 001401 BEQ 8$
3291 025774 104072 ERROR 72 ;DATA LATE WHEN UNLOADING HEADER
3292 025776 032737 001000 002604 8$: BIT #BIT9,E.CONT
3293 026004 001401 BEQ 9$
3294 026006 104073 ERROR 73 ;CONTROLLER ERROR DURING DRIVER SERVICE
3295 026010 032737 002000 002604 9$: BIT #BIT10,E.CONT
3296 026016 001401 BEQ 10$
3297 026020 104074 ERROR 74 ;DRIVE DETECTED PARITY ERROR
3298 026022 032737 100000 002604 10$: BIT #BIT15,E.CONT
3299 026030 001401 BEQ 11$
3300 026032 104052 ERROR 52 ;MULTIPLE DRIVE SELECT
3301 026034 104075 ERROR 75 ;UNDEFINED ERROR
3302 026036 032737 000400 006364 7$: BIT #LEV2ER,RECODE ;TEST IF LEVEL 2 ERROR
3303 026044 001401 BEQ 14$ ;NO - SKIP
3304 026046 104106 ERROR 106
3305 026050 005037 002604 14$: CLR E.CONT ;CLEAR CONTROLLER ERROR WORD
3306 026054 000137 030174 JMP CERTY ;GO DO RETRY
3307 ;*****
3308 ;SBTTL REPORT SUPPORT ROUTINE
3309 ;*THIS ROUTINE LOADS ALL THE PARAMETER BLOCK DATA TO BE REPORTED
3310 ;*INTO THE PROPER TEMPORARY REGISTERS FOR REPORTING. ALL THESE MAY
3311 ;*NOT BE INCLUDED IN THE REPORT, BUT THEY ARE LOADED ANYWAY.
3312 REPSUP:
3313 SAVREG
3314 CLR ERRCOM ;CLEAR ERROR COMMAND STORE
3315 MOVB P.CMND(R5),ERRCOM ;STORE COMMAND START VALUES
3316 MOV #SREG0,R0 ;FOR REPORTING
3317 MOV P.CYLN(R5),(R0)+
3318 MOVB P.TRCK(R5),(R0)+
3319 CLRB (R0)+
3320 MOVB P.SECT(R5),(R0)+
3321 CLRB (R0)+
3322 MOV P.WC(R5),(R0)+
3323 MOV P.BALO(R5),(R0)+
3324 MOV P.CS1(R5),(R0)+ ;GET ALL THE VALUES FROM THE
3325 MOV P.CS2(R5),(R0)+ ;PARAMETER BLOCK AND LOAD
3326 MOV P.DCYL(R5),(R0)+ ;THE TEMPORARY REGISTERS
3327 MOV P.DTS(R5),(R0)+ ;FOR REPORTING. ALL THIS
3328 MOV P.WCR(R5),(R0)+ ;DATA MAY NOT BE VALID
3329 ;FOR ALL REPORTS (TO BE
3330 MOV P.BAR(R5),(R0)+ ;DETERMINED LATER) BUT IT IS
3331 MOV P.ASOF(R5),(R0)+ ;STORED ANY WAY.
3332 MOV P.DS(R5),(R0)+

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3333 026170 016520 000034  
 3334 026174 016520 000040  
 3335 026200 016520 000042  
 3336 026204 016520 000044  
 3337 026210 016520 000046  
 3338 026214 016520 000050  
 3339 026220 016520 000052  
 3340 026224 016520 000054  
 3341 026230 016520 000056  
 3342 026234 104412  
 3343 026236 000207

MOV P.ER(R5),(R0)+  
 MOV P.A00(R5),(R0)+  
 MOV P.B00(R5),(R0)+  
 MOV P.A01(R5),(R0)+  
 MOV P.B01(R5),(R0)+  
 MOV P.A10(R5),(R0)+  
 MOV P.B10(R5),(R0)+  
 MOV P.A11(R5),(R0)+  
 MOV P.B11(R5),(R0)+  
 RESREG  
 RTS PC

\*\*\*\*\*  
 ;SBTTL REPORT ERROR ROUTINE  
 ;\* ENTRY JSR PC,ERRHDL  
 ;\*RETURN RTS PC  
 ;\*  
 ;\*THIS ROUTINE IS CALLED BY THE DRIVER WHEN AN ERROR IS DETECTED  
 ;\*IN THE OPERATION. THE ROUTINE DETERMINES WHICH COMMAND WAS  
 ;\*BEING EXECUTED AND GENERATES THE PROPER ERROR MESSAGE.  
 ;\*\*\*\*\*

3354 026240 104411  
 3355 026242 152737 000377 002652  
 3356 026250 105237 002654  
 3357 026254 005037 006364  
 3358 026260 032737 000400 006364  
 3359 026266 001402  
 3360 026270 012705 002446  
 3361 026274 012737 030310 002600  
 3362 026302 012737 030326 002576  
 3363 026310 004737 026060

ERRHDL: SAVREG  
 BISB #377,DONE ;SET DONE FLAG  
 INCB ERRCNT ;INCREMENT ERROR COUNT  
 CLR RECODE ;CLEAR RECOVERY CODE WORD  
 ER2ENT: BIT #LEV2ER,RECODE ;TEST IF 2ND LEVEL ERROR  
 BEQ 52\$ ;NO - SKIP PARAM BLOCK CHANGE  
 MOV #PARM1,R5 ;ELSE SET R5 TO PARAMETER BLOCK 1  
 52\$: MOV #RETANL,A.ABNL ;SET NOW ABNORMAL AND NORMAL RETURN FOR  
 MOV #RETNML,A.NORM ;DRIVER OPERATIONS IN ERROR PROCESSING  
 JSR PC,REPSUP ;GO SET UP REGISTERS FOR REPORT  
 ;NOW BEGIN TESTING THE ERROR  
 ;BITS. THE SEQUENCE IN  
 ;WHICH THEY ARE TESTED IS  
 ;CONSIDERED SIGNIFICANT IN  
 ;THAT ERRORS OF A MORE  
 ;CATASTROPHIC NATURE ARE FIRST  
 ;TESTED.  
 ;  
 ;IF AN ERROR IS FOUND SET  
 ;THAT ERROR IS REPORTED AND  
 ;THE REPORTING IS TERMINATED.  
 ;IF ADDITIONAL ERRORS ARE SET,  
 ;THE RK611 REGISTER PRINTOUTS  
 ;WILL SHOW THIS BUT THE  
 ;REGISTER CONTENTS MUST BE  
 ;MANUALLY DECODED TO LOCATE THE  
 ;SECOND ERROR  
 ;SET R4 TO ERROR REGISTER  
 ;TEST UPE. IF UES-SET  
 ;REPORT ERROR  
 MOV P.ER(R5),R4  
 BIT #UPE,P.CS2(R5)  
 BEQ 1\$  
 ERROR 1  
 BIS #ABORT,RECODE  
 JMP 37\$  
 1\$: BIT #NEM,P.CS2(R5) ;TEST NON-EXISTANT MEMORY  
 BEQ 2\$  
 2\$

3381 026314 016504 000034  
 3382 026320 032765 020000 000020  
 3383 026326 001406  
 3384 026330 104001  
 3385 026332 052737 000200 006364  
 3386 026340 000137 027664  
 3387 026344 032765 004000 000020  
 3388 026352 001406

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|      |        |        |        |        |       |       |                    |                                    |
|------|--------|--------|--------|--------|-------|-------|--------------------|------------------------------------|
| 3389 | 026354 | 104002 |        |        |       | ERROR | 2                  |                                    |
| 3390 | 026356 | 052737 | 000200 | 006364 |       | BIS   | #ABORT, RECODE     |                                    |
| 3391 | 026364 | 000137 | 027664 |        |       | JMP   | 37\$               |                                    |
| 3392 | 026370 | 032765 | 010000 | 000020 | 2\$:  | BIT   | #NED, P.CS2(R5)    | ; TEST NON-EXISTANT DRIVE          |
| 3393 | 026376 | 001412 |        |        |       | BEQ   | 3\$                |                                    |
| 3394 | 026400 | 032765 | 000400 | 000020 |       | BIT   | #UFE, P.CS2(R5)    | ; TEST IF NED & UFE BOTH SET       |
| 3395 | 026406 | 001403 |        |        |       | BEQ   | 38\$               |                                    |
| 3396 | 026410 | 104035 |        |        |       | ERROR | 35                 | ; NED & UFE BOTH SET ERROR         |
| 3397 | 026412 | 000137 | 027664 |        |       | JMP   | 37\$               |                                    |
| 3398 | 026416 | 104003 |        |        | 38\$: | ERROR | 3                  | ; NED ONLY                         |
| 3399 | 026420 | 000137 | 027664 |        |       | JMP   | 37\$               |                                    |
| 3400 | 026424 | 032765 | 000400 | 000020 | 3\$:  | BIT   | #UFE, P.CS2(R5)    | ; TEST UNIT FIELD ERROR            |
| 3401 | 026432 | 001412 |        |        |       | BEQ   | 4\$                |                                    |
| 3402 | 026434 | 032765 | 010000 | 000020 |       | BIT   | #NED, P.CS2(R5)    | ; TEST IF UFE & NED BOTH SET       |
| 3403 | 026442 | 001403 |        |        |       | BEQ   | 39\$               | ; NO-SKIP                          |
| 3404 | 026444 | 104035 |        |        |       | ERROR | 35                 | ; REPORT NED & UFE BOTH SET        |
| 3405 | 026446 | 000137 | 027664 |        |       | JMP   | 37\$               |                                    |
| 3406 | 026452 | 104004 |        |        | 39\$: | ERROR | 4                  | ; REPORT UFE ONLY                  |
| 3407 | 026454 | 000137 | 027664 |        |       | JMP   | 37\$               |                                    |
| 3408 | 026460 | 032765 | 000100 | 000014 | 4\$:  | BIT   | #CMDT0, P.PRST(R5) |                                    |
| 3409 | 026466 | 001414 |        |        |       | BEQ   | 5\$                |                                    |
| 3410 | 026470 | 004737 | 030336 |        |       | JSR   | PC, TOPROC         | ; GO PROCESS TIMEOUT               |
| 3411 | 026474 | 032737 | 000400 | 006364 |       | BIT   | #LEV2ER, RECODE    | ; TEST IF LEVEL 2 ERROR            |
| 3412 | 026502 | 001003 |        |        |       | BNE   | 41\$               | ; YES - SKIP TO ERROR 57           |
| 3413 | 026504 | 104005 |        |        |       | ERROR | 5                  | ; ELSE MAKE FULL TIMEOUT REPORT    |
| 3414 | 026506 | 000137 | 027664 |        |       | JMP   | 37\$               |                                    |
| 3415 | 026512 | 104057 |        |        | 41\$: | ERROR | 57                 | ; 2ND LEVEL ERROR REPORT           |
| 3416 | 026514 | 000137 | 027664 |        |       | JMP   | 37\$               |                                    |
| 3417 | 026520 | 032765 | 020000 | 000016 | 5\$:  | BIT   | #SPAR, P.CS1(R5)   | ; TEST DRIVE BUS PARITY ERROR      |
| 3418 | 026526 | 001406 |        |        |       | BEQ   | 6\$                |                                    |
| 3419 | 026530 | 104006 |        |        |       | ERROR | 6                  |                                    |
| 3420 | 026532 | 052737 | 004000 | 006364 |       | BIS   | #RCLREQ, RECODE    |                                    |
| 3421 | 026540 | 000137 | 027664 |        |       | JMP   | 37\$               |                                    |
| 3422 | 026544 | 032704 | 000010 |        | 6\$:  | BIT   | #DRPAR, R4         | ; TEST DRIVE DETECTED PARITY ERROR |
| 3423 | 026550 | 001406 |        |        |       | BEQ   | 7\$                |                                    |
| 3424 | 026552 | 104007 |        |        |       | ERROR | 7                  |                                    |
| 3425 | 026554 | 052737 | 004000 | 006364 |       | BIS   | #RCLREQ, RECODE    |                                    |
| 3426 | 026562 | 000137 | 027664 |        |       | JMP   | 37\$               |                                    |
| 3427 | 026566 | 032765 | 000010 | 000036 | 7\$:  | BIT   | #ACLO, P.DS(R5)    | ; TEST AC LOW                      |
| 3428 | 026574 | 001403 |        |        |       | BEQ   | 8\$                |                                    |
| 3429 | 026576 | 104010 |        |        |       | ERROR | 10                 |                                    |
| 3430 | 026600 | 000137 | 027664 |        |       | JMP   | 37\$               |                                    |
| 3431 | 026604 | 032765 | 000020 | 000036 | 8\$:  | BIT   | #SPDLSS, P.DS(R5)  | ; TEST SPEED LOSS                  |
| 3432 | 026612 | 001403 |        |        |       | BEQ   | 24\$               |                                    |
| 3433 | 026614 | 104011 |        |        |       | ERROR | 11                 |                                    |
| 3434 | 026616 | 000137 | 027664 |        |       | JMP   | 37\$               |                                    |
| 3435 | 026622 | 032765 | 004000 | 000016 | 24\$: | BIT   | #CT0, P.CS1(R5)    | ; TEST FOR CONTROLLER TIMEOUT      |
| 3436 | 026630 | 001401 |        |        |       | BEQ   | 25\$               |                                    |
| 3437 | 026632 | 104027 |        |        |       | ERROR | 27                 |                                    |
| 3438 | 026634 | 032704 | 000001 |        | 25\$: | BIT   | #ILC, R4           | ; TEST ILLEGAL FUNCTION CODE       |
| 3439 | 026640 | 001403 |        |        |       | BEQ   | 10\$               |                                    |
| 3440 | 026642 | 104012 |        |        |       | ERROR | 12                 |                                    |
| 3441 | 026644 | 000137 | 027664 |        |       | JMP   | 37\$               |                                    |
| 3442 | 026650 | 032765 | 002000 | 000020 | 10\$: | BIT   | #PGE, P.CS2(R5)    | ; TEST PROGRAMMING ERROR           |
| 3443 | 026656 | 001403 |        |        |       | BEQ   | 11\$               |                                    |
| 3444 | 026660 | 104013 |        |        |       | ERROR | 13                 |                                    |

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|      |        |        |               |       |       |                |                              |
|------|--------|--------|---------------|-------|-------|----------------|------------------------------|
| 3445 | 026662 | 000137 | 027664        |       | JMP   | 37\$           |                              |
| 3446 | 026666 | 032704 | 000004        | 11\$: | BIT   | #NXF,R4        | ;TEST ILLEGAL DRIVE FUNCTION |
| 3447 | 026672 | 001403 |               |       | BEQ   | 12\$           |                              |
| 3448 | 026674 | 104014 |               |       | ERROR | 14             |                              |
| 3449 | 026676 | 000137 | 027664        |       | JMP   | 37\$           |                              |
| 3450 | 026702 | 032704 | 000040        | 12\$: | BIT   | #DTYE,R4       | ;TEST DRIVE TYPE ERROR       |
| 3451 | 026706 | 001403 |               |       | BEQ   | 13\$           |                              |
| 3452 | 026710 | 104015 |               |       | ERROR | 15             |                              |
| 3453 | 026712 | 000137 | 027664        |       | JMP   | 37\$           |                              |
| 3454 | 026716 | 032704 | 000020        | 13\$: | BIT   | #FMTE,R4       | ;TEST FORMAT ERROR           |
| 3455 | 026722 | 001403 |               |       | BEQ   | 14\$           |                              |
| 3456 | 026724 | 104016 |               |       | ERROR | 16             |                              |
| 3457 | 026726 | 000137 | 027664        |       | JMP   | 37\$           |                              |
| 3458 | 026732 | 032704 | 004000        | 14\$: | BIT   | #WLE,R4        | ;TEST WRITE LOCK ERROR       |
| 3459 | 026736 | 001403 |               |       | BEQ   | 15\$           |                              |
| 3460 | 026740 | 104017 |               |       | ERROR | 17             |                              |
| 3461 | 026742 | 000137 | 027664        |       | JMP   | 37\$           |                              |
| 3462 | 026746 | 032704 | 040000        | 15\$: | BIT   | #UNS,R4        | ;TEST DRIVE UNSAFE           |
| 3463 | 026752 | 001406 |               |       | BEQ   | 16\$           |                              |
| 3464 | 026754 | 104020 |               |       | ERROR | 20             |                              |
| 3465 | 026756 | 052737 | 000200 006364 |       | BIS   | #ABORT,RECODE  |                              |
| 3466 | 026764 | 000137 | 027664        |       | JMP   | ALLTRM         |                              |
| 3467 | 026770 | 032704 | 000002        | 16\$: | BIT   | #SKI,R4        | ;TEST SEEK INCOMPLETE        |
| 3468 | 026774 | 001406 |               |       | BEQ   | 17\$           |                              |
| 3469 | 026776 | 104021 |               |       | ERROR | 21             |                              |
| 3470 | 027000 | 052737 | 004000 006364 |       | BIS   | #RCLREQ,RECODE |                              |
| 3471 | 027006 | 000137 | 027664        |       | JMP   | 37\$           |                              |
| 3472 | 027012 | 032704 | 001000        | 17\$: | BIT   | #COE,R4        | ;TEST CYLINDER OVERFLOW      |
| 3473 | 027016 | 001406 |               |       | BEQ   | 18\$           |                              |
| 3474 | 027020 | 104022 |               |       | ERROR | 22             |                              |
| 3475 | 027022 | 052737 | 004000 006364 |       | BIS   | #RCLREQ,RECODE |                              |
| 3476 | 027030 | 000137 | 027664        |       | JMP   | 37\$           |                              |
| 3477 | 027034 | 032704 | 002000        | 18\$: | BIT   | #IDAE,R4       | ;TEST ILLEGAL CYLINDER       |
| 3478 | 027040 | 001406 |               |       | BEQ   | 19\$           |                              |
| 3479 | 027042 | 104023 |               |       | ERROR | 23             |                              |
| 3480 | 027044 | 052737 | 004000 006364 |       | BIS   | #RCLREQ,RECODE |                              |
| 3481 | 027052 | 000137 | 027664        |       | JMP   | 37\$           |                              |
| 3482 | 027056 | 032765 | 000040 000036 | 19\$: | BIT   | #DROT,P.DS(R5) | ;TEST DRIVE OFF TRACK        |
| 3483 | 027064 | 001406 |               |       | BEQ   | 20\$           |                              |
| 3484 | 027066 | 104024 |               |       | ERROR | 24             |                              |
| 3485 | 027070 | 052737 | 004000 006364 |       | BIS   | #RCLREQ,RECODE |                              |
| 3486 | 027076 | 000137 | 027664        |       | JMP   | 37\$           |                              |
| 3487 | 027102 | 032704 | 010000        | 20\$: | BIT   | #DTE,R4        | ;TEST DRIVE TIMING ERROR     |
| 3488 | 027106 | 001406 |               |       | BEQ   | 21\$           |                              |
| 3489 | 027110 | 104025 |               |       | ERROR | 25             |                              |
| 3490 | 027112 | 052737 | 000200 006364 |       | BIS   | #ABORT,RECODE  |                              |
| 3491 | 027120 | 000137 | 027664        |       | JMP   | 37\$           |                              |
| 3492 | 027124 | 032765 | 100000 000020 | 21\$: | BIT   | #DLT,P.CS2(R5) | ;TEST DATA LATE              |
| 3493 | 027132 | 001403 |               |       | BEQ   | 22\$           |                              |
| 3494 | 027134 | 104026 |               |       | ERROR | 26             |                              |
| 3495 | 027136 | 000137 | 027664        |       | JMP   | 37\$           |                              |
| 3496 | 027142 | 032704 | 020000        | 22\$: | BIT   | #OPI,R4        | ;TEST IF OPI ERROR           |
| 3497 | 027146 | 001457 |               |       | BEQ   | 29\$           |                              |
| 3498 | 027150 | 052737 | 000010 006364 |       | BIS   | #OPIERR,RECODE |                              |
| 3499 | 027156 | 105737 | 002650        |       | TSTB  | DERCNT         | ;TEST IF FIRST ERROR         |
| 3500 | 027162 | 001402 |               |       | BEQ   | 50\$           |                              |



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|      |        |        |        |        |       |       |                   |                                         |
|------|--------|--------|--------|--------|-------|-------|-------------------|-----------------------------------------|
| 3501 | 027164 | 000137 | 027664 |        |       | JMP   | 37\$              | ; NO - SKIP REPORT                      |
| 3502 | 027170 | 032737 | 000400 | 006364 | 50\$: | BIT   | #LEV2ER, RECODE   | ; TEST IF A SECOND LEVEL 2 ERROR        |
| 3503 | 027176 | 001403 |        |        |       | BEQ   | 26\$              | ; HAS ALREADY OCCURRED                  |
| 3504 | 027200 | 104054 |        |        | 27\$: | ERROR | 54                |                                         |
| 3505 | 027202 | 000137 | 027664 |        |       | JMP   | 37\$              | ; GET OUT OF ERROR REPORT               |
| 3506 | 027206 | 004737 | 031324 |        | 26\$: | JSR   | PC, BLDEXH        | ; GO BUILD EXPECTED HEADER              |
| 3507 | 027212 | 004737 | 030700 |        |       | JSR   | PC, RDHDO         | ; GET HEADER OF SECTOR 0                |
| 3508 | 027216 | 032737 | 000400 | 006364 |       | BIT   | #LEV2ER, RECODE   | ; TEST IF ERROR GETTING HDR             |
| 3509 | 027224 | 001025 |        |        |       | BNE   | 28\$              | ; IF YES-GO MAKE ABBREVIATED REPORT     |
| 3510 | 027226 | 013702 | 002570 |        |       | MOV   | RKBAS, R2         | ; STORE HEADER 0 INTO REGISTERS         |
| 3511 | 027232 | 042762 | 000100 | 000000 |       | BIC   | #IE, RKCS1(R2)    | ; RESET INTERRUPT ENABLE                |
| 3512 | 027240 | 016237 | 000024 | 001202 |       | MOV   | RKDB(R2), \$REG10 | ; FOR REPORTING                         |
| 3513 | 027246 | 016237 | 000024 | 001204 |       | MOV   | RKDB(R2), \$REG11 |                                         |
| 3514 | 027254 | 016237 | 000024 | 001206 |       | MOV   | RKDB(R2), \$REG12 |                                         |
| 3515 | 027262 | 032762 | 100000 | 000000 |       | BIT   | #CERR, RKCS1(R2)  | ; TEST IF ERROR DURING STORAGE          |
| 3516 | 027270 | 001343 |        |        |       | BNE   | 27\$              |                                         |
| 3517 | 027272 | 104030 |        |        |       | ERROR | 30                | ; MAKE OPI REPORT                       |
| 3518 | 027274 | 000137 | 027664 |        |       | JMP   | 37\$              |                                         |
| 3519 | 027300 | 104054 |        |        | 28\$: | ERROR | 54                |                                         |
| 3520 | 027302 | 000137 | 026260 |        |       | JMP   | ER2ENT            | ; GO MAKE 2ND LEVEL REPORT              |
| 3521 | 027306 | 032704 | 000400 |        | 29\$: | BIT   | #HVRC, R4         | ; TEST IF HVRC ERROR                    |
| 3522 | 027312 | 001457 |        |        |       | BEQ   | 23\$              |                                         |
| 3523 | 027314 | 052737 | 000004 | 006364 |       | BIS   | #HVRCER, RECODE   |                                         |
| 3524 | 027322 | 105737 | 002650 |        |       | TSTB  | DERCNT            | ; TEST IF FIRST ERROR                   |
| 3525 | 027326 | 001402 |        |        |       | BEQ   | 30\$              | ; YES - REPORT                          |
| 3526 | 027330 | 000137 | 027664 |        |       | JMP   | 37\$              | ; JUMP TO RETURN                        |
| 3527 | 027334 | 032737 | 000400 | 006364 | 30\$: | BIT   | #LEV2ER, RECODE   | ; TEST IF A 2ND LEVEL ERROR HAS ALREADY |
| 3528 | 027342 | 001403 |        |        |       | BEQ   | 31\$              | ; OCCURRED. NO-SKIP EXIT                |
| 3529 | 027344 | 104055 |        |        | 51\$: | ERROR | 55                |                                         |
| 3530 | 027346 | 000137 | 027664 |        |       | JMP   | 37\$              | ; GET OUT OF ERROR REPORT               |
| 3531 | 027352 | 004737 | 031324 |        | 31\$: | JSR   | PC, BLDEXH        | ; GO BUILD EXPECTED HEADER              |
| 3532 | 027356 | 004737 | 030700 |        |       | JSR   | PC, RDHDO         | ; GO GET HDR 0                          |
| 3533 | 027362 | 032737 | 000400 | 006364 |       | BIT   | #LEV2ER, RECODE   | ; TEST IF ERROR IN GETTING HDR          |
| 3534 | 027370 | 001025 |        |        |       | BNE   | 32\$              | ; IF YES-GO MAKE ABBREVIATED REPORT     |
| 3535 | 027372 | 013702 | 002570 |        |       | MOV   | RKBAS, R2         | ; GET RK611 BASE ADDRESS                |
| 3536 | 027376 | 042762 | 000100 | 000000 |       | BIC   | #IE, RKCS1(R2)    | ; CLEAR INTERRUPT ENABLE                |
| 3537 | 027404 | 016237 | 000024 | 001202 |       | MOV   | RKDB(R2), \$REG10 | ; STORE OFF HEADER                      |
| 3538 | 027412 | 016237 | 000024 | 001204 |       | MOV   | RKDB(R2), \$REG11 |                                         |
| 3539 | 027420 | 016237 | 000024 | 001206 |       | MOV   | RKDB(R2), \$REG12 |                                         |
| 3540 | 027426 | 032762 | 100000 | 000000 |       | BIT   | #CERR, RKCS1(R2)  | ; TEST IN ANY ERROR IN UNLO. 0          |
| 3541 | 027434 | 001343 |        |        |       | BNE   | 51\$              | ; IF YES - GO MAKE SHORT REPORT         |
| 3542 | 027436 | 104031 |        |        |       | ERROR | 31                | ; MAKE FULL REPORT                      |
| 3543 | 027440 | 000137 | 027664 |        |       | JMP   | 37\$              |                                         |
| 3544 | 027444 | 104055 |        |        | 32\$: | ERROR | 55                | ; ABBREVIATED HVRC ERROR RPORT          |
| 3545 | 027446 | 000137 | 026260 |        |       | JMP   | ER2ENT            | ; GO REPORT 2ND LEVEL ERROR             |
| 3546 | 027452 | 032704 | 000200 |        | 23\$: | BIT   | #BSE, R4          | ; TEST FOR BAD SECTOR ERROR             |
| 3547 | 027456 | 001422 |        |        |       | BEQ   | 33\$              | ; NO - SKIP                             |
| 3548 | 027460 | 052737 | 000002 | 006364 |       | BIS   | #BSERR, RECODE    | ; SET ERROR FLAG                        |
| 3549 | 027466 | 016502 | 000026 |        |       | MOV   | P.DTS(R5), R2     | ; GET SECTOR IN ERROR                   |
| 3550 | 027472 | 042702 | 177740 |        |       | BIC   | #177740, R2       | ; CLEAR ALL BITS EXCEPT SECTOR          |
| 3551 | 027476 | 004737 | 021476 |        |       | JSR   | PC, BDRCK         | ; GO SEE IF THIS SECTOR LISTED          |
| 3552 | 027502 | 032737 | 001000 | 006364 |       | BIT   | #BADSEC, RECODE   | ; TEST RESULT                           |
| 3553 | 027510 | 001065 |        |        |       | BNE   | 37\$              | ; YES - EXIT, NO ERROR OR REPORT        |
| 3554 | 027512 | 104104 |        |        |       | ERROR | 104               | ; ELSE REPORT BAD BSE                   |
| 3555 | 027514 | 042737 | 000002 | 006364 |       | BIC   | #BSERR, RECODE    | ; RESET BSE ERROR FLAG                  |
| 3556 | 027522 | 000460 |        |        |       | BR    | 37\$              | ; GO EXIT                               |



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3557 027524 032704 100000      33$: BIT      #DCK,R4      ;TEST IF DATA CHECK
3558 027530 001435      BEQ      36$
3559 027532 052737 000020 006364  BIS      #DCKERR,RECODE ;SET DATA CHECK ERROR IN RECOVERY CODE
3560 027540 032704 000100      BIT      #ECH,R4      ;TEST IF ECC IS HARD. IF
3561 027544 001406      BEQ      34$      ;YES SET UNCORRECTABLE IN
3562 027546 052737 000040 006364  BIS      #ECCNC,RECODE ;RECOVERY FLAG AND A 0 IN
3563 027554 005037 001206      CLR      $REG12      ;REG12 TO INDICATE UNCORRECTABLE,
3564 027560 000403      BR       35$      ;A 1 IN REG 12 FOR CORRECTABLE
3565 027562 012737 000001 001206 34$: MOV      #1,$REG12
3566 027570 105737 002650      35$: TSTB     DERCNT      ;TEST IF FIRST ERROR
3567 027574 001033      BNE      37$      ;NO SKIP REPORT
3568 027576 004737 031200      JSR      PC,GTPKAD      ;GO GET PACK ADDRESS OF ERROR
3569 027602 016537 000060 001202  MOV      P.EPOS(R5),$REG10 ;STORE ECC POSITION &
3570 027610 016537 000062 001204  MOV      P.EPAT(R5),$REG11 ;PATTERN
3571 027616 104032      ERROR     32      ;REPORT DCK ERROR
3572 027620 000137 027664      JMP      37$
3573 027624 032765 040000 000020 36$: BIT      #WCE,P.CS2(R5) ;TEST WRITE CHECK ERROR
3574 027632 001414      BEQ      37$
3575 027634 042737 000200 006364  BIC      #ABORT,RECODE ;CLEAR ABORT & SET WRITE
3576 027642 052737 000100 006364  BIS      #WCERR,RECODE ;CHECK ERROR IN RECODE
3577 027650 105737 002650      TSTB     DERCNT      ;TEST IF FIRST ERROR
3578 027654 001003      BNE      37$      ;NO - SKIP
3579 027656 004737 031200      JSR      PC,GTPKAD      ;GO GET ADDRESS OF ERROR
3580 027662 104032      ERROR     33      ;REPORT WCE
3581
3582 027664 032765 000020 000014 37$: BIT      #DRVHRO,P.PRST(R5) ;TEST HARD ERROR
3583 027672 001404      BEQ      43$
3584 027674 104036      ERROR     36
3585 027676 052737 000200 006364  BIS      #ABORT,RECODE
3586
3587 027704 032765 000040 000014 43$: BIT      #DRVDSC,P.PRST(R5) ;TEST STATUS CHANGE NOT CLEARED
3588 027712 001404      BEQ      44$
3589 027714 104037      ERROR     37
3590 027716 052737 000200 006364  BIS      #ABORT,RECODE
3591
3592 027724 032765 004000 000014 44$: BIT      #MODSC,P.PRST(R5) ;IFST ATTENTION BUT NO FAULT OR DSC
3593 027732 001404      BEQ      46$
3594 027734 104040      ERROR     40
3595 027736 052737 000200 006364  BIS      #ABORT,RECODE
3596 027744 032765 000010 000014 46$: BIT      #UEXATT,P.PRST(R5) ;TEST UNEXPECTED ATTENTION
3597 027752 001404      BEQ      ALLTRM
3598 027754 104042      ERROR     42
3599 027756 052737 000200 006364  BIS      #ABORT,RECODE
3600
3601
3602      ;ALL ERRORS MUST EXIT THROUGH THIS POINT
3603
3604 027764 012705 002362      ALLTRM: MOV      #PARMO,R5      ;RESTORE PARAMETER BLOCK SELECTION
3605 027770 012737 026240 002600  MOV      #ERRHDL,A,ABNL ;RESTORE INTERRUPT VECTORS FOR RETRY
3606 027776 012737 025302 002576  MOV      #ERRFRE,A,NORM ;DRIVER OPERATIONS, IF ANY
3607 030004 032737 000200 006364  BIT      #ABORT,RECODE ;IF ABORT IS NOT SET AND
3608 030012 001050      BNE      48$      ;THE DRIVE IS READY (HAS NOT
3609      ;CYCLED DOWN)
3610 030014 013702 002570      MOV      RKBAS,R2      ;GET BASE ADDRESS
3611 030020 032762 000200 000012  BIT      #DRDY,RKDS(R2) ;TEST IF DRIVE READY SET
3612 030026 001004      BNE      47$      ;RECALIBRATE REQUIRED BIT IS SET

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3613 030030 052737 000200 006364 BIS #ABORT,RECODE ;ELSE ABORT WITH ABORT MESSAGE
3614 030036 000436 BR 46$
3615 030040 032737 004000 006364 47$: BIT #RECAL,RECODE ;IF RECALIBRATE IS REQUIRED
3616 030046 001436 BEQ BGNRTY ;FOR RETRY SET UP PARAM
3617 030050 012705 002446 MOV #PARM1,R5 ;SET TO PARAMETER BLOCK ONE
3618 030054 112765 000113 000001 MOV #RECAL,P.CMND(R5) ;BLOCK TO DO IT.
3619 030062 012737 030310 002600 MOV #RETANL,A.ABNL
3620 030070 004737 025220 JSR PC,DRVCL
3621 030074 012737 026240 002600 MOV #ERRHCL,A.ABNL ;RESTORE ERROR RETURN
3622 030102 032737 000400 006364 BIT #LEVZER,RECODE ;IF AN ERROR OCCURRED IN THE
3623 030110 001003 BNE 49$ ;RECAL ATTEMPT SET ABORT,
3624 030112 012705 002362 MOV #PARM0,R5 ;RESET PARAM TO BLOCK 0
3625 030116 000412 BR BGNRTY
3626 030120 052737 000200 006364 49$: BIS #ABORT,RECODE ;PRINT THE RECAL ERROR MESSAGE, AND
3627 030126 104060 ERROR 60 ;GO REPORT DETAILS
3628 030130 000137 026260 JMP ERZENT
3629 030134 104061 48$: ERROR 61 ;REPORT ABORT-RETRY FAILED

;THE PROGRAM WILL HALT HERE IF THE ABORT FLAG HAS BEEN SET OR
;IF THE DRIVE READY BIT IS RESET.
3630
3631
3632
3633
3634 030136 000000 HLT PRG: HALT
3635 030140 000137 016100 JMP START
3636
3637
3638
3639 ;THE FOLLOWING CODE WILL DETERMINE IF AND DATA TYPE ERROR
3640 ;HAS OCCURRED. IF YES, THE RETRY IS NOT DONE HERE BUT RETURNS TO
3641 ;THE INITIATING ROUTINE FOR RETRY. ANY OTHER ERROR IS TO BE
3642 ;RETRIED HERE. IF RETRY IS UNSUCCESSFUL AFTER 4 ATTEMPTS, THE ABORT
3643 ;FLAG IS SET AND PROGRAM HALTS.
3644 030144 032737 000136 006364 BGNRTY: BIT #BSERR!HVR CER!OPTERR!DCKERR!WCERR,RECODE ;TEST IF ANY DATA ERROR
3645 030152 001404 BEQ DOL3
3646 030154 052737 100000 006364 BIS #ANYDER,RECODE
3647 030162 000450 BR DOL2
3648 030164 DOL3:
3649 030164 032737 001000 006364 BIT #BADSEC,RECODE ;TEST IF BAD SECTOR FLAG SET
3650 030172 001044 BNE DOL2 ;IF YES-EXIT TO CALLER
3651 030174 123737 002654 002655 CERTY: CMPB ERRCNT,ERRLMT ;BEGIN RETRY IF ERROR COUNT HAS
3652 030202 001012 BNE DOL1 ;NOT BEEN EXCEEDED
3653 030204 005037 001174 CLR $REG5
3654 030210 113737 002654 001174 MOVB ERRCNT,$REG5 ;GET ERROR RETRY COUNT
3655 030216 104102 ERROR 102 ;REPORT RETRY UNSUCCESSFUL
3656 030220 052737 000200 006364 BIS #ABORT,RECODE ;SET ABORT & QUIT
3657 030226 000743 BR HLT PRG
3658 030230 013702 002570 DOL1: MOV RKBAS,R2 ;GET BASE ADDRESS
3659 030234 012762 000040 000010 MOV #SCLR,RKCS2(R2) ;CLEAR SUBSYSTEM
3660 030242 013746 000000 MOV 0,-(SP) ;PUT NEW PS ON STACK
3661 030246 012746 030254 MOV #64$,-(SP) ;PUT NEW PC ON STACK
3662 030252 000002 RTI ;POP NEW PC AND PS
3663 030254 64$:
3664 030254 012700 005660 MOV #COMSTR,R0 ;GO AND REESTABLISH THE COMMAND
3665 030260 012025 MOV (R0)+,(R5)+ ;AS IT WAS ENTERED INTO THE
3666 030262 012025 MOV (R0)+,(R5)+ ;PARAMETER BLOCK
3667 030264 012025 MOV (R0)+,(R5)+
3668 030266 012025 MOV (R0)+,(R5)+

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3669 030270 012025      MOV      (R0)+,(R5)+
3670 030272 012025      MOV      (R0)+,(R5)+
3671 030274 012705      MOV      #PARM0,R5
3672 030300 004737      JSR      PC,DRVCL      ;CALL DRIVER
3673 030304 104412      DOL2:    RESREG      ;IF RETURN GETS HERE, NO ERROR
3674 030306 000207      RTS      PC      ;OCCURRED, RECOVERY WAS SUCCESSFUL
3675 030310 152737      RETANL: B1SB      #377,DONE ;SET DONE
3676 030316 052737      B1S      #LEV2ER,RECODE ;SET LEVEL TWO ERROR
3677 030324 000207      RTS      PC
3678 030326 152737      RETNML: B1SB      #377,DONE ;SET DONE
3679 030334 000207      RTS      PC
3680
3681 ;*****
3682 .SBTTL TIME OUT PROCESSOR ROUTINE
3683 ;*THIS ROUTINE SUPPORTS THE ERROR HANDLER BY PROCESSING TIME OUT STATUS
3684 ;*GATHERING DUTIES.
3685 ;*****
3686
3687 030336      TOPROC: SAVREG
3688 030336 104411      MOV      RKBAS,R2
3689 030340 013702      MOV      #SREG0,R1      ;SET UP R1 FOR RK REGISTER STORAGE
3690 030344 012701      CLR      ERRCOM      ;CLEAR FOR COMMAND
3691 030350 005037      MOV      P.CMND(R5),ERRCOM ;STORE COMMAND
3692 030354 116537      MOV      P.CYLN(R5),(R1)+ ;STORE CYLINDER
3693 030362 016521      MOV      P.TRCK(R5),(R1)+ ;STORE TRACK
3694 030366 116521      CLRB      (R1)+
3695 030372 105021      MOV      P.SECT(R5),(R1)+ ;STORE SECTOR
3696 030374 116521      CLRB      (R1)+
3697 030400 105021      MOV      P.WC(R5),(R1)+ ;STORE WORD COUNT
3698 030406 016521      MOV      P.BALO(R5),(R1)+ ;STORE BUS ADDRESS
3699 030412 016221      MOV      RKCS1(R2),(R1)+ ;STORE ALL PARAMETERES AND VALID RK611
3700 030416 016221      MOV      RKCS2(R2),(R1)+ ;REGISTERS
3701 030422 016221      MOV      RKDC(R2),(R1)+
3702 030426 016221      MOV      RKDA(R2),(R1)+
3703 030432 016221      MOV      RKWC(R2),(R1)+
3704 030436 016221      MOV      RKBA(R2),(R1)+
3705 030442 016221      MOV      RKASOF(R2),(R1)+
3706 030446 016221      MOV      RKDS(R2),(R1)+
3707 030452 016221      MOV      RKER(R2),(R1)+
3708
3709 ;THIS CODE WILL ATTEMPT TO
3710 ;RETRIEVE THE STATUS FROM THE
3711 ;DRIVE.
3712 030456 004737      JSR      PC,GETDRST ;GO GET DRIVE STATUS
3713 030462 104412      RESREG
3714 030464 000207      RTS      PC
3715
3716 ;*****
3717 .SBTTL RETRIEVE DRIVE STATUS ROUTINE
3718 ;*****
3719
3720 030466      GETDRST: SAVREG
3721 030470 005000      CLR      R0
3722 030472 012762      MOV      #CCLR,RKCS1(R2) ;CLEAR CONTROLLER
3723 030500 010146      MOV      R1,-(SP)      ;STORE R5
3724 030502 012703      MOV      #10,R3      ;SET COUNT FOR STATUS CLEAR
3725 030506 012721      MOV      #123456,(R1)+ ;INSERT CLEAR WORD
3726 030512 005303      DEC      R3      ;BUMP COUNTER
3727 030514 001374      BNE      1$      ;LOOP UNTIL 0
3728 030516 012601      MOV      (SP)+,R1      ;RESTORE R5
  
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3725 030520 152737 000377 002632 BISB #377,W.TIME ;GIVE WATCH DOG SOMETHING TO TIME
3726 030526 013746 002600 MOV A.ABNL,-(SP) ;STORE ERROR RETURN ADDRESS
3727 030532 012737 030310 002600 MOV #RETANL,A.ABNL ;SET UP NEW ERROR RETURN
3728 030540 013762 006340 000010 MOV DRINUS,RKCS2(R2) ;LOAD DRIVE NUMBER
3729 030546 032762 100000 000000 BIT #CERR,RKCS1(R2) ;TEST IF CONT ERROR SET
3730 030554 001037 BNE 4$ ;YES - GET OUT
3731 030556 010062 000022 3$: MOV R0,RKMR1(R2) ;SET UP STATUS WORD TO READ
3732 030562 012762 000001 000000 MOV #1,RKCS1(R2) ;DO DRIVE SELECT
3733 030570 016204 000000 MOV RKCS1(R2),R4 ;GET CS1
3734 030574 032704 000200 BIT #RDY,R4 ;TEST IF READY
3735 030600 001007 BNE 2$ ;YES - SKIP
3736 030602 004737 032102 JSR PC,W.WTCH ;CALL WATCH DOG
3737 030606 032765 000100 000014 BIT #CMDTO,P.PRST(R5) ;TEST IF TIMEOUT
3738 030614 001360 BNE 3$ ;NO - LOOP
3739 030616 000416 BR 4$ ;ELSE GET OUT
3740 030620 016204 000000 2$: MOV RKCS1(R2),R4 ;GET CS1
3741 030624 032704 100000 BIT #CERR,R4 ;TEST IF ERROR
3742 030630 001011 BNE 4$ ;YES - GET OUT
3743 030632 016221 000034 MOV RKMR2(R2),(R1)+ ;ELSE STORE STATUS WORDS JUST READ
3744 030636 016221 000036 MOV RKMR3(R2),(R1)+
3745 030642 005200 INC R0 ;BUMP TO NEXT STATUS PAIR
3746 030644 020027 000004 CMP R0,#4 ;TEST IF ALL HAVE BEEN READ
3747 030650 001342 BNE 3$ ;YES - GOOD EXIT
3748 030652 000406 BR 5$
3749 030654 052737 000400 006364 4$: BIS #LEV2ER,RECODE ;SET LEVEL 2 ERROR
3750 030662 012762 000040 000010 MOV #SCLR,RKCS2(R2) ;CLEAR SUBSYSTEM
3751 030670 012637 002600 5$: MOV (SP)+,A.ABNL ;RESTORE OLD ERROR RETURN
3752 030674 104412 RESREG
3753 030676 000207 RTS PC
3754 *****
3755 .SBTTL READ HEADER 0 ROUTINE
3756 *****
3757 RDHDO:
3758 030700 104411 SAVREG
3759 030702 016501 000026 MOV P.DTS(R5),R1 ;STORE TRACK AND SECTOR
3760 030706 016500 000052 MOV P.B10(R5),R0 ;GET THE CYLINDER ADDRESS
3761 030712 042700 160013 BIC #160013,R0 ;FROM THE DRIVE STATUS. CLEAR
3762 030716 006200 ASR R0 ;OFF UNUSED BITS AND POSITION
3763 030720 006200 ASR R0 ;FOR USE AS THE DESIRED
3764 030722 006200 ASR R0 ;CYLINDER IN THE READ
3765 030724 006200 ASR R0 ;HEADER COMMAND
3766 030726 012705 002446 MOV #PARM1,R5 ;SET UP TO USE PARM 1
3767 030732 010165 000004 MOV R1,P.SECT(R5) ;INSERT TRK/SECT FOR READ HEADER
3768 030736 010065 000002 MOV R0,P.CYLN(R5)
3769 030742 132737 000020 002653 BITB #B.CFMT,TYPFMT ;TEST PRESENT FORMAT & CHANGE
3770 030750 001404 BEQ 1$ ;TO THE OPPOSITE. THIS WILL CAUSE
3771 030752 142765 000020 000007 BICB #B.CFMT,P.CS1H(R5) ;A READ OF SECTOR 0 HEADER ON
3772 030760 000403 BR 2$ ;THE READ HEADER COMMAND
3773 030762 152765 000020 000007 1$: BISB #B.CFMT,P.CS1H(R5)
3774 030770 112765 000125 000001 2$: MOVB #RDHEAD,P.CMND(R5) ;SET UP TO READ HEADER
3775 030776 013746 000000 MOV 0,-(SP) ;PUT NEW PS ON STACK
3776 031002 012746 031010 MOV #64$,-(SP) ;PUT NEW PC ON STACK
3777 031006 000002 RTI ;POP NEW PC AND PS
3778 64$:
3779 031010 004737 025220 JSR PC,DRVCL ;CALL DRIVER
3780 031014 142765 000020 000007 BICB #B.CFMT,P.CS1H(R5) ;CLEAR THE FORMAT BIT

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 DZR6LB.P11 03-AUG-76 00:00 READ HEADER 0 ROUTINE

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3781 031022 153765 002653 000007      BISB  TYPEMT,P.CS1H(R5) ;RESTORE TYPE AND FORMAT IN USE
3782 031030 012705 002362              MOV   #PARMO,R5 ;RESTORE PARM 0 BLOCK
3783 031034 104412                      RESREG ;RETURN
3784 031036 000207                      RTS    PC
3785                                     ;*****
3786                                     .SBTTL  POSITION AND OFFSET ROUTINE
3787                                     ;*THIS ROUTINE CHECKS IF OFFSET IS REQUIRED. IF IT IS, THE HEADS
3788                                     ;*POSITIONED TO THE CYLINDER SPECIFIED IN R0 AND THE HEADS ARE OFFSET
3789                                     ;*TO THE AMOUNT SPECIFIED IN "OFINUS".
3790                                     ;*****
3791
3792 031040 104411 000020 002656      POSOFF: SAVREG
3793 031042 132737                      BITB   #OREQSW,OPCONT ;TEST IF OFFSET REQUIRED
3794 031050 001424                      BEQ    1$ ;IF NO - SKIP TO EXIT
3795 031052 112765 000117 000001      MOVB   #SEEK,P.CMND(R5) ;SET UP TO DO THE SEEK
3796 031060 010065 000002              MOV    R0,P.CYLN(R5) ;SET CYLINDER
3797 031064 004737 025220              JSR    PC,DRVCAL ;GO DO IT
3798 031070 112765 000115 000001      MOVB   #OFFSET,P.CMND(R5) ;SET UP TO OFFSET
3799 031076 113765 006362 000006      MOVB   OFINUS,P.OFST(R5) ;SET OFFSET VALUE
3800 031104 105165 000032              COMB   P.ASOF(R5) ;COMPLEMENT ASOF
3801 031110 142765 000200 000032      BICB   #200,P.ASOF(R5) ;CLEAR UPPER BIT
3802 031116 004737 025220              JSR    PC,DRVCAL ;GO DO IT
3803 031122 104412                      1$: RESREG
3804 031124 000207                      RTS    PC
3805
3806                                     ;*****
3807                                     ;*****
3808                                     .SBTTL  PREPARE FOR LOOP ON ERROR
3809 031126 105037 002654      PREPLP: CLRB   ERRCNT ;CLEAR ERROR COUNT
3810 031132 005037 006364      CLR      RECODE ;CLEAR RECODE
3811 031136 013700 006370      MOV      CCINUS,R0 ;SET CURRENT CYLINDER
3812 031142 013701 006366      MOV      CTINUS,R1 ;SET CURRENT TRACK
3813 031146 012737 026240 002600      MOV      #ERRHDL,A.ABNL ;SET UP ERROR RETURN
3814 031154 012737 025302 002576      MOV      #ERRFRE,A.NORM ;SET UP ERROR FREE RETURN
3815 031162 012704 001074      MOV      #STACK-4,R4 ;SET R4 TO STACK BASE -4
3816 031166 011624              MOV      (SP),(R4)+ ;STORE RETURN ON STACK
3817 031170 005014              CLR      (R4) ;CLEAR FOR 0 PRIORITY
3818 031172 012706 001074      MOV      #STACK-4,SP ;SET STACK POINTER FOR RETURN
3819 031176 000002              RTI      ;DO RTI TO RETURN TO LOOPING ROUTINE
3820
3821                                     .SBTTL  GET PACK ADDRESS ROUTINE
3822                                     ;*****
3823 031200 016537 000030 001174      GTPKAD: MOV   P.DCYL(R5),SREG5 ;GET CYLINDER NUMBER
3824 031206 005037 001176              CLR      SREG6 ;CLEAR REGISTERS FOR
3825 031212 005037 001200              CLR      SREG7 ;TRACK & SECTOR STORAGE
3826 031216 116537 000026 001200      MOVB   P.DTS(R5),SREG7 ;STORE THE TRACK AND SECTOR
3827 031224 116537 000027 001176      MOVB   P.DTS+1(R5),SREG6
3828 031232 005737 001200      TST      SREG7 ;ADJUST THE ADDRESS CONTAINED IN
3829                                     ;THE RK REGISTERS FOR THE AUTOMATIC
3830 031236 001403              BEQ      1$ ;INCREMENT
3831 031240 005337 001200              DEC      SREG7
3832 031244 000426              BR       5$
3833 031246 032765 010000 000016 1$: BIT      #CFMT,P.CS1(R5)
3834 031254 001404              BEQ      2$
3835 031256 012737 000023 001200      MOV      #19.,SREG7
3836 031264 000403              BR       3$

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3837 031266 012737 000025 001200 2$: MOV #21, $REG7
3838 031274 005737 001176 3$: TST $REG6
3839 031300 001403 BEQ 4$
3840 031302 005337 001176 DEC $REG6
3841 031306 000405 BR 5$
3842 031310 012737 000002 001176 4$: MOV #2, $REG6
3843 031316 005337 001174 DEC $REG5
3844 031322 000207 5$: RTS PC
3845 ;*****
3846 .SBTTL BUILD EXPECTED HEADER
3847 ;*USES DESIRED CYLINDER, TRACK AND SECTOR REGISTERS TO DETERMINE
3848 ;*WHICH HEADER WAS EXPECTED. LOADS EXPECTED VALUES IN $REG5, 6, AND
3849 ;*7 FOR REPORTING.
3850 ;*****
3851 031324 104411 BLDEXH: SAVREG
3852 031326 016537 000030 001174 MOV P.DCYL(R5), $REG5 ;CONSTRUCT EXPECTED HDR
3853 031334 016501 000026 MOV P.DTS(R5), R1 ;DESIRED CYLINDER & DESIRED TRACK
3854 031340 042701 174377 BIC #174377, R1 ;CLEAR ALL BUT TRACK BITS
3855 031344 006201 ASR R1 ;AND SECTOR. SHIFT THE TRACK
3856 031346 006201 ASR R1 ;OVER TO CONFORM TO HEADER FORMAT
3857 031350 006201 ASR R1 ;CHECK THE FORMAT BIT AND
3858 ;IF SET, SET THE HEADER FORMAT
3859 031352 016537 000026 001176 MOV P.DTS(R5), $REG6 ;BIT.
3860 031360 042737 177740 001176 BIC #177740, $REG6 ;CLEAR ALL BUT SECTOR
3861 031366 060137 001176 ADD R1, $REG6 ;ADD TRACK AND SECTOR TOGETHER
3862 031372 052737 140000 001176 BIS #140000, $REG6 ;INSERT BSE BITS
3863 031400 032765 010000 000016 BIT #CFMT, P.CS1(R5)
3864 031406 001403 BEQ 23$
3865 031410 052737 001000 001176 BIS #1000, $REG6
3866 031416 013737 001174 001200 23$: MOV $REG5, $REG7 ;COMPUTE THE HEADER VRC
3867 031424 013701 001176 MOV $REG6, R1
3868 031430 043737 001176 001200 BIC $REG6, $REG7
3869 031436 043701 001174 BIC $REG5, R1
3870 031442 050137 001200 BIS R1, $REG7
3871 031446 104412 RESREG
3872 031450 000207 RTS PC
3873 ;*****
3874 .SBTTL WRITE BAD SECTOR FILE ROUTINE
3875 ;*THIS ROUTINE WRITES THE BSSOFT (BAD SECTOR FILE DETECTED BY SOFTWARE)
3876 ;*INTO THE APPROPRIATE BAD SECTOR FILE. IT DOES NOT WRITE THE FACTORY
3877 ;*DETECTED FILES.
3878 ;*****
3879 031452 BDSTWT:
3880 031452 104411 SAVREG
3881 031454 105037 002650 CLRB DERCNT ;CLEAR ERROR COUNT
3882 031460 012703 000006 MOV #6, R3 ;PRESET FOR 6 SECTORS TO BE WRITTEN
3883 031464 012702 000012 MOV #12, R2 ;PRESET TO 22 SECTOR/TRACK
3884 031470 005065 000014 CLR P.PAST(R5) ;CLEAR PROG STAT REG
3885 031474 132737 000020 002653 BITB #B.CFMT, TYPFMT ;TEST IF 20 OR 22 SEC/TRACK
3886 031502 001404 BEQ 1$ ;22 SECTOR - SKIP
3887 031504 005202 INC R2 ;20 SECTOR - BUMP TO NEXT SECTOR (13)
3888 031506 142765 000020 000007 BICB #B.CFMT, P.CS1H(R5) ;CLEAR FOR 22 SECTOR WRITE
3889 031514 012765 003660 000010 1$: MOV #BSSOFT, P.BALO(R5) ;SET UP PARAMETER BLOCK
3890 031522 112765 000123 000001 MOVB #WRDATA, P.CMND(R5) ;TO WRITE THE SECTORS OF BAD
3891 031530 012765 000632 000002 MOV #632, P.CYLN(R5) ;SECTOR TABLE (SOFTWARE DETECTED)
3892 031536 112765 000002 000005 MOVB #2, P.TRCK(R5)

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RAC6 PACK FORMATTER MACY11 27(1006) 03-NOV-76 16:15 PAGE 73  
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3893 031544 110265 000004      MOV      R2,P.SECT(R5) ;INSERT SECTOR NUMBER
3894 031550 012765 177400 000012      MOV      #177400,P.WC(R5)
3895 031556 004737 025220      JSR      PC,DRVCAL
3896 031562 032737 100000 006364      BIT      #ANYDER,RECODE ;CHECK IF ANY ERROR IN WRITE
3897 031570 001005      BNE      3$ ;IF YES - SKIP
3898 031572 062702 000002 2$:      ADD      #2,R2 ;ELSE BUMP SECTOR BY TWO
3899 031576 005303      DEC      R3 ;DECREMENT COUNTER
3900 031600 001345      BNE      1$ ;EXIT IF DONE
3901 031602 000417      BR       4$
3902 031604 105237 002650 3$:      INCB     DERCNT ;COUNT ERROR FOR RETR.
3903 031610 122737 000007 002650      CMPB     #7,DERCNT ;IF TO MANY TYPE MESSAGE
3904 031616 002736      BLT      1$ ;ELSE RETRY
3905 031620 104401 015402      TYPE     ,BSWERR ;ERROR MESSAGE
3906 031624 104401 015470      TYPE     ,SECINE
3907 031630 010246      MOV      #2,-(SP)
3908 031632 104402      TYP0C
3909 031634 104401 001267      TYPE     ,$CRLF
3910 031640 000754      BR       2$
3911 031642 104401 015512 4$:      TYPE     ,BSWTFI ;TYPE FINISHED MESSAGE
3912 031646 104412      RESREG
3913 031650 000207      RTS      PC
3914
3915 ;*****
3916 ;$BTTL BAD SECTOR REPORT ROUTINE
3917 ;*****
3918 BSREPT:
3919      SAVREG
3920      CLR      $TMP2 ;CLEAR TEMP 2 FOR PASS SWITCH
3921      TYPE     ,BSHEAD ;TYPE HEADER LINE
3922      CLR      R0 ;CLEAR R0 FOR COUNTER
3923      MOV      #TWENTY,2$ ;CHOSE THE MODE TO REPORT
3924      BITB     #B.CFMT,TYPFMT ;20 OR 22 SECTOR FORMAT
3925      BEQ      1$ ;QUESTED RIGHT - SKIP
3926      MOV      #TWENTY,2$ ;QUESTED WRONG, SET TO 22 SECTOR
3927      TYPE     1$:
3928      .WORD    2$:
3929      TYPE     ,BSTAIL
3930      TYPE     ,FBSLAB ;TYPE FACTORY LABEL
3931      MOV      #BSFACT+10,R4 ;SET R4 TO POINT TO FACTORY TABLE
3932      TYPE     ,COLHD ;TYPE COLUMN HEADER
3933      TYPE     ,SPACE4 ;SET FORMAT OF REPORT
3934      MOV      (R4)+,-(SP) ;GET FIRST CYLINDER WORD
3935      BMI      4$ ;IF ALL 1'S EXIT THIS LOOP
3936      TYP0C     ;ELSE TYPE VALUE
3937      TYPE     ,SPACE2 ;FORMAT
3938      TSTB     (R4)+ ;BUMP R4 TO THE TRACK IN TRK/SEC WORD
3939      MOV      (R4),-(SP) ;PUT TRACK ON THE STACK
3940      TYP0C     ;TYPE TRACK NUMBER
3941      TYPE     ,SPACE2 ;FORMAT
3942      MOV      -(R4),-(SP) ;PUT SECTOR ON STACK
3943      TYP0C     ;TYPE SECTOR NUMBER
3944      TYPE     , $CRLF ;RETURN THE CARRIAGE
3945      TST      (R4)+ ;PUT R4 AT NEXT FILE ENTRY
3946      INC      R0 ;COUNT BAD SECTORS
3947      BR       3$ ;LOOP
3948      TST      (SP)+ ;CLEAN OFF STACK
3949      TST      $TMP2 ;TEST IF 2ND PASS, IF YES

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 DZRLB.P11 03-AUG-76 00:00 BAD SECTOR REPORT ROUTINE

|      |        |        |               |             |               |                           |
|------|--------|--------|---------------|-------------|---------------|---------------------------|
| 3949 | 032012 | 001016 |               | BNE         | 5\$           | :EXIT                     |
| 3950 | 032014 | 052737 | 000001 001242 | BIS         | #1,\$TMP2     | :ELSE SET 2ND PASS SWITCH |
| 3951 | 032022 | 012704 | 003670        | MOV         | #BSSOFT+10,R4 | :SWITCH TO OTHER TABLE    |
| 3952 | 032026 | 005700 |               | TST         | R0            |                           |
| 3953 | 032030 | 001004 |               | BNE         | 7\$           |                           |
| 3954 | 032032 | 104401 | 001267        | TYPE        | ,SCRLF        |                           |
| 3955 | 032036 | 104401 | 015751        | TYPE        | ,NONE         |                           |
| 3956 | 032042 | 104401 | 015706        | 7\$: TYPE   | ,SBSLAB       | :TYPE SOFTWARE LABEL      |
| 3957 | 032046 | 000731 |               | BR          | 6\$           | :GO BACK TO LOOP          |
| 3958 | 032050 | 104401 | 001267        | 5\$: TYPE   | ,SCRLF        |                           |
| 3959 | 032054 | 005700 |               | TST         | R0            |                           |
| 3960 | 032056 | 001405 |               | BEQ         | 9\$           |                           |
| 3961 | 032060 | 010046 |               | MOV         | R0,-(SP)      | :EXIT ROUTINE - TYPE THE  |
| 3962 | 032062 | 104402 |               | TYPOC       |               | :NUMBER OF BAD SECTORS    |
| 3963 | 032064 | 104401 | 016034        | TYPE        | ,TOTMES       | :AND RETURN               |
| 3964 | 032070 | 000402 |               | BR          | 8\$           |                           |
| 3965 | 032072 | 104401 | 015751        | 9\$: TYPE   | ,NONE         |                           |
| 3966 | 032076 | 104412 |               | 8\$: RESREG |               |                           |
| 3967 | 032100 | 000207 |               | RTS         | PC            |                           |

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RK611/RK06 UNIBUS DRIVER FOR SEQUENTIAL OPERATIONS (REV. 0.08)

.SBTTL RK611/RK06 UNIBUS DRIVER FOR SEQUENTIAL OPERATIONS (REV. 0.08)

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 ;\*MAYNARD, MA. 01754  
 ;\*AUTHOR: ROY SPITZER

.SBTTL \*WATCH-DOG TIMER

\*\*\*\*\*

THE WATCH-DOG TIMER DOES A PSEUDO-TIMING OF RK06 UNIBUS  
 SUBSYSTEM COMMAND. SINCE ONE CAN NOT GUARANTEE THAT A  
 REAL-TIME CLOCK (KW11-P OR KW11-L) IS ON THE SYSTEM  
 THE RK06 DRIVER WILL USE THE LOCATION W.MTIM FOR  
 MILLI-SECOND TIMING. WHEN W.MTIM REACHES ZERO THE  
 WATCH-DOG TIMER WILL SCAN THE DRIVES IN USE AS  
 DETERMINED BY THE LOCATION W.TIME. THE TIMER COUNTS  
 (ONE FOR EACH DRIVE) ARE KEPT IN THE TABLE W.DRV.  
 IF ANY COUNT IN THE TABLE W.DRV REACHES ZERO A COMMAND  
 TIME-OUT WILL BE DESIGNATED IN THE PROGRAM DEVICE STATUS  
 REGISTER OF THAT DRIVE'S PARAMETER BLOCK.

THE DRIVER WILL USE THE LOCATION W.MIN AS THE NUMBER  
 OF MILLISECONDS FOR AN UNLOAD OR START SPINDLE COMMAND.  
 THE DRIVER WILL USE THE LOCATION W.SEC AS THE TIME  
 LIMIT FOR ALL OTHER COMMANDS.

FOR QUEUED OPERATIONS THE WATCH-DOG TIMER WILL  
 WATCH UP TO 8 OPERATIONS SIMULTANEOUSLY. FOR SEQUENTIAL  
 OPERATIONS ONLY ONE OPERATION WILL BE WATCHED.

\*CALL JSR PC,W.WTCH  
 RETURN IF NO DRIVE ORDER EXCEEDED ITS TIME LIMIT

OTHERWISE AN ABNORMAL RETURN TO THE ROUTINE ADDRESS  
 BY LOCATION A.ABNL WILL OCCUR AND THE CMDTO FLAG  
 IN THE PROGRAM DEVICE STATUS REGISTER OF THE  
 APPROPRIATE PARAMETER BLOCK WILL BE SET.

\*\*\*\*\*

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 4010 032102 010546  
 4011 032104 010446  
 4012 032106 010346  
 4013 032110 010246  
 4014 032112 013746 177776  
 4015 032116 005337 002610  
 4016 032122 001034  
 4017 032124 013737 002612 002610  
 4018 032132 105737 002632  
 4019 032136 001426  
 4020 032140 013737 002574 177776  
 4021 032146 013702 002570  
 4022 032152 005337 002646  
 4023 032156 001016

W.WTCH: MOV R5,-(SP) ;SAVE R5 ON THE STACK  
 MOV R4,-(SP) ;SAVE R4 ON THE STACK  
 MOV R3,-(SP) ;SAVE R3 ON THE STACK  
 MOV R2,-(SP) ;SAVE R2 ON STACK  
 MOV PS,-(SP) ;SAVE PROGRAM STATUS WORD ON STACK  
 DEC W.MTIM ;DECREMENT MILLISECOND TIMER  
 BNE 20\$ ;IF NOT ZERO RETURN  
 MOV W.MILI,W.MTIM ;REINITIALIZE MILLISECOND TIMER  
 TSTB W.TIME ;CHECK IF DRIVE IS BEING TIMED  
 BEQ 20\$ ;NO RETURN  
 MOV RKPRI,PS ;LOCK OUT RK06 INTERRUPTS  
 MOV RKBAS,R2 ;LOAD BASE OF RK06 REGISTERS  
 DEC W.DRV ;DECREMENT COMMAND TIMER  
 BNE 20\$ ;RETURN IF NO TIME OUT

K06

RK06 PACK FORMATTER MACY11 27(1006) 03-NOV-76 16:15 PAGE 76  
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|      |        |        |        |        |      |                   |                                     |
|------|--------|--------|--------|--------|------|-------------------|-------------------------------------|
| 4024 | 032160 | 105037 | 002632 |        | CLRB | W.TIME            | ; RESET TIMING INDICATOR            |
| 4025 | 032164 | 013705 | 002644 |        | MOV  | PCLKT,R5          | ; LOAD ADDRESS OF PARAMETER BLOCK   |
| 4026 |        |        |        |        |      |                   | TABLE FOR INDEXING                  |
| 4027 | 032170 | 052765 | 000100 | 000014 | BIS  | *CMDTO,P.PRST(R5) | ; SET COMMAND TIME OUT              |
| 4028 | 032176 | 020537 | 002606 |        | CMP  | R5,0.WAIT         | ; CHECK IF DRIVER IS WAITING FOR    |
| 4029 |        |        |        |        |      |                   | COMMAND COMPLETION                  |
| 4030 | 032202 | 001002 |        |        | BNE  | 5\$               | ; NO, DO NOT ALTER WAITING FOR      |
| 4031 |        |        |        |        |      |                   | COMMAND COMPLETION                  |
| 4032 | 032204 | 005037 | 002606 |        | CLR  | 0.WAIT            | ; CLEAR WAIT FOR COMMAND COMPLETION |
| 4033 | 032210 | 004737 | 035464 | 5\$:   | JSR  | PC,R.ABNL         | ; BRANCH TO ERROR ROUTINE           |
| 4034 | 032214 | 012637 | 177776 | 20\$:  | MOV  | (SP)+,PS          | ; RESTORE PSW                       |
| 4035 | 032220 | 012602 |        |        | MOV  | (SP)+,R2          | ; RESTORE R2                        |
| 4036 | 032222 | 012603 |        |        | MOV  | (SP)+,R3          | ; RESTORE R3                        |
| 4037 | 032224 | 012604 |        |        | MOV  | (SP)+,R4          | ; RESTORE R4                        |
| 4038 | 032226 | 012605 |        |        | MOV  | (SP)+,R5          | ; RESTORE R5                        |
| 4039 | 032230 | 000207 |        |        | RTS  | PC                | ; RETURN                            |

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\*RK06 INTERRUPT SERVICE ROUTINE

.SBTTL \*RK06 INTERRUPT SERVICE ROUTINE

\*\*\*\*\*

THIS ROUTINE WILL SERVICE ALL RK06 INTERRUPTS.

UPON RECEIVING AN INTERRUPT, THIS ROUTINE WILL  
 PERFORM ONE OF THE FOLLOWING SERVICES:

- 1.) SERVICE PORT WAS SEIZED BY OTHER PORT
- 2.) SERVICE DRIVER IS WAIT FOR COMMAND COMPLETION
- 3.) SERVICE POSITIONING COMPLETION
- 4.) REQUEUE COMMAND IF DRIVE WAS RELEASED  
 FOR THE QUEUED RK06 DRIVER.
- 5.) IF NO SERVICE IS REQUIRED, THE COMMAND WILL BE ISSUED  
 FOR THE QUEUED RK06 DRIVER.

THREE LINKS ARE PROVIDED TO THE DRIVING PROGRAM.  
 THEY ARE:

- 1.) A.NORM ADDRESS OF NORMAL RETURN (SUCESSFUL COMPLETION OF COMMAND)
- 2.) A.ABNL ADDRESS OF ABNORMAL RETURN (UNSUCESSFUL COMPLETION OF COMMAND)
- 3.) A.CONT ADDRESS OF CONTROL ERROR RETURN

FOR NORMAL AND ABNORMAL RETURNS, THE ADDRESS OF THE APPROPRIATE  
 PARAMETER BLOCK WILL BE IN R5.

FOR THE CONTROLLER ERROR RETURN, THE LOCATION E.CONT CONTAINS  
 THE REASON FOR THE CONTROLLER ERROR.

ROUTINES USED:

C.OPT (QUEUED ONLY)  
 Q.PUSH (QUEUED ONLY)  
 Q.RMOV (QUEUED ONLY)  
 R.CONT (SEQUENTIAL ONLY)  
 R.NORM (SEQUENTIAL ONLY)  
 R.ABNL (SEQUENTIAL ONLY)  
 I.CSTS  
 I.STAT  
 I.ISSU  
 I.CCLR

\*\*\*\*\*

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 4084 032232 010546  
 4085 032234 010446  
 4086 032236 010346  
 4087 032240 010246  
 4088 032242 010146  
 4089 032244 010046  
 4090 032246 013702 002570  
 4091 032252 016237 000010 002534  
 4092 032260 032737 001000 002534  
 4093 032266 001407  
 4094 032270 052737 100000 002604  
 4095 032276 004737 035510

I.INTR: MOV R5,-(SP) ;STORE R5 ON THE STACK  
 MOV R4,-(SP) ;STORE R4 ON THE STACK  
 MOV R3,-(SP) ;STORE R3 ON THE STACK  
 MOV R2,-(SP) ;STORE R2 ON THE STACK  
 MOV R1,-(SP) ;STORE R1 ON THE STACK  
 MOV R0,-(SP) ;STORE R0 ON THE STACK  
 MOV RKBAS,R2 ;LOAD R2 TO ADDRESS RK06 REGISTER  
 MOV RKCS2(R2),T.CS2 ;STORE CS2  
 BIT #MDS,T.CS2 ;CHECK IF MULTIPLE DRIVE SELECT  
 BEQ IS ;NO, CONTINUE PROCESSING  
 BIS #E.MDS,E.CONT ;SET MULTIPLE DRIVE SELECT  
 JSR PC,R.CONT ;REPORT ERROR

RK06 PACK FORMATTER MACY11 27(1006) 03-NOV-76 16:15 PAGE 78  
 DZR6LB.P11 03-AUG-76 00:00 \*RK06 INTERRUPT SERVICE ROUTINE

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4096 032302 000137 034462      JMP      I.ATRN      ;RETURN
4097
4098 032306 105737 002626      1$:  TSTB      I.ISRL      ;CHECK IF INTERRUPT OR RELEASE
4099 032312 001410                BEQ        6$          ;NO, CHECK IF DRIVE AVAILABLE
4100 032314 100403                BMI        5$          ;CHECK IF RELEASE COMMAND
4101 032316 105037 002626      CLR      I.ISRL      ;YES, CLEAR FLAG
4102 032322 000473                BR         I.I00      ;CONTINUE PROCESSING INTERRUPT
4103
4104 032324 105037 002626      5$:  CLRB      I.ISRL      ;CLEAR FLAG
4105 032330 000137 033444      JMP      I.ATTN      ;GO PROCESS DRIVE ATTENTIONS
4106
4107 032334 032737 010400 002534 6$:  BIT        #NED!UFE,T.CS2 ;CHECK FOR NON-EXISTENT DRIVE OR
4108                                ;UNIT FIELD ERROR
4109 032342 001413                BEQ        7$          ;NO, WAIT FOR DUAL ACCESS INTERRUPT
4110 032344 013704 002534      MOV      T.CS2,R4      ;LOAD R4 FOR DRIVE NUMBER
4111 032350 042704 177770      BIC      #1C<DRVMSK>,R4 ;KEEP DRIVE BITS
4112 032354 013705 002644      MOV      PBLKT,R5      ;STORE PARAMETER BLOCK ADDRESS
4113 032360 016237 000000 002522  MOV      RKCS1(R2),T.CS1 ;LOAD TEMPORARY CS1 FOR STATUS REPORT
4114 032366 000137 032654      JMP      I.ERRC      ;REPORT ERROR
4115
4116 032372 016237 000012 002552 7$:  MOV      RKDS(R2),T.DS ;STORE STATUS REGISTER FOR COMPARISON
4117 032400 032737 000001 002552  BIT      #DRA,T.DS      ;CHECK IF DRIVE SEIZED BY OTHER
4118                                ;PORT
4119 032406 001041                BNE      I.I00      ;NO, CONTINUE PROCESSING INTERRUPT
4120
4121                                ;CHECK IF ANY DATA TRANSFER ERROR EXISTS
4122 032410 032737 164000 002534  BIT      #DLT!WCE!UPE!NEM,T.CS2
4123
4124 032416 001007                BNE      10$         ;INDICATE ERROR
4125 032420 016237 000014 002550  MOV      RKER(R2),T.ER ;STORE ERROR REGISTER
4126
4127                                ;CHECK FOR DATA TRANSFER ERROR TYPE ERROR
4128 032426 032737 125700 002550  BIT      #DCK!OPI!WLE!COE!HVRC!BSE!ECH,T.ER
4129
4130 032434 001407                BEQ        11$         ;NO, WAIT FOR RELEASE OF RK06 DRIVE
4131
4132 032436 052737 000010 002604 10$:  BIS      #E.UDAT,E.CONT ;SET UNEXPECTED DATA TYPE ERROR
4133 032444 004737 035510      JSR      PC,R.CONT ;REPORT ERROR
4134 032450 000137 034462      JMP      I.ATRN      ;RESTORE REGISTERS
4135
4136 032454 105037 002632      11$:  CLRB      W.TIME      ;RESET TIMING ON THIS DRIVE
4137 032460 005037 002646      CLR      W.DRV      ;CLEAR TIMING COUNT FOR THIS DRIVE
4138 032464 013705 002644      MOV      PBLKT,R5      ;LOAD R5 WITH PARAMETER BLOCK
4139                                ;ADDRESS
4140 032470 052765 010000 000014  BIS      #DRVSZD,P.PRST(R5) ;SET DRIVE SEIZED IN THE
4141                                ;PROGRAM DRIVE STATUS REGISTER
4142 032476 005037 002606      CLR      O.WAIT      ;CLEAR WAIT FOR COMMAND COMPLETION
4143 032502 004737 035464      JSR      PC,R.ABNL ;INDICATE ABNORMAL TERMINATION
4144 032506 000137 034462      JMP      I.ATRN      ;GO RESTORE REGISTERS
4145
4146 032512 013705 002606      I.I00: MOV      O.WAIT,R5 ;LOAD PARAMETER BLOCK ADDRESS INTO R5
4147 032516 001002                BNE      2$          ;IS COMMAND WAITING PROCESSING
4148                                ;YES, DO PROCESSING
4149 032520 000137 033444      JMP      I.ATTN      ;NO, PROCESS ATTENTION
4150
4151 032524 013704 002534      2$:  MOV      T.CS2,R4      ;STORE RKCS2 FOR DRIVE NUMBER

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4152 032530 042704 177770          BIC      #1C<DRVMSK>,R4 ;MASK OUT UNNECESSARY BITS
4153
4154
4155 032534 126504 000000          CMPB     P.DRVN(R5),R4 ;CHECK IF DRIVE NUMBER IS EXPECTED
4156 032540 001401          BEQ        3$ ;YES, CONTINUE
4157 032542 000000          HALT
4158 032544 122765 000164 000001 3$: CMPB     #RDALHD,P.CMND(R5) ;CHECK IF READ ALL HEADERS
4159 032552 001002          BNE        10$ ;NO, EXECUTE NORMAL DATA TRANSFER
4160 032554 000137 033112          JMP      I.HDAL ;GO EXECUTE SPECIAL HEADER SEQUENCE
4161
4162 032560 005037 002606          CLR      O.WAIT ;CLEAR WAIT FOR COMMAND COMPLETION
4163 032564 005037 002646          CLR      W.DRV ;CLEAR WATCH-DOG TIME
4164 032570 105037 002632          CLRB    W.TIME ;RESET TIMING ON THIS DRIVE
4165 032574 016237 000000 002532 MOV      RKCS1(R2),T.CS1 ;STORE COMMAND AND STATUS REGISTER 1
4166 032602 032737 100000 002532 BIT      #CERR,T.CS1 ;CHECK IF CONTROLLER ERROR
4167 032610 001021          BNE        I.ERRC ;YES, PROCESS ERROR
4168 032612 016237 000016 002546 MOV      RKASOF(R2),T.ASOF ;STORE ATTENTION SUMMARY
4169 032620 133737 002633 002547 BITB     INTMSK,T.ASOF+1 ;CHECK IF DRIVE ATTENTION SET
4170 032626 001004          BNE        15$ ;YES, REPORT ERROR
4171 032630 004737 035476          JSR      PC,R.NORM ;INDICATE NORMAL RETURN
4172 032634 000137 034462          JMP      I.ATRN ;RESTORE REGISTERS
4173
4174 032640 052765 000010 000014 15$: BIS      #UEXATT,P.PRST(R5) ;SET UNEXPECTED ATTENTION
4175
4176 032646 004737 035132          I.ERRA: JSR      PC,I.CSTS ;STORE CONTROLLER STATUS
4177 032652 000405          BR         I.ERR ;STORE PATTERN AND POSITION INFORMATION
4178
4179 032654 013765 002532 000016 I.ERRC: MOV      T.CS1,P.CS1(R5) ;GET ERROR RKCS1
4180 032662 004737 035154          JSR      PC,I.CST1 ;GET REST OF CONTROLLER STATUS
4181 032666 016265 000032 000062 I.ERR: MOV      RKECPT(R2),P.EPAT(R5) ;STORE ECC PATTERN
4182 032674 016265 000030 000060 MOV      RKECPS(R2),P.EPOS(R5) ;STORE ECC POSITION
4183 032702 004037 034500          JSR      RO,I.CCLR ;CLEAR CONTROLLER
4184 032706 034462          I.ATRN    ;ERROR RETURN
4185 032710 032765 010400 000020 BIT      #NED!UFE,P.CS2(R5) ;CHECK IF IT WAS NON-EXISTENT DRIVE OR
4186                                     ; UNIT FIELD ERROR
4187 032716 001046          BNE        5$ ;YES, REPORT ERROR
4188 032720 004037 035236          JSR      RO,I.STAT ;GATHER DRIVE STATUS
4189 032724 034462          I.ATRN    ;ERROR RETURN
4190 032726 112737 000005 002532 MOVB     #DR.CLR,T.CS1 ;LOAD COMMAND
4191 032734 004037 034562          JSR      RO,I.ISSU ;ISSUE DRIVE CLEAR
4192 032740 034462          I.ATRN    ;ERROR RETURN
4193 032742 133737 002633 002547 BITB     INTMSK,T.ASOF+1 ;CHECK IF ATTENTION RESET
4194 032750 001407          BEQ        2$ ;NO, INDICATE DRIVE ERROR
4195 032752 052737 000020 002604 BIS      #E.CLAT,E.CONT ;SET ATTENTION DID NOT RESET
4196                                     ; WITH CLEAR
4197 032760 004737 035510          JSR      PC,R.CONT ;REPORT CONTROLLER ERROR
4198 032764 000137 034462          JMP      I.ATRN ;GO RESTORE REGISTERS
4199
4200 032770 032737 040000 002556 2$: BIT      #S.DSC,T.MR2 ;CHECK IF DRIVE STATUS CHANGE CLEARED
4201 032776 001403          BEQ        3$ ;YES, CHECK FAULT
4202 033000 052765 000040 000014 BIS      #DRVDSC,P.PRST(R5) ;SET DSC DID NOT CLEAR
4203 033006 032737 001000 002560 3$: BIT      #S.PAR,T.MR3 ;CHECK IF DRIVE PARITY ERROR
4204 033014 001407          BEQ        5$ ;NO, INDICATE ABNORMAL TERMINATION
4205 033016 052737 002000 002604 BIS      #E.DPAR,E.CONT ;SET DRIVE PARITY ERROR
4206 033024 004737 035510          JSR      PC,R.CONT ;INDICATE CONTROLLER ERROR
4207 033030 000137 034462          JMP      I.ATRN ;RETURN

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4209
4209 033034 032765 000020 000014 5$: BIT      #DRVHRD,P.PRST(R5) ;CHECK IF HARD DRIVE ERROR
4210 033042 001017 10$      ;YES, GO REPORT ERROR
4211 033044 032737 020000 002556 BIT      #S.PIP,T.MR2 ;CHECK IF DRIVE IS CYCLING DOWN
4212 033052 001413 10$      ;NO, REPORT ERROR
4213 033054 052765 020030 000014 BIS      #E.UNLD,P.PRST(R5) ;SET DRIVE UNLOADING
4214 033062 113737 002633 002632 MOV      INTMSK,W.TIME ;SET UP 8 SECONDS FOR DRIVE TO CYCLE UP
4215 033070 013737 002616 002646 MCV      W.BSEC,W.DRV
4216 033076 000137 034462 JMP      I.RTRN ;GO RESTORE REGISTERS
4217
4218 033102 004737 035464 10$: JSP      PC,R.ABNL ;GO REPORT ERROR
4219 033106 000137 034462 JMP      I.RTRN ;GO RESTORE REGISTERS
4220
4221 .SBTTL *READ ALL HEADERS INTERRUPT SEQUENCE
4222
4223 033112 016237 000000 002532 I.WDAL: MOV      RKCS1(R2),T.CS1 ;STORE CS1 TO CHECK CONTROLLER
4224 ;ERROR
4225 033120 032737 100000 002532 BIT      #CERR,T.CS1 ;CHECK IF CONTROLLER ERROR
4226 033126 001422 5$      ;NO, CHECK FOR ATTENTION
4227
4228 033130 005037 002606 CLR      O.WAIT ;CLEAR WAITING FOR COMMAND COMPLETE
4229 033134 105037 002632 CLR      W.TIME ;RESET TIMING ON DRIVE
4230 033140 005037 002646 CLR      W.DRV ;CLEAR TIME OUT COUNT
4231 033144 013765 002532 000016 MOV      T.CS1,P.CS1(R5) ;STORE ERROR RKCS1
4232 033152 004737 035154 JSR      PC,I.CST1 ;STORE CONTROLLER REGISTERS
4233 033156 004037 034500 JSR      RO,I.CCLR ;CLEAR CONTROLLER
4234 033162 034462 I.RTRN ;ERROR RETURN
4235 033164 004737 035464 JSR      PC,R.ABNL ;INDICATE ERROR RETURN
4236 033170 000137 034462 JMP      I.RTRN ;RESTORE REGISTERS
4237
4238 033174 016537 000016 002546 5$: MOV      RKASOF(R5),T.ASOF ;STORE ATTENTION SUMMARY
4239 033202 133737 002633 002547 BIT      INTMSK,T.ASOF+1 ;CHECK IF DRIVE ATTENTION IS SET
4240 033210 001410 7$      ;NO, CHECK IF READ ALL HEADERS
4241 033212 005037 002606 CLR      O.WAIT ;CLEAR WAITING FOR COMMAND COMPLETION
4242 033216 105037 002632 CLR      W.TIME ;RESET TIMING ON DRIVE
4243 033222 005037 002646 CLR      W.DRV ;CLEAR TIME OUT COUNT
4244 033226 000137 032646 JMP      I.ERRA ;GO REPORT ERROR
4245
4246 033232 013701 002622 7$: MOV      HDR.AD,R1 ;GET MAIN MEMORY ADDRESS
4247 033236 016221 000024 MOV      RKDB(R2),(R1)+ ;GET FIRST WORD OF HEADER
4248 033242 016221 000024 MOV      RKDB(R2),(R1)+ ;GET SECOND WORD OF HEADER
4249 033246 016221 000024 MOV      RKDB(R2),(R1)+ ;GET THIRD WORD OF HEADER
4250 033252 010137 002622 MOV      R1,HDR.AD ;STORE ADDRESS FOR NEXT HEADER
4251 033256 016237 000010 002534 MOV      RKCS2(R2),T.CS2 ;STORE CS2 TO CHECK FOR DATA LATE
4252 033264 032737 100000 002534 BIT      #DLT,T.CS2 ;CHECK FOR DATA LATE
4253 033272 001055 35$      ;YES, REPORT ERROR
4254 033274 005337 002624 DEC      HDR.CT ;DECREMENT NUMBER OF HEADER YET TO READ
4255 033300 001026 25$      ;IF NON-ZERO, GO ISSUE NEXT READ HEADER
4256 033302 005037 002606 CLR      O.WAIT ;CLEAR DRIVER WAITING FOR COMMAND COMPLETION
4257 033306 005037 002646 CLR      W.DRV ;CLEAR TIME OUT COUNT FOR THIS DRIVE
4258 033312 105037 002632 CLR      W.TIME ;CLEAR WATCH DOG TIME ON THIS DRIVE
4259 033316 012762 000003 000022 MOV      #3,RKMR1(R2) ;LOAD MAINTENANCE REGISTER FOR SECTOR COUNT
4260 033324 112737 000001 002532 MOV      #DR.SEL,T.CS1 ;LOAD SELECT COMMAND
4261 033332 004037 034562 JSR      RO,I.ISSU ;GET SECTOR COUNT
4262 033336 034462 I.RTRN ;ERROR RETURN
4263 033340 013765 002560 000056 MOV      T.MR3,P.B11(R5) ;LOAD SECTOR COUNT

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C07

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4264 033346 004737 035476      JSR    PC.R.NORM      ;INDICATE NORMAL TERMINATION
4265 033352 000137 034462      JMP    I.ATRN        ;RESTORE REGISTERS
4266
4267 033356 016562 000002 000020 25$: MOV    P.CYLN(R5),RKDCYL(R2) ;LOAD CYLINDER ADDRESS REGISTER
4268 033364 016562 000004 000006      MOV    P.SECT(R5),RKDA(R2) ;LOAD SECTOR AND TRACK
4269 033372 116565 000007 000017      MOV    P.CSIH(R5),P.CSI+1(R5) ;STORE BITS 8-15 OF CSI
4270 033400 042765 165777 000016      BIC    #1C<CDT!CFMT>,P.CSI(R5) ;CLEAR ALL BITS EXCEPT FORMAT AND
4271                                     ; DRIVE TYPE
4272 033406 112765 000125 000016      MOV    #RDHEAD,P.CSI(R5) ;STORE COMMAND ISSUED
4273 033414 016562 000016 000000      MOV    P.CSI(R5),RKCSI(R2) ;ISSUE READ HEADER
4274 033422 000137 034462      JMP    I.ATRN        ;RESTORE REGISTERS
4275
4276 033426 052737 000400 002604 35$: BIS    #E.DLT,E.CONT ;SET DATA LATE WHILE UNLOADING HEADER
4277 033434 004737 035510      JSR    PC.R.CONT      ;REPORT ERROR
4278 033440 000137 034462      JMP    I.ATF         ;RESTORE REGISTERS
4279
4280                                     .SBTTL  *DRIVE ATTENTION SCANNER
4281
4282 033444 016237 000000 002532 I.ATTN: MOV    RKCSI(R2),T.CS1 ;STORE COMMAND AND STATUS
4283                                     ; REGISTER 1 FOR COMPARISON
4284 033452 032737 100000 002532      BIT     #CERR,T.CS1 ;CHECK IF CONTROLLER ERROR OCCURRED
4285 033460 001441                                     BEQ     SS          ;NO, CHECK IF ATTENTION
4286
4287                                     ;CHECK IF ANY DATA TRANSFER TYPE ERROR EXISTS
4288 033462 032737 164000 002534      BIT     #DLT!WCE!UPE!NEH,T.CS2
4289
4290 033470 001007                                     BNE     IS          ;INDICATE ERROR
4291 033472 016237 000014 002550      MOV     RKR(R2),T.ER ;STORE ERROR REGISTER
4292
4293                                     ; CHECK FOR DATA TRANSFER ERROR TYPE
4294 033500 032737 125700 002550      BIT     #DCK!OPI!WLE!COE!HVRC!BSE!ECH,T.ER
4295
4296 033506 001407                                     BEQ     2$          ;NO DATA TRANSFER ERROR
4297
4298 033510 052737 000010 002604 1$: BIS    #E.UDAT,E.CONT ;SET UNEXPECTED DATA TYPE ERROR
4299 033516 004737 035510      JSR    PC.R.CONT      ;REPORT ERROR
4300 033522 000137 034462      JMP    I.ATRN        ;RESTORE REGISTERS
4301
4302 033526 013704 002534          2$: MOV    T.CS2,R4 ;SAVE CS2 FOR REGISTER NUMBER
4303 033532 042704 177770      BIC    #1C<DRVMSK>,R4 ;STRIP OFF JUNK
4304 033536 105037 002632      CLR    W.TIME ;CLEAR WATCH DOG TIMER
4305 033542 005037 002646      CLR    W.DRV ;RESET TIMER VALUE
4306 033546 013705 002644      MOV    PBLKT,R5 ;STORE PARAMETER BLOCK ADDRESS IN R5
4307
4308                                     ; CLEAR DRIVE POSITIONING AND DRIVE POSITIONED FOR DATA TRANSFER
4309                                     ; IN PROGRAM DEVICE STATUS REGISTER
4310 033552 042765 000006 000014      BIC    #DRVPOS!DRVPDT,P.PRST(R5)
4311
4312 033560 000137 032654      JMP    I.ERRC ;GO REPORT ERROR
4313
4314 033564 032737 040000 002532 5$: BIT     #DI,T.CS1 ;CHECK IF ANY DRIVE ATTENTION
4315 033572 001002                                     BNE     6$          ;YES, PROCESS INTERRUPT
4316 033574 000137 034462      JMP    I.ATRN        ;RESTORE REGISTERS
4317
4318 033600 016237 000016 002546 6$: MOV    RKASOF(R2),T.ASOF ;STORE ATTENTION SUMMARY
4319 033606 105737 002547      TSTB   T.ASOF+1 ;CHECK IF ANY ATTENTIONS SET

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|      |        |        |        |        |            |                     |                                        |
|------|--------|--------|--------|--------|------------|---------------------|----------------------------------------|
| 4320 | 033612 | 001007 |        |        | BNE        | 7\$                 | ;YES GO PROCESS INTERRUPT              |
| 4321 | 033614 | 052737 | 000002 | 002604 | BIS        | #E.NOAT,E.CONT      | ;SET NO ATTENTION IN ATTENTION SUMMARY |
| 4322 | 033622 | 004737 | 035510 |        | JSR        | PC,R.CONT           | ;GO REPORT ERROR                       |
| 4323 | 033626 | 000137 | 034462 |        | JMP        | I.ATRN              | ;GO RESTORE REGISTERS                  |
| 4324 |        |        |        |        |            |                     |                                        |
| 4325 | 033632 | 133737 | 002633 | 002547 | 7\$: BITB  | INTMSK,T.ASOF+1     | ;CHECK IF DESIRED INTERRUPT            |
| 4326 | 033640 | 001007 |        |        | BNE        | 8\$                 | ;YES, GO PROCESS IT                    |
| 4327 | 033642 | 052737 | 000004 | 002604 | BIS        | #E.UATT,E.CONT      | ;SET UNSOLICATED ATTENTION             |
| 4328 | 033650 | 004737 | 035510 |        | JSR        | PC,R.CONT           | ;GO REPORT ERROR                       |
| 4329 | 033654 | 000137 | 034462 |        | JMP        | I.ATRN              | ;GO RESTORE REGISTERS                  |
| 4330 |        |        |        |        |            |                     |                                        |
| 4331 | 033660 | 013705 | 002644 |        | 8\$: MOV   | PBLKT,R5            | ;STORE PARAMETER BLOCK TABLE           |
| 4332 | 033664 | 116504 | 000000 |        | MOVB       | P.DRVN(R5),R4       | ;STORE DRIVE NUMBER                    |
| 4333 | 033670 | 032765 | 020000 | 000014 | BIT        | #E.UNLO,P.PRST(R5)  | ;CHECK IF DRIVE UNLOADING              |
| 4334 | 033676 | 001402 |        |        | BEQ        | 11\$                | ;NO, CONTINUE                          |
| 4335 | 033700 | 000137 | 034362 |        | JMP        | I.UNLD              | ;SERVICE DRIVE IN POSITION AFTER ERROR |
| 4336 |        |        |        |        |            |                     |                                        |
| 4337 | 033704 | 042765 | 000002 | 000014 | 11\$: BIC  | #DRVPOS,P.PRST(R5)  | ;RESET DRIVE POSITIONING               |
| 4338 | 033712 | 005062 | 000022 |        | CLR        | RKMRI(R2)           | ;CLEAR MAINTENANCE REGISTER 1          |
| 4339 | 033716 | 112737 | 000001 | 002532 | MOVB       | #DR.SEL,T.CS1       | ;LOAD COMMAND                          |
| 4340 | 033724 | 004037 | 034562 |        | JSR        | RD,I.ISSU           | ;SELECT DRIVE WITH ATTENTION HIGH      |
| 4341 | 033730 | 034462 |        |        | I.ATRN     |                     | ;ERROR RETURN                          |
| 4342 | 033732 | 013765 | 002560 | 000042 | MOV        | T.MR3,P.800(R5)     | ;STORE STATUS BYTE 00 MESS 2           |
| 4343 | 033740 | 032765 | 000200 | 000042 | BIT        | #S.FLT,P.800(R5)    | ;CHECK IF DRIVE FAULT                  |
| 4344 | 033746 | 001401 |        |        | BEQ        | 12\$                | ;NO, CHECK FOR DRIVE STATUS CHANGE     |
| 4345 | 033750 | 000461 |        |        | BR         | I.AERR              | ;PROCESS ERROR                         |
| 4346 |        |        |        |        |            |                     |                                        |
| 4347 | 033752 | 013765 | 002556 | 000040 | 12\$: MOV  | T.MR2,P.A00(R5)     | ;STORE MAINTENANCE REGISTER 2          |
| 4348 | 033760 | 032765 | 040000 | 000040 | BIT        | #S.DSC,P.A00(R5)    | ;CHECK FOR DRIVE STATUS CHANGE         |
| 4349 | 033766 | 001004 |        |        | BNE        | 13\$                | ;YES, PROCESS DRIVE STATUS CHANGE      |
| 4350 | 033770 | 052765 | 004000 | 000014 | BIS        | #NODSC,P.PRST(R5)   | ;SET NO DRIVE STATUS CHANGE            |
| 4351 | 033776 | 000446 |        |        | BR         | I.AERR              | ;PROCESS ERROR                         |
| 4352 |        |        |        |        |            |                     |                                        |
| 4353 | 034000 | 112737 | 000005 | 002532 | 13\$: MOVB | #DR.CLR,T.CS1       | ;LOAD COMMAND                          |
| 4354 | 034006 | 004037 | 034562 |        | JSR        | RD,I.ISSU           | ;CLEAR DRIVE STATUS CHANGE             |
| 4355 | 034012 | 034462 |        |        | I.ATRN     |                     | ;ERROR RETURN                          |
| 4356 | 034014 | 013765 | 002546 | 000032 | MOV        | T.ASOF,P.ASOF(R5)   | ;STORE ATTENTION SUMMARY               |
| 4357 | 034022 | 133765 | 002633 | 000033 | BITB       | INTMSK,P.ASOF+1(R5) | ;CHECK IF ATTENTION RESET              |
| 4358 | 034030 | 001407 |        |        | BEQ        | 15\$                | ;YES, CONTINUE INTERRUPT PROCESSING    |
| 4359 | 034032 | 052737 | 000020 | 002604 | BIS        | #E.CLAT,E.CONT      | ;SET ATTENTION DID NOT RESET           |
| 4360 |        |        |        |        |            |                     | ;WITH DRIVE CLEAR                      |
| 4361 | 034040 | 004737 | 035510 |        | JSR        | PC,R.CONT           | ;FLAG ERROR                            |
| 4362 | 034044 | 000137 | 034462 |        | JMP        | I.ATRN              | ;RESTORE REGISTERS                     |
| 4363 |        |        |        |        |            |                     |                                        |
| 4364 | 034050 | 013765 | 002556 | 000040 | 15\$: MOV  | T.MR2,P.A00(R5)     | ;STORE MAINTENANCE REGISTER 2          |
| 4365 | 034056 | 032765 | 040000 | 000040 | BIT        | #S.DSC,P.A00(R5)    | ;CHECK IF DRIVE STATUS CHANGE          |
| 4366 |        |        |        |        |            |                     | ;RESET                                 |
| 4367 | 034064 | 001404 |        |        | BEQ        | 16\$                | ;YES, CONTINUE INTERRUPT PROCESSING    |
| 4368 | 034066 | 052765 | 000040 | 000014 | BIS        | #DRVDSC,P.PRST(R5)  | ;SET DRIVE STATUS CHANGE DID NOT CLEAR |
| 4369 | 034074 | 000407 |        |        | BR         | I.AERR              | ;GO PROCESS ERROR                      |
| 4370 |        |        |        |        |            |                     |                                        |
| 4371 | 034076 | 105037 | 002632 |        | 16\$: CLRB | W.TIME              | ;RESET TIMING ON THIS DRIVE            |
| 4372 | 034102 | 005037 | 002646 |        | CLR        | W.DRV               | ;CLEAR DRIVE TIMING COUNT              |
| 4373 | 034106 | 004737 | 035476 |        | JSR        | PC,R.NORM           | ;REPORT SUCCESSFUL COMMAND COMPLETION  |
| 4374 | 034112 | 000563 |        |        | BR         | I.ATRN              | ;RESTORE REGISTERS                     |
| 4375 |        |        |        |        |            |                     |                                        |

```

4376 .SBTTL *ATTENTION ERROR HANDLER
4377
4378 034114 042765 000004 000014 I.AERR: BIC #DRV PDT,P.PRST(R5) ;RESET POSITIONING IN PROGRESS BECAUSE
4379                                     ; OF DATA TRANSFER
4380 034122 105037 002632 CLR W.TIME ;CLEAR TIMING FOR THIS DRIVE
4381 034126 005037 002646 CLR W.DRV ;RESET WATCH-DOG TIME
4382 034132 042765 177741 000016 BIC #177741,P.CS1(R5) ;KEEP COMMAND ISSUED
4383 034140 042737 000036 002532 BIC #36,T.CS1 ;KEEP CURRENT CONTROLLER STATUS
4384 034146 053765 002532 000016 BIS T.CS1,P.CS1(R5) ;MAKE GOOD MESSAGE
4385 034154 013765 002534 000020 MOV T.CS2,P.CS2(R5) ;STORE CONTROLLER REGISTERS
4386 034162 013765 002536 000022 MOV T.WCR,P.WCR(R5)
4387 034170 013765 002540 000024 MOV T.BA,P.BAR(R5)
4388 034176 013765 002542 000026 MOV T.DA,P.DTS(R5)
4389 034204 013765 002544 000030 MOV T.DC,P.DCYL(R5)
4390 034212 013765 002546 000032 MOV T.ASOF,P.ASOF(R5)
4391 034220 013765 002550 000034 MOV T.ER,P.ER(R5)
4392 034226 013765 002552 000036 MOV T.DS,P.DS(R5)
4393 034234 004037 035236 JSR RD,I.STAT ;GATHER DRIVE STATUS
4394 034240 034462 I.RTRN ;ERROR RETURN
4395 034242 112737 000005 002532 MOVB #DR.CLR,T.CS1 ;LOAD COMMAND
4396 034250 004037 034562 JSR RD,I.ISSU ;CLEAR DRIVE ERRORS
4397 034254 034462 I.RTRN ;ERROR RETURN
4398 034256 133737 002633 002547 BITB INTMSK,T.ASOF+1 ;CHECK IF ATTENTION RESET
4399 034264 001407 BEQ 2$ ;YES, FLAG DRIVE ERROR
4400 034266 052737 000020 002604 BIS #E.CLAT,E.CONT ;SET ATTENTION DID NOT RESET
4401 034274 004737 035510 JSR PC,R.CONT ;REPORT ERROR
4402 034300 000137 034462 JMP I.RTRN ;RESTORE REGISTERS
4403
4404 034304 032765 000020 000014 2$: BIT #DRVHRD,P.PRST(R5) ;CHECK IF AWARD DRIVE ERROR
4405 034312 001017 BNE 10$ ;YES, REPORT ERROR
4406 034314 032737 020000 002556 BIT #S.P1P,T.MR2 ;CHECK IF DRIVE IS UNLOADING
4407 034322 001413 BEQ 10$ ;NO, REPORT ERROR
4408 034324 052765 020000 000014 BIS #E.UNLD,P.PRST(R5) ;SET DRIVE UNLOADING DUE TO ERROR
4409 034332 113737 002633 002632 MOVB INTMSK,W.TIME ;SET TIMING ON THIS DRIVE
4410 034340 013737 002616 002646 MOV W.8SEC,W.DRV ;LOAD 8 SECONDS FOR CYCLE UP TIME
4411 034346 000137 034462 JMP I.RTRN ;RESTORE REGISTERS
4412
4413 034352 004737 035464 10$: JSR PC,R.ABNL ;REPORT ERROR
4414 034356 000137 034462 JMP I.RTRN ;RESTORE REGISTERS
4415
4416 .SBTTL *ERROR CAUSING DRIVE TO UNLOAD
4417
4418 034362 052765 020000 000014 I.UNLD: BIS #E.UNLD,P.PRST(R5) ;CLEAR DRIVE UNLOADING BECAUSE OF ERROR
4419 034370 112737 000005 002532 MOVB #DR.CLR,T.CS1 ;LOAD IN DRIVE CLEAR
4420 034376 004037 034562 JSR RD,I.ISSU ;GO ISSUE DRIVE CLEAR
4421 034402 034462 I.RTRN ;ERROR RETURN
4422 034404 136437 002633 002547 BITB INTMSK(R4),T.ASOF+1 ;CHECK IF ATTENTION CLEARED
4423 034412 001406 BEQ 15$ ;YES, CONTINUE
4424 034414 012737 000020 002604 MOV #E.CLAT,E.CONT ;SET ATTENTION DID NOT RESET
4425 034422 004737 035510 JSR PC,R.CONT ;REPORT ERROR
4426 034426 000415 BR I.RTRN ;RESTORE REGISTERS
4427
4428 034430 032737 040000 002556 15$: BIT #S.DSC,T.MR2 ;CHECK IF DRIVE STAUUS CHANGE RESET
4429 034436 001403 BEQ 20$ ;YES, CONTINUE
4430 034440 052765 000040 000014 BIS #DRV DSC,P.PRST(R5) ;SET DRIVE STAUUS CHANGE DID NOT CLEAR
4431 034446 105037 002632 20$: CLRB W.TIME ;RESET TIMING ON THIS DRIVE

```

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RAD6 PACK FORMATTER MACY11 27(1006) 03-NOV-76 16:15 PAGE 84  
 D2R6LB.P11 03-AUG-76 00:00 \*ERROR CAUSING DRIVE TO UNLOAD

|      |        |        |        |             |           |                   |
|------|--------|--------|--------|-------------|-----------|-------------------|
| 4432 | 034452 | 005037 | 002646 | CLR         | W.DRV     | :CLEAR TIME COUNT |
| 4433 | 034456 | 004737 | 035464 | JSR         | PC,R.ABNL | :REPORT ERROR     |
| 4434 |        |        |        |             |           |                   |
| 4435 | 034462 | 012600 |        | I.RTRN: MOV | (SP)+,R0  | :RESTORE R0       |
| 4436 | 034464 | 012601 |        | MOV         | (SP)+,R1  | :RESTORE R1       |
| 4437 | 034466 | 012602 |        | MOV         | (SP)+,R2  | :RESTORE R2       |
| 4438 | 034470 | 012603 |        | MOV         | (SP)+,R3  | :RESTORE R3       |
| 4439 | 034472 | 012604 |        | MOV         | (SP)+,R4  | :RESTORE R4       |
| 4440 | 034474 | 012605 |        | MOV         | (SP)+,R5  | :RESTORE R5       |
| 4441 | 034476 | 000002 |        | RTI         |           | :RETURN           |
| 4442 |        |        |        |             |           |                   |

RK06 PACK FORMATTER MACY11 27(1006) 03-NOV-76 16:15 PAGE 85  
 DZR6LB.P11 03-AUG-76 00:00 \*CONTROLLER CLEAR ROUTINE

.SBTTL \*CONTROLLER CLEAR ROUTINE

\*\*\*\*\*

THIS ROUTINE WILL BE USED BY THE DRIVER TO CLEAR THE CONTROLLER  
 AND CHECK IF THE CONTROLLER ERRORS ARE RESET. IF THE ERROR IS NOT  
 CLEARED, THE ROUTINE AS SPECIFIED IN A.CONT WILL BE CALLED WITH  
 E.CCLR SET IN E.CONT.

REGISTER USE  
 -----

R2 ADDRESS OF RK06 REGISTERS  
 R5 ADDRESS OF PARAMETER BLOCK

\*CALL JSR R0,I.CCLR  
 <ADDRESS OF ERROR RETURN>  
 RETURN

\*\*\*\*\*

|      |        |        |        |        |             |                 |                                           |
|------|--------|--------|--------|--------|-------------|-----------------|-------------------------------------------|
| 4464 | 034500 | 012762 | 100000 | 000000 | I.CCLR: MOV | #CCLR,RKCS1(R2) | ;CLEAR CONTROLLER                         |
| 4465 | 034506 | 016237 | 000000 | 002532 | MOV         | RKCS1(R2),T.CS1 | ;STORE COMMAND AND STATUS REGISTER 1      |
| 4466 | 034514 | 032737 | 100000 | 002532 | BIT         | #CERR,T.CS1     | ;CHECK IF CONTROLLER CLEAR DID            |
| 4467 |        |        |        |        |             |                 | ;CLEAR ERROR                              |
| 4468 | 034522 | 001407 |        |        | BEQ         | SS              | ;YES, RETURN TO DRIVER PROCESSING         |
| 4469 | 034524 | 052737 | 000001 | 002604 | BIS         | #E.CCLR,E.CONT  | ;SET CLEAR CONTROLLER DID NOT CLEAR ERROR |
| 4470 | 034532 | 004737 | 035510 |        | JSR         | PC,R.CONT       | ;REPORT CONTROLLER ERROR                  |
| 4471 | 034536 | 011000 |        |        | MOV         | (R0),R0         | ;SET UP ERROR RETURN                      |
| 4472 | 034540 | 000200 |        |        | RTS         | R0              | ;RETURN                                   |
| 4473 |        |        |        |        |             |                 |                                           |
| 4474 | 034542 | 012762 | 000100 | 000000 | SS: MOV     | #IE,RKCS1(R2)   | ;SET INTERRUPT ENABLE                     |
| 4475 | 034550 | 112737 | 177777 | 002626 | MOVB        | #-1,I.ISRL      | ;SET INTERRUPT ENABLE ISSUED              |
| 4476 | 034556 | 005720 |        |        | TST         | (R0)+           | ;ADJUST FOR NORMAL RETURN                 |
| 4477 | 034560 | 000200 |        |        | RTS         | R0              | ;RETURN                                   |

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RK06 PACK FORMATTER MACY11 27(1006)  
DZR6LB.P11 03-AUG-76 00:0003-NOV-76 16:15 PAGE 86  
\*COMMAND ISSUED BY DRIVER SERVICE ROUTINE

.SBTTL \*COMMAND ISSUED BY DRIVER SERVICE ROUTINE

\*\*\*\*\*

```

* THIS ROUTINE WILL ISSUE THE COMMAND AS SPECIFIED IN T.CS1
* AND CHECK IF A CONTROLLER ERROR OCCURRED. IF A CONTROLLER
* ERROR OCCURRED, E.CERR WILL BE SET IN E.CONT AND
* CONTROL WILL BE TURN OVER TO THE ROUTINE SPECIFIED BY THE
* ADDRESS IN A.CONT.

```

```

* REGISTER      USE
* -----      ---

```

```

* R2            ADDRESS OF RK06 REGISTERS
* R5            ADDRESS OF PARAMETER BLOCK

```

```

*CALL JSR      RO.I.ISSU
*      <ADDRESS OF ERROR RETURN>
*      RETURN

```

```

* ROUTINES USED:
* -----

```

```

* I.CCLR
* I.STOR

```

\*\*\*\*\*

|      |        |        |        |        |             |                                                   |                                        |
|------|--------|--------|--------|--------|-------------|---------------------------------------------------|----------------------------------------|
| 4506 | 034562 | 013746 | 002532 |        | I.ISSU: MOV | T.CS1, -(SP)                                      | ;STORE COMMAND ISSUED                  |
| 4507 | 034566 | 005037 | 002534 |        | CLR         | T.CS2                                             | ;CLEAR TEMPORARY CS2                   |
| 4508 | 034572 | 116537 | 000000 | 002534 | MOVB        | P.DRVN(R5), T.CS2                                 | ;LOAD IN DRIVE NUMBER                  |
| 4509 | 034600 | 013762 | 002534 | 000010 | MOV         | T.CS2, RKCS2(R2)                                  | ;LOAD DRIVE NUMBER FOR COMMAND         |
| 4510 | 034606 | 116537 | 000007 | 002533 | MOVB        | P.CS1H(R5), T.CS1+1                               | ;STORE BITS 8-15 OF CS1                |
| 4511 | 034614 | 142737 | 177753 | 002533 | BICB        | #1C<B.CDT!B.CFMT>, T.CS1+1                        | ;CLEAR ALL BITS EXCEPT                 |
| 4512 |        |        |        |        |             |                                                   | ;FORMAT AND DRIVE TYPE                 |
| 4513 | 034622 | 013762 | 002532 | 000000 | MOV         | T.CS1, RKCS1(R2)                                  | ;ISSUE COMMAND                         |
| 4514 | 034630 | 105762 | 000000 |        | 1\$: TSTB   | RKCS1(R2)                                         | ;WAIT FOR READY                        |
| 4515 | 034634 | 100375 |        |        | BPL         | 1\$                                               |                                        |
| 4516 | 034636 | 004737 | 035004 |        | JSR         | PC, I.STOR                                        | ;GO STORE REGISTERS                    |
| 4517 | 034642 | 032737 | 100000 | 002532 | BIT         | #CERR, T.CS1                                      | ;CHECK IF CONTROLLER ERROR OCCURED     |
| 4518 | 034650 | 001437 |        |        | BEQ         | 5\$                                               | ;NO, RETURN                            |
| 4519 | 034652 | 032737 | 001000 | 002534 | BIT         | #MDS, T.CS2                                       | ;CHECK IF MULTIPLE DRIVE SELECT        |
| 4520 | 034660 | 001406 |        |        | BEQ         | 2\$                                               | ;NO, CHECK FOR OTHER CONTROLLER ERRORS |
| 4521 | 034662 | 052737 | 100000 | 002604 | BIS         | #E.MDS, E.CONT                                    | ;SET MULTIPLE DRIVE SELECT FLAG        |
| 4522 | 034670 | 004737 | 035510 |        | JSR         | PC, R.CONT                                        | ;REPORT CONTROLLER ERROR               |
| 4523 | 034674 | 000440 |        |        | BR          | 10\$                                              | ;RETURN                                |
| 4524 |        |        |        |        |             |                                                   |                                        |
| 4525 |        |        |        |        |             |                                                   | ;CHECK IF ANY CONTROLLER ERROR IS SET  |
| 4526 | 034676 | 032737 | 024000 | 002532 | 2\$: BIT    | #CTO!SPAR, T.CS1                                  |                                        |
| 4527 | 034704 | 001027 |        |        | BNE         | 7\$                                               |                                        |
| 4528 | 034706 | 032737 | 176400 | 002534 | BIT         | #UFE!PGE!NEM!NED!UPE!WCE!DLT, T.CS2               |                                        |
| 4529 | 034714 | 001023 |        |        | BNE         | 7\$                                               |                                        |
| 4530 | 034716 | 032737 | 131761 | 002550 | BIT         | #ILC!DTYE!FMTE!ECH!BSE!HVRC!COE!DTE!OPI!DCK, T.ER |                                        |
| 4531 | 034724 | 001017 |        |        | BNE         | 7\$                                               |                                        |
| 4532 |        |        |        |        |             |                                                   |                                        |
| 4533 | 034726 | 122716 | 000005 |        | CMPB        | #DR.CLR, (SP)                                     | ;CHECK IF CLEAR DRIVE                  |



RK06 PACK FORMATTER MACY11 27(1006) 03-NOV-76 16:15 PAGE 87  
 DZR6LB.P11 03-AUG-76 00:00 \*COMMAND ISSUED BY DRIVER SERVICE ROUTINE

|      |        |        |        |        |       |                    |                                             |
|------|--------|--------|--------|--------|-------|--------------------|---------------------------------------------|
| 4534 | 034732 | 001003 |        |        | BNE   | 3\$                | ;NO, DO NOT SET DRIVE HARD ERROR            |
| 4535 | 034734 | 052765 | 000020 | 000014 | BIS   | *DRVHRO,P.PRST(R5) | ;SET HAFD DRIVE ERROR                       |
| 4536 | 034742 | 004037 | 034500 |        | JSR   | RO,I.CCLR          | ;GO ISSUE A CONTROLLER CLEAR                |
| 4537 | 034746 | 034776 |        |        | 10\$  |                    | ;ERROR RETURN                               |
| 4538 | 034750 | 012762 | 000100 | 000000 | MOV   | *IE,RKCS1(R2)      | ;SET INTERRUPT ENABLE                       |
| 4539 | 034756 | 005726 |        |        | TST   | (SP)+              | ;ADJUST STACK                               |
| 4540 | 034760 | 005720 |        |        | TST   | (RO)+              | ;ADJUST RO FOR NORMAL RETURN                |
| 4541 | 034762 | 000200 |        |        | RTS   | RO                 | ;RETURN                                     |
| 4542 |        |        |        |        |       |                    |                                             |
| 4543 | 034764 | 052737 | 001000 | 002604 | 7\$:  | BIS                | *E.CERR.E.CONT ;SET CONTROLLER ERROR DURING |
| 4544 |        |        |        |        |       |                    | DRIVER SERVICING                            |
| 4545 | 034772 | 004737 | 035510 |        | JSR   | PC,R.CONT          | ;REPORT ERROR                               |
| 4546 | 034776 | 005726 |        |        | 10\$: | TST                | (SP)+                                       |
| 4547 | 035000 | 011000 |        |        | MOV   | (RO),RO            | ;ADJUST RO FOR ERROR RETURN                 |
| 4548 | 035002 | 000200 |        |        | RTS   | RO                 | ;RETURN                                     |



RK06 PACK FORMATTER MACY11 27(1006) 03-NOV-76 16:15 PAGE 88  
 DZR6LB.P11 03-AUG-76 00:00

\*STORE RK611 UNIBUS REGISTERS

.SBTTL \*STORE RK611 UNIBUS REGISTERS

```

*****
*
*   THIS SUBROUTINE IS CALLED BY THE RK06 DRIVER TO STORE ALL
*   RK611 REGISTER IN TEMPORARY LOCATIONS.
*
*CALL JSR    PC,I.STOR
*   RETURN
*
*   REGISTER      USE
*   -----      ---
*
*   R2              ADDRESS OF RK611 REGISTERS
*
*****

```

```

4549
4550
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4562
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4565
4566 035004 016237 000000 002532
4567 035012 016237 000010 002534
4568 035020 016237 000002 002536
4569 035026 016237 000004 002540
4570 035034 016237 000006 002542
4571 035042 016237 000012 002552
4572 035050 016237 000014 002550
4573 035056 016237 000016 002546
4574 035064 016237 000020 002544
4575 035072 016237 000022 002554
4576 035100 016237 000034 002556
4577 035106 016237 000036 002560
4578 035114 016237 000030 002562
4579 035122 016237 000032 002564
4580 035130 000207

```

```

I.STOR: MOV    RKCS1(R2),T.CS1 ;STORE ALL CONTROLLER REGISTERS
        MOV    RKCS2(R2),T.CS2 ; EXCEPT DATA BUFFER
        MOV    RKWC(R2),T.WCR
        MOV    RKBA(R2),T.BA
        MOV    RKDA(R2),T.DA
        MOV    RKDS(R2),T.DS
        MOV    RKER(R2),T.ER
        MOV    RKASOF(R2),T.ASOF
        MOV    RKDCYL(R2),T.DC
        MOV    RKMR1(R2),T.MR1
        MOV    RKMR2(R2),T.MR2
        MOV    RKMR3(R2),T.MR3
        MOV    RKECP5(R2),T.POS
        MOV    RKECPT(R2),T.PAT
        RTS    PC              ;RETURN

```

K07

RK06 PACK FORMATTER MACY11 27(1006) 03-NOV-76 16:15 PAGE 89  
 DZR6LB.P11 03-AUG-76 00:00 \*STORE CONTROLLER STATUS

.SBTTL \*STORE CONTROLLER STATUS

```

*****
;
; THIS SUBROUTINE IS CALLED BY THE RK06 DRIVER AT PRIORITY 7.
; THE FOLLOWING REGISTERS WILL BE STORED:
;
; COMMAND AND STATUS REGISTER 2
; WORD COUNT REGISTER
; BUS ADDRESS REGISTER
; DESIRED TRACK AND SECTOR
; STATUS REGISTER
; ERROR REGISTER
; ATTENTION SUMMARY/OFFSET REGISTER
; CYLINDER ADDRESS REGISTER

```

```

;CALL JSR PC,I.CSTS
;RETURN

```

THIS ROUTINE ASSUMES THE FOLLOWING REGISTERS CONTAIN:

| REGISTER | CONTENTS                   |
|----------|----------------------------|
| -----    | -----                      |
| R2       | RK06 BASE ADDRESS          |
| R5       | ADDRESS OF PARAMETER BLOCK |

```

*****

```

|      |        |        |        |        |             |                       |                                      |
|------|--------|--------|--------|--------|-------------|-----------------------|--------------------------------------|
| 4611 | 035132 | 042765 | 177741 | 000016 | I.CSTS: BIC | #177741,P.CS1(R5)     | ;CLEAR ALL BITS EXCEPT FUNCTION      |
| 4612 |        |        |        |        |             |                       | ;OF LAST COMMAND ISSUED              |
| 4613 | 035140 | 042737 | 000036 | 002532 | BIC         | #36,T.CS1             | ;CLEAR FUNCTION OF CS1 STATUS        |
| 4614 | 035146 | 053765 | 002532 | 000016 | BIS         | T.CS1,P.CS1(R5)       | ;GENERATE CS1 STATUS INFORMATION     |
| 4615 | 035154 | 016265 | 000010 | 000020 | I.CST1: MOV | RKCS2(R2),P.CS2(R5)   | ;STORE COMMAND AND STATUS REGISTER 2 |
| 4616 | 035162 | 016265 | 000002 | 000022 | MOV         | RKWC(R2),P.WCR(R5)    | ;STORE WORD COUNT REGISTER           |
| 4617 | 035170 | 016265 | 000004 | 000024 | MOV         | RKBA(R2),P.BAR(R5)    | ;STORE BUS ADDRESS REGISTER          |
| 4618 | 035176 | 016265 | 000006 | 000026 | MOV         | RKDA(R2),P.DTS(R5)    | ;STORE DESIRED TRACK AND SECTOR      |
| 4619 | 035204 | 016265 | 000012 | 000036 | MOV         | RKDS(R2),P.DS(R5)     | ;STORE DRIVE STATUS REGISTER         |
| 4620 | 035212 | 016265 | 000014 | 000034 | MOV         | RKER(R2),P.ER(R5)     | ;STORE ERROR REGISTER                |
| 4621 | 035220 | 016265 | 000016 | 000032 | MOV         | RKASOF(R2),P.ASOF(R5) | ;STORE ATTENTION SUMMARY AND         |
| 4622 |        |        |        |        |             |                       | ;OFFSET                              |
| 4623 | 035226 | 016265 | 000020 | 000030 | MOV         | RKDCYL(R2),P.DCYL(R5) | ;STORE CYLINDER ADDRESS              |
| 4624 | 035234 | 000207 |        |        | RTS         | PC                    | ;RETURN                              |
| 4625 |        |        |        |        |             |                       |                                      |

L07

```
.SBTTL  *GATHER DRIVE STATUS
```

..\*\*\*\*\*

```

; * THIS SUBROUTINE WILL BE USED TO GATHER DRIVE STATUS
; * BYTE 01, 10, AND 11. IT IS ASSUMED THAT THE DRIVE
; * HAS PREVIOUSLY BEEN SEIZED. IT RUNS AT PRIORITY 7.

```

```

; *CALL JSR RO, I, STAT
; *      <ADDRESS OF ERROR RETURN>
; *      RETURN

```

THIS ROUTINE ASSUMES THE FOLLOWING REGISTERS CONTAIN:

```

,*
,*
,*
,*
,*
,*
,*

```

| REGISTER<br>----- | CONTENTS<br>-----          |
|-------------------|----------------------------|
| R2                | RK06 BASE ADDRESS          |
| R5                | ADDRESS OF PARAMETER BLOCK |

ROUTINES USED:  
I. ISSU

.....

```

I. STAT: MOV      #1, RKMR1(R2)      ; LOAD MAINTENANCE REGISTER 1
; FOR STATUS BYTE 01
MOVB      #DR.SEL, T.CS1             ; LOAD COMMAND
JSR        RO, I.ISSU                ; GET STATUS BYTES 01
3$        ; ERROR RETURN
MOV        T.MR2, P.A01(R5)          ; STORE STATUS BYTE 01 MESS A
MOV        T.MR3, P.B01(R5)          ; STORE STATUS BYTE 01 MESS B
MOV        #2, RKMR1(R2)             ; LOAD MAINTENANCE REGISTER 1
; FOR STATUS BYTE 10
MOVB      #DR.SEL, T.CS1             ; LOAD COMMAND
JSR        RO, I.ISSU                ; GET STATUS BYTES 10
3$        ; ERROR RETURN
MOV        T.MR2, P.A10(R5)          ; STORE STATUS BYTE 10 MESS A
MOV        T.MR3, P.B10(R5)          ; STORE STATUS BYTE 10 MESS B
MOV        #3, RKMR1(R2)             ; LOAD MAINTENANCE REGISTER
; FOR STATUS BYTE 11
MOVB      #DR.SEL, T.CS1             ; LOAD COMMAND
JSR        RO, I.ISSU                ; GET STATUS BYTES 11
3$        ; ERROR RETURN
MOV        T.MR2, P.A11(R5)          ; STORE STATUS BYTE 11 MESS A
MOV        T.MR3, P.B11(R5)          ; STORE STATUS BYTE 11 MESS B
CLR        RKMR1(R2)                 ; LOAD MAINTENANCE REGISTER 1
; FOR STATUS BYTE 00
MOVB      #DR.SEL, T.CS1             ; LOAD COMMAND
JSR        RO, I.ISSU                ; GET STATUS BYTES 00
3$        ; ERROR RETURN
MOV        T.MR2, P.A00(R5)          ; STORE STATUS BYTE 00 MESS A
MOV        T.MR3, P.B00(R5)          ; STORE STATUS BYTE 00 MESS B
BIT        #S.PAR, T.MR3             ; CHECK IF BAD PARITY DETECTED BY DRIVE
BEQ        5$                        ; NO. RETURN NORMALLY

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 DZR6LB.P11 03-AUG-76 00:00 \*COMMON DRIVER RETURNS

|      |        |        |        |         |                        |                                           |
|------|--------|--------|--------|---------|------------------------|-------------------------------------------|
| 4691 |        |        |        | .SBTTL  | *COMMON DFIVER RETURNS |                                           |
| 4692 |        |        |        |         |                        |                                           |
| 4693 | 035464 | 105037 | 002633 | R.ABNL: | CLRB INTMSK            | ;INHIBIT FUTURE DRIVE INTERRUPT REPORTING |
| 4694 | 035470 | 004777 | 145104 |         | JSR PC,2A.ABNL         | ;INDICATE ABNORMAL RETURN                 |
| 4695 | 035474 | 000207 |        |         | RTS PC                 | ;RETURN                                   |
| 4696 |        |        |        |         |                        |                                           |
| 4697 | 035476 | 105037 | 002633 | R.NORM: | CLRB INTMSK            | ;INHIBIT FUTURE DRIVE INTERRUPT REPORTING |
| 4698 | 035502 | 004777 | 145070 |         | JSR PC,2A.NORM         | ;INDICATE NORMAL RETURN                   |
| 4699 | 035506 | 000207 |        |         | RTS PC                 | ;RETURN                                   |
| 4700 |        |        |        |         |                        |                                           |
| 4701 | 035510 | 105037 | 002633 | R.CONT: | CLRB INTMSK            | ;INHIBIT FUTURE DRIVE INTERRUPT REPORTING |
| 4702 | 035514 | 105037 | 002632 |         | CLRB W.TIME            | ;RESET WATCH DOG TIMING ON THIS DRIVE     |
| 4703 | 035520 | 005037 | 002646 |         | CLR W.DRV              | ;CLEAR TIMING COUNT FOR THIS DRIVE        |
| 4704 | 035524 | 004777 | 145052 |         | JSR PC,2A.CONT         | ;INDICATE CONTROLLER ERROR RETURN         |
| 4705 | 035530 | 000207 |        |         | RTS PC                 | ;RETURN                                   |

.SBTTL \*COMMAND INITIATOR

\*\*\*\*\*

THIS SUBROUTINE WILL INITIATE ALL COMMANDS AS SPECIFIED  
BY THE COMMAND FIELD OF THE PARAMETER BLOCK. THE FOLLOWING  
SPECIAL COMMAND ARE ALSO EXECUTED:

RELEASE  
CONROLLER CLEAR  
SUBSYSTEM CLEAR  
READ ALL DRIVE STATUS  
READ SPECIFIED HEADER

THE ABOVE COMMANDS ARE TRANSLATED INTO A SEQUENCE OF COMMANDS

CALL JSR PC.C.INIT  
(ADDRESS OF PARAMETER BLOCK)  
RETURN

FOR THE SEQUENTIAL OPERATIONS, THE DRIVER WILL LOAD THE  
LOCATIONS, PBLKT AND INTMSK.

ROUTINES USED:  
W.WTCH  
I.CSTS  
I. STAT  
I.CCLR

\*\*\*\*\*

C.INIT: MOV R5, -(SP) ;STORE R5 ON STACK  
MOV R4, -(SP) ;STORE R4 ON STACK  
MOV R3, -(SP) ;STORE R3 ON STACK  
MOV R2, -(SP) ;STORE R2 ON STACK  
MOV R1, -(SP) ;STORE R1 ON STACK  
MOV R0, -(SP) ;STORE R0 ON STACK  
MOV PS, -(SP) ;STORE PSW ON STACK  
MOV RKPRI, PS ;LOCK OUT RK06 INTERRUPTS  
MOV @16(SP), R5 ;STORE PARAMETER BLOCK ADDRESS  
ADD #2, 16(SP) ;ADJUST RETURN  
MOV P.DRVN(R5), R4 ;STORE DRIVE NUMBER  
BIC #1C(DRVMSK), R4 ;MASK OUT JUNK  
MOV R5, PBLKT ;LOAD PARAMETER BLOCK TABLE  
MOVB I.DRV(R4), INTMSK ;LOAD INTERRUPT MASK  
MOVB I.DRV(R4), W.TIME ;SET WATCH-DOG TIMER FLAG  
MOV W.SEC, W.DRV ;LOAD WATCH-DOG TIME

MOV RKBAS, R2 ;LOAD R2 WITH RK06 ADDRESS BASE

RESET ALL BITS IN PROGRAM DEVICE STATUS REGISTER EXCEPT  
DRIVE IN USE  
WRITE FOR WRITE CHECK  
NO CHECK  
DROP DRIVE FROM TEST SEQUENCE  
INHIBIT BUS ADDRESS INCREMENT

4736  
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4761

035532 010546  
035534 010446  
035536 010346  
035540 C10246  
035542 010146  
035544 010046  
035546 013746 177776  
035552 013737 002574 177776  
035560 017605 000016  
035564 062766 000002 000016  
035572 016504 000000  
035576 042704 177770  
035602 010537 002644  
035606 116437 002634 002633  
035614 116437 002634 002632  
035622 013737 002614 002646  
035630 013702 002570



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 CCR6LB.P11 03-AUG-76 00:00 \*COMMAND INITIATOR

|      |        |        |        |        |      |      |                                                |                                         |
|------|--------|--------|--------|--------|------|------|------------------------------------------------|-----------------------------------------|
| 4762 | 035634 | 042765 | 075176 | 000014 |      | BIC  | #IC(DRVUSE!W.WCK!NOCHK!DRPDY!DTBAI),P.PRST(R5) |                                         |
| 4763 |        |        |        |        |      |      |                                                |                                         |
| 4764 | 035642 | 010500 |        |        |      | MOV  | R5,R0                                          | :STORE PARAMETER BLOCK ADDRESS          |
| 4765 | 035644 | 062700 | 000016 |        |      | ADD  | #P.CS1,R0                                      | :CALCULATE FIRST LOCATION TO BE CLEARED |
| 4766 | 035650 | 010501 |        |        |      | MOV  | R5,R1                                          | :STORE PARAMETER BLOCK ADDRESS          |
| 4767 | 035652 | 062701 | 000062 |        |      | ADD  | #P.EPAT,R1                                     | :CALCULATE LAST LOCATION TO BE CLEARED  |
| 4768 |        |        |        |        |      |      |                                                |                                         |
| 4769 | 035656 | 005020 |        |        | 1\$: | CLR  | (R0)+                                          | :CLEAR RETURN PARAMETER                 |
| 4770 | 035660 | 020001 |        |        |      | CMP  | R0,R1                                          | :CHECK IF FINISHED                      |
| 4771 | 035662 | 101775 |        |        |      | BLOS | 1\$                                            | :NO, CLEAR NEXT RETURN PARAMETER        |
| 4772 | 035664 | 105037 | 002626 |        |      | CLRB | I.ISRL                                         | :CLEAR RELEASE OR INTERRUPT ISSUED      |
| 4773 | 035670 | 010465 | 000020 |        |      | MOV  | R4,P.CS2(R5)                                   | :STORE DRIVE NUMBER                     |
| 4774 | 035674 | 005062 | 000022 |        |      | CLR  | RKMR1(R2)                                      | :CLEAR RK06 MAINTENANCE REGISTER 1      |
| 4775 | 035700 | 132765 | 000040 | 000001 |      | BITB | #BITS,P.CMND(R5)                               | :CHECK IF SPECIAL COMMAND               |
| 4776 | 035706 | 001402 |        |        |      | BEG  | 3\$                                            | :NO PROCESS                             |
| 4777 | 035710 | 000137 | 036424 |        |      | JMP  | C.SPEC                                         | :JUMP TO SPECIAL COMMAND PROCESSOR      |
| 4778 |        |        |        |        |      |      |                                                |                                         |
| 4779 | 035714 | 122765 | 000107 | 000001 | 3\$: | CMPB | #UNLOAD,P.CMND(R5)                             | :CHECK IF POSITIONING COMMAND           |
| 4780 |        |        |        |        |      |      |                                                | :START SPINDLE                          |
| 4781 |        |        |        |        |      |      |                                                | :RECALIBRATE                            |
| 4782 |        |        |        |        |      |      |                                                | :OFFSET                                 |
| 4783 |        |        |        |        |      |      |                                                | :SEEK                                   |
| 4784 |        |        |        |        |      |      |                                                | :UNLOAD                                 |
| 4785 |        |        |        |        |      |      |                                                |                                         |
| 4786 | 035722 | 101174 |        |        |      | BHI  | 25\$                                           | :NO, DRIVE COMMAND                      |
| 4787 |        |        |        |        |      |      |                                                | :SELECT DRIVE                           |
| 4788 |        |        |        |        |      |      |                                                | :PACK ACKNOWLEDGE                       |
| 4789 |        |        |        |        |      |      |                                                | :CLEAR                                  |
| 4790 |        |        |        |        |      |      |                                                |                                         |
| 4791 | 035724 | 122765 | 000117 | 000001 |      | CMPB | #SEEK,P.CMND(R5)                               | :CHECK IF DATA TRANSFER                 |
| 4792 | 035732 | 103540 |        |        |      | BLO  | 20\$                                           | :YES, DATA TRANSFER COMMAND             |
| 4793 |        |        |        |        |      |      |                                                | :READ DATA                              |
| 4794 |        |        |        |        |      |      |                                                | :WRITE DATA                             |
| 4795 |        |        |        |        |      |      |                                                | :READ HEADER                            |
| 4796 |        |        |        |        |      |      |                                                | :WRITE HEADER                           |
| 4797 |        |        |        |        |      |      |                                                | :WRITE CHECK                            |
| 4798 | 035734 | 016562 | 000020 | 000010 |      | MOV  | P.CS2(R5),RKCS2(R2)                            | :LOAD DRIVE NUMBER                      |
| 4799 | 035742 | 052765 | 000002 | 000014 |      | BIS  | #DR.POS,P.PRST(R5)                             | :SET DRIVE POSITIONING                  |
| 4800 | 035750 | 005037 | 002606 |        |      | CLR  | 0.WAIT                                         | :CLEAR WAIT FOR COMMAND                 |
| 4801 | 035754 | 122765 | 000117 | 000001 |      | CMPB | #SEEK,P.CMND(R5)                               | :CHECK IF SEEK                          |
| 4802 | 035762 | 001007 |        |        |      | BNE  | 5\$                                            | :NO, CHECK FOR OFFSET                   |
| 4803 | 035764 | 016562 | 000002 | 000020 |      | MOV  | P.CYLN(R5),RKDCYL(R2)                          | :LOAD CYLINDER ADDRESS                  |
| 4804 | 035772 | 016562 | 000004 | 000006 |      | MOV  | P.SECT(R5),RKDA(R2)                            | :LOAD SECTOR AND TRACK                  |
| 4805 | 036000 | 000431 |        |        |      | BR   | 8\$                                            | :GO ISSUE COMMAND                       |
| 4806 |        |        |        |        |      |      |                                                |                                         |
| 4807 | 036002 | 122765 | 000115 | 000001 | 5\$: | CMPB | #OFFSET,P.CMND(R5)                             | :CHECK IF OFFSET                        |
| 4808 | 036010 | 001007 |        |        |      | BNE  | 6\$                                            | :NO, CHECK FOR UNLOAD                   |
| 4809 | 036012 | 116565 | 000006 | 000032 |      | MOVB | P.OFST(R5),P.ASOF(R5)                          | :STORE OFFSET                           |
| 4810 | 036020 | 016562 | 000032 | 000016 |      | MOV  | P.ASOF(R5),RKASOF(R2)                          | :LOAD OFFSET REGISTER                   |
| 4811 | 036026 | 000416 |        |        |      | BR   | 8\$                                            | :GO ISSUE COMMAND                       |
| 4812 |        |        |        |        |      |      |                                                |                                         |
| 4813 | 036030 | 122765 | 000111 | 000001 | 6\$: | CMPB | #SRTSPL,P.CMND(R5)                             | :CHECK IF START SPINDLE                 |
| 4814 | 036036 | 001003 |        |        |      | BNE  | 7\$                                            | :NO, CHECK IF RECAL                     |
| 4815 | 036040 | 013737 | 002620 | 002646 |      | MOV  | W.MIN,W.DRV                                    | :LOAD WATCH DOG TIME FOR 1 MINUTE       |
| 4816 | 036046 | 122765 | 000113 | 000001 | 7\$: | CMPB | #RECAL,P.CMND(R5)                              | :CHECK IF RECAL                         |
| 4817 | 036054 | 001003 |        |        |      | BNE  | 8\$                                            | :NO, CONTINUE                           |

|      |        |        |        |        |         |        |                                             |                                          |
|------|--------|--------|--------|--------|---------|--------|---------------------------------------------|------------------------------------------|
| 4818 | 036056 | 013737 | 002616 | 002646 |         | MOV    | W.BSEC,W.DRV                                | :LOAD RECAL TIME FOR 8 SECONDS           |
| 4819 | 036064 | 116565 | 000007 | 000017 | 8\$:    | MOVB   | P.CS1H(R5),P.CS1+1(R5)                      | :STORE BITS 8-15 OF CS1                  |
| 4820 | 036072 | 042765 | 165777 | 000016 |         | BIC    | #1C<CFMT!CDT>,P.CS1(R5)                     | :CLEAR ALL BITS EXCEPT FORMAT            |
| 4821 |        |        |        |        |         |        |                                             | :AND DRIVE TYPE                          |
| 4822 | 036100 | 116565 | 000001 | 000016 |         | MOVB   | P.CMND(R5),P.CS1(R5)                        | :MOVE COMMAND INTO CS1                   |
| 4823 | 036106 | 042765 | 000200 | 000014 |         | BIC    | #W.WCK,P.PRST(R5)                           | :RESET WRITE FOR WRITE CHECK             |
| 4824 | 036114 | 032765 | 000400 | 000014 |         | BIT    | #NOCHK,P.PRST(R5)                           | :CHECK IN NO CHECK MODE                  |
| 4825 | 036122 | 001533 |        |        |         | BEQ    | 30\$                                        | :NO, SKIP CLEAR OF INTERRUPT ENABLE      |
| 4826 | 036124 | 042765 | 000100 | 000016 |         | BIC    | #IE,P.CS1(R5)                               | :CLEAR INTERRUPT ENABLE                  |
| 4827 | 036132 | 016562 | 000016 | 000000 |         | MOV    | P.CS1(R5),RKCS1(R2)                         | :ISSUE COMMAND                           |
| 4828 | 036140 | 004737 | 032102 |        | 10\$:   | JSR    | PC,W.WTCH                                   | :CALL WATCH DOG TIMER                    |
| 4829 | 036144 | 016237 | 000000 | 002532 |         | MOV    | RKCS1(R2),T.CS1                             | :STORE COMMAND AND STATUS REGISTER 1     |
| 4830 | 036152 | 032737 | 000200 | 002532 |         | BIT    | #RDY,T.CS1                                  | :WAIT FOR READY                          |
| 4831 | 036160 | 001767 |        |        |         | BEQ    | 10\$                                        |                                          |
| 4832 | 036162 | 032737 | 100000 | 002532 |         | BIT    | #CERR,T.CS1                                 | :CHECK FOR ERROR                         |
| 4833 | 036170 | 001011 |        |        |         | BNE    | 15\$                                        | :YES, GIVE NORMAL RETURN                 |
| 4834 | 036172 | 004737 | 032102 |        | 11\$:   | JSR    | PC,W.WTCH                                   | :CALL WATCH DOG TIMER                    |
| 4835 | 036176 | 016237 | 000016 | 002546 |         | MOV    | RKASOF(R2),T.ASOF                           | :STORE ATTENTION SUMMARY                 |
| 4836 | 036204 | 133737 | 002633 | 002547 |         | BITB   | INTMSK,T.ASOF+1                             | :CHECK IF INTERRUPT HAS OCCURRED         |
| 4837 | 036212 | 001767 |        |        |         | BEQ    | 11\$                                        | :WAIT FOR DRIVE INTERRUPT                |
| 4838 | 036214 | 105037 | 002632 |        | 15\$:   | CLRB   | W.TIME                                      | :RESET TIMING ON THIS DRIVE              |
| 4839 | 036220 | 005037 | 002646 |        |         | CLR    | W.DRV                                       | :CLEAR DRIVE TIMING COUNT                |
| 4840 | 036224 | 004737 | 035476 |        |         | JSR    | PC,R.NORM                                   | :INDICATE COMMAND IS FINISHED            |
| 4841 | 036230 | 000137 | 037404 |        |         | JMP    | C.RTRN                                      | :RESTORE REGISTERS                       |
| 4842 |        |        |        |        |         |        |                                             |                                          |
| 4843 | 036234 | 016562 | 000010 | 000004 | 20\$:   | MOV    | P.BALO(R5),RKBA(R2)                         | :LOAD BUS ADDRESS REGISTER               |
| 4844 | 036242 | 016562 | 000012 | 000002 |         | MOV    | P.WC(R5),RKWC(R2)                           | :LOAD WORD COUNT REGISTER                |
| 4845 | 036250 | 016562 | 000002 | 000020 |         | MOV    | P.CYLN(R5),RKDCYL(R2)                       | :LOAD CYLINDER ADDRESS REGISTER          |
| 4846 | 036256 | 016562 | 000004 | 000006 |         | MOV    | P.SECT(R5),RKDA(R2)                         | :LOAD SECTOR AND TRACK NUMBER            |
| 4847 | 036264 | 122765 | 000131 | 000001 |         | CMPB   | #WRTCHK,P.CMND(R5)                          | :CHECK IF WRITE CHECK COMMAND            |
| 4848 | 036272 | 001010 |        |        |         | BNE    | 25\$                                        | :NO, GO ISSUE THE COMMAND                |
| 4849 | 036274 | 032765 | 000200 | 000014 |         | BIT    | #W.WCK,P.PRST(R5)                           | :CHECK IF WRITE COMMAND SHOULD BE ISSUED |
| 4850 | 036302 | 001404 |        |        |         | BEQ    | 25\$                                        | :NO, GO ISSUE THE COMMAND                |
| 4851 | 036304 | 012765 | 000123 | 000016 |         | MOV    | #WRDATA,P.CS1(R5)                           | :ISSUE WRITE COMMAND                     |
| 4852 | 036312 | 000406 |        |        |         | BR     | 26\$                                        | :GO ISSUE COMMAND                        |
| 4853 |        |        |        |        |         |        |                                             |                                          |
| 4854 | 036314 | 116565 | 000001 | 000016 | 25\$:   | MOVB   | P.CMND(R5),P.CS1(R5)                        | :MOVE COMMAND INTO CS1                   |
| 4855 | 036322 | 042765 | 000200 | 000014 |         | BIC    | #W.WCK,P.PRST(R5)                           | :RESET WRITE FOR WRITE CHECK             |
| 4856 | 036330 | 116565 | 000007 | 000017 | 26\$:   | MOVB   | P.CS1H(R5),P.CS1+1(R5)                      | :STORE BITS 8-15 OF CS1                  |
| 4857 | 036336 | 142765 | 177750 | 000017 |         | BICB   | #1C<B.CFMT!B.CDT!B.BAI6!B.BAI7>,P.CS1+1(R5) | :CLEAR ALL BITS EXCEPT                   |
| 4858 |        |        |        |        |         |        |                                             | :FORMAT, DRIVE TYPE, AND BUS ADDRESS     |
| 4859 |        |        |        |        |         |        |                                             | :BITS 16-17                              |
| 4860 | 036344 | 010537 | 002606 |        |         | MOV    | R5,0.WAIT                                   | :LOAD WAITING FOR COMMAND                |
| 4861 | 036350 | 032765 | 100000 | 000014 |         | BIT    | #DIBAI1,P.PRST(R5)                          | :CHECK IF INHIBIT BUS ADDRESS INCREMENT  |
| 4862 | 036356 | 001403 |        |        |         | BEQ    | 27\$                                        | :NO, LOAD CS2                            |
| 4863 | 036370 | 052765 | 000020 | 000020 |         | BIS    | #BAI,P.CS2(R5)                              | :SET INHIBIT BUS ADDRESS INCREMENT       |
| 4864 | 036366 | 016562 | 000020 | 000010 | 27\$:   | MOV    | P.CS2(R5),RKCS2(R2)                         | :LOAD CS2                                |
| 4865 | 036374 | 032765 | 000400 | 000014 |         | BIT    | #NOCHK,P.PRST(R5)                           | :CHECK IN NO CHECK MODE                  |
| 4866 | 036402 | 001403 |        |        |         | BEQ    | 30\$                                        | :NO, SKIP CLEAR OF INTERRUPT ENABLE      |
| 4867 | 036404 | 042765 | 000100 | 000016 |         | BIC    | #IE,P.CS1(R5)                               | :CLEAR INTERRUPT ENABLE                  |
| 4868 | 036412 | 016562 | 000016 | 000000 | 30\$:   | MOV    | P.CS1(R5),RKCS1(R2)                         | :ISSUE COMMAND                           |
| 4869 | 036420 | 000137 | 037404 |        |         | JMP    | C.RTRN                                      | :RESTORE REGISTERS                       |
| 4870 |        |        |        |        |         |        |                                             |                                          |
| 4871 |        |        |        |        |         | .SBTTL | *SPECIAL COMMAND PROCESSING                 |                                          |
| 4872 |        |        |        |        |         |        |                                             |                                          |
| 4873 | 036424 | 122765 | 000141 | 000001 | C.SPEC: | CMPB   | #RDSTAT,P.CMND(R5)                          | :CHECK IF READ DRIVE STATUS              |



|      |        |        |        |        |            |                         |                                                  |
|------|--------|--------|--------|--------|------------|-------------------------|--------------------------------------------------|
| 4874 | 036432 | 001132 |        |        | BNE        | 10\$                    | :NO, PROCESS OTHER COMMANDS                      |
| 4875 | 036434 | 016562 | 000020 | 000010 | MOV        | P.CS2(R5),RKCS2(R2)     | :LOAD CS2 FOR COMMAND                            |
| 4876 | 036442 | 116565 | 000007 | 000017 | MOVB       | P.CS1H(R5),P.CS1+1(R5)  | :STORE BITS 8-15 OF CS1                          |
| 4877 | 036450 | 042765 | 165777 | 000016 | BIC        | *IC(CFMT!COT),P.CS1(R5) | :CLEAR ALL BITS EXCEPT FORMAT                    |
| 4878 |        |        |        |        |            |                         | : AND DRIVE TYPE                                 |
| 4879 | 036456 | 112765 | 000001 | 000016 | MOVB       | *DR.SEL,P.CS1(R5)       | :STORE COMMAND                                   |
| 4880 | 036464 | 016562 | 000016 | 000000 | MOV        | P.CS1(R5),RKCS1(R2)     | :ISSUE COMMAND                                   |
| 4881 | 036472 | 004737 | 032102 |        | JSR        | PC,W.WTCH               | :CALL WATCH-DOG TIMER                            |
| 4882 | 036476 | 016265 | 000000 | 000016 | MOV        | RKCS1(R2),P.CS1(R5)     | :STORE COMMAND AND STATUS REG. 1                 |
| 4883 | 036504 | 032765 | 000200 | 000016 | BIT        | *RDY,P.CS1(R5)          | :WAIT FOR READY                                  |
| 4884 | 036512 | 001767 |        |        | BEQ        | 2\$                     |                                                  |
| 4885 | 036514 | 004737 | 035154 |        | JSR        | PC,I.CST1               | :STORE CONTROLLER REGISTERS                      |
| 4886 | 036520 | 016265 | 000034 | 000040 | MOV        | RKMR2(R2),P.A00(R5)     | :STORE STATUS BYTE 00 MESSAGE A                  |
| 4887 | 036526 | 016265 | 000036 | 000042 | MOV        | RKMR3(R2),P.B00(R5)     | :STORE STATUS BYTE 00 MESSAGE B                  |
| 4888 | 036534 | 032765 | 100000 | 000016 | BIT        | *CERR,P.CS1(R5)         | :CHECK IF CONTROLLER ERROR                       |
| 4889 | 036542 | 001436 |        |        | BEQ        | 6\$                     | :NO, GATHER DRIVE STATUS                         |
| 4890 | 036544 | 105037 | 002632 |        | CLRB       | W.TIME                  | :RESET WATCH DOG TIMING ON THIS DRIVE            |
| 4891 | 036550 | 005037 | 002646 |        | CLR        | W.DRV                   | :CLEAR WATCH DOG COUNT                           |
| 4892 | 036554 | 032765 | 000400 | 000014 | BIT        | *NOCHK,P.PRST(R5)       | :CHECK IF NO CHECK MODE                          |
| 4893 | 036562 | 001043 |        |        | BNE        | 8\$                     | :YES, INDICATE NORMAL RETURN                     |
| 4894 | 036564 | 032765 | 001000 | 000020 | BIT        | *MDS,P.CS2(R5)          | :CHECK IF MULTIPLE DRIVE SELECT                  |
| 4895 | 036572 | 001043 |        |        | BNE        | 9\$                     | :YES, INDICATE CONTROLLER ERROR                  |
| 4896 | 036574 | 004037 | 034500 |        | JSR        | RD,I.CCLR               | :CLEAR ERROR                                     |
| 4897 | 036600 | 037404 |        |        | C.RTRN     |                         | :ERROR RETURN                                    |
| 4898 | 036602 | 032765 | 010400 | 000020 | BIT        | *NED!UFE,P.CS2(R5)      | :CHECK IF NON-EXISTENT DRIVE OR UNIT FIELD ERROR |
| 4899 | 036610 | 001007 |        |        | BNE        | 5\$                     | :REPORT ERROR                                    |
| 4900 | 036612 | 032765 | 000001 | 000036 | BIT        | *DRA,P.DS(R5)           | :CHECK IF DRIVE AVAILIABLE                       |
| 4901 | 036620 | 001003 |        |        | BNE        | 5\$                     | :YES, REPORT ERROR                               |
| 4902 | 036622 | 052765 | 010000 | 000014 | BIS        | *DRVSZD,P.PRST(R5)      | :INDICATE DRIVE IS SEIZED BY OTHER PORT          |
| 4903 | 036630 | 004737 | 035464 |        | JSR        | PC,R.ABNL               | :INDICATE ABNORMAL RETURN                        |
| 4904 | 036634 | 000137 | 037404 |        | JMP        | C.ATRN                  | :RESTORE REGISTERS                               |
| 4905 |        |        |        |        |            |                         |                                                  |
| 4906 | 036640 | 004037 | 035236 |        | JSR        | RD,I.STAT               | :GATHER DRIVE STATUS                             |
| 4907 | 036644 | 037404 |        |        | C.RTRN     |                         | :ERROR RETURN                                    |
| 4908 | 036646 | 105037 | 002632 |        | CLRB       | W.TIME                  | :STOP WATCH-DOG TIMING ON DRIVE                  |
| 4909 | 036652 | 005037 | 002646 |        | CLR        | W.DRV                   | :RESET WATCH-DOG TIME                            |
| 4910 | 036656 | 032765 | 000400 | 000014 | BIT        | *NOCHK,P.PRST(R5)       | :CHECK IF NO CHECK MODE                          |
| 4911 | 036664 | 001402 |        |        | BEQ        | 8\$                     | :NO, REPORT ERROR                                |
| 4912 | 036666 | 005062 | 000000 |        | CLR        | RKCS1(R2)               | :CLEAR INTERRUPT ENABLE                          |
| 4913 | 036672 | 004737 | 035476 |        | JSR        | PC,R.NORM               | :REPORT COMMAND COMPLETE                         |
| 4914 | 036676 | 000137 | 037404 |        | JMP        | C.ATRN                  | :RESTORE REGISTERS                               |
| 4915 |        |        |        |        |            |                         |                                                  |
| 4916 | 036702 | 052737 | 100000 | 002604 | BIS        | *E.MDS,E.CONT           | :SET MULTIPLE DRIVE SELECT                       |
| 4917 | 036710 | 004737 | 035510 |        | JSR        | PC,R.CONT               | :INDICATE CONTROLLER ERROR                       |
| 4918 | 036714 | 000137 | 037404 |        | JMP        | C.ATRN                  |                                                  |
| 4919 |        |        |        |        |            |                         |                                                  |
| 4920 | 036720 | 122765 | 000140 | 000001 | 10\$: CMPB | *RELEAS,P.CMND(R5)      | :CHECK IF RELEASE COMMAND                        |
| 4921 | 036726 | 001040 |        |        | BNE        | 13\$                    | :NO, CHECK IF READ ALL HEADERS                   |
| 4922 | 036730 | 010537 | 002606 |        | MOV        | R5,O.WAIT               | :STORE PARAMETER BLOCK ADDRESS IN                |
| 4923 |        |        |        |        |            |                         | : WAIT FOR COMMAND                               |
| 4924 | 036734 | 052765 | 000010 | 000020 | BIS        | *RLS,P.CS2(R5)          | :SET RELEASE BIT                                 |
| 4925 | 036742 | 016562 | 000020 | 000010 | MOV        | P.CS2(R5),RKCS2(R2)     | :LOAD CS2 FOR DESELECT                           |
| 4926 | 036750 | 112737 | 000001 | 002626 | MOVB       | *I.I.SRL                | :SET FLAG FOR RELEASE COMMAND                    |
| 4927 | 036756 | 116565 | 000007 | 000017 | MOVB       | P.CS1H(R5),P.CS1+1(R5)  | :STORE BITS 8-15 OF CS1                          |
| 4928 | 036764 | 042765 | 165777 | 000016 | BIC        | *IC(CFMT!COT),P.CS1(R5) | :CLEAR ALL BITS EXCEPT FORMAT                    |
| 4929 |        |        |        |        |            |                         | : AND DRIVE TYPE                                 |

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|      |        |        |        |        |       |        |                                                           |
|------|--------|--------|--------|--------|-------|--------|-----------------------------------------------------------|
| 4930 | 036772 | 112765 | 000101 | 000016 |       | MOV    | #SELDIV,P.CS1(R5) ;STORE COMMAND                          |
| 4931 | 037000 | 032765 | 000400 | 000014 |       | BIT    | #NOCHK,P.PRST(R5) ;CHECK IF NO CHECK MODE                 |
| 4932 | 037006 | 001403 |        |        |       | BEQ    | 11\$ ;NO, DO NOT RESET INTERRUPT ENABLE                   |
| 4933 | 037010 | 042765 | 000100 | 000016 |       | BIC    | #IE,P.CS1(R5) ;RESET INTERRUPT ENABLE                     |
| 4934 | 037016 | 016562 | 000016 | 000000 | 11\$: | MOV    | P.CS1(R5),RKCS1(R2) ;ISSUE COMMAND                        |
| 4935 | 037024 | 000137 | 037404 |        |       | JMP    | C.RTRN ;RESTORE REGISTERS                                 |
| 4936 |        |        |        |        |       |        |                                                           |
| 4937 | 037030 | 122765 | 000164 | 000001 | 13\$: | CMPB   | #RDALHD,P.CMND(R5) ;CHECK IF READ ALL HEADERS             |
| 4938 | 037036 | 001053 |        |        |       | BNE    | 30\$ ;NO, CHECK IF CONTROLLER CLEAR                       |
| 4939 | 037040 | 010537 | 002606 |        |       | MOV    | R5,0.WAIT ;SET WAITING FOR COMMAND COMPLETION             |
| 4940 | 037044 | 016537 | 000010 | 002622 |       | MOV    | P.BALO(R5),HDR.AD ;LOAD HEADER ADDRESS                    |
| 4941 | 037052 | 132765 | 000020 | 000007 |       | BITB   | #B.CFMT,P.CS1H(R5) ;CHECK IF 22 SECTOR FORMANT            |
| 4942 | 037060 | 001404 |        |        |       | BEQ    | 14\$ ;YES, LOAD 22 IN HEADER COUNT                        |
| 4943 | 037062 | 012737 | 000024 | 002624 |       | MOV    | #20.,HDR.CT ;LOAD 20 IN SECTOR COUNT                      |
| 4944 | 037070 | 000403 |        |        |       | BR     | 22\$ ;GO ISSUE READ HEADER COMMAND                        |
| 4945 |        |        |        |        |       |        |                                                           |
| 4946 | 037072 | 012737 | 000026 | 002624 | 14\$: | MOV    | #22.,HDR.CT ;LOAD 22 IN SECTOR COUNT                      |
| 4947 | 037100 | 016562 | 000002 | 000020 | 22\$: | MOV    | P.CYLN(R5),RKDCYL(R2) ;LOAD CYLINDER ADDRESS              |
| 4948 | 037106 | 016562 | 000004 | 000006 |       | MOV    | P.SECT(R5),RKDA(R2) ;LOAD TRACK NUMBER                    |
| 4949 | 037114 | 016562 | 000020 | 000010 |       | MOV    | P.CS2(R5),RKCS2(R2) ;LOAD DRIVE NUMBER                    |
| 4950 | 037122 | 116565 | 000007 | 000017 |       | MOV    | P.CS1H(R5),P.CS1+1(R5) ;STORE BITS 8-15 OF CS1            |
| 4951 | 037130 | 042765 | 165777 | 000016 |       | BIC    | #IC(CFMT:CDT),P.CS1(R5) ;CLEAR ALL BITS EXCEPT DRIVE TYPE |
| 4952 |        |        |        |        |       |        | AND FORMAT                                                |
| 4953 | 037136 | 112765 | 000125 | 000016 |       | MOV    | #RDHEAD,P.CS1(R5) ;STORE READ HEADER COMMAND              |
| 4954 | 037144 | 032765 | 000400 | 000014 |       | BIT    | #NOCHK,P.PRST(R5) ;CHECK IF NO CHECK MODE                 |
| 4955 | 037152 | 001027 |        |        |       | BNE    | 34\$ ;YES, INDICATE ILLEGAL DRIVER COMMAND                |
| 4956 | 037154 | 016562 | 000016 | 000000 |       | MOV    | P.CS1(R5),RKCS1(R2) ;ISSUE READ HEADER                    |
| 4957 | 037162 | 000137 | 037404 |        |       | JMP    | C.RTRN ;RESTORE REGISTERS                                 |
| 4958 |        |        |        |        |       |        |                                                           |
| 4959 | 037166 | 122765 | 000176 | 000001 | 30\$: | CMPB   | #CONCLR,P.CMND(R5) ;CHECK IF CONTROLLER CLEAR             |
| 4960 | 037174 | 001012 |        |        |       | BNE    | 32\$ ;NO, CHECK IF SUBSYSTEM CLEAR                        |
| 4961 | 037176 | 004037 | 034500 |        |       | JSR    | RO,I.CCLR ;CLEAR CONTROLLER                               |
| 4962 | 037202 | 037404 |        |        |       | C.RTRN | ERROR RETURN                                              |
| 4963 | 037204 | 032765 | 000400 | 000014 |       | BIT    | #NOCHK,P.PRST(R5) ;CHECK IF NO CHECK MODE                 |
| 4964 | 037212 | 001472 |        |        |       | BEQ    | 40\$ ;NO, INDICATE NORMAL RETURN                          |
| 4965 | 037214 | 005062 | 000000 |        |       | CLR    | RKCS1(R2) ;RESET INTERRUPT ENABLE                         |
| 4966 | 037220 | 000467 |        |        |       | BR     | 40\$ ;INDICATE NORMAL RETURN                              |
| 4967 |        |        |        |        |       |        |                                                           |
| 4968 | 037222 | 122765 | 000177 | 000001 | 32\$: | CMPB   | #SUBCLR,P.CMND(R5) ;CHECK IF SUBSYSTEM CLEAR              |
| 4969 | 037230 | 001406 |        |        |       | BEQ    | 36\$ ;YES, CLEAR SUBSYSTEM                                |
| 4970 | 037232 | 052737 | 000100 | 002604 | 34\$: | BIS    | #E.IILD,E.CONT ;SET ILLEGAL DRIVER COMMAND                |
| 4971 | 037240 | 004737 | 035510 |        |       | JSR    | PC,R.CONT ;REPORT ERROR                                   |
| 4972 | 037244 | 000457 |        |        |       | BR     | C.RTRN ;RESTORE REGISTERS                                 |
| 4973 |        |        |        |        |       |        |                                                           |
| 4974 | 037246 | 012762 | 000040 | 000010 | 36\$: | MOV    | #SCLR,RKCS2(R2) ;ISSUE SUBSYSTEM CLEAR                    |
| 4975 | 037254 | 016265 | 000000 | 000016 |       | MOV    | RKCS1(R2),P.CS1(R5) ;STORE COMMAND AND STATUS REGISTER 1  |
| 4976 | 037262 | 032765 | 100000 | 000016 |       | BIT    | #CERR,P.CS1(R5) ;CLEAR IF CONTROLLER ERROR RESET          |
| 4977 | 037270 | 001406 |        |        |       | BEQ    | 37\$ ;NO, FINISH COMMAND                                  |
| 4978 | 037272 | 052737 | 000001 | 002604 |       | BIS    | #BITO,E.CONT ;SET CLEAR SUBSYSTEM DID NOT CLEAR           |
| 4979 |        |        |        |        |       |        | CONTROLLER ERROR                                          |
| 4980 | 037300 | 004737 | 035510 |        |       | JSR    | PC,R.CONT ;REPORT ERROR                                   |
| 4981 | 037304 | 000437 |        |        |       | BR     | C.RTRN ;RESTORE REGISTERS                                 |
| 4982 |        |        |        |        |       |        |                                                           |
| 4983 | 037306 | 013746 | 002612 |        | 37\$: | MOV    | W.MILI,-(SP) ;LOAD 16 MILI-SECOND COUNT FOR ATTENTION     |
| 4984 |        |        |        |        |       |        | TO DISAPPEAR                                              |
| 4985 | 037312 | 016265 | 000000 | 000016 | 38\$: | MOV    | RKCS1(R2),P.CS1(R5) ;STORE CS1                            |

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4986 037320 032765 040000 000016      BIT      #DI,P.CS1(R5) ;CHECK IF ATTENTIONS CLEARED
4987 037326 001411                      BEQ      39$      ;YES, FINISH COMMAND
4988 037330 005316                      DEC      (SP)      ;DECREMENT 16 MILLISECOND COUNT
4989 037332 001367                      BNE      38$      ;CHECK DRIVE INTERRUPT AGAIN
4990 037334 005726                      TST      (SP)+      ;ADJUST STACK
4991 037336 052737 000040 002604      BIS      #E.SCLR,E.CONT ;SET SUBSYSTEM CLEAR DID NOT CLEAR
4992                                ;DRIVE ATTENTIONS
4993 037344 004737 035510      JSR      PC,R.CONT ;REPORT ERROR
4994 037350 000415                      BR       C.RTRN    ;RESTORE REGISTER
4995
4996 037352 005726                      39$:    TST      (SP)+      ;ADJUST STACK
4997 037354 032765 000400 000014      BIT      #NOCHK,P.PRST(R5) ;CHECK IF NO CHECK MODE
4998 037362 001010                      BNE      C.RTRN    ;YES, RESTORE REGISTERS
4999 037364 112737 177777 002626      MOV      #-1,I.ISRL ;SET INTERRUPT ENABLE SET
5000 037372 012762 000100 000000      MOV      #IE,RKCS1(R2) ;SET INTERRUPT ENABLE
5001 037400 004737 035476      40$:    JSR      PC,R.NORM ;INDICATE NORMAL TERMINATION
5002
5003 037404 012637 177776      C.RTRN:  MOV      (SP)+,PS ;RESTORE PSW
5004 037410 012600                      MOV      (SP)+,R0 ;RESTORE R0
5005 037412 012601                      MOV      (SP)+,R1 ;RESTORE R1
5006 037414 012602                      MOV      (SP)+,R2 ;RESTORE R2
5007 037416 012603                      MOV      (SP)+,R3 ;RESTORE R3
5008 037420 012604                      MOV      (SP)+,R4 ;RESTORE R4
5009 037422 012605                      MOV      (SP)+,R5 ;RESTORE R5
5010 037424 000207                      RTS      PC ;RETURN
5011
5012      .SBTTL OCTAL TO BINARY CONVERSION ROUTINE
5013
5014      ;*****
5015      ;
5016      ; THIS ROUTINE WILL CHECK A STRING OF ASCII CHARACTERS TERMINATED
5017      ; WITH A NULL <000> OR COMMA. IF THE CHARACTERS ARE LEGAL
5018      ; IT WILL GENERATE TWO BINARY WORDS PLACING THE LOW 16 BITS
5019      ; ON THE STACK AND THE HIGH 16 BITS IN LOCATION $HIOCT.
5020      ;
5021      ;CALL
5022      ;
5023      ; MOV      <ADDRESS OF ASCII STRING>,-(SP)
5024      ; JSR      PC,OCTBIN
5025      ; <ADDRESS OF ERROR RETURN>
5026      ; RETURN
5027      ;*****
5028
5028 037426 010046      OCTBIN:  MOV      R0,-(SP) ;SAVE R0
5029 037430 010146      MOV      R1,-(SP) ;SAVE R1
5030 037432 010246      MOV      R2,-(SP) ;SAVE R2
5031 037434 016600 000010      MOV      10(SP),R0 ;GET ADDRESS OF ASCII STRING
5032 037440 005001                      CLR      R1 ;CLEAR DATA WORDS
5033 037442 005002                      CLR      R2
5034 037444 112046      2$:    MOV      (R0)+,-(SP) ;PICK THIS CHARACTER
5035 037446 001423                      BEQ      3$      ;IF ZERO GET OUT
5036 037450 121627 000054      CMP      (SP),#', ;CHECK IF COMMA
5037 037454 001420                      BEQ      3$      ;IF COMMA GET OUT
5038 037456 122716 000060      CMP      #'0,(SP) ;MAKE SURE THIS CHARACTER IS
5039 037462 003030                      BGT      4$      ; AN OCTAL DIGIT
5040 037464 122716                      CMP      #'7,(SP)
5041 037470 002425                      BLT      4$

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5042 037472 006301      ASL      R1          ; *2
5043 037474 006102      ROL      R2
5044 037476 006301      ASL      R1          ; *4
5045 037500 006102      ROL      R2
5046 037502 006301      ASL      R1          ; *8
5047 037504 006102      ROL      R2
5048 037506 042716 177770 BIC      #1C7, (SP) ; STRIP THE ASCII JUNK
5049 037512 062601      ADD      (SP)+, R1 ; ADD THIS DIGIT
5050 037514 000753      BR       2$        ; LOOP
5051 037516 005726      3$: TST      (SP)+    ; CLEAN PARTIAL FROM STACK
5052 037520 010166 000010 MOV      R1, 10(SP) ; SAVE RESULT
5053 037524 010237 037560 MOV      R2, $HI OCT
5054 037530 012602      MOV      (SP)+, R2 ; RESTORE R2
5055 037532 012601      MOV      (SP)+, R1 ; RESTORE R1
5056 037534 012600      MOV      (SP)+, R0 ; RESTORE R0
5057 037536 062716 000002 ADD      #2, (SP) ; ADJUST RETURN
5058 037542 000207      RTS      PC        ; RETURN
5059
5060 037544 005726      4$: TST      (SP)+    ; CLEAN UP PARTIAL FROM STACK
5061 037546 012602      MOV      (SP)+, R2 ; RESTORE R2
5062 037550 012601      MOV      (SP)+, R1 ; RESTORE R1
5063 037552 012600      MOV      (SP)+, R0 ; RESTORE R0
5064 037554 013616      MOV      2(SP)+, (SP) ; PUT ADDRESS OF ERROR ROUTINE ON STACK
5065 037556 000207      RTS      PC        ; GO PROCESS ERROR
5066 037560 000000      $HI OCT: .WORD 0 ; HIGH ORDER BITS GO HERE
5067
5068
5069
5070
5071
5072
5073
5074
5075
5076
5077
5078
5079
5080
5081
5082
5083
5084 037562 105737 001157 $TYPE: TSTB   $TPFLG ; IS THERE A TERMINAL?
5085 037566 100002      BPL      1$        ; BR IF YES
5086 037570 000000      HALT      ; HALT HERE IF NO TERMINAL
5087 037572 000407      BR       3$        ; LEAVE
5088 037574 010046      1$: MOV      R0, -(SP) ; SAVE R0
5089 037576 017600 000002 MOV      22(SP), R0 ; GET ADDRESS OF ASCII STRING
5090 037602 112046      2$: MOVB    (R0)+, -(SP) ; PUSH CHARACTER TO BE TYPED ONTO STACK
5091 037604 001005      BNE      4$        ; BR IF IT ISN'T THE TERMINATOR
5092 037606 005726      TST      (SP)+    ; IF TERMINATOR POP IT OFF THE STACK
5093 037610 012600      60$: MOV      (SP)+, R0 ; RESTORE R0
5094 037612 062716 000002 3$: ADD      #2, (SP) ; ADJUST RETURN PC
5095 037616 000002      RTI
5096 037620 122716 000011 4$: CMPB    #HT, (SP) ; BRANCH IF <HT>
5097 037624 001430      BEQ      8$

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\*\*\*\*\*  
 ; ROUTINE TO TYPE ASCII MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.  
 ; THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.  
 ; NOTE1: \$NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.  
 ; NOTE2: \$FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.  
 ; NOTE3: \$FILLC CONTAINS THE CHARACTER TO FILL AFTER.  
 ; \*  
 ; \*CALL:  
 ; \*1) USING A TRAP INSTRUCTION  
 ; \* TYPE ,MESADR ; MESADR IS FIRST ADDRESS OF AN ASCII STRING  
 ; \*OR  
 ; \* TYPE  
 ; \* MESADR  
 ; \*

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5098 037626 122716 000200      CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
5099 037632 001006      BNE      5$
5100 037634 005726      TST      (SP)+      ;;POP <CR><LF> EQUIV
5101 037636 104401      TYPE      ;;TYPE A CR AND LF
5102 037640 001267      $CRLF
5103 037642 105037 037776      CLRB     $CHARCNT      ;;CLEAR CHARACTER COUNT
5104 037646 000755      BR       2$      ;;GET NEXT CHARACTER
5105 037650 004737 037732      JSR      PC,$TYPEC      ;;GO TYPE THIS CHARACTER
5106 037654 123726 001156      5$:      CMPB    $FILLC,(SP)+      ;;IS IT TIME FOR FILLER CHARS.?
5107 037660 001350      BNE      2$      ;;IF NO GO GET NEXT CHAR.
5108 037662 013746 001154      MOV      $NULL,-(SP)      ;;GET # OF FILLER CHARS. NEEDED
5109                                ;;AND THE NULL CHAR.
5110 037666 105366 000001      7$:      DECB     1(SP)      ;;DOES A NULL NEED TO BE TYPED?
5111 037672 002770      BLT      6$      ;;BR IF NO--GO POP THE NULL OFF OF STACK
5112 037674 004737 037732      JSR      PC,$TYPEC      ;;GO TYPE A NULL
5113 037700 105337 037776      DECB     $CHARCNT      ;;DO NOT COUNT AS A COUNT
5114 037704 000770      BR       7$      ;;LOOP
5115
5116                                ;HORIZONTAL TAB PROCESSOR
5117
5118 037706 112716 000040      8$:      MOVB     #'',(SP)      ;;REPLACE TAB WITH SPACE
5119 037712 004737 037732      9$:      JSR      PC,$TYPEC      ;;TYPE A SPACE
5120 037716 132737 000007 037776      BITB     #7,$CHARCNT      ;;BRANCH IF NOT AT
5121 037724 001372      BNE      9$      ;;TAB STOP
5122 037726 005726      TST      (SP)+      ;;POP SPACE OFF STACK
5123 037730 000724      BR       2$      ;;GET NEXT CHARACTER
5124 037732 105777 141212      $TYPEC: TSTB     2$TPS      ;;WAIT UNTIL PRINTER IS READY
5125 037736 100375      BPL      $TYPEC
5126 037740 116677 000002 141204      MOVB     2(SP),2$TPB      ;;LOAD CHAR TO BE TYPED INTO DATA REG.
5127 037746 122766 000015 000002      CMPB     #CR,2(SP)      ;;IS CHARACTER A CARRIAGE RETURN?
5128 037754 001003      BNE      1$      ;;BRANCH IF NO
5129 037756 105037 037776      CLRB     $CHARCNT      ;;YES--CLEAR CHARACTER COUNT
5130 037762 000406      BR       $TYPEX      ;;EXIT
5131 037764 122766 000012 000002      1$:      CMPB     #LF,2(SP)      ;;IS CHARACTER A LINE FEED?
5132 037772 001402      BEQ      $TYPEX      ;;BRANCH IF YES
5133 037774 105227      INCB     (PC)+      ;;COUNT THE CHARACTER
5134 037776 000000      $CHARCNT: .WORD 0      ;;CHARACTER COUNT STORAGE
5135 040000 000207      $TYPEX: RTS      PC
5136
5137                                .SBTTL DOUBLE LENGTH BINARY TO OCTAL ASCII CONVERT ROUTINE
5138
5139                                ;*****
5140                                ;THIS ROUTINE WILL CONVERT A 32-BIT UNSIGNED BINARY NUMBER TO AN
5141                                ;UNSIGNED OCTAL ASCII NUMBER.
5142                                ;CALL
5143                                ;*
5144                                ;*      MOV      #PNTR,-(SP)      ;;POINTER TO LOW WORD OF BINARY NUMBER
5145                                ;*      JSR      PC,2#$DB20      ;;CALL THE ROUTINE
5146                                ;*      RETURN      ;;THE ADDRESS OF THE FIRST ASCII CHAR. IS ON THE STACK
5147
5148 040002 104411      $DB20: SAVREG      ;;SAVE ALL REGISTERS
5149 040004 016601 000002      MOV      2(SP),R1      ;;PICKUP THE POINTER TO LOW WORD
5150 040010 012705 040121      MOV      *$OCTVL+13.,R5      ;;POINTER TO DATA TABLE
5151 040014 012704 000014      MOV      #12.,R4      ;;DO ELEVEN CHARACTERS
5152 040020 012703 177770      MOV      #1C7,R3      ;;MASK
5153 040024 012100      MOV      (R1)+,R0      ;;LOWER WORD

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5154 040026 012101      MOV      (R1)+,R1      ;;HIGH WORD
5155 040030 005002      CLR      R2          ;;TERMINATOR
5156 040032 110245      1$:  MOV     R2,-(R5)      ;;PUT CHARACTER IN DATA TABLE
5157 040034 010002      MOV     R0,R2          ;;GET THIS DIGIT
5158 040036 005304      DEC     R4          ;;COUNT THIS CHARACTER
5159 040040 003007      BGT     3$          ;;BR IF NOT THE LAST DIGIT
5160 040042 001405      BEQ     2$          ;;BR IF IT IS THE LAST DIGIT
5161 040044 005205      INC     R5          ;;ALL DIGITS DONE-ADJUST POINTER FOR FIRST
5162 040046 010566 000002  MOV     R5,2(SP)      ;;ASCIZ CHAR. & PUT IT ON THE STACK
5163 040052 104412      RESREG          ;;RESTORE ALL REGISTERS
5164 040054 000207      RTS     PC          ;;RETURN TO USER
5165 040056 006203      2$:  ASR     R3          ;;POSITION THE MASK FOR THE LAST DIGIT
5166 040060 006001      3$:  ROR     R1          ;;POSITION THE BINARY NUMBER FOR
5167 040062 006000      ROR     R0          ;;THE NEXT OCTAL DIGIT
5168 040064 006001      ROR     R1
5169 040066 006000      ROR     R0
5170 040070 006001      ROR     R1
5171 040072 006000      ROR     R0
5172 040074 040302      BIC     R3,R2          ;;MASK OUT ALL JUNK
5173 040076 062702 000060  ADD     #0,R2          ;;MAKE THIS CHAR. ASCII
5174 040102 000753      BR      1$          ;;GO PUT IT IN THE DATA TABLE
5175 040104 000016      $OCTVL: .BLKB 14.          ;;RESERVE DATA TABLE
5176
5177      .SBTTL BINARY TO OCTAL (ASCII) AND TYPE
5178
5179      ;;*****
5180      ;;THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
5181      ;;OCTAL (ASCII) NUMBER AND TYPE IT.
5182      ;;$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
5183      ;;CALL:
5184      ;;      MOV     NUM,-(SP)          ;;NUMBER TO BE TYPED
5185      ;;      TYPOS          ;;CALL FOR TYPEOUT
5186      ;;      .BYTE  N          ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
5187      ;;      .BYTE  M          ;;M=1 OR 0
5188      ;;                      ;;1=TYPE LEADING ZEROS
5189      ;;                      ;;0=SUPPRESS LEADING ZEROS
5190      ;;$STYPON---ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
5191      ;;$STYPOS OR $STYPOC
5192      ;;CALL:
5193      ;;      MOV     NUM,-(SP)          ;;NUMBER TO BE TYPED
5194      ;;      TYPON          ;;CALL FOR TYPEOUT
5195      ;;
5196      ;;$STYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
5197      ;;CALL:
5198      ;;      MOV     NUM,-(SP)          ;;NUMBER TO BE TYPED
5199      ;;      TYPOC          ;;CALL FOR TYPEOUT
5200
5201 040122 017646 000000 040345 $TYPOS: MOV     2(SP),-(SP)      ;;PICKUP THE MODE
5202 040126 116637 000001      MOV     1(SP),$OFILL      ;;LOAD ZERO FILL SWITCH
5203 040134 112637 040347      MOV     (SP)+,$OMODE+1      ;;NUMBER OF DIGITS TO TYPE
5204 040140 062716 000002      ADD     #2,(SP)          ;;ADJUST RETURN ADDRESS
5205 040144 000406      BR      $TYPON
5206 040146 112737 000001 040345 $TYPOC: MOV     #1,$OFILL      ;;SET THE ZERO FILL SWITCH
5207 040154 112737 000006 040347      MOV     #6,$OMODE+1      ;;SET FOR SIX(6) DIGITS
5208 040162 112737 000005 040344 $TYPON: MOV     #5,$OCNT      ;;SET THE ITERATION COUNT
5209 040170 010346      MOV     R3,-(SP)          ;;SAVE R3

```



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RK06 PACK FORMATTER MACY11 27(1006) 03-NOV-76 16:15 PAGE 102  
 DZR6LB.P11 03-AUG-76 00:00 BINARY TO OCTAL (ASCII) AND TYPE

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5210 040172 010446      MOV      R4,-(SP)      ;;SAVE R4
5211 040174 010546      MOV      R5,-(SP)      ;;SAVE R5
5212 040176 113704 040347  MOVVB    $OMODE+1,R4  ;;GET THE NUMBER OF DIGITS TO TYPE
5213 040202 005404      NEG      R4
5214 040204 062704 000006  ADD      #6,R4      ;;SUBTRACT IT FOR MAX. ALLOWED
5215 040210 110437 040346  MOVVB    R4,$OMODE  ;;SAVE IT FOR USE
5216 040214 113704 040345  MOVVB    $OFILL,R4  ;;GET THE ZERO FILL SWITCH
5217 040220 016605 000012  MOV      12(SP),R5  ;;PICKUP THE INPUT NUMBER
5218 040224 005003      CLR      R3      ;;CLEAR THE OUTPUT WORD
5219 040226 006105 1$:      ROL      R5      ;;ROTATE MSB INTO "C"
5220 040230 000404      BR       3$      ;;GO DO MSB
5221 040232 006105 2$:      ROL      R5      ;;FORM THIS DIGIT
5222 040234 006105      ROL      R5
5223 040236 006105      ROL      R5
5224 040240 010503      MOV      R5,R3
5225 040242 006103 3$:      ROL      R3      ;;GET LSB OF THIS DIGIT
5226 040244 105337 040346  DECB     $OMODE  ;;TYPE THIS DIGIT?
5227 040250 100016      BPL      7$      ;;BR IF NO
5228 040252 042703 177770  BIC      #177770,R3  ;;GET RID OF JUNK
5229 040256 001002      BNE      4$      ;;TEST FOR 0
5230 040260 005704      TST      R4      ;;SUPPRESS THIS 0?
5231 040262 001403      BEQ      5$      ;;BR IF YES
5232 040264 005204 4$:      INC      R4      ;;DON'T SUPPRESS ANYMORE 0'S
5233 040266 052703 000060  BIS      #'0,R3  ;;MAKE THIS DIGIT ASCII
5234 040272 052703 000040 5$:      BIS      #' ,R3  ;;MAKE ASCII IF NOT ALREADY
5235 040276 110337 040342  MOVVB    R3,$$      ;;SAVE FOR TYPING
5236 040302 104401 040342  TYPE     $$      ;;GO TYPE THIS DIGIT
5237 040306 105337 040344 7$:      DECB     $OCNT  ;;COUNT BY 1
5238 040312 003347      BGT      2$      ;;BR IF MORE TO DO
5239 040314 002402      BLT      6$      ;;BR IF DONE
5240 040316 005204      INC      R4      ;;INSURE LAST DIGIT ISN'T A BLANK
5241 040320 000744      BR       2$      ;;GO DO THE LAST DIGIT
5242 040322 012605 6$:      MOV      (SP)+,R5  ;;RESTORE R5
5243 040324 012604      MOV      (SP)+,R4  ;;RESTORE R4
5244 040326 012603      MOV      (SP)+,R3  ;;RESTORE R3
5245 040330 016666 000002 000004  MOV      2(SP),4(SP)  ;;SET THE STACK FOR RETURNING
5246 040336 012616      MOV      (SP)+,(SP)
5247 040340 000002      RTI
5248 040342 000      8$:      .BYTE    0      ;;RETURN
5249 040343 000      .BYTE    0      ;;STORAGE FOR ASCII DIGIT
5250 040344 000      $OCNT:  .BYTE    0      ;;TERMINATOR FOR TYPE ROUTINE
5251 040345 000      $OFILL: .BYTE    0      ;;OCTAL DIGIT COUNTER
5252 040346 000000      $OMODE: .WORD    0      ;;ZERO FILL SWITCH
5253      .SBTTL  ERROR HANDLER ROUTINE  ;;NUMBER OF DIGITS TO TYPE
5254
5255      ;*****
5256      ;THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
5257      ;SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
5258      ;AND GO TO TYPERR ON ERROR
5259      ;THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
5260      ;$SW15=1      HALT ON ERROR
5261      ;$SW13=1      INHIBIT ERROR TYPEOUTS
5262      ;$SW10=1      BELL ON ERROR
5263      ;$SW09=1      LOOP ON ERROR
5264      ;$CALL
5265      ;*      ERROR      N      ;;ERROR=EMT AND N=ERROR ITEM NUMBER

```



```
5266
5267 040350
5268 040350 104406
5269 040352 105237 001103
5270 040356 001775
5271 040360 013777 001102 140554
5272 040366 032777 002000 140544
5273 040374 001402
5274 040376 104401 001262
5275 040402 005237 001112
5276 040406 011637 001116
5277 040412 162737 000002 001116
5278 040420 117737 140472 001114
5279 040426 032777 020000 140504
5280 040434 001004
5281 040436 004737 025362
5282 040442 104401 001267
5283 040446
5284 040446 005777 140466
5285 040452 100002
5286 040454 000000
5287 040456 104406
5288 040460 032777 001000 140452
5289 040466 001402
5290 040470 013716 001110
5291 040474 005737 001260
5292 040500 001402
5293 040502 013716 001260
5294 040506
5295 040506 000002
5296
5297
5298
5299
5300 040510 000000
5301 040512 000000
5302 040514 000000
5303 040516 000001
5304 040517
5305 040520
5306
5307
5308
5309
5310
5311
5312
5313
5314
5315 040520 005037 040510
5316 040524 012737 040516 040512
5317 040532 013737 040512 040514
5318 040540 012737 040570 000060
5319 040546 012737 000200 000062
5320 040554 005777 140366
5321 040560 012777 000100 140356

$ERROR:
7$: CKSWR
    INCB $ERFLG
    BEQ 7$
    MOV $TSTNM, $DISPLAY
    BIT $BIT10, $SWR
    BEQ 1$
    TYPE $BELL
    INC $ERTTL
    MOV (SP), $ERRPC
    SUB $2, $ERRPC
    MOV $ERRPC, $ITEMB
    BIT $BIT13, $SWR
    BNE 20$
    JSR PC, $TYPERR
    TYPE $CRLF
    ;; TEST FOR CHANGE IN SOFT-SWR
    ;; SET THE ERROR FLAG
    ;; DON'T LET THE FLAG GO TO ZERO
    ;; DISPLAY TEST NUMBER AND ERROR FLAG
    ;; BELL ON ERROR?
    ;; NO - SKIP
    ;; RING BELL
    ;; COUNT THE NUMBER OF ERRORS
    ;; GET ADDRESS OF ERROR INSTRUCTION
    ;; STRIP AND SAVE THE ERROR ITEM CODE
    ;; SKIP TYPEOUT IF SET
    ;; SKIP TYPEOUTS
    ;; GO TO USER ERROR ROUTINE

20$:
2$: TST $SWR
    BPL 3$
    HALT
    CKSWR
    BIT $BIT09, $SWR
    BEQ 4$
    MOV $LPERR, (SP)
    TST $ESCAPE
    BEQ 5$
    MOV $ESCAPE, (SP)
    ;; HALT ON ERROR
    ;; SKIP IF CONTINUE
    ;; HALT ON ERROR!
    ;; TEST FOR CHANGE IN SOFT-SWR
    ;; LOOP ON ERROR SWITCH SET?
    ;; BR IF NO
    ;; FUDGE RETURN FOR LOOPING
    ;; CHECK FOR AN ESCAPE ADDRESS
    ;; BR IF NONE
    ;; FUDGE RETURN ADDRESS FOR ESCAPE.

5$: RTI
    .SBTTL TTY INPUT ROUTINE
    ;; RETURN

;*****
;ENABL LSB
$TKCNT: .WORD 0
$TKQIN: .WORD 0
$TKQOUT: .WORD 0
$TKQSRT: .BLKB 1
$TKQEND=.
.EVEN
;NUMBER OF ITEMS IN QUEUE
;INPUT POINTER
;OUTPUT POINTER
;TTY KEYBOARD QUEUE

;*TK INITIALIZE ROUTINE
;*THIS ROUTINE WILL INITIALIZE THE TTY KEYBOARD INPUT QUEUE
;*SETUP THE INTERRUPT VECTOR AND TURN ON THE KEYBOARD INTERRUPT
;*CALL:
;* JSR PC, $TKINT
;* RETURN
$TKINT: CLR $TKCNT
    MOV $TKQSRT, $TKQIN
    MOV $TKQIN, $TKQOUT
    MOV $TKSRV, $TKVEC
    MOV $200, $TKVEC+2
    TST $TKB
    MOV $100, $TKS
    ;; CLEAR COUNT OF ITEMS IN QUEUE
    ;; MOVE THE STARTING ADDRESS OF THE
    ;; QUEUE INTO THE INPUT & OUTPUT POINTERS.
    ;; INITIALIZE THE KEYBOARD VECTOR
    ;; "BR" LEVEL 4
    ;; CLEAR DONE FLAG
    ;; ENABLE TTY KEYBOARD INTERRUPT
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5322 040566 000207          R/S    PC          ;;RETURN TO CALLER
5323
5324          ;*TK SERVICE ROUTINE
5325          ;*THIS ROUTINE WILL SERVICE THE TTY KEYBOARD INTERRUPT
5326          ;*BY READING THE CHARACTER FROM THE INPUT BUFFER AND PUTTING
5327          ;*IT IN THE QUEUE.
5328          ;*IF THE CHARACTER IS A "CONTROL-C" (↑C) $TKINT IS CALLED AND
5329          ;*UPON RETURN EXIT IS MADE TO THE "CONTROL-C" RESTART ADDRESS (START)
5330
5331 040570 117746 140352    $TKSRV: MOVB    2$TKB, -(SP)          ;;PICKUP THE CHARACTER
5332 040574 042716 177600          BIC      #↑C177, (SP)          ;;STRIP THE JUNK
5333 040600 021627 000003          CMP      (SP), #3          ;;IS IT A CONTROL C?
5334 040604 001007          BNE      1$          ;;BRANCH IF NO
5335 040606 104401 041766          TYPE     , $CNTLC          ;;TYPE A CONTROL-C (↑C)
5336 040612 004737 040520          JSR      PC, $TKINT          ;;INIT THE KEYBOARD
5337 040616 005726          TST      (SP)+          ;;CLEAN UP STACK
5338 040620 000137 016100          JMP      START          ;;CONTROL C RESTART
5339 040624 021627 000007    1$:    CMP      (SP), #7          ;;IS IT A CONTROL G?
5340 040630 001004          BNE      2$          ;;BRANCH IF NO
5341 040632 022737 000176 001140    CMP      #SWREG, SWR          ;;IS SOFT-SWR SELECTED?
5342 040640 001500          BEQ      6$          ;;GO TO SWR CHANGE
5343
5344 040642          2$:    CMP      #1, $TKCNT          ;;IS THE QUEUE FULL?
5345 040642 022737 000001 040510    BNE      3$          ;;BRANCH IF NO
5346 040650 001004          TYPE     , $BELL          ;;RING THE TTY BELL
5347 040652 104401 001262          TST      (SP)+          ;;CLEAN CHARACTER OFF OF STACK
5348 040656 005726          BR        5$          ;;EXIT
5349 040660 000451          3$:    CMP      (SP), #23          ;;IS IT A CONTROL-S?
5350 040662 021627 000023    BNE      32$          ;;BRANCH IF NO
5351 040666 001021          CLR      2$TKS          ;;DISABLE TTY KEYBOARD INTERRUPTS
5352 040670 005077 140250          TST      (SP)+          ;;CLEAN CHAR OFF STACK
5353 040674 005726          31$:   TSTB     2$TKS          ;;WAIT FOR A CHAR
5354 040676 105777 140242    BPL      31$          ;;LOOP UNTIL ITS THERE
5355 040702 100375          MOVB     2$TKB, -(SP)          ;;GET THE CHARACTER
5356 040704 117746 140236          BIC      #↑C177, (SP)          ;;MAKE IT 7-BIT ASCII
5357 040710 042716 177600          CMP      (SP)+, #21          ;;IS IT A CONTROL-Q?
5358 040714 022627 000021    BNE      31$          ;;BRANCH IF NO
5359 040720 001366          MOV      #100, 2$TKS          ;;REENABLE TTY KEYBOARD INTERRUPTS
5360 040722 012777 000100 140214    RTI          ;;RETURN
5361 040730 000002          32$:   INC      $TKCNT          ;;COUNT THIS CHARACTER
5362 040732 005237 040510          CMP      (SP), #140          ;;IS IT UPPER CASE?
5363 040736 021627 000140          BLT      4$          ;;BRANCH IF YES
5364 040742 002405          CMP      (SP), #175          ;;IS IT A SPECIAL CHAR?
5365 040744 021627 000175          BGT      4$          ;;BRANCH IF YES
5366 040750 003002          BIC      #40, (SP)          ;;MAKE IT UPPER CASE
5367 040752 042716 000040          MOVB     (SP)+, 2$TKQIN          ;;AND PUT IT IN QUEUE
5368 040756 112677 177530          INC      $TKQIN          ;;UPDATE THE POINTER
5369 040762 005237 040512          CMP      $TKQIN, #2$TKQEND          ;;GO OFF THE END?
5370 040766 023727 040512 040517    BNE      5$          ;;BRANCH IF NO
5371 040774 001003          MOV      #2$TKQSRT, $TKQIN          ;;RESET THE POINTER
5372 040776 012737 040516 040512    RTI          ;;RETURN
5373 041004 000002    5$:
5374
5375          ;*****
5376          ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
5377          ;*ROUTINE IS ENTERED FROM THE TRAP HANDLER, AND WILL

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5378      : *SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP
5379      : *CALL WHEN OPERATING IN TTY INTERRUPT MODE.
5380 041006 022737 000176 001140 $CKSWR: CMP      #SWREG,SWR      ;; IS THE SOFT-SWR SELECTED
5381 041014 001124      BNE      15$      ;; EXIT IF NOT
5382 041016 105777 140122      TSTB     @STKS      ;; IS A CHAR WAITING?
5383 041022 100121      BPL      15$      ;; IF NOT, EXIT
5384 041024 117746 140116      MOVB     @STKB,-(SP)      ;; YES
5385 041030 042716 177600      BIC      #1C177,(SP)      ;; MAKE IT 7-BIT ASCII
5386 041034 021627 000007      CMP      (SP),#?      ;; IS IT A CONTROL-G?
5387 041040 001300      BNE      2$      ;; IF NOT, PUT IT IN THE TTY QUEUE
5388      ;; AND EXIT
5389
5390      ;*****
5391      ;*CONTROL IS PASSED TO THIS POINT FROM EITHER THE TTY INTERRUPT SERVICE
5392      ;*ROUTINE OR FROM THE SOFTWARE SWITCH REGISTER TRAP CALL, AS A RESULT OF A
5393      ;*CONTROL-G BEING TYPED, AND THE SOFTWARE SWITCH REGISTER BEING SELECTED.
5394 041042 123727 001134 000001 6$:  CMPB     $AUTOB,#1      ;; ARE WE RUNNING IN AUTO-MODE?
5395 041050 001674      BEQ      2$      ;; BRANCH IF YES
5396 041052 005726      TST      (SP)+      ;; CLEAR CONTROL-G OFF STACK
5397 041054 004737 040520      JSR      PC,$TKINT      ;; FLUSH THE TTY INPUT QUEUE
5398 041060 005077 140060      CLR      @STKS      ;; DISABLE TTY KEYBOARD INTERRUPTS
5399 041064 112737 000001 001135      MOVB     #1,$INTAG      ;; SET INTERRUPT MODE INDICATOR
5400
5401 041072 104401 042000      SGTSWR: TYPE     , $CNTLG      ;; ECHO THE CONTROL-G (↑G)
5402 041076 104401 042005      TYPE     , $MSWR      ;; TYPE CURRENT CONTENTS
5403 041102 013746 000176      MOV      $WREG,-(SP)      ;; SAVE SWREG FOR TYPEOUT
5404 041106 104402      TYPOC      ;; GO TYPE--OCTAL ASCII(ALL DIGITS)
5405 041110 104401 042016      TYPE     , $MNEW      ;; PROMPT FOR NEW SWR
5406 041114 005046      19$:  CLR      -(SP)      ;; CLEAR COUNTER
5407 041116 005046      CLR      -(SP)      ;; THE NEW SWR
5408 041120 105777 140020      7$:  TSTB     @STKS      ;; CHAR THERE?
5409 041124 100375      BPL      7$      ;; IF NOT TRY AGAIN
5410
5411 041126 117746 140014      MOVB     @STKB,-(SP)      ;; PICK UP CHAR
5412 041132 042716 177600      BIC      #1C177,(SP)      ;; MAKE IT 7-BIT ASCII
5413
5414 041136 021627 000003      CMP      (SP),#3      ;; IS IT A CONTROL-C?
5415 041142 001015      BNE      9$      ;; BRANCH IF NOT
5416 041144 104401 041766      TYPE     , $CNTLC      ;; YES, ECHO CONTROL-C (↑C)
5417 041150 062706 000006      ADD      #6,SP      ;; CLEAN UP STACK
5418 041154 123727 001135 000001      CMPB     $INTAG,#1      ;; REENABLE TTY KEYBOARD INTERRUPTS?
5419 041162 001003      BNE      8$      ;; BRANCH IF NO
5420 041164 012777 000100 137752      MOV      #100,@STKS      ;; ALLOW TTY KEYBOARD INTERRUPTS
5421 041172 000137 016100      8$:  JMP      START      ;; CONTROL-C RESTART
5422
5423
5424 041176 021627 000025      9$:  CMP      (SP),#25      ;; IS IT A CONTROL-U?
5425 041202 001005      BNE      10$      ;; BRANCH IF NOT
5426 041204 104401 041773      TYPE     , $CNTLU      ;; YES, ECHO CONTROL-U (↑U)
5427 041210 062706 000006      20$:  ADD      #6,SP      ;; IGNORE PREVIOUS INPUT
5428 041214 000737      BR      19$      ;; LET'S TRY IT AGAIN
5429
5430
5431 041216 021627 000015      10$:  CMP      (SP),#15      ;; IS IT A <CR>?
5432 041222 001022      BNE      16$      ;; BRANCH IF NO
5433 041224 005766 000004      TST      4(SP)      ;; YES, IS IT THE FIRST CHAR?

```

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 02R6L8.P11 03-AUG-76 00:00 TTY INPUT ROUTINE

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5434 041230 001403      BEQ      11$      ;; BRANCH IF YES
5435 041232 016677 000002 137700    MOV      2(SP),@SWR    ;; SAVE NEW SWR
5436 041240 062706 000006      ADD      @6,SP      ;; CLEAR UP STACK
5437 041244 104401 001267 11$:      TYPE      $CRLF    ;; ECHO <CR> AND <LF>
5438 041250 123727 001135 000001 14$:      CMPB     $INTAG,@1    ;; RE-ENABLE TTY KBD INTERRUPTS?
5439 041256 001003      BNE      15$      ;; BRANCH IF NOT
5440 041260 012777 000100 137656    MOV      @100,@STKS    ;; RE-ENABLE TTY KBD INTERRUPTS
5441 041266 000002      RTI      15$:      RETURN      ;; RETURN
5442 041270 004737 037732 15$:      JSR      PC,$TYPEC    ;; ECHO CHAR
5443 041274 021627 000060      CMP      (SP),@60    ;; CHAR < 0?
5444 041300 002420      BLT      18$      ;; BRANCH IF YES
5445 041302 021627 000067      CMP      (SP),@57    ;; CHAR > 7?
5446 041306 003015      BGT      18$      ;; BRANCH IF YES
5447 041310 042726 000060      BIC      @60,(SP)+    ;; STRIP-15: ASCII
5448 041314 005766 000002      TST      2(SP)      ;; IS THIS THE FIRST CHAR
5449 041320 001403      BEQ      17$      ;; BRANCH IF YES
5450 041322 006316      ASL      (SP)      ;; NO, SHIFT PRESENT
5451 041324 006316      ASL      (SP)      ;; CHAR OVER TO MAKE
5452 041326 006316      ASL      (SP)      ;; ROOM FOR NEW ONE.
5453 041330 005266 000002 17$:      INC      2(SP)      ;; KEEP COUNT OF CHAR
5454 041334 056616 177776      BIS      -2(SP),(SP)    ;; SET IN NEW CHAR
5455 041340 000667      BR       7$      ;; GET THE NEXT ONE
5456 041342 104401 001266 18$:      TYPE      $QUES    ;; TYPE ?<CR><LF>
5457 041346 000720      BR       20$    ;; SIMULATE CONTROL-U
5458      .DSABL    L5B

```

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*****
; THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
; CALL:
;      RDCHR      ;; GET A CHARACTER FROM THE QUEUE
;      RETURN HERE ;; CHARACTER IS ON THE STACK
;                  ;; WITH PARITY BIT STRIPPED OFF
;

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5459 041350 011646      SRDCHR: MOV      (SP),-(SP)    ;; PUSH DOWN THE PC AND
5460 041352 016666 000004 000002    MOV      4(SP),2(SP)    ;; THE PS
5461 041360 005066 000004      CLR      4(SP)      ;; GET READY FOR A CHARACTER
5462 041364 005046      CLR      -(SP)      ;; PUT NEW PS ON STACK
5463 041366 012746 041374      MOV      @64$,-(SP)    ;; PUT NEW PC ON STACK
5464 041372 000002      RTI      64$:      ;; POP NEW PC AND PS
5465 041374      15$:      TST      $TKCNT      ;; WAIT ON A CHARACTER
5466 041374 005737 040510      BEQ      1$      ;;
5467 041400 001775      DEC      $TKCNT      ;; DECREMENT THE COUNTER
5468 041402 005337 040510      MOV      @STKQOUT,4(SP)    ;; GET ONE CHARACTER
5469 041406 117766 177102 000004    INC      $TKQOUT    ;; UPDATE THE POINTER
5470 041414 005237 040514      CMP      $TKQOUT,@STKQEND    ;; DID IT GO OFF OF THE END?
5471 041420 023727 040514 040517    BNE      2$      ;; BRANCH IF NO
5472 041426 001003      MOV      @STKQSRST,$TKQOUT    ;; RESET THE POINTER
5473 041430 012737 040516 040514    RTI      2$:      RETURN
5474 041436 000002
5475 *****
5476 ; THIS ROUTINE WILL INPUT A STRING FROM THE TTY
5477 ; CALL:
5478 ;      RDLIN      ;; INPUT A STRING FROM THE TTY
5479 ;      RETURN HERE ;; ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
5480
5481
5482
5483
5484
5485
5486
5487
5488
5489

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5490          :*                                     ;; TERMINATOR WILL BE A BYTE OF ALL 0'S
5491          SARLIN: MOV R3, -(SP)                ;; SAVE R3
5492          CLR -(SP)                            ;; CLEAR THE RUBOUT KEY
5493          15: MOV #STTYIN, R3                    ;; GET ADDRESS
5494          25: CMP #STTYIN+72, R3                ;; BUFFER FULL?
5495          BLOS 45                                ;; BR IF YES
5496          RDCHR (SP)+, (R3)                    ;; GO READ ONE CHARACTER FROM THE TTY
5497          MOV8 #177, (R3)                      ;; GET CHARACTER
5498          105: CMPB #177, (R3)                 ;; IS IT A RUBOUT
5499          BNE 55                                ;; BR IF NO
5500          TST (SP)                              ;; IS THIS THE FIRST RUBOUT?
5501          SNE 65                                ;; BR IF NO
5502          MOV8 #'\, 95                          ;; TYPE A BACK SLASH
5503          65: DEC R3                            ;; SET THE RUBOUT KEY
5504          CMP R3, #STTYIN                       ;; BACKUP BY ONE
5505          BLO 45                                ;; STACK EMPTY?
5506          MOV8 (R3), 95                         ;; BR IF YES
5507          55: TST (SP)                          ;; SETUP TO TYPEOUT THE DELETED CHAR.
5508          BEQ 75                                ;; GO TYPE
5509          MOV8 #'\, 95                          ;; GO READ ANOTHER CHAR.
5510          55: TST (SP)                          ;; RUBOUT KEY SET?
5511          BEQ 75                                ;; BR IF NO
5512          MOV8 #'\, 95                          ;; TYPE A BACK SLASH
5513          75: CLR (SP)                          ;; CLEAR THE RUBOUT KEY
5514          CMPB #25, (R3)                       ;; IS CHARACTER A CTRL U?
5515          BNE 85                                ;; BR IF NO
5516          TYPE ,SCNTLU                         ;; TYPE A CONTROL "U"
5517          BR 15                                ;; GO START OVER
5518          85: CMPB #22, (R3)                   ;; IS CHARACTER A "R"?
5519          BNE 35                                ;; BRANCH IF NO
5520          CLRB (R3)                             ;; CLEAR THE CHARACTER
5521          TYPE ,SCRLF                          ;; TYPE A "CR" & "LF"
5522          TYPE ,STTYIN                        ;; TYPE THE INPUT STRING
5523          BR 25                                ;; GO PICKUP ANOTHER CHARACTER
5524          45: TYPE ,SQUES                      ;; TYPE A '?'
5525          BR 15                                ;; CLEAR THE BUFFER AND LOOP
5526          35: MOV8 (R3), 95                    ;; ECHO THE CHARACTER
5527          TYPE ,95                             ;; CHECK FOR RETURN
5528          CMPB #15, (R3)+                      ;; LOOP IF NOT RETURN
5529          BNE 25                                ;; CLEAR RETURN (THE 15)
5530          CLRB -1(R3)                          ;; TYPE A LINE FEED
5531          TYPE ,SLF                            ;; TYPE A LINE FEED
5532          TST (SP)+                            ;; CLEAN RUBOUT KEY FROM THE STACK
5533          MOV (SP)+, R3                        ;; RESTORE R3
5534          MOV (SP), -(SP)                      ;; ADJUST THE STACK AND PUT ADDRESS OF THE
5535          MOV 4(SP), 2(SP)                     ;; FIRST ASCII CHARACTER ON IT
5536          MOV #STTYIN, 4(SP)
5537          RTI
5538          95: .BYTE 0                          ;; RETURN
5539          .BYTE 0                              ;; STORAGE FOR ASCII CHAR. TO TYPE
5540          STTYIN: .BLKB 72                     ;; TERMINATOR
5541          SCNTLC: .ASCIZ /?C/<15><12>         ;; RESERVE 72 BYTES FOR TTY INPUT
5542          SCNTLU: .ASCIZ /?U/<15><12>         ;; CONTROL "C"
5543          .ASCIZ /?U/<15><12>                 ;; CONTROL "U"

```

```

5546 042000 043536 005015 000 $CNTLG: .ASCIZ /1G/15/12/ ;:CONTROL "G"
5547 042005 015 051412 051127 $MSWR: .ASCIZ 15/12/SWR = /
5548 042012 036440 000040
5549 042016 020040 042516 020127 $MNEW: .ASCIZ / NEW = /
5550 042024 020075 000
5551 042030 .EVEN
5552 .SBTTL POWER DOWN AND UP ROUTINES
5553
5554 ;:*****
5555 ;:POWER DOWN ROUTINE
5556 042030 012737 042170 000024 $PWRDN: MOV $SILLUP,2*PWRVEC ;:SET FOR FAST UP
5557 042036 012737 000340 000026 MOV $340,2*PWRVEC+2 ;:PRIO:7
5558 042044 010046 MOV R0,-(SP) ;:PUSH R0 ON STACK
5559 042046 010146 MOV R1,-(SP) ;:PUSH R1 ON STACK
5560 042050 010246 MOV R2,-(SP) ;:PUSH R2 ON STACK
5561 042052 010346 MOV R3,-(SP) ;:PUSH R3 ON STACK
5562 042054 010446 MOV R4,-(SP) ;:PUSH R4 ON STACK
5563 042056 010546 MOV R5,-(SP) ;:PUSH R5 ON STACK
5564 042060 017746 137054 MOV 2SWR,-(SP) ;:PUSH 2SWR ON STACK
5565 042064 010637 042174 MOV SP,$SAVR6 ;:SAVE SP
5566 042070 012737 042102 000024 MOV $PWRUP,2*PWRVEC ;:SET UP VECTOR
5567 042076 000000 HALT
5568 042100 000776 BR .-2 ;:HANG UP
5569
5570 ;:*****
5571 ;:POWER UP ROUTINE
5572 042102 012737 042170 000024 $PWRUP: MOV $SILLUP,2*PWRVEC ;:SET FOR FAST DOWN
5573 042110 013706 042174 MOV $SAVR6,SP ;:GET SP
5574 042114 005037 042174 CLR $SAVR6 ;:WAIT LOOP FOR THE TTY
5575 042120 005237 042174 15: INC $SAVR6 ;:WAIT FOR THE INC
5576 042124 001375 BNE 15 ;:OF WORD
5577 042126 012677 137006 MOV (SP)+,2SWR ;:POP STACK INTO 2SWR
5578 042132 012605 MOV (SP)+,R5 ;:POP STACK INTO R5
5579 042134 012604 MOV (SP)+,R4 ;:POP STACK INTO R4
5580 042136 012603 MOV (SP)+,R3 ;:POP STACK INTO R3
5581 042140 012602 MOV (SP)+,R2 ;:POP STACK INTO R2
5582 042142 012601 MOV (SP)+,R1 ;:POP STACK INTO R1
5583 042144 012600 MOV (SP)+,R0 ;:POP STACK INTO R0
5584 042146 012737 042030 000024 MOV $PWRDN,2*PWRVEC ;:SET UP THE POWER DOWN VECTOR
5585 042154 012737 000340 000026 MOV $340,2*PWRVEC+2 ;:PRIO:7
5586 042162 104401 TYPE ;:REPORT THE POWER FAILURE
5587 042164 042176 $PWRMG: .WORD $POWER ;:POWER FAIL MESSAGE POINTER
5588 042166 000002 RTI
5589 042170 000000 $SILLUP: HALT ;:THE POWER UP SEQUENCE WAS STARTED
5590 042172 000776 BR .-2 ;:BEFORE THE POWER DOWN WAS COMPLETE
5591 042174 000000 $SAVR6: 0 ;:PUT THE SP HERE
5592 042176 005015 047520 042527 $POWER: .ASCIZ 15/12/POWER
5593 042204 000122
5594
5595 .EVEN
5596 .SBTTL ROUTINE TO SIZE MEMORY
5597
5598 ;:*****
5599 ;:CALL:
5600 * JSR PC,$SIZE
5601 * RETURN
;:$LSTAD WILL CONTAIN THE LAST AVAILABLE MEMORY LOCATION

```

```

5602
5603 042206 010046 $SIZE: MOV RC,-(SP) ;;SAVE RO ON THE STACK
5604 042210 010146 MOV R1,-(SP) ;;SAVE R1 ON THE STACK
5605 042212 013746 000004 MOV @#ERRVEC,-(SP) ;;SAVE PRESENT ERROR VECTOR PS & PC
5606 042216 013746 000006 MOV @#ERRVEC+2,-(SP)
5607 042222 010600 MOV SP,RO ;;SAVE THE STACK POINTER
5608 ;;SET THE ERRVEC PS TO THE PRESENT PS
5609 042224 104400 TRAP ;;PUSH OLD PSW AND PC ON STACK
5610 042226 012637 000006 MOV (SP)+,@#ERRVEC+2 ;;SAVE THE PSW IN @#ERRVEC+2
5611 042232 012737 042252 000004 MOV #2,@#ERRVEC ;;SET FOR TIMEOUT
5612 042240 012701 020000 MOV #20000,R1 ;;FIRST ADDRESS
5613 042244 005711 15: TST (R1) ;;TEST THIS ADDRESS
5614 042246 005721 TST (R1)+ ;;STEP TO NEXT ADDRESS
5615 042250 000775 BR 15 ;;TRY ANOTHER
5616 042252 162701 000002 25: SUB #2,R1 ;;DROP BACK
5617 042256 010006 MOV RO,SP ;;RESTORE THE STACK
5618 042260 012637 000006 MOV (SP)+,@#ERRVEC+2 ;;RESTORE ERROR VECTOR
5619 042264 012637 000004 MOV (SP)+,@#ERRVEC
5620 042270 010137 042302 MOV R1,$LASTAD ;;LAST ADDRESS
5621 042274 012601 MOV (SP)+,R1 ;;RESTORE R1
5622 042276 012600 MOV (SP)+,RO ;;RESTORE RO
5623 042300 000207 RTS PC
5624 042302 000000 $LASTAD: .WORD 0 ;;CONTAINS THE LAST ADDRESS
5625 .SBTTL SAVE AND RESTORE RO-R5 ROUTINES
5626
5627 ;*****
5628 ;*SAVE RO-R5
5629 ;*CALL:
5630 ;* SAVREG
5631 ;*UPON RETURN FROM $SAVREG THE STACK WILL LOOK LIKE:
5632 ;*
5633 ;*TOP---(+16)
5634 ;* +2---(+18)
5635 ;* +4---R5
5636 ;* +6---R4
5637 ;* +8---R3
5638 ;*+10---R2
5639 ;*+12---R1
5640 ;*+14---RO
5641
5642 042304 $SAVREG:
5643 042304 010046 MOV RO,-(SP) ;;PUSH RO ON STACK
5644 042306 010146 MOV R1,-(SP) ;;PUSH R1 ON STACK
5645 042310 010246 MOV R2,-(SP) ;;PUSH R2 ON STACK
5646 042312 010346 MOV R3,-(SP) ;;PUSH R3 ON STACK
5647 042314 010446 MOV R4,-(SP) ;;PUSH R4 ON STACK
5648 042316 010546 MOV R5,-(SP) ;;PUSH R5 ON STACK
5649 042320 016646 000022 MOV 22(SP),-(SP) ;;SAVE PS OF MAIN FLOW
5650 042324 016646 000022 MOV 22(SP),-(SP) ;;SAVE PC OF MAIN FLOW
5651 042330 016646 000022 MOV 22(SP),-(SP) ;;SAVE PS OF CALL
5652 042334 016646 000022 MOV 22(SP),-(SP) ;;SAVE PC OF CALL
5653 042340 000002 RTI
5654
5655 ;*RESTORE RO-R5
5656 ;*CALL:
5657 ;* RESREG

```



5658 042342  
5659 042342 012666 000022  
5660 042346 012666 000022  
5661 042352 012666 000022  
5662 042356 012666 000022  
5663 042362 012605  
5664 042364 012604  
5665 042366 012603  
5666 042370 012602  
5667 042372 012601  
5668 042374 012600  
5669 042376 000002

\$RESREG:

```

MOV (SP)+,22(SP) ;;RESTORE PC OF CALL
MOV (SP)+,22(SP) ;;RESTORE PS OF CALL
MOV (SP)+,22(SP) ;;RESTORE PC OF MAIN FLOW
MOV (SP)+,22(SP) ;;RESTORE PS OF MAIN FLOW
MOV (SP)+,R5 ;;POP STACK INTO R5
MOV (SP)+,R4 ;;POP STACK INTO R4
MOV (SP)+,R3 ;;POP STACK INTO R3
MOV (SP)+,R2 ;;POP STACK INTO R2
MOV (SP)+,R1 ;;POP STACK INTO R1
MOV (SP)+,R0 ;;POP STACK INTO R0
RTI

```

.SBTTL TRAP DECODER

```

*****
*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
*GO TO THAT ROUTINE.

```

5677  
5678 042400 010046  
5679 042402 016600 000002  
5680 042406 005740  
5681 042410 111000  
5682 042412 006300  
5683 042414 016000 042434  
5684 042420 000200

```

$TRAP: MOV R0,-(SP) ;;SAVE R0
MOV 2(SP),R0 ;;GET TRAP ADDRESS
TST -(R0) ;;BACKUP BY 2
MOVB (R0),R0 ;;GET RIGHT BYTE OF TRAP
ASL R0 ;;POSITION FOR INDEXING
MOV $TRPAD(R0),R0 ;;INDEX TO TABLE
RTS R0 ;;GO TO ROUTINE

```

;;THIS IS USE TO HANDLE THE "GETPRI" MACRO

5687  
5688  
5689 042422 011646  
5690 042424 016666 000004 000002  
5691 042432 000002

```

$TRAP2: MOV (SP),-(SP) ;;MOVE THE PC DOWN
MOV 4(SP),2(SP) ;;MOVE THE PSW DOWN
RTI ;;RESTORE THE PSW

```

.SBTTL TRAP TABLE

```

*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
*BY THE "TRAP" INSTRUCTION.

```

; ROUTINE

```

;-----
$TRPAD: .WORD $TRAP2
$TYPE ;;CALL=TYPE TRAP+1(104401) TTY TYPEOUT ROUTINE
$TYPOC ;;CALL=TYPOC TRAP+2(104402) TYPE OCTAL NUMBER (WITH LEADING ZEROS)
$TYPOS ;;CALL=TYPOS TRAP+3(104403) TYPE OCTAL NUMBER (NO LEADING ZEROS)
$TYPON ;;CALL=TYPON TRAP+4(104404) TYPE OCTAL NUMBER (AS PER LAST CALL)

$GTSWR ;;CALL=GTSWR TRAP+5(104405) GET SOFT-SWR SETTING

$CKSWR ;;CALL=CKSWR TRAP+6(104406) TEST FOR CHANGE IN SOFT-SWR
$RDCHR ;;CALL=RDCHR TRAP+7(104407) TTY TYPEIN CHARACTER ROUTINE
$RDLIN ;;CALL=RDLIN TRAP+10(104410) TTY TYPEIN STRING ROUTINE
$SAVREG ;;CALL=SAVREG TRAP+11(104411) SAVE RO-R5 ROUTINE
$RESREG ;;CALL=RESREG TRAP+12(104412) RESTORE RO-R5 ROUTINE

```

5700 042434 042422  
5701 042436 037562  
5702 042440 040146  
5703 042442 040122  
5704 042444 040162  
5705  
5706 042446 041076  
5707  
5708 042450 041006  
5709 042452 041350  
5710 042454 041440  
5711 042456 042304  
5712 042460 042342  
5713

|      |        |        |        |        |       |        |                                  |
|------|--------|--------|--------|--------|-------|--------|----------------------------------|
| 5714 | 042462 | 025052 | 020040 | 047125 | EM1:  | .ASCIZ | /** UNIBUS PARITY ERROR/         |
| 5715 | 042470 | 041111 | 051525 | 050040 |       |        |                                  |
| 5716 | 042476 | 051101 | 052111 | 020131 |       |        |                                  |
| 5717 | 042504 | 051105 | 047522 | 000122 |       |        |                                  |
| 5718 | 042512 | 025052 | 020040 | 047516 | EM2:  | .ASCIZ | /** NON-EXISTANT MEMORY ERROR/   |
| 5719 | 042520 | 026516 | 054105 | 051511 |       |        |                                  |
| 5720 | 042526 | 040524 | 052116 | 046440 |       |        |                                  |
| 5721 | 042534 | 046505 | 051117 | 020131 |       |        |                                  |
| 5722 | 042542 | 051105 | 047522 | 000122 |       |        |                                  |
| 5723 | 042550 | 025052 | 020040 | 047516 | EM3:  | .ASCIZ | /** NON-EXISTANT DRIVE ERROR/    |
| 5724 | 042556 | 026516 | 054105 | 051511 |       |        |                                  |
| 5725 | 042564 | 040524 | 052116 | 042040 |       |        |                                  |
| 5726 | 042572 | 044522 | 042526 | 042440 |       |        |                                  |
| 5727 | 042600 | 051122 | 051117 | 000    |       |        |                                  |
| 5728 | 042605 | 052    | 020052 | 052440 | EM4:  | .ASCIZ | /** UNIT FIELD ERROR/            |
| 5729 | 042612 | 044516 | 020124 | 044506 |       |        |                                  |
| 5730 | 042620 | 046105 | 020104 | 051105 |       |        |                                  |
| 5731 | 042626 | 047522 | 000122 |        |       |        |                                  |
| 5732 | 042632 | 025052 | 020040 | 052523 | EM5:  | .ASCIZ | /** SUBSYSTEM TIMEOUT/           |
| 5733 | 042640 | 051502 | 051531 | 042524 |       |        |                                  |
| 5734 | 042646 | 020115 | 044524 | 042515 |       |        |                                  |
| 5735 | 042654 | 052517 | 000124 |        |       |        |                                  |
| 5736 | 042660 | 025052 | 020040 | 051104 | EM6:  | .ASCIZ | /** DRIVE BUS PARITY ERROR/      |
| 5737 | 042666 | 053111 | 020105 | 052502 |       |        |                                  |
| 5738 | 042674 | 020123 | 040520 | 044522 |       |        |                                  |
| 5739 | 042702 | 054524 | 042440 | 051122 |       |        |                                  |
| 5740 | 042710 | 051117 | 000    |        |       |        |                                  |
| 5741 | 042713 | 052    | 020052 | 042040 | EM7:  | .ASCIZ | /** DRIVE DETECTED PARITY ERROR/ |
| 5742 | 042720 | 044522 | 042526 | 042040 |       |        |                                  |
| 5743 | 042726 | 052105 | 041505 | 042524 |       |        |                                  |
| 5744 | 042734 | 020104 | 040520 | 044522 |       |        |                                  |
| 5745 | 042742 | 054524 | 042440 | 051122 |       |        |                                  |
| 5746 | 042750 | 051117 | 000    |        |       |        |                                  |
| 5747 | 042753 | 052    | 020052 | 040440 | EM10: | .ASCIZ | /** AC LOW/                      |
| 5748 | 042760 | 020103 | 047514 | 000127 |       |        |                                  |
| 5749 | 042766 | 025052 | 020040 | 050123 | EM11: | .ASCIZ | /** SPEED LOSS/                  |
| 5750 | 042774 | 042505 | 020104 | 047514 |       |        |                                  |
| 5751 | 043002 | 051523 | 000    |        |       |        |                                  |
| 5752 | 043005 | 052    | 020052 | 044440 | EM12: | .ASCIZ | /** ILLEGAL FUNCTION ERROR/      |
| 5753 | 043012 | 046114 | 043505 | 046101 |       |        |                                  |
| 5754 | 043020 | 043040 | 047125 | 052103 |       |        |                                  |
| 5755 | 043026 | 047511 | 020116 | 051105 |       |        |                                  |
| 5756 | 043034 | 047522 | 000122 |        |       |        |                                  |
| 5757 | 043040 | 025052 | 020040 | 051120 | EM13: | .ASCIZ | /** PROGRAMMING ERROR/           |
| 5758 | 043046 | 043517 | 040522 | 046515 |       |        |                                  |
| 5759 | 043054 | 047111 | 020107 | 051105 |       |        |                                  |
| 5760 | 043062 | 047522 | 000122 |        |       |        |                                  |
| 5761 | 043066 | 025052 | 020040 | 047516 | EM14: | .ASCIZ | /** NON-EXISTANT FUNCTION ERROR/ |
| 5762 | 043074 | 026516 | 054105 | 051511 |       |        |                                  |
| 5763 | 043102 | 040524 | 052116 | 043040 |       |        |                                  |
| 5764 | 043110 | 047125 | 052103 | 047511 |       |        |                                  |
| 5765 | 043116 | 020116 | 051105 | 047522 |       |        |                                  |
| 5766 | 043124 | 000122 |        |        |       |        |                                  |
| 5767 | 043126 | 025052 | 020040 | 051104 | EM15: | .ASCIZ | /** DRIVE TYPE ERROR/            |
| 5768 | 043134 | 053111 | 020105 | 054524 |       |        |                                  |
| 5769 | 043142 | 042520 | 042440 | 051122 |       |        |                                  |



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|      |        |        |        |        |                                                  |
|------|--------|--------|--------|--------|--------------------------------------------------|
| 5770 | 043150 | 051117 | 000    |        |                                                  |
| 5771 | 043153 | 052    | 020052 | 043040 | EM16: .ASCIZ /** FORMAT ERROR/                   |
| 5772 | 043160 | 051117 | 040515 | 020124 |                                                  |
| 5773 | 043166 | 051105 | 047522 | 000122 |                                                  |
| 5774 | 043174 | 025052 | 020040 | 051127 | EM17: .ASCIZ /** WRITE LOCK ERROR/               |
| 5775 | 043202 | 052111 | 020105 | 047514 |                                                  |
| 5776 | 043210 | 045503 | 042440 | 051122 |                                                  |
| 5777 | 043216 | 051117 | 000    |        |                                                  |
| 5778 | 043221 | 052    | 020052 | 042040 | EM20: .ASCIZ /** DRIVE UNSAFE ERROR/             |
| 5779 | 043226 | 044522 | 042526 | 052440 |                                                  |
| 5780 | 043234 | 051516 | 043101 | 020105 |                                                  |
| 5781 | 043242 | 051105 | 047522 | 000122 |                                                  |
| 5782 | 043250 | 025052 | 020040 | 042523 | EM21: .ASCIZ /** SEEK INCOMPLETE ERROR/          |
| 5783 | 043256 | 045505 | 044440 | 041516 |                                                  |
| 5784 | 043264 | 046517 | 046120 | 052105 |                                                  |
| 5785 | 043272 | 020105 | 051105 | 047522 |                                                  |
| 5786 | 043300 | 000122 |        |        |                                                  |
| 5787 | 043302 | 025052 | 020040 | 054503 | EM22: .ASCIZ /** CYLINDER OVERFLOW ERROR/        |
| 5788 | 043310 | 044514 | 042116 | 051105 |                                                  |
| 5789 | 043316 | 047440 | 042526 | 043122 |                                                  |
| 5790 | 043324 | 047514 | 020127 | 051105 |                                                  |
| 5791 | 043332 | 047522 | 000122 |        |                                                  |
| 5792 | 043336 | 025052 | 020040 | 046111 | EM23: .ASCIZ /** ILLEGAL CYLINDER ADDRESS ERROR/ |
| 5793 | 043344 | 042514 | 040507 | 020114 |                                                  |
| 5794 | 043352 | 054503 | 044514 | 042116 |                                                  |
| 5795 | 043360 | 051105 | 040440 | 042104 |                                                  |
| 5796 | 043366 | 042522 | 051523 | 042440 |                                                  |
| 5797 | 043374 | 051122 | 051117 | 000    |                                                  |
| 5798 | 043401 | 052    | 020052 | 042040 | EM24: .ASCIZ /** DRIVE OFF TRACK/                |
| 5799 | 043406 | 044522 | 042526 | 047440 |                                                  |
| 5800 | 043414 | 043106 | 052040 | 040522 |                                                  |
| 5801 | 043422 | 045503 | 000    |        |                                                  |
| 5802 | 043425 | 052    | 020052 | 042040 | EM25: .ASCIZ /** DRIVE TIMING ERROR/             |
| 5803 | 043432 | 044522 | 042526 | 052040 |                                                  |
| 5804 | 043440 | 046511 | 047111 | 020107 |                                                  |
| 5805 | 043446 | 051105 | 047522 | 000122 |                                                  |
| 5806 | 043454 | 025052 | 020040 | 040504 | EM26: .ASCIZ /** DATA LATE ERROR/                |
| 5807 | 043462 | 040524 | 046040 | 052101 |                                                  |
| 5808 | 043470 | 020105 | 051105 | 047522 |                                                  |
| 5809 | 043476 | 000122 |        |        |                                                  |
| 5810 | 043500 | 025052 | 020040 | 047503 | EM27: .ASCIZ /** CONTROLLER TIMEOUT ERROR/       |
| 5811 | 043506 | 052116 | 047522 | 046114 |                                                  |
| 5812 | 043514 | 051105 | 052040 | 046511 |                                                  |
| 5813 | 043522 | 047505 | 052125 | 042440 |                                                  |
| 5814 | 043530 | 051122 | 051117 | 000    |                                                  |
| 5815 | 043535 | 052    | 020052 | 047440 | EM30: .ASCIZ /** OPERATION INCOMPLETE ERROR/     |
| 5816 | 043542 | 042520 | 040522 | 044524 |                                                  |
| 5817 | 043550 | 047117 | 044440 | 041516 |                                                  |
| 5818 | 043556 | 046517 | 046120 | 052105 |                                                  |
| 5819 | 043564 | 020105 | 051105 | 047522 |                                                  |
| 5820 | 043572 | 000122 |        |        |                                                  |
| 5821 | 043574 | 025052 | 020040 | 042510 | EM31: .ASCIZ /** HEADER VRC ERROR/               |
| 5822 | 043602 | 042101 | 051105 | 053040 |                                                  |
| 5823 | 043610 | 041522 | 042440 | 051122 |                                                  |
| 5824 | 043616 | 051117 | 000    |        |                                                  |
| 5825 | 043621 | 052    | 020052 | 042040 | EM32: .ASCIZ /** DATA CHECK ERROR/               |

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|      |        |        |        |        |                                                           |
|------|--------|--------|--------|--------|-----------------------------------------------------------|
| 5826 | 043626 | 052101 | 020101 | 044103 |                                                           |
| 5827 | 043634 | 041505 | 020113 | 051105 |                                                           |
| 5828 | 043642 | 047522 | 000122 |        |                                                           |
| 5829 | 043646 | 025052 | 020040 | 051127 | EM33: .ASCIZ /** WRITE CHECK ERROR/                       |
| 5830 | 043654 | 052111 | 020105 | 044103 |                                                           |
| 5831 | 043662 | 041505 | 020113 | 051105 |                                                           |
| 5832 | 043670 | 047522 | 000122 |        |                                                           |
| 5833 | 043674 | 025052 | 020040 | 040504 | EM34: .ASCIZ /** DATA MISCOMPARE/                         |
| 5834 | 043702 | 040524 | 046440 | 051511 |                                                           |
| 5835 | 043710 | 047503 | 050115 | 051101 |                                                           |
| 5836 | 043716 | 000105 |        |        |                                                           |
| 5837 | 043720 | 025052 | 020040 | 047516 | EM35: .ASCIZ /** NO DRIVE RESPONSE-UFE & NED/             |
| 5838 | 043726 | 042040 | 044522 | 042526 |                                                           |
| 5839 | 043734 | 051040 | 051505 | 047520 |                                                           |
| 5840 | 043742 | 051516 | 026505 | 043125 |                                                           |
| 5841 | 043750 | 020105 | 020046 | 042516 |                                                           |
| 5842 | 043756 | 000104 |        |        |                                                           |
| 5843 | 043760 | 025052 | 020040 | 051104 | EM36: .ASCIZ /** DRIVE ERROR WILL NOT CLEAR/              |
| 5844 | 043766 | 053111 | 020105 | 051105 |                                                           |
| 5845 | 043774 | 047522 | 020122 | 044527 |                                                           |
| 5846 | 044002 | 046114 | 047040 | 052117 |                                                           |
| 5847 | 044010 | 041440 | 042514 | 051101 |                                                           |
| 5848 | 044016 | 000    |        |        |                                                           |
| 5849 | 044017 | 052    | 020052 | 042040 | EM37: .ASCIZ /** DRIVE STATUS CHANGE WILL NOT CLEAR/      |
| 5850 | 044024 | 044522 | 042526 | 051440 |                                                           |
| 5851 | 044032 | 040524 | 052524 | 020123 |                                                           |
| 5852 | 044040 | 044103 | 047101 | 042507 |                                                           |
| 5853 | 044046 | 053440 | 046111 | 020114 |                                                           |
| 5854 | 044054 | 047516 | 020124 | 046105 |                                                           |
| 5855 | 044062 | 040505 | 000122 |        |                                                           |
| 5856 | 044066 | 025052 | 020040 | 052101 | EM40: .ASCIZ /** ATTENTION BUT NO STATUS CHANGE OR FAULT/ |
| 5857 | 044074 | 042524 | 052116 | 047511 |                                                           |
| 5858 | 044102 | 020116 | 052502 | 020124 |                                                           |
| 5859 | 044110 | 047516 | 051440 | 040524 |                                                           |
| 5860 | 044116 | 052524 | 020123 | 044103 |                                                           |
| 5861 | 044124 | 047101 | 042507 | 047440 |                                                           |
| 5862 | 044132 | 020122 | 040506 | 046125 |                                                           |
| 5863 | 044140 | 000124 |        |        |                                                           |
| 5864 | 044142 | 025052 | 020040 | 052101 | EM41: .ASCIZ /** ATTENTION BUT DRIVE NOT AVAILABLE/       |
| 5865 | 044150 | 042524 | 052116 | 047511 |                                                           |
| 5866 | 044156 | 020116 | 052502 | 020124 |                                                           |
| 5867 | 044164 | 051104 | 053111 | 020105 |                                                           |
| 5868 | 044172 | 047516 | 020124 | 053101 |                                                           |
| 5869 | 044200 | 044501 | 040514 | 046102 |                                                           |
| 5870 | 044206 | 000105 |        |        |                                                           |
| 5871 | 044210 | 025052 | 020040 | 052101 | EM42: .ASCIZ /** ATTENTION WHEN NOT EXPECTED/             |
| 5872 | 044216 | 042524 | 052116 | 047511 |                                                           |
| 5873 | 044224 | 020116 | 044127 | 047105 |                                                           |
| 5874 | 044232 | 047040 | 052117 | 042440 |                                                           |
| 5875 | 044240 | 050130 | 041505 | 042524 |                                                           |
| 5876 | 044246 | 000104 |        |        |                                                           |
| 5877 | 044250 | 025052 | 020040 | 051105 | EM43: .ASCIZ /** ERROR WHILE GATHERING DRIVE STATUS/      |
| 5878 | 044256 | 047522 | 020122 | 044127 |                                                           |
| 5879 | 044264 | 046111 | 020105 | 040507 |                                                           |
| 5880 | 044272 | 044124 | 051105 | 047111 |                                                           |
| 5881 | 044300 | 020107 | 051104 | 053111 |                                                           |

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|      |        |        |        |        |                                                              |
|------|--------|--------|--------|--------|--------------------------------------------------------------|
| 5882 | 044306 | 020105 | 052123 | 052101 |                                                              |
| 5883 | 044314 | 051525 | 000    |        |                                                              |
| 5884 | 044317 | 052    | 020052 | 046440 | EM52: .ASCIZ /** MULTIPLE DRIVE SELECT/                      |
| 5885 | 044324 | 046125 | 044524 | 046120 |                                                              |
| 5886 | 044332 | 020105 | 051104 | 053111 |                                                              |
| 5887 | 044340 | 020105 | 042523 | 042514 |                                                              |
| 5888 | 044346 | 052103 | 000    |        |                                                              |
| 5889 | 044351 | 052    | 020052 | 044040 | EM53: .ASCIZ /** HEADER COMPARE ERROR/                       |
| 5890 | 044356 | 040505 | 042504 | 020122 |                                                              |
| 5891 | 044364 | 047503 | 050115 | 051101 |                                                              |
| 5892 | 044372 | 020105 | 051105 | 047522 |                                                              |
| 5893 | 044400 | 000122 |        |        |                                                              |
| 5894 | 044402 | 025052 | 020040 | 052523 | EM56: .ASCIZ /** SUBSYSTEM TIMEOUT/                          |
| 5895 | 044410 | 051502 | 051531 | 042524 |                                                              |
| 5896 | 044416 | 020115 | 044524 | 042515 |                                                              |
| 5897 | 044424 | 052517 | 000124 |        |                                                              |
| 5898 | 044430 | 025052 | 020040 | 051105 | EM60: .ASCIZ /** ERROR IN RECALIBRATE FOR RECOVERY/          |
| 5899 | 044436 | 047522 | 020122 | 047111 |                                                              |
| 5900 | 044444 | 051040 | 041505 | 046101 |                                                              |
| 5901 | 044452 | 041111 | 040522 | 042524 |                                                              |
| 5902 | 044460 | 043040 | 051117 | 051040 |                                                              |
| 5903 | 044466 | 041505 | 053117 | 051105 |                                                              |
| 5904 | 044474 | 000131 |        |        |                                                              |
| 5905 | 044476 | 025052 | 020040 | 051120 | EM61: .ASCIZ /** PROGRAM ABORTING FATAL ERROR IN RETRY/      |
| 5906 | 044504 | 043517 | 040522 | 020115 |                                                              |
| 5907 | 044512 | 041101 | 051117 | 044524 |                                                              |
| 5908 | 044520 | 043516 | 043040 | 052101 |                                                              |
| 5909 | 044526 | 046101 | 042440 | 051122 |                                                              |
| 5910 | 044534 | 051117 | 044440 | 020116 |                                                              |
| 5911 | 044542 | 042522 | 051124 | 000131 |                                                              |
| 5912 | 044550 | 025052 | 020040 | 042510 | EM62: .ASCIZ /** HEADER MISCOMPARE/                          |
| 5913 | 044556 | 042101 | 051105 | 046440 |                                                              |
| 5914 | 044564 | 051511 | 047503 | 050115 |                                                              |
| 5915 | 044572 | 051101 | 000105 |        |                                                              |
| 5916 | 044576 | 025052 | 020040 | 046103 | EM63: .ASCIZ /** CLEAR CONTROLLER DID NOT CLEAR ERROR/       |
| 5917 | 044604 | 040505 | 020122 | 047503 |                                                              |
| 5918 | 044612 | 052116 | 047522 | 046114 |                                                              |
| 5919 | 044620 | 051105 | 042040 | 042111 |                                                              |
| 5920 | 044626 | 047040 | 052117 | 041440 |                                                              |
| 5921 | 044634 | 042514 | 051101 | 042440 |                                                              |
| 5922 | 044642 | 051122 | 051117 | 000    |                                                              |
| 5923 | 044647 | 052    | 020052 | 047040 | EM64: .ASCIZ /** NO ATTENTION IN ATTENTION SUMMARY REGISTER/ |
| 5924 | 044654 | 020117 | 052101 | 042524 |                                                              |
| 5925 | 044662 | 052116 | 047511 | 020116 |                                                              |
| 5926 | 044670 | 047111 | 040440 | 052124 |                                                              |
| 5927 | 044676 | 047105 | 044524 | 047117 |                                                              |
| 5928 | 044704 | 051440 | 046525 | 040515 |                                                              |
| 5929 | 044712 | 054522 | 051040 | 043505 |                                                              |
| 5930 | 044720 | 051511 | 042524 | 000122 |                                                              |
| 5931 | 044726 | 025052 | 020040 | 047125 | EM65: .ASCIZ /** UNSOLICITED ATTENTION/                      |
| 5932 | 044734 | 047523 | 044514 | 044503 |                                                              |
| 5933 | 044742 | 042524 | 020104 | 052101 |                                                              |
| 5934 | 044750 | 042524 | 052116 | 047511 |                                                              |
| 5935 | 044756 | 000116 |        |        |                                                              |
| 5936 | 044760 | 025052 | 020040 | 047125 | EM66: .ASCIZ /** UNEXPECTED DATA TYPE ERROR/                 |
| 5937 | 044766 | 054105 | 042520 | 052103 |                                                              |

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|      |        |        |        |        |                                                                          |
|------|--------|--------|--------|--------|--------------------------------------------------------------------------|
| 5938 | 044774 | 042105 | 042040 | 052101 |                                                                          |
| 5939 | 045002 | 020101 | 054524 | 042520 |                                                                          |
| 5940 | 045010 | 042440 | 051122 | 051117 |                                                                          |
| 5941 | 045016 | 000    |        |        |                                                                          |
| 5942 | 045017 | 052    | 020052 | 040440 | EM67: .ASCIZ /** ATTENTION DID NOT RESET WITH CLEAR/                     |
| 5943 | 045024 | 052124 | 047105 | 044524 |                                                                          |
| 5944 | 045032 | 047117 | 042040 | 042111 |                                                                          |
| 5945 | 045040 | 047040 | 052117 | 051040 |                                                                          |
| 5946 | 045046 | 051505 | 052105 | 053440 |                                                                          |
| 5947 | 045054 | 052111 | 020110 | 046103 |                                                                          |
| 5948 | 045062 | 040505 | 000122 |        |                                                                          |
| 5949 | 045066 | 025052 | 020040 | 052523 | EM70: .ASCIZ /** SUBSYSTEM CLEAR DID NOT CLEAR DRIVE ATTENTION/          |
| 5950 | 045074 | 051502 | 051531 | 042524 |                                                                          |
| 5951 | 045102 | 020115 | 046103 | 040505 |                                                                          |
| 5952 | 045110 | 020122 | 044504 | 020104 |                                                                          |
| 5953 | 045116 | 047516 | 020124 | 046103 |                                                                          |
| 5954 | 045124 | 040505 | 020122 | 051104 |                                                                          |
| 5955 | 045132 | 053111 | 020105 | 052101 |                                                                          |
| 5956 | 045140 | 042524 | 052116 | 047511 |                                                                          |
| 5957 | 045146 | 000116 |        |        |                                                                          |
| 5958 | 045150 | 025052 | 020040 | 040504 | EM71: .ASCIZ /** DATA LATE WHEN UNLOADING HEADER/                        |
| 5959 | 045156 | 040524 | 046040 | 052101 |                                                                          |
| 5960 | 045164 | 020105 | 044127 | 047105 |                                                                          |
| 5961 | 045172 | 052440 | 046116 | 040517 |                                                                          |
| 5962 | 045200 | 044504 | 043516 | 044040 |                                                                          |
| 5963 | 045206 | 040505 | 042504 | 000122 |                                                                          |
| 5964 | 045214 | 025052 | 020040 | 047503 | EM72: .ASCIZ /** CONTROLLER ERROR WHEN DRIVER SERVICING/                 |
| 5965 | 045222 | 052116 | 047522 | 046114 |                                                                          |
| 5966 | 045230 | 051105 | 042440 | 051122 |                                                                          |
| 5967 | 045236 | 051117 | 053440 | 042510 |                                                                          |
| 5968 | 045244 | 020116 | 051104 | 053111 |                                                                          |
| 5969 | 045252 | 051105 | 051440 | 051105 |                                                                          |
| 5970 | 045260 | 044526 | 044503 | 043516 |                                                                          |
| 5971 | 045266 | 000    |        |        |                                                                          |
| 5972 | 045267 | 052    | 020052 | 042040 | EM73: .ASCIZ /** DRIVE DETECTED PARITY ERROR/                            |
| 5973 | 045274 | 044522 | 042526 | 042040 |                                                                          |
| 5974 | 045302 | 052105 | 041505 | 042524 |                                                                          |
| 5975 | 045310 | 020104 | 040520 | 044522 |                                                                          |
| 5976 | 045316 | 054524 | 042440 | 051122 |                                                                          |
| 5977 | 045324 | 051117 | 000    |        |                                                                          |
| 5978 | 045327 | 052    | 020052 | 052440 | EM74: .ASCIZ /** UNDEFINED ERROR/                                        |
| 5979 | 045334 | 042116 | 043105 | 047111 |                                                                          |
| 5980 | 045342 | 042105 | 042440 | 051122 |                                                                          |
| 5981 | 045350 | 051117 | 000    |        |                                                                          |
| 5982 | 045353 | 052    | 020052 | 046440 | EM75: .ASCIZ /** MARKING THIS SECTOR BAD/                                |
| 5983 | 045360 | 051101 | 044513 | 043516 |                                                                          |
| 5984 | 045366 | 052040 | 044510 | 020123 |                                                                          |
| 5985 | 045374 | 042523 | 052103 | 051117 |                                                                          |
| 5986 | 045402 | 041040 | 042101 | 000    |                                                                          |
| 5987 | 045407 | 052    | 020052 | 041040 | EM76: .ASCIZ /** BAD DATA VERIFICATION WITH READ. ECC OF LAST RETRY IS:/ |
| 5988 | 045414 | 042101 | 042040 | 052101 |                                                                          |
| 5989 | 045422 | 020101 | 042526 | 044522 |                                                                          |
| 5990 | 045430 | 044506 | 040503 | 044524 |                                                                          |
| 5991 | 045436 | 047117 | 053440 | 052111 |                                                                          |
| 5992 | 045444 | 020110 | 042522 | 042101 |                                                                          |
| 5993 | 045452 | 020056 | 041505 | 020103 |                                                                          |

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|      |        |        |        |        |                                                                      |
|------|--------|--------|--------|--------|----------------------------------------------------------------------|
| 5994 | 045460 | 043117 | 046040 | 051501 |                                                                      |
| 5995 | 045466 | 020124 | 042522 | 051124 |                                                                      |
| 5996 | 045474 | 020131 | 051511 | 000072 |                                                                      |
| 5997 | 045502 | 025052 | 020040 | 042522 | EM77: .ASCIZ /** RETRY SUCCESSFUL/                                   |
| 5998 | 045510 | 051124 | 020131 | 052523 |                                                                      |
| 5999 | 045516 | 041503 | 051505 | 043123 |                                                                      |
| 6000 | 045524 | 046125 | 000    |        |                                                                      |
| 6001 | 045527 | 052    | 020052 | 051040 | EM100: .ASCIZ /** RETRY UNSUCCESSFUL/                                |
| 6002 | 045534 | 052105 | 054522 | 052440 |                                                                      |
| 6003 | 045542 | 051516 | 041525 | 042503 |                                                                      |
| 6004 | 045550 | 051523 | 052506 | 000114 |                                                                      |
| 6005 | 045556 | 025052 | 020040 | 040503 | EM101: .ASCIZ /** CANNOT FIND A VALID HEADER IN TRACK JUST READ/     |
| 6006 | 045564 | 047116 | 052117 | 043040 |                                                                      |
| 6007 | 045572 | 047111 | 020104 | 020101 |                                                                      |
| 6008 | 045600 | 040526 | 044514 | 020104 |                                                                      |
| 6009 | 045606 | 042510 | 042101 | 051105 |                                                                      |
| 6010 | 045614 | 044440 | 020116 | 051124 |                                                                      |
| 6011 | 045622 | 041501 | 020113 | 052512 |                                                                      |
| 6012 | 045630 | 052123 | 051040 | 040505 |                                                                      |
| 6013 | 045636 | 000104 |        |        |                                                                      |
| 6014 | 045640 | 025052 | 020040 | 040502 | EM102: .ASCIZ /** BAD SECTOR ERROR ON SECTOR NOT LISTED BAD/         |
| 6015 | 045646 | 020104 | 042523 | 052103 |                                                                      |
| 6016 | 045654 | 051117 | 042440 | 051122 |                                                                      |
| 6017 | 045662 | 051117 | 047440 | 020116 |                                                                      |
| 6018 | 045670 | 042523 | 052103 | 051117 |                                                                      |
| 6019 | 045676 | 047040 | 052117 | 046040 |                                                                      |
| 6020 | 045704 | 051511 | 042524 | 020104 |                                                                      |
| 6021 | 045712 | 040502 | 000104 |        |                                                                      |
| 6022 | 045716 | 025052 | 053440 | 051117 | EM103: .ASCIZ /** WORD COUNT INCORRECT TO CONTINUE/                  |
| 6023 | 045724 | 020104 | 047503 | 047125 |                                                                      |
| 6024 | 045732 | 020124 | 047111 | 047503 |                                                                      |
| 6025 | 045740 | 051122 | 041505 | 020124 |                                                                      |
| 6026 | 045746 | 047524 | 041440 | 047117 |                                                                      |
| 6027 | 045754 | 044524 | 052516 | 000105 |                                                                      |
| 6028 | 045762 | 025052 | 040503 | 052125 | EM104: .ASCIZ /**CAUTION** DRIVE STATUS REPORTED MAY NOT BE CORRECT/ |
| 6029 | 045770 | 047511 | 025116 | 020052 |                                                                      |
| 6030 | 045776 | 051104 | 053111 | 020105 |                                                                      |
| 6031 | 046004 | 052123 | 052101 | 051525 |                                                                      |
| 6032 | 046012 | 051040 | 050105 | 051117 |                                                                      |
| 6033 | 046020 | 042524 | 020104 | 040515 |                                                                      |
| 6034 | 046026 | 020131 | 047516 | 020124 |                                                                      |
| 6035 | 046034 | 042502 | 041440 | 051117 |                                                                      |
| 6036 | 046042 | 042522 | 052103 | 000    |                                                                      |
| 6037 | 046047 | 105    | 051122 | 051117 | EM105: .ASCII /ERROR IN SECTOR ALREADY MARKED BAD/<15><12>           |
| 6038 | 046054 | 044440 | 020116 | 042523 |                                                                      |
| 6039 | 046062 | 052103 | 051117 | 040440 |                                                                      |
| 6040 | 046070 | 051114 | 040505 | 054504 |                                                                      |
| 6041 | 046076 | 046440 | 051101 | 042513 |                                                                      |
| 6042 | 046104 | 020104 | 040502 | 006504 |                                                                      |
| 6043 | 046112 | 012    |        |        |                                                                      |
| 6044 | 046113 | 123    | 051525 | 042520 | .ASCII /SUSPECT PHYSICAL DAMAGE IN HEADER AREA/<15><12>              |
| 6045 | 046120 | 052103 | 050040 | 054510 |                                                                      |
| 6046 | 046126 | 051523 | 040503 | 020114 |                                                                      |
| 6047 | 046134 | 040504 | 040515 | 042507 |                                                                      |
| 6048 | 046142 | 044440 | 020116 | 042510 |                                                                      |
| 6049 | 046150 | 042101 | 051105 | 040440 |                                                                      |

| Address | Offset | Value  | Label  | Comment |
|---------|--------|--------|--------|---------|
| 6050    | 046156 | 042522 | 006501 | 012     |
| 6051    | 046163 | 106    | 051117 | 040515  |
| 6052    | 046170 | 020124 | 041101 | 051117  |
| 6053    | 046176 | 044524 | 043516 | 000     |
| 6054    | 046203 | 103    | 046517 | 040515  |
| 6055    | 046210 | 042116 | 051440 | 040524  |
| 6056    | 046216 | 052122 | 053040 | 046101  |
| 6057    | 046224 | 042525 | 000123 |         |
| 6058    | 046230 | 045522 | 030466 | 020061  |
| 6059    | 046236 | 042522 | 044507 | 052123  |
| 6060    | 046244 | 051105 | 000123 |         |
| 6061    | 046250 | 042522 | 040515 | 047111  |
| 6062    | 046256 | 047111 | 020107 | 042522  |
| 6063    | 046264 | 044507 | 052123 | 051105  |
| 6064    | 046272 | 020123 | 047516 | 020124  |
| 6065    | 046300 | 040526 | 044514 | 000104  |
| 6066    | 046306 | 044124 | 020105 | 047506  |
| 6067    | 046314 | 046114 | 053517 | 047111  |
| 6068    | 046322 | 020107 | 042522 | 044507  |
| 6069    | 046330 | 052123 | 051105 | 042040  |
| 6070    | 046336 | 052101 | 020101 | 040515  |
| 6071    | 046344 | 020131 | 042502 | 044440  |
| 6072    | 046352 | 041516 | 051117 | 042522  |
| 6073    | 046360 | 052103 | 000    |         |
| 6074    | 046363 | 105    | 051122 | 050040  |
| 6075    | 046370 | 020103 | 042040 | 044522  |
| 6076    | 046376 | 042526 | 020040 | 041440  |
| 6077    | 046404 | 047115 | 020104 | 020040  |
| 6078    | 046412 | 041440 | 046131 | 042116  |
| 6079    | 046420 | 020122 | 052040 | 040522  |
| 6080    | 046426 | 045503 | 020040 | 051440  |
| 6081    | 046434 | 041505 | 047524 | 020122  |
| 6082    | 046442 | 020040 | 042127 | 041440  |
| 6083    | 046450 | 052116 | 020040 | 052502  |
| 6084    | 046456 | 043106 | 051105 | 000     |
| 6085    | 046463 | 122    | 041513 | 030523  |
| 6086    | 046470 | 020040 | 051040 | 041513  |
| 6087    | 046476 | 031123 | 020040 | 051040  |
| 6088    | 046504 | 042113 | 020103 | 020040  |
| 6089    | 046512 | 051040 | 042113 | 020101  |
| 6090    | 046520 | 020040 | 051040 | 053513  |
| 6091    | 046526 | 051103 | 020040 | 045522  |
| 6092    | 046534 | 040502 | 020040 | 020040  |
| 6093    | 046542 | 045522 | 051501 | 043117  |
| 6094    | 046550 | 000    |        |         |
| 6095    | 046551 | 122    | 042113 | 020123  |
| 6096    | 046556 | 020040 | 051040 | 042513  |
| 6097    | 046564 | 000122 |        |         |
| 6098    | 046566 | 030101 | 020060 | 020040  |
| 6099    | 046574 | 020040 | 030102 | 020060  |
| 6100    | 046602 | 020040 | 020040 | 030101  |
| 6101    | 046610 | 020061 | 020040 | 020040  |
| 6102    | 046616 | 030102 | 020061 | 020040  |
| 6103    | 046624 | 020040 | 030101 | 020062  |
| 6104    | 046632 | 020040 | 020040 | 030102  |
| 6105    | 046640 | 020062 | 020040 | 020040  |



|      |        |        |        |        |                                                         |
|------|--------|--------|--------|--------|---------------------------------------------------------|
| 6106 | 046646 | 030101 | 020063 | 020040 |                                                         |
| 6107 | 046654 | 020040 | 030102 | 000063 |                                                         |
| 6108 | 046662 | 042510 | 042101 | 051105 | DH601: .ASCIZ /HEADER SHOULD BE:/                       |
| 6109 | 046670 | 051440 | 047510 | 046125 |                                                         |
| 6110 | 046676 | 020104 | 042502 | 000072 |                                                         |
| 6111 | 046704 | 042510 | 042101 | 051105 | DH602: .ASCIZ /HEADER OF SECTOR 0 THIS CYLINDER IS:/    |
| 6112 | 046712 | 047440 | 020106 | 042523 |                                                         |
| 6113 | 046720 | 052103 | 051117 | 030040 |                                                         |
| 6114 | 046726 | 052040 | 044510 | 020123 |                                                         |
| 6115 | 046734 | 054503 | 044514 | 042116 |                                                         |
| 6116 | 046742 | 051105 | 044440 | 035123 |                                                         |
| 6117 | 046750 | 000    |        |        |                                                         |
| 6118 | 046751 | 123    | 040505 | 041522 | DH603: .ASCIZ /SEARCHING FOR HEADP:/                    |
| 6119 | 046756 | 044510 | 043516 | 043040 |                                                         |
| 6120 | 046764 | 051117 | 044040 | 040505 |                                                         |
| 6121 | 046772 | 042504 | 035122 | 000    |                                                         |
| 6122 | 046777 | 120    | 041501 | 020113 | DH604: .ASCIZ /PACK ADDRESS OF ERROR IS:/               |
| 6123 | 047004 | 042101 | 051104 | 051505 |                                                         |
| 6124 | 047012 | 020123 | 043117 | 042440 |                                                         |
| 6125 | 047020 | 051122 | 051117 | 044440 |                                                         |
| 6126 | 047026 | 035123 | 000    |        |                                                         |
| 6127 | 047031 | 103    | 046131 | 042116 | DH6041: .ASCIZ /CYLNDR TRACK SECTOR/                    |
| 6128 | 047036 | 020122 | 052040 | 040522 |                                                         |
| 6129 | 047044 | 045503 | 020040 | 051440 |                                                         |
| 6130 | 047052 | 041505 | 047524 | 000122 |                                                         |
| 6131 | 047060 | 054503 | 047114 | 051104 | DH6042: .ASCIZ /CYLNDR TRACK/                           |
| 6132 | 047066 | 020040 | 051124 | 041501 |                                                         |
| 6133 | 047074 | 000113 |        |        |                                                         |
| 6134 | 047076 | 041505 | 020103 | 040504 | DH605: .ASCIZ /ECC DATA IS:/                            |
| 6135 | 047104 | 040524 | 044440 | 035123 |                                                         |
| 6136 | 047112 | 000    |        |        |                                                         |
| 6137 | 047113 | 120    | 051517 | 020040 | DH6051: .ASCIZ /POS PAT CORRECTABLE?/                   |
| 6138 | 047120 | 020040 | 050040 | 052101 |                                                         |
| 6139 | 047126 | 020040 | 020040 | 041440 |                                                         |
| 6140 | 047134 | 051117 | 042522 | 052103 |                                                         |
| 6141 | 047142 | 041101 | 042514 | 000077 |                                                         |
| 6142 | 047150 | 047527 | 042122 | 020061 | DH606: .ASCIZ /WORD1 WORD2 WORD3/                       |
| 6143 | 047156 | 020040 | 047527 | 042122 |                                                         |
| 6144 | 047164 | 020062 | 020040 | 047527 |                                                         |
| 6145 | 047172 | 042122 | 000063 |        |                                                         |
| 6146 | 047176 | 047507 | 042117 | 020040 | DH701: .ASCIZ /GOOD BAD WORD NUM/                       |
| 6147 | 047204 | 020040 | 040502 | 020104 |                                                         |
| 6148 | 047212 | 020040 | 020040 | 047527 |                                                         |
| 6149 | 047220 | 042122 | 047040 | 046525 |                                                         |
| 6150 | 047226 | 000    |        |        |                                                         |
| 6151 | 047227 | 102    | 042101 | 044040 | DH607: .ASCIZ /BAD HEADER IS:/                          |
| 6152 | 047234 | 040505 | 042504 | 020122 |                                                         |
| 6153 | 047242 | 051511 | 000072 |        |                                                         |
| 6154 | 047246 | 045522 | 051504 | 020040 | DH204: .ASCIZ /RKDS RKER RKMR2 RKMR3/                   |
| 6155 | 047254 | 020040 | 045522 | 051105 |                                                         |
| 6156 | 047262 | 020040 | 020040 | 045522 |                                                         |
| 6157 | 047270 | 051115 | 020062 | 020040 |                                                         |
| 6158 | 047276 | 045522 | 051115 | 000063 |                                                         |
| 6159 | 047304 | 051105 | 047522 | 020122 | DH502: .ASCIZ /ERROR TRYING TO GET FAILURE INFORMATION/ |
| 6160 | 047312 | 051124 | 044531 | 043516 |                                                         |
| 6161 | 047320 | 052040 | 020117 | 042507 |                                                         |

|      |        |        |        |        |                                                                                     |
|------|--------|--------|--------|--------|-------------------------------------------------------------------------------------|
| 6162 | 047326 | 020124 | 040506 | 046111 |                                                                                     |
| 6163 | 047334 | 051125 | 020105 | 047111 |                                                                                     |
| 6164 | 047342 | 047506 | 046522 | 052101 |                                                                                     |
| 6165 | 047350 | 047511 | 000116 |        |                                                                                     |
| 6166 | 047354 | 042523 | 047503 | 042116 | D4503: .ASCIZ SECOND TIMEOUT OCCURRED GETTING DRIVE STATUS/                         |
| 6167 | 047362 | 052040 | 046511 | 047505 |                                                                                     |
| 6168 | 047370 | 052125 | 047440 | 041503 |                                                                                     |
| 6169 | 047376 | 051125 | 042522 | 020104 |                                                                                     |
| 6170 | 047404 | 042507 | 052124 | 047111 |                                                                                     |
| 6171 | 047412 | 020107 | 051104 | 053111 |                                                                                     |
| 6172 | 047420 | 020105 | 052123 | 052101 |                                                                                     |
| 6173 | 047426 | 051525 | 000    |        |                                                                                     |
| 6174 | 047431 | 116    | 046525 | 042502 | D4800: .ASCIZ /NUMBER OF RETRIES:/                                                  |
| 6175 | 047436 | 020122 | 043117 | 051040 |                                                                                     |
| 6176 | 047444 | 052105 | 044522 | 051505 |                                                                                     |
| 6177 | 047452 | 000072 |        |        |                                                                                     |
| 6178 |        |        |        |        |                                                                                     |
| 6179 | 047454 | 042523 | 052103 | 051117 | D4900: .EVEN .ASCIZ /SECTOR WC SB WC IS/                                            |
| 6180 | 047462 | 020040 | 041527 | 051440 |                                                                                     |
| 6181 | 047470 | 020102 | 020040 | 041527 |                                                                                     |
| 6182 | 047476 | 044440 | 000123 |        |                                                                                     |
| 6183 | 047502 | 001116 | 006340 | 006372 | DT100: .WORD \$ERRPC, DRINUS, ERRCOM, \$REG0, \$REG1, \$REG2, \$REG3, \$REG4        |
| 6184 | 047510 | 001162 | 001164 | 001166 |                                                                                     |
| 6185 | 047516 | 001170 | 001172 |        |                                                                                     |
| 6186 | 047522 | 001174 | 001176 | 001200 | DT201: .WORD \$REG5, \$REG6, \$REG7, \$REG10, \$REG11, \$REG12, \$REG13             |
| 6187 | 047530 | 001202 | 001204 | 001206 |                                                                                     |
| 6188 | 047536 | 001210 |        |        |                                                                                     |
| 6189 | 047540 | 001212 | 001214 |        | DT202: .WORD \$REG14, \$REG15                                                       |
| 6190 | 047544 | 001216 | 001220 | 001222 | DT203: .WORD \$REG16, \$REG17, \$REG20, \$REG21, \$REG22, \$REG23, \$REG24, \$REG25 |
| 6191 | 047552 | 001224 | 001226 | 001230 |                                                                                     |
| 6192 | 047560 | 001232 | 001234 |        |                                                                                     |
| 6193 | 047564 | 001174 | 001176 | 001200 | DT601: .WORD \$REG5, \$REG6, \$REG7                                                 |
| 6194 | 047572 | 001202 | 001204 | 001206 | DT602: .WORD \$REG10, \$REG11, \$REG12                                              |
| 6195 |        |        |        |        |                                                                                     |
| 6196 | 047600 | 000005 |        |        | DF01: .WORD 5 ;NUMBER OF HEADER LINES                                               |
| 6197 | 047602 | 000    |        |        | .BYTE 0 ;NUMBER OF COL FOR FIRST HDR                                                |
| 6198 | 047603 | 000    |        |        | .BYTE 0 ;ALL CHARACTERS OCTAL                                                       |
| 6199 | 047604 | 046363 |        |        | .WORD 04101 ;SECOND HDR LINE                                                        |
| 6200 | 047606 | 010    | 000    |        | .BYTE 10,0 ;NUM OF COL-ALL OCTAL                                                    |
| 6201 | 047610 | 046230 |        |        | .WORD 04200                                                                         |
| 6202 | 047612 | 000    | 000    |        | .BYTE 0,0                                                                           |
| 6203 | 047614 | 046463 |        |        | .WORD 04201                                                                         |
| 6204 | 047616 | 007    | 000    |        | .BYTE 7,0                                                                           |
| 6205 | 047620 | 046250 |        |        | .WORD 04500                                                                         |
| 6206 | 047622 | 000    | 000    |        | .BYTE 0,0                                                                           |
| 6207 |        |        |        |        |                                                                                     |
| 6208 | 047624 | 000006 |        |        | DF02: .WORD 6                                                                       |
| 6209 | 047626 | 000    | 000    |        | .BYTE 0,0                                                                           |
| 6210 | 047630 | 046363 |        |        | .WORD 04101                                                                         |
| 6211 | 047632 | 010    | 000    |        | .BYTE 10,0                                                                          |
| 6212 | 047634 | 046230 |        |        | .WORD 04200                                                                         |
| 6213 | 047636 | 000    | 000    |        | .BYTE 0,0                                                                           |
| 6214 | 047640 | 046463 |        |        | .WORD 04201                                                                         |
| 6215 | 047642 | 007    | 000    |        | .BYTE 7,0                                                                           |
| 6216 | 047644 | 046551 |        |        | .WORD 04202                                                                         |
| 6217 | 047646 | 002    | 000    |        | .BYTE 2,0                                                                           |



|      |        |        |     |             |        |
|------|--------|--------|-----|-------------|--------|
| 6218 | 047650 | 046566 |     | .WORD       | DH203  |
| 6219 | 047652 | 010    | 000 | .BYTE       | 10,0   |
| 6220 |        |        |     |             |        |
| 6221 | 047654 | 000007 |     | DF03: .WORD | 7      |
| 6222 | 047656 | 000    | 000 | .BYTE       | 0,0    |
| 6223 | 047660 | 046363 |     | .WORD       | DH101  |
| 6224 | 047662 | 010    | 000 | .BYTE       | 10,0   |
| 6225 | 047664 | 046230 |     | .WORD       | DH200  |
| 6226 | 047666 | 000    | 000 | .BYTE       | 0,0    |
| 6227 | 047670 | 046463 |     | .WORD       | DH201  |
| 6228 | 047672 | 007    | 000 | .BYTE       | 7,0    |
| 6229 | 047674 | 046306 |     | .WORD       | DH501  |
| 6230 | 047676 | 000    | 000 | .BYTE       | 0,0    |
| 6231 | 047700 | 046551 |     | .WORD       | DH202  |
| 6232 | 047702 | 002    | 000 | .BYTE       | 2,0    |
| 6233 | 047704 | 046566 |     | .WORD       | DH203  |
| 6234 | 047706 | 010    | 000 | .BYTE       | 10,0   |
| 6235 |        |        |     |             |        |
| 6236 | 047710 | 000006 |     | DF05: .WORD | 6      |
| 6237 | 047712 | 000    | 000 | .BYTE       | 0,0    |
| 6238 | 047714 | 046363 |     | .WORD       | DH101  |
| 6239 | 047716 | 010    | 000 | .BYTE       | 10,0   |
| 6240 | 047720 | 046751 |     | .WORD       | DH603  |
| 6241 | 047722 | 000    | 000 | .BYTE       | 0,0    |
| 6242 | 047724 | 047150 |     | .WORD       | DH606  |
| 6243 | 047726 | 003    | 000 | .BYTE       | 3,0    |
| 6244 | 047730 | 046704 |     | .WORD       | DH602  |
| 6245 | 047732 | 000    | 000 | .BYTE       | 0,0    |
| 6246 | 047734 | 047150 |     | .WORD       | DH606  |
| 6247 | 047736 | 003    | 000 | .BYTE       | 3,0    |
| 6248 |        |        |     |             |        |
| 6249 | 047740 | 000006 |     | DF06: .WORD | 6      |
| 6250 | 047742 | 000    | 000 | .BYTE       | 0,0    |
| 6251 | 047744 | 046363 |     | .WORD       | DH101  |
| 6252 | 047746 | 010    | 000 | .BYTE       | 10,0   |
| 6253 | 047750 | 046662 |     | .WORD       | DH601  |
| 6254 | 047752 | 000    | 000 | .BYTE       | 0,0    |
| 6255 | 047754 | 047150 |     | .WORD       | DH606  |
| 6256 | 047756 | 003    | 000 | .BYTE       | 3,0    |
| 6257 |        |        |     | .WORD       | DH607  |
| 6258 | 047760 | 046704 |     | .WORD       | DH602  |
| 6259 | 047762 | 000    | 000 | .BYTE       | 0,0    |
| 6260 | 047764 | 047150 |     | .WORD       | DH606  |
| 6261 | 047766 | 003    | 000 | .BYTE       | 3,0    |
| 6262 |        |        |     |             |        |
| 6263 | 047770 | 000006 |     | DF07: .WORD | 6      |
| 6264 | 047772 | 000    | 000 | .BYTE       | 0,0    |
| 6265 | 047774 | 046363 |     | .WORD       | DH101  |
| 6266 | 047776 | 010    | 000 | .BYTE       | 10,0   |
| 6267 | 050000 | 046777 |     | .WORD       | DH604  |
| 6268 | 050002 | 000    | 000 | .BYTE       | 0,0    |
| 6269 | 050004 | 047031 |     | .WORD       | DH6041 |
| 6270 | 050006 | 003    | 000 | .BYTE       | 3,0    |
| 6271 | 050010 | 047076 |     | .WORD       | DH605  |
| 6272 | 050012 | 000    | 000 | .BYTE       | 0,0    |
| 6273 | 050014 | 047113 |     | .WORD       | DH6051 |

; "THE FOLLOWING REG DATA MB INCORRECT"

; OPERATION INCOMPLETE

; HEADER VRC ERROR

 ; THIS LINE WHEN SPECIFIC HEADER CAN BE READ  
 ; THIS LINE THEN DELETES

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|      |        |        |     |       |       |        |
|------|--------|--------|-----|-------|-------|--------|
| 6274 | 050016 | 003    | 000 |       | .BYTE | 3,0    |
| 6275 |        |        |     |       |       |        |
| 6276 | 050020 | 000004 |     | DF10: | .WORD | 4      |
| 6277 | 050022 | 000    | 000 |       | .BYTE | 0,0    |
| 6278 | 050024 | 046363 |     |       | .WORD | 04101  |
| 6279 | 050026 | 010    | 000 |       | .BYTE | 10,0   |
| 6280 | 050030 | 046777 |     |       | .WORD | 04604  |
| 6281 | 050032 | 000    | 000 |       | .BYTE | 0,0    |
| 6282 | 050034 | 047031 |     |       | .WORD | 046041 |
| 6283 | 050036 | 003    | 000 |       | .BYTE | 3,0    |
| 6284 |        |        |     |       |       |        |
| 6285 | 050040 | 000003 |     | DF11: | .WORD | 3      |
| 6286 | 050042 | 000    | 000 |       | .BYTE | 0,0    |
| 6287 | 050044 | 047031 |     |       | .WORD | 046041 |
| 6288 | 050046 | 003    | 000 |       | .BYTE | 3,0    |
| 6289 | 050050 | 047176 |     |       | .WORD | 04701  |
| 6290 | 050052 | 000    | 000 |       | .BYTE | 0,0    |
| 6291 |        |        |     |       |       |        |
| 6292 | 050054 | 000005 |     | DF12: | .WORD | 5      |
| 6293 | 050056 | 000    | 000 |       | .BYTE | 0,0    |
| 6294 | 050060 | 046363 |     |       | .WORD | 04101  |
| 6295 | 050062 | 010    | 000 |       | .BYTE | 10,0   |
| 6296 | 050064 | 046230 |     |       | .WORD | 04200  |
| 6297 | 050066 | 000    | 000 |       | .BYTE | 0,0    |
| 6298 | 050070 | 046463 |     |       | .WORD | 04201  |
| 6299 | 050072 | 007    | 000 |       | .BYTE | 7,0    |
| 6300 | 050074 | 047246 |     |       | .WORD | 04204  |
| 6301 | 050076 | 004    | 000 |       | .BYTE | 4,0    |
| 6302 |        |        |     |       |       |        |
| 6303 | 050100 | 000005 |     | DF13: | .WORD | 5      |
| 6304 | 050102 | 000    | 000 |       | .BYTE | 0,0    |
| 6305 | 050104 | 046363 |     |       | .WORD | 04101  |
| 6306 | 050106 | 010    | 000 |       | .BYTE | 10,0   |
| 6307 | 050110 | 046662 |     |       | .WORD | 04601  |
| 6308 | 050112 | 000    | 000 |       | .BYTE | 0,0    |
| 6309 | 050114 | 047150 |     |       | .WORD | 04606  |
| 6310 | 050116 | 003    | 000 |       | .BYTE | 3,0    |
| 6311 | 050120 | 047304 |     |       | .WORD | 04502  |
| 6312 | 050122 | 000    | 000 |       | .BYTE | 0,0    |
| 6313 |        |        |     |       |       |        |
| 6314 | 050124 | 000005 |     | DF14: | .WORD | 5      |
| 6315 | 050126 | 000    | 000 |       | .BYTE | 0,0    |
| 6316 | 050130 | 046363 |     |       | .WORD | 04101  |
| 6317 | 050132 | 010    | 000 |       | .BYTE | 10,0   |
| 6318 | 050134 | 046751 |     |       | .WORD | 04603  |
| 6319 | 050136 | 000    | 000 |       | .BYTE | 0,0    |
| 6320 | 050140 | 047150 |     |       | .WORD | 04606  |
| 6321 | 050142 | 003    | 000 |       | .BYTE | 3,0    |
| 6322 | 050144 | 047304 |     |       | .WORD | 04502  |
| 6323 | 050146 | 000    | 000 |       | .BYTE | 0,0    |
| 6324 |        |        |     |       |       |        |
| 6325 | 050150 | 000010 |     | DF15: | .WORD | 10     |
| 6326 | 050152 | 000    | 000 |       | .BYTE | 0,0    |
| 6327 | 050154 | 046363 |     |       | .WORD | 04101  |
| 6328 | 050156 | 010    | 000 |       | .BYTE | 10,0   |
| 6329 | 050160 | 046230 |     |       | .WORD | 04200  |

;FORMAT FOR 2ND LEVEL ERROR  
 ;IN HEADER COMPARE ERROR  
 ;AND 2ND LEVEL HEADER  
 ;VRC ERROR

;FORMAT FOR 2ND LEVEL ERROR  
 ;IN OPERATION INCOMPLETE ERROR

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 DZR6LB.P11 03-AUG-76 00:00 TRAP TABLE

|      |        |        |     |             |        |
|------|--------|--------|-----|-------------|--------|
| 6330 | 050162 | 000    | 000 | .BYTE       | 0,0    |
| 6331 | 050164 | 046463 |     | .WORD       | 04201  |
| 6332 | 050166 | 007    | 000 | .BYTE       | 7,0    |
| 6333 | 050170 | 046551 |     | .WORD       | 04202  |
| 6334 | 050172 | 002    | 000 | .BYTE       | 2,0    |
| 6335 | 050174 | 047354 |     | .WORD       | 04503  |
| 6336 | 050176 | 000    | 000 | .BYTE       | 0,0    |
| 6337 | 050200 | 046306 |     | .WORD       | 04501  |
| 6338 | 050202 | 000    | 000 | .BYTE       | 0,0    |
| 6339 | 050204 | 046566 |     | .WORD       | 04203  |
| 6340 | 050206 | 010    | 000 | .BYTE       | 10,0   |
| 6341 |        |        |     |             |        |
| 6342 | 050210 | 000010 |     | DF16: .WORD | 10     |
| 6343 | 050212 | 000    | 000 | .BYTE       | 0,0    |
| 6344 | 050214 | 046363 |     | .WORD       | 04101  |
| 6345 | 050216 | 010    | 000 | .BYTE       | 10,0   |
| 6346 | 050220 | 046230 |     | .WORD       | 04200  |
| 6347 | 050222 | 000    | 000 | .BYTE       | 0,0    |
| 6348 | 050224 | 046463 |     | .WORD       | 04201  |
| 6349 | 050226 | 007    | 000 | .BYTE       | 7,0    |
| 6350 | 050230 | 046551 |     | .WORD       | 04202  |
| 6351 | 050232 | 002    | 000 | .BYTE       | 2,0    |
| 6352 | 050234 | 047304 |     | .WORD       | 04502  |
| 6353 | 050236 | 000    | 000 | .BYTE       | 0,0    |
| 6354 | 050240 | 046306 |     | .WORD       | 04501  |
| 6355 | 050242 | 000    | 000 | .BYTE       | 0,0    |
| 6356 | 050244 | 046566 |     | .WORD       | 04203  |
| 6357 | 050246 | 010    | 000 | .BYTE       | 10,0   |
| 6358 |        |        |     |             |        |
| 6359 | 050250 | 000004 |     | DF17: .WORD | 4      |
| 6360 | 050252 | 000    | 000 | .BYTE       | 0,0    |
| 6361 | 050254 | 047150 |     | .WORD       | 04606  |
| 6362 | 050256 | 003    | 000 | .BYTE       | 3,0    |
| 6363 | 050260 | 047227 |     | .WORD       | 04607  |
| 6364 | 050262 | 000    | 000 | .BYTE       | 0,0    |
| 6365 | 050264 | 047150 |     | .WORD       | 04606  |
| 6366 | 050266 | 003    | 000 | .BYTE       | 3,0    |
| 6367 |        |        |     |             |        |
| 6368 | 050270 | 000002 |     | DF21: .WORD | 2      |
| 6369 | 050272 | 000    | 000 | .BYTE       | 0,0    |
| 6370 | 050274 | 047113 |     | .WORD       | 046051 |
| 6371 | 050276 | 003    | 000 | .BYTE       | 3,0    |
| 6372 |        |        |     |             |        |
| 6373 | 050300 | 000001 |     | DF23: .WORD | 1      |
| 6374 | 050302 | 001    | 000 | .BYTE       | 1,0    |
| 6375 |        |        |     |             |        |
| 6376 | 050304 | 000001 |     | DF24: .WORD | 1      |
| 6377 | 050306 | 002    | 000 | .BYTE       | 2,0    |
| 6378 |        |        |     |             |        |
| 6379 | 050310 | 000001 |     | DF25: .WORD | 1      |
| 6380 | 050312 | 003    | 000 | .BYTE       | 3,0    |
| 6381 |        |        |     |             |        |
| 6382 | 050314 | 000002 |     | DF26: .WORD | 2      |
| 6383 | 050316 | 000    | 000 | .BYTE       | 0,0    |
| 6384 | 050320 | 047031 |     | .WORD       | 046041 |
| 6385 | 050322 | 003    | 000 | .BYTE       | 3,0    |

F10

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6396

000001

.END

RAJ6 PACK FORMATTER MACY11 27(1006) 03-NOV-76 16:15 PAGE 125  
DZR6LB.P11 03-AUG-76 00:00 CROSS REFERENCE TABLE -- USER SYMBOLS

|                |       |       |       |       |       |       |      |       |       |       |      |      |      |
|----------------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|------|------|------|
| ABORT = 000200 | 1201# | 3385  | 3390  | 3465  | 3490  | 3575  | 3585 | 3590  | 3595  | 3599  | 3607 | 3613 | 3626 |
| ACLO = 000010  | 3556  |       |       |       |       |       |      |       |       |       |      |      |      |
| ALLTRM 027764  | 791#  | 3427  |       |       |       |       |      |       |       |       |      |      |      |
| ALNPAC 014763  | 3466  | 3597  | 3604# |       |       |       |      |       |       |       |      |      |      |
| ANYDER= 100000 | 1804# | 2349  |       |       |       |       |      |       |       |       |      |      |      |
| A.ABNL 002600  | 1206# | 2322  | 2621  | 2645  | 2669  | 2886  | 2952 | 2957  | 3049  | 3075  | 3164 | 3646 | 3896 |
| A.CONT 002602  | 1072# | 2271* | 3361* | 3605* | 3619* | 3621* | 3726 | 3727* | 3751* | 3813* | 4694 |      |      |
| A.NORM 002576  | 1073# | 4704  |       |       |       |       |      |       |       |       |      |      |      |
| BADENT 013711  | 1071# | 2272* | 3362* | 3606* | 3814* | 4698  |      |       |       |       |      |      |      |
| BADSEC= 001000 | 1703# | 2127  | 2139  |       |       |       |      |       |       |       |      |      |      |
| BAD632 014427  | 1203# | 2550  | 2558  | 2677  | 3552  | 3649  |      |       |       |       |      |      |      |
| BAI = 000020   | 1765# | 2327  |       |       |       |       |      |       |       |       |      |      |      |
| BA16 = 000400  | 750#  | 4863  |       |       |       |       |      |       |       |       |      |      |      |
| BA17 = 001000  | 726#  |       |       |       |       |       |      |       |       |       |      |      |      |
| BDSRCK 021476  | 727#  |       |       |       |       |       |      |       |       |       |      |      |      |
| BOSTWT 031452  | 2540# | 2676  | 3551  |       |       |       |      |       |       |       |      |      |      |
| BGNRTY 030144  | 2406  | 3879# |       |       |       |       |      |       |       |       |      |      |      |
| BIT0 = 000001  | 3616  | 3625  | 3644# |       |       |       |      |       |       |       |      |      |      |
| BIT00 = 000001 | 123#  | 723   | 740   | 766   | 788   | 936   | 1080 | 1153  | 2636  | 2876  | 3002 | 3265 | 4978 |
| BIT01 = 000002 | 113#  | 123   |       |       |       |       |      |       |       |       |      |      |      |
| BIT02 = 000004 | 112#  | 122   |       |       |       |       |      |       |       |       |      |      |      |
| BIT03 = 000010 | 111#  | 121   |       |       |       |       |      |       |       |       |      |      |      |
| BIT04 = 000020 | 110#  | 120   |       |       |       |       |      |       |       |       |      |      |      |
| BIT05 = 000040 | 109#  | 119   |       |       |       |       |      |       |       |       |      |      |      |
| BIT06 = 000100 | 108#  | 118   |       |       |       |       |      |       |       |       |      |      |      |
| BIT07 = 000200 | 107#  | 117   |       |       |       |       |      |       |       |       |      |      |      |
| BIT08 = 000400 | 106#  | 116   |       |       |       |       |      |       |       |       |      |      |      |
| BIT09 = 001000 | 105#  | 115   |       |       |       |       |      |       |       |       |      |      |      |
| BIT1 = 000002  | 104#  | 114   | 5288  |       |       |       |      |       |       |       |      |      |      |
| BIT10 = 002000 | 122#  | 741   | 768   | 937   | 1081  | 1154  | 1195 | 3269  |       |       |      |      |      |
|                | 103#  | 728   | 757   | 779   | 814   | 828   | 841  | 856   | 870   | 949   | 1090 | 1204 | 3295 |
|                | 5272  |       |       |       |       |       |      |       |       |       |      |      |      |
| BIT11 = 004000 | 102#  | 729   | 758   | 780   | 799   | 815   | 829  | 842   | 857   | 871   | 950  | 1205 |      |
| BIT12 = 010000 | 101#  | 731   | 759   | 781   | 816   | 830   | 843  | 844   | 858   | 872   | 951  |      |      |
| BIT13 = 020000 | 100#  | 732   | 760   | 782   | 800   | 817   | 831  | 845   | 859   | 873   | 952  | 5279 |      |
| BIT14 = 040000 | 99#   | 733   | 761   | 783   | 801   | 818   | 832  | 846   | 860   | 874   | 953  | 1091 | 2485 |
| BIT15 = 100000 | 98#   | 734   | 735   | 762   | 784   | 802   | 819  | 879   | 954   | 1092  | 1206 | 2467 | 3298 |
| BIT2 = 000004  | 121#  | 742   | 769   | 770   | 790   | 938   | 1082 | 1155  | 1196  | 3273  |      |      |      |
| BIT3 = 000010  | 120#  | 748   | 749   | 771   | 791   | 939   | 1083 | 1156  | 1197  | 3277  |      |      |      |
| BIT4 = 000020  | 119#  | 743   | 750   | 772   | 792   | 793   | 808  | 850   | 864   | 940   | 1084 | 1157 | 1198 |
|                | 3281  |       |       |       |       |       |      |       |       |       |      |      |      |
| BIT5 = 000040  | 118#  | 751   | 752   | 773   | 794   | 809   | 823  | 836   | 851   | 865   | 941  | 1085 | 1158 |
|                | 1199  | 3285  |       |       |       |       |      |       |       |       |      |      |      |







[illegible]



|         |        |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
|---------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|--|--|--|--|
| EM22    | 043302 | 346   | 5787# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM23    | 043336 | 352   | 5792# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM24    | 043401 | 358   | 5798# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM25    | 043425 | 364   | 5802# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM26    | 043454 | 370   | 5806# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM27    | 043500 | 376   | 5810# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM3     | 042550 | 256   | 5723# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM30    | 043535 | 382   | 502   | 5815# |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM31    | 043574 | 388   | 508   | 5821# |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM32    | 043621 | 394   | 5825# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM33    | 043646 | 400   | 5829# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM34    | 043674 | 406   | 5833# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM35    | 043720 | 412   | 5837# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM36    | 043760 | 418   | 5843# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM37    | 044017 | 424   | 5849# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM4     | 042605 | 262   | 5728# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM40    | 044066 | 430   | 5856# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM41    | 044142 | 436   | 5864# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM42    | 044210 | 442   | 5871# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM43    | 044250 | 448   | 5877# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM5     | 042632 | 268   | 5732# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM52    | 044317 | 490   | 5884# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM53    | 044351 | 496   | 5889# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM56    | 044402 | 514   | 520   | 5894# |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM6     | 042660 | 274   | 5736# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM60    | 044430 | 526   | 5898# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM61    | 044476 | 532   | 5905# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM62    | 044550 | 538   | 5912# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM63    | 044576 | 454   | 550   | 5916# |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM64    | 044647 | 460   | 556   | 5923# |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM65    | 044726 | 466   | 562   | 5931# |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM66    | 044760 | 472   | 568   | 5936# |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM67    | 045017 | 478   | 574   | 5942# |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM7     | 042713 | 280   | 5741# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM70    | 045066 | 484   | 580   | 5949# |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM71    | 045150 | 586   | 5958# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM72    | 045214 | 592   | 5964# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM73    | 045267 | 598   | 5972# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM74    | 045327 | 604   | 5978# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM75    | 045353 | 610   | 5982# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM76    | 045407 | 616   | 5987# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| EM77    | 045502 | 622   | 628   | 5997# |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| ERRCNT  | 002654 | 1150# | 2273# | 3166# | 3168  | 3171  | 3173* | 3259* | 3356* | 3651  | 3654  | 3809* |       |       |  |  |  |  |  |  |
| ERRCOM  | 006372 | 1194# | 3314# | 3315# | 3689* | 3690* | 6183  |       |       |       |       |       |       |       |  |  |  |  |  |  |
| ERRFRE  | 025302 | 1071  | 2272  | 3163# | 3606  | 3814  |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| ERRHDL  | 026240 | 1072  | 2271  | 3354# | 3605  | 3621  | 3813  |       |       |       |       |       |       |       |  |  |  |  |  |  |
| ERRLMT  | 002655 | 1151# | 3651  |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| ERRVEC= | 000004 | 126#  | 1932  | 1933* | 1944* | 5605  | 5606  | 5610* | 5611* | 5618* | 5619* |       |       |       |  |  |  |  |  |  |
| ER2ENT  | 026260 | 3358# | 3520  | 3545  | 3628  |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| ETINUS  | 006354 | 1187# | 2001  | 2009  | 2012  | 2146  | 2242  | 2429  |       |       |       |       |       |       |  |  |  |  |  |  |
| E.CCLR= | 000001 | 1080# | 4469  |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| E.CERR= | 001000 | 1089# | 4543  |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| E.CLAT= | 000020 | 1084# | 4195  | 4359  | 4400  | 4424  |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| E.CMT0= | 040000 | 1091# |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| E.CONT  | 002604 | 1074# | 3265  | 3269  | 3273  | 3277  | 3281  | 3285  | 3289  | 3292  | 3295  | 3298  | 3305* | 4094* |  |  |  |  |  |  |
|         |        | 4132* | 4195* | 4205* | 4276* | 4298* | 4321* | 4327* | 4359* | 4400* | 4424* | 4469* | 4521* | 4543* |  |  |  |  |  |  |

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|         |         |       |       |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
|---------|---------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|--|--|--|--|--|
| INVDSE  | 013756  | 1710# | 2022  |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| INVDTK  | 014055  | 1722# | 2026  | 2150  |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| INVDTP  | 014126  | 1730# | 2032  |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| IOTVEC= | 000020  | 131#  |       |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| IR =    | 000100  | 753#  |       |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| IVDCYL  | 016640  | 2004  | 2024# |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| IVDDRV  | 016664  | 2016  | 2030# |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| IVDMOD  | 016700  | 2018  | 2034# |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| IVDOF   | 016716  | 2020  | 2038# |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| IVDTP   | 016672  | 1998  | 2032# |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| IVDTRK  | 016646  | 2010  | 2013  | 2026# |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| I.AERR  | 034114  | 4345  | 4351  | 4369  | 4378# |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| I.ATTN  | 033444  | 4105  | 4149  | 4282# |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| I.CCLR  | 034500  | 4183  | 4233  | 4464# | 4536  | 4896  | 4961  |       |       |      |      |      |      |      |  |  |  |  |  |
| I.CSTS  | 035132  | 4176  | 4611# |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| I.CSTI  | 035154  | 4180  | 4232  | 4615# | 4885  |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| I.DRV   | 002634  | 1127# | 4750  | 4751  |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| I.ERR   | 032666  | 4177  | 4181# |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| I.ERRA  | 032646  | 4176# | 4244  |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| I.ERRC  | 032654  | 4114  | 4167  | 4179# | 4312  |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| I.HDAL  | 033112  | 4160  | 4223# |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| I.INTR  | 032232  | 1948  | 4084# |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| I.ISRL  | 002626  | 1117# | 4098  | 4101* | 4104* | 4475* | 4772* | 4926* | 4999* |      |      |      |      |      |  |  |  |  |  |
| I.ISSU  | 034562  | 4191  | 4261  | 4340  | 4354  | 4396  | 4420  | 4506# | 4655  | 4662 | 4669 | 4676 |      |      |  |  |  |  |  |
| I.IDO   | 032512  | 4102  | 4119  | 4146# |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| I.RTRN  | 034462  | 4096  | 4134  | 4144  | 4172  | 4184  | 4189  | 4192  | 4198  | 4207 | 4216 | 4219 | 4234 | 4236 |  |  |  |  |  |
|         |         | 4262  | 4265  | 4274  | 4278  | 4300  | 4316  | 4323  | 4329  | 4341 | 4355 | 4362 | 4374 | 4394 |  |  |  |  |  |
|         |         | 4397  | 4402  | 4411  | 4414  | 4421  | 4426  | 4435# |       |      |      |      |      |      |  |  |  |  |  |
| I.STAT  | 035236  | 4188  | 4393  | 4652# | 4906  |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| I.STOR  | 035004  | 4516  | 4566# |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| I.UNLD  | 034362  | 4335  | 4418# |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| KIPARO= | ***** U | 5601  |       |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| LEVZER= | 000400  | 1202# | 3302  | 3358  | 3411  | 3502  | 3508  | 3527  | 3533  | 3622 | 3676 | 3749 |      |      |  |  |  |  |  |
| LF =    | 000012  | 37#   | 5131  | 5137  |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| MCLK =  | 000400  | 812#  |       |       |       |       |       |       |       |      |      |      |      |      |  |  |  |  |  |
| MDINUS  | 006344  | 1183# | 2017  | 2036  | 2054  | 2058  | 20    |       |       |      |      |      |      |      |  |  |  |  |  |

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|                 |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| F.BALO= 000010  | 930*  | 2310* | 2336* | 2612* | 2635* | 2638* | 2774* | 2875* | 2878* | 2965* | 3072* | 3323  | 3697  |
| P.BAR = 000024  | 3999* | 484*  | 4940  |       |       |       |       |       |       |       |       |       |       |
| P.BOO = 000042  | 964*  | 3330  | 4387* | 4617* |       |       |       |       |       |       |       |       |       |
| P.BOI = 000046  | 971*  | 3335  | 4342* | 4343  | 4679* | 4887* |       |       |       |       |       |       |       |
| P.BIO = 000052  | 973*  | 3337  | 4658* |       |       |       |       |       |       |       |       |       |       |
| P.BII = 000056  | 975*  | 3339  | 3760  | 4665* |       |       |       |       |       |       |       |       |       |
| P.CMNO= 000001  | 977*  | 3341  | 4263* | 4672* |       |       |       |       |       |       |       |       |       |
|                 | 923*  | 2281* | 2284* | 2286* | 2288* | 2306* | 2313* | 2611* | 2641* | 2662* | 2779* | 2884* | 2945* |
|                 | 2959* | 3047* | 3067* | 3315  | 3618* | 3690  | 3774* | 3795* | 3798* | 3890* | 4158  | 4775  | 4779  |
|                 | 4791  | 4801  | 4807  | 4813  | 4816  | 4822  | 4847  | 4854  | 4873  | 4920  | 4937  | 4959  | 4968  |
| P.CSI = 000016  | 961*  | 3324  | 3417  | 3435  | 3833  | 3863  | 4179* | 4231* | 4269* | 4270* | 4272* | 4273  | 4382* |
|                 | 4384* | 4611* | 4614* | 4765  | 4819* | 4820* | 4822* | 4826* | 4827  | 4851* | 4854* | 4856* | 4857* |
|                 | 4867* | 4868  | 4876* | 4977* | 4879* | 4880  | 4882* | 4883  | 4888  | 4927* | 4928* | 4930* | 4933* |
|                 | 4934  | 4950* | 4951* | 4953* | 4956  | 4975* | 4976  | 4985* | 4986  |       |       |       |       |
| P.CSIH= 000037  | 928*  | 2277* | 2316* | 2352* | 3771* | 3773* | 3780* | 3781* | 3888* | 4269  | 4510  | 4819  | 4956  |
|                 | 4876  | 4927  | 4941  | 4950  |       |       |       |       |       |       |       |       |       |
| P.CS2 = 000020  | 962*  | 3325  | 3382  | 3387  | 3392  | 3394  | 3400  | 3402  | 3442  | 3492  | 3573  | 4185  | 4385* |
|                 | 4615* | 4773* | 4798  | 4863* | 4864  | 4875  | 4894  | 4898  | 4924* | 4925  | 4949  |       |       |
| P.CYLN= 000002  | 924*  | 2307* | 2613* | 2639* | 2664* | 2776* | 2880* | 2946* | 2961* | 3043* | 3068* | 3317  | 3691  |
|                 | 3768* | 3796* | 3891* | 4267  | 4803  | 4845  | 4947  |       |       |       |       |       |       |
| P.DCYL= 000030  | 966*  | 3326  | 3823  | 3852  | 4389* | 4623* |       |       |       |       |       |       |       |
| P.DRYN= 000000  | 922*  | 2276* | 2283* | 4155  | 4332  | 4508  | 4747  |       |       |       |       |       |       |
| P.DS = 000036   | 969*  | 3332  | 3427  | 3431  | 3482  | 4392* | 4619* | 4900  |       |       |       |       |       |
| P.DTS = 000026  | 965*  | 2651  | 2657  | 2890  | 3053  | 3327  | 3549  | 3759  | 3826  | 3827  | 3853  | 3859  | 4388* |
|                 | 4618* |       |       |       |       |       |       |       |       |       |       |       |       |
| P.EPAT= 000062  | 979*  | 3085  | 3570  | 4181* | 4767  |       |       |       |       |       |       |       |       |
| P.EPOS= 000060  | 978*  | 3084  | 3569  | 4182* |       |       |       |       |       |       |       |       |       |
| P.ER = 000034   | 968*  | 3333  | 3381  | 4391* | 4620* |       |       |       |       |       |       |       |       |
| P.OFST= 000006  | 927*  | 3799* | 4809  |       |       |       |       |       |       |       |       |       |       |
| P.PRST= 000014  | 932*  | 2280* | 2610* | 2642* | 2643* | 2667* | 2775* | 2882* | 2883* | 2950* | 2964* | 3045* | 3046* |
|                 | 3073* | 3260  | 3408  | 3582  | 3587  | 3592  | 3596  | 3737  | 3884* | 4027* | 4140* | 4174* | 4202* |
|                 | 4209  | 4213* | 4310* | 4333  | 4337* | 4350* | 4368* | 4378* | 4404  | 4408* | 4418* | 4430* | 4535* |
|                 | 4687* | 4762* | 4799* | 4823* | 4824  | 4849  | 4855* | 4861  | 4865  | 4892  | 4902* | 4910  | 4931  |
|                 | 4954  | 4963  | 4997  |       |       |       |       |       |       |       |       |       |       |
| P.SECT= 000004  | 925*  | 2320* | 2634* | 2666* | 2695* | 2713  | 2873* | 2910* | 2929  | 2948* | 2963* | 3039* | 3070* |
|                 | 3094* | 3102  | 3320  | 3694  | 3767* | 3893* | 4268  | 4804  | 4846  | 4948  |       |       |       |
| P.TRCK= 000005  | 925*  | 2308* | 2619* | 2640* | 2665* | 2777* | 2881* | 2947* | 2962* | 3044* | 3069* | 3318  | 3692  |
|                 | 3892* |       |       |       |       |       |       |       |       |       |       |       |       |
| P.WC = 000012   | 931*  | 2314* | 2315* | 2614* | 2617* | 2618* | 2633* | 2663* | 2725* | 2871* | 2941* | 2949* | 2960* |
|                 | 3041* | 3071* | 3111* | 3322  | 3696  | 3894* | 4844  |       |       |       |       |       |       |
| P.WCR = 000022  | 963*  | 2654  | 2889  | 3052  | 3328  | 4386* | 4616* |       |       |       |       |       |       |
| QNEWSM= ***** U | 682   | 3800  |       |       |       |       |       |       |       |       |       |       |       |
| QUES 006374     | 1208* | 2162  | 2239  |       |       |       |       |       |       |       |       |       |       |
| Q.INIT= 040000  | 953*  |       |       |       |       |       |       |       |       |       |       |       |       |
| RCDSM= 000010   | 1156* | 2056  | 2401  | 2749  |       |       |       |       |       |       |       |       |       |
| RCLREQ= 004000  | 1205* | 3420  | 3425  | 3470  | 3475  | 3480  | 3485  | 3615  |       |       |       |       |       |
| RDALHD= 000164  | 711*  | 2779  | 4158  | 4937  |       |       |       |       |       |       |       |       |       |
| RDBUF 002660    | 1161* | 2089  | 2104  | 2367  | 2774  | 2787  | 2789  | 2798  | 2799  | 2800  | 2801  | 2803  | 2812  |
|                 | 2822  | 2823  | 2824  | 2965  | 3005  |       |       |       |       |       |       |       |       |
| ROCHR = 104407  | 5497  | 5709* |       |       |       |       |       |       |       |       |       |       |       |
| RODATA= 000121  | 700*  | 2313  | 2959  | 3047  | 3067  |       |       |       |       |       |       |       |       |
| ROGATE= 100000  | 819*  |       |       |       |       |       |       |       |       |       |       |       |       |
| ROHDS 023016    | 2746  | 2771* |       |       |       |       |       |       |       |       |       |       |       |
| ROHDO 030700    | 3507  | 3532  | 3757* |       |       |       |       |       |       |       |       |       |       |
| ROHEAD= 000125  | 702*  | 3774  | 4272  | 4953  |       |       |       |       |       |       |       |       |       |
| ROLIN = 104410  | 1956  | 2095  | 2107  | 2176  | 2207  | 5710* |       |       |       |       |       |       |       |

|         |          |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| RDOP    | 024516   | 2751  | 3037* |       |       |       |       |       |       |       |       |       |       |       |
| RDSTAT= | 000141   | 710*  | 2288  | 4873  |       |       |       |       |       |       |       |       |       |       |
| RDY     | = 000200 | 725*  | 3734  | 4830  | 4883  |       |       |       |       |       |       |       |       |       |
| RECAL   | = 000113 | 697*  | 2284  | 3618  | 4816  |       |       |       |       |       |       |       |       |       |
| RECODE  | 006264   | 1191* | 2274* | 2322  | 2550* | 2558* | 2621  | 2645  | 2648  | 2659  | 2669  | 2677  | 2886  | 2894  |
|         |          | 2896  | 2903  | 2952  | 2956  | 2967  | 2969  | 2972  | 2976  | 3049  | 3056  | 3058  | 3075  | 3082  |
|         |          | 3087  | 3164  | 3174* | 3302  | 3357* | 3358  | 3385* | 3390* | 3411  | 3420* | 3425* | 3465* | 3470* |
|         |          | 3475* | 3480* | 3485* | 3490* | 3498* | 3502  | 3508  | 3523* | 3527  | 3533  | 3548* | 3552  | 3555* |
|         |          | 3559* | 3562* | 3575* | 3576* | 3585* | 3590* | 3595* | 3599* | 3607  | 3613* | 3615  | 3622  | 3626* |
|         |          | 3644  | 3646* | 3649  | 3656* | 3676* | 3749* | 3810* | 3896  |       |       |       |       |       |
|         |          | 709*  | 4920  |       |       |       |       |       |       |       |       |       |       |       |
| RELEAS= | 000140   | 3262  | 3312* | 3363  |       |       |       |       |       |       |       |       |       |       |
| REFSUP  | 026060   | 2466  | 2551  | 2578  | 2625  | 2731  | 2836  | 2864  | 2993  | 3017  | 3118  | 3244  | 3342  | 3673  |
| RESREG= | 104412   | 3711  | 3752  | 3783  | 3803  | 3871  | 3912  | 3966  | 5163  | 5712* |       |       |       |       |
|         |          | 127*  |       |       |       |       |       |       |       |       |       |       |       |       |
| RESVEC= | 000010   | 3361  | 3619  | 3675* | 3727  |       |       |       |       |       |       |       |       |       |
| RETANL  | 030310   | 3362  | 3678* |       |       |       |       |       |       |       |       |       |       |       |
| RETNML  | 030326   | 678*  | 3704  | 4168  | 4238  | 4318  | 4573  | 4621  | 4810* | 4835  |       |       |       |       |
| RKASOF= | 000016   | 673*  | 3703  | 4569  | 4617  | 4843* |       |       |       |       |       |       |       |       |
| RKBA    | = 000004 | 1068* | 2278  | 3510  | 3535  | 3610  | 3658  | 3687  | 4021  | 4090  | 4754  |       |       |       |
| RK9AS   | 002570   | 671*  | 2296* | 2303* | 3511* | 3515  | 3536* | 3540  | 3698  | 3718* | 3729  | 3732* | 3733  | 3740  |
| RKCS1   | = 000000 | 4113  | 4165  | 4223  | 4273* | 4282  | 4464* | 4465  | 4474* | 4513* | 4514  | 4538* | 4566  | 4827* |
|         |          | 4829  | 4968* | 4880* | 4882  | 4912* | 4934* | 4956* | 4965* | 4975  | 4985  | 5000* |       |       |
|         |          | 675*  | 3659* | 3699  | 3728* | 3750* | 4091  | 4251  | 4509* | 4567  | 4615  | 4798* | 4864* | 4875* |
|         |          | 4925* | 4949* | 4974* |       |       |       |       |       |       |       |       |       |       |
| RKDA    | = 000006 | 674*  | 3701  | 4268* | 4570  | 4618  | 4804* | 4846* | 4948* |       |       |       |       |       |
| RKDB    | = 000024 | 681*  | 3512  | 3513  | 3514  | 3537  | 3538  | 3539  | 4247  | 4248  | 4249  |       |       |       |
| RKDC    | = 000020 | 679*  | 3700  |       |       |       |       |       |       |       |       |       |       |       |
| RKDCYL= | 000020   | 680*  | 4267* | 4574  | 4623  | 4803* | 4845* | 4947* |       |       |       |       |       |       |
| RKDS    | = 000012 | 676*  | 3611  | 3705  | 4116  | 4571  | 4619  |       |       |       |       |       |       |       |
| RKECPS= | 000030   | 686*  | 4182  | 4578  |       |       |       |       |       |       |       |       |       |       |
| RKECPT= | 000032   | 688*  | 4181  | 4579  |       |       |       |       |       |       |       |       |       |       |
| RKER    | = 000014 | 677*  | 3706  | 4125  | 4291  | 4572  | 4620  |       |       |       |       |       |       |       |
| RKMR1   | = 000022 | 682*  | 3731* | 4259* | 4338* | 4575  | 4652* | 4659* | 4666* | 4673* | 4774* |       |       |       |
| RKMR2   | = 000034 | 683*  | 3743  | 4576  | 4886  |       |       |       |       |       |       |       |       |       |
| RKMR3   | = 000036 | 684*  | 3744  | 4577  | 4887  |       |       |       |       |       |       |       |       |       |
| RKPAT   | = 000032 | 687*  |       |       |       |       |       |       |       |       |       |       |       |       |
| RKPOS   | = 000030 | 685*  |       |       |       |       |       |       |       |       |       |       |       |       |
| RKPRI   | 002574   | 1070* | 4020  | 4744  |       |       |       | </    |       |       |       |       |       |       |



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DZR6LB.P11 03-AUG-76 00:00 CROSS REFERENCE TABLE -- USER SYMBOLS

|                |       |       |       |      |       |      |      |       |      |       |      |      |      |
|----------------|-------|-------|-------|------|-------|------|------|-------|------|-------|------|------|------|
| SEEK = 000117  | 699#  | 2306  | 3795  | 4791 | 4801  |      |      |       |      |       |      |      |      |
| SEINUS 006342  | 1182# | 2043  | 2045* | 2153 | 2693  | 2708 | 2783 | 2814  | 2816 | 2844  | 2901 | 2906 | 2924 |
|                | 3062  | 3092  |       |      |       |      |      |       |      |       |      |      |      |
| SELDIV= 000101 | 692#  | 4930  |       |      |       |      |      |       |      |       |      |      |      |
| SERNUM 014723  | 1798# | 2340  |       |      |       |      |      |       |      |       |      |      |      |
| SETR5 016652   | 2023  | 2025  | 2027# |      |       |      |      |       |      |       |      |      |      |
| SKI = 000002   | 768#  | 3467  |       |      |       |      |      |       |      |       |      |      |      |
| SPACE2 012744  | 1614# | 3222  | 3231  | 3242 | 3936  | 3940 |      |       |      |       |      |      |      |
| SPACE3 016030  | 1904# |       |       |      |       |      |      |       |      |       |      |      |      |
| SPACE4 016023  | 1903# | 3932  |       |      |       |      |      |       |      |       |      |      |      |
| SPAR = 020000  | 732#  | 3417  | 4526  |      |       |      |      |       |      |       |      |      |      |
| SPCLSS= 000020 | 792#  | 3431  |       |      |       |      |      |       |      |       |      |      |      |
| SRHTBS 021334  | 2469  | 2501# | 2542  |      |       |      |      |       |      |       |      |      |      |
| SRTSPL= 000111 | 696#  | 4813  |       |      |       |      |      |       |      |       |      |      |      |
| STACK = 001100 | 31#   | 1920  | 2269  | 2410 | 3815  | 3818 |      |       |      |       |      |      |      |
| STARS 015370   | 1852# | 2346  |       |      |       |      |      |       |      |       |      |      |      |
| START 016100   | 148   | 1913# | 2351  | 2365 | 2376  | 2390 | 2683 | 2730  | 2811 | 3635  | 5338 | 5421 |      |
| STINUS 006352  | 1186# | 2001  | 2028  | 2148 | 2219  | 2431 | 2586 | 2739  |      |       |      |      |      |
| STKLMT= 177774 | 42#   |       |       |      |       |      |      |       |      |       |      |      |      |
| STPARM 016342  | 1959  | 1974# | 2031  | 2033 | 2232  | 2414 |      |       |      |       |      |      |      |
| SUBCLR= 000177 | 713#  | 2281  | 4968  |      |       |      |      |       |      |       |      |      |      |
| SVAL = 100000  | 802#  |       |       |      |       |      |      |       |      |       |      |      |      |
| SMLREQ 014235  | 1743# | 2294  |       |      |       |      |      |       |      |       |      |      |      |
| SWR 001140     | 178#  | 1918  | 1934* | 1936 | 1942* | 2407 | 2411 | 2420  | 2589 | 2595  | 2743 | 2756 | 3028 |
|                | 3187  | 5272  | 5279  | 5284 | 5288  | 5341 | 5380 | 5435* | 5564 | 5577* |      |      |      |
| SWREG 000176   | 146#  | 1942  | 5341  | 5380 | 5403  |      |      |       |      |       |      |      |      |
| SW0 = 000001   | 95#   | 2411  |       |      |       |      |      |       |      |       |      |      |      |
| SW00 = 000001  | 85#   | 95    |       |      |       |      |      |       |      |       |      |      |      |
| SW01 = 000002  | 84#   | 94    |       |      |       |      |      |       |      |       |      |      |      |
| SW02 = 000004  | 83#   | 93    |       |      |       |      |      |       |      |       |      |      |      |
| SW03 = 000010  | 82#   | 92    |       |      |       |      |      |       |      |       |      |      |      |
| SW04 = 000020  | 81#   | 91    |       |      |       |      |      |       |      |       |      |      |      |
| SW05 = 000040  | 80#   | 90    |       |      |       |      |      |       |      |       |      |      |      |
| SW06 = 000100  | 79#   | 89    |       |      |       |      |      |       |      |       |      |      |      |
| SW07 = 000200  | 78#   | 88    |       |      |       |      |      |       |      |       |      |      |      |
| SW08 = 000400  | 77#   | 87    |       |      |       |      |      |       |      |       |      |      |      |
| SW09 = 001000  | 76#   | 86    |       |      |       |      |      |       |      |       |      |      |      |
| SW1 = 000002   | 94#   | 3028  |       |      |       |      |      |       |      |       |      |      |      |
| SW10 = 002000  | 75#   |       |       |      |       |      |      |       |      |       |      |      |      |
| SW11 = 004000  | 74#   |       |       |      |       |      |      |       |      |       |      |      |      |
| SW12 = 010000  | 73#   |       |       |      |       |      |      |       |      |       |      |      |      |
| SW13 = 020000  | 72#   | 3187  |       |      |       |      |      |       |      |       |      |      |      |
| SW14 = 040000  | 71#   | 2420  |       |      |       |      |      |       |      |       |      |      |      |
| SW15 = 100000  | 70#   |       |       |      |       |      |      |       |      |       |      |      |      |
| SW2 = 000004   | 93#   |       |       |      |       |      |      |       |      |       |      |      |      |
| SW3 = 000010   | 92#   |       |       |      |       |      |      |       |      |       |      |      |      |
| SW4 = 000020   | 91#   |       |       |      |       |      |      |       |      |       |      |      |      |
| SW5 = 000040   | 90#   |       |       |      |       |      |      |       |      |       |      |      |      |