RP11-C/RP03

DISK PACK FORMATTER

MD-11-DZRPD-B

EP-DZRPD-B-DL A

OCT 1976

FICHE 1 OF 1

digital

Made in U.S.A.

.REM %

IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-DZRPD-B-D
PRODUCT NAME:	RP11C DISK PACK FORMATTER
DATE CREATED:	JUNE 15, 1973
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	JOE STUBBLEBINE

CONTENTS

1.0 ABSTRACT

THE RP11C FORMATTER CONSISTS OF THREE PARTS. PART 1 FORMATS AN RP03 DISK IN THE NORMAL MANNER AND CHECKS ALL ADDRESSES FOR VALIDITY. PART 2 ALLOWS THE OPERATOR TO REWRITE THE HEADER OF ANY DESIRED SECTOR. PART 3 FORMATS AND VERIFIES THE DISK WITH THE SEQUENCE OF SECTOR ADDRESSES SPECIFIED BY THE OPERATOR.

2.0 REQUIREMENTS

2.1 EQUIPMENT

STANDARD PDP-11 CONFIGURATION
RP11C DISK CONTROLLER
ONE OR MORE RP03 DISK DRIVES

2.2 STORAGE

PROGRAM REQUIRES 4K OF STORAGE

2.3 PRELIMINARY PROGRAMS

DZRPA DISKLESS DIAGNOSTIC
DZRPB RP11C RELIABILITY DIAGNOSTIC

3.0 LOADING PROCEDURE

USE STANDARD PROCEDURE FOR ABS TYPES.

4.0 STARTING PROCEDURE

4.1 CONTROL SWITCH SETTING

SEE SECTION 5.1.1

```
   123                              4.2     STARTING ADDRESS
```

THE PROGRAM MAY BE STARTED AT ONE OF FOUR LOCATIONS

1. STARTING ADDRESS 200 WILL FORMAT THE ENTIRE PACK AND THEN VERIFY THAT THE HEADERS HAVE BEEN WRITTEN CORRECTLY.

2. STARTING ADDRESS 250 WILL ALLOW THE OPERATOR TO SPECIFY A PARTICULAR HEADER TO BE REWRITTEN AND VERIFIED

3. STARTING ADDRESS 300 WILL FORMAT THE ENTIRE PACK USING THE SECTOR ADDRESS SEQUENCE PROVIDED BY THE OPERATOR. AFTER FORMATTING THE PACK IS VERIFIED.

4. STARTING ADDRESS 350 ALLOWS THE OPERATOR TO VERIFY ALL THE HEADERS ON THE PACK.

4.3 PROGRAM AND/OR OPERATOR ACTION

1. LOAD THE PROGRAM INTO MEMORY USING THE ABS LOADER.

2. LOAD DESIRED STARTING ADDRESS

3. SET SWITCHES (SEE SEC 5.1.1)

4. PRESS START

5. WHEN THE PROGRAM IS COMPLETE, IT TYPES OUT "TEST COMPLETE" AND HALTS.

5.0 OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

AFTER LOADING STARTING ADDRESS SELECT THE DESIRED SWITCHES.

5.1.1 SWITCH SETTINGS ARE:

```
SW<15>=1.....HALT ON ERROR
SW<14>  .....NOT USED
SW<13>=1.....INHIBIT PRINTOUT
SW<12>  .....NOT USED
SW<11>  .....NOT USED
SW<10>=1.....BELL ON ERROR
```

5.2 SUBROUTINE ABSTRACTS

5.2.1 TRAPCATCHER

A ".+2" - "HALT" SEQUENCE IS REPEATED FROM 0-776 TO CATCH ANY UNEXPECTED TRAPS. THUS ANY UNEXPECTED TRAPS OR INTERRUPTS WILL HALT AT THE VECTOR +2.

5.2.2 ERROR HANDLER

THIS ROUTINE IS ENTERED UPON DETECTION OF AN ERROR. THE ERROR ADDRESS, PDP-11 STATUS, AND RELEVENT ERROR INFORMATION IS TYPED OUT. RING THE BELL, INHIBIT TYPEOUTS, AND HALT ON ERROR SWITCHES ARE TESTED.

6.0 ERRORS

6.1 ERROR PRINTOUTS

#1 ERROR MESSAGE FORMAT:

```
ERROR AT ADDRESS XXXX  PS= PROCESSOR STATUS
CALLED FROM SUBROUTINE AT YYY
RPCS =   CONTENTS OF RPCS
RPCS =   CONTENTS OF RPCS
RPER =   CONTENTS OF RPER
RPDS =   CONTENTS OF RPDS

XXXX =   THE ADDRESS WHERE THE ERROR WAS
         ENCOUNTERED.
YYY  =   IF THE ERROR WAS ENCOUNTERED IN A
SUBROUTINE, THIS ADDRESS REFERS BACK TO THE
MAINLINE CODE WHICH CALLED THE SUBROUTINE.
```

```
230                                     #2  ERROR AT ADDRESS XXXX PS= PROCESSOR STATUS
231                                         CALLED FROM SUBROUTINE AT YYY
```

```
                    CYLINDER  TRACK   SECTOR
          GOOD =       -        -       -
          BAD  =       -        -       -
```

THIS MESSAGE IS GIVEN IF AN ERROR OCCURS WHILE VERIFYING A HEADER. GOOD EQUALS THE EXPECTED CONTENTS OF THE HEADER AND BAD EQUALS WHAT WAS ACTUALLY FOUND IN THE HEADER.

7.0 RESTRICTIONS

NONE

8.0 MISCELLANEOUS

8.1 EXECUTION TIME

AFTER PERFORMING THE SELECTED TASK, THE PROGRAM WILL TYPE TEST COMPLETE AND HALT.

8.2 STACK POINTER

THE STACK IS INITIALLY SET TO 600.

9.0 PROGRAM DISCRIPTION

9.1 STANDARD FORMATTER

ONCE STARTED THE PROGRAM TYPES:

UNIT

AND WAITS FOR INPUT. RESPOND WITH THE RELEVENT OCTAL NUMBER (0-7) AND TERMINATE WITH A CARRIAGE RETURN.

THE TTY THEN PRINTS:

SET THE FORMAT ENABLE SWITCH.
SET THE RP11C WRITE ENABLE SWITCH.
SET THE SELECTED UNIT WRITE ENABLE SWITCH.

```
   298                                  STRIKE ANY TELETYPE KEY WHEN READY.
```

STRIKING ANY KEY CAUSES THE FORMATTING OPERATION TO BEGIN. WHEN THE DISK HAS BEEN FORMATTED, THE TTY PRINTS:

RESET THE FORMAT ENABLE SWITCH TO NORMAL.
STRIKE ANY TELETYPE KEY WHEN READY.

STRIKING ANY KEY CAUSE THE PROGRAM TO ENTER A READ/COMPARE HEADER SEQUENCE. WHEN COMPLETE THE PROGRAM TYPES TEST COMPLETE.

9.2 SINGLE HEADER FORMATTER

ONCE STARTED, THE PROGRAM QUERIES FOR THE UNIT NUMBER AS IN 9.1. THE PROGRAM THEN PRINTS:

```
CYLINDER     TRACK SECTOR
OLD:
```

AND WAITS FOR INPUT.
TYPE THE PHYSICAL CYLINDER, TRACK, AND SECTOR OF THE DESIRED ADDRESS; TERMINATE THE FIRST TWO WITH A SPACE AND THE LAST WITH A CARRIAGE RETURN.
THE PROGRAM THEN TYPES:

```
NEW
```

AND WAITS FOR INPUT. THE THE DESIRED ADDRESS IN THE SAME SEQUENCE AS ABOVE. THE PROGRAM WILL FIRST REWRITE AND THEN READ THE DESIRED HEADER TO DETERMINE VALIDITY. WHEN FINISHED THE PROGRAM TYPES TEST COMPLETE AND HALTS.

9.3 SPECIAL FORMATTER

ONCE STARTED, THE PROGRAM QUERIES FOR THE UNIT NUMBER AS IN 9.1. THE PROGRAM THEN PRINTS:

INPUT THE SECTOR NUMBERS (0-9) IN THE DESIRED ORDER.

```
0:
```

RESPOND WITH THE FIRST DESIRED SECTOR NUMBER. THE OTHER NINE NUMBERS ARE REQUESTED AND SPECIFIED IN LIKE MANNER. ONCE A SECTOR NUMBER HAS BEEN USED IT CANNOT BE SPECIFIED AGAIN.

AFTER THE LAST PARAMETER HAS BEEN PROCESSED, THE PROGRAM WRITE THE PACK TO THE DESIRED FORMAT AND

```
                                THEN ENTERS A READ/COMPARE HEADER SEQUENCE TO ENSURE
                                THE  VALIDITY OF ALL ADDRESSES.  WHEN THE PROGRAM IS
```

```
                                                                                   PAGE 8


                                       FINISHED IT TYPES TEST COMPLETE AND HALTS.  %

                                :RP11 DISK FORMATTER
                                ;ROBERT J. COLLINS
                                ;JANUARY 29,1971

          177570                SR=177570                ;SWITCH REGISTER
          177776                CC=177776                ;CONDITION CODES
          177560                TKS=177560
          177562                TKB=177562
          177564                TPS=177564
          177566                TPB=177566
          000060                TKV=60
          000064                TPV=64

          000015                CR=15
          000012                LF=12
          000006                SP=%6                    ;STACK POINTER
          000000                R0=%0
          000001                R1=%1
          000002                R2=%2
          000003                R3=%3
          000004                R4=%4
          000005                R5=%5
          000006                R6=%6
          000007                R7=%7
          000007                PC=%7
          000000                XX=HALT
          177776                PS=CC
          000240                NOP=240
          000000                P0=0
          000040                P1=40
          000100                P2=100
          000140                P3=140
          000200                P4=200
          000240                P5=240
          000300                P6=300
          000340                P7=340
          000001                B0=1
          000002                B1=2
          000004                B2=4
          000010                B3=10
          000020                B4=20
          000040                B5=40
          000100                B6=100
          000200                B7=200
          000400                B8=400
          001000                B9=1000
          002000                B10=2000
          004000                B11=4000
          010000                B12=10000
          020000                B13=20000
          040000                B14=40000
```

```
                        100000          B15=100000U
                        104000          ERR=EMT
                        104400          ERM=TRAP
                        000001          GB=B0
                        000002          DD=B1
                        000004          DS=B2
                        000010          ER=B3
                        000020          CS=B4
                        000040          DA=B5
                        000100          HD=B6
                        005726          POP=5726
                        022626          POPPOP=22626

                                        .MACR   ANDI    A,B
                                        BIC     #-A-1,B :MASK A APPLIED TO B
                                        .ENDM


                                        .MACR   PNTM A
                                        MOV     #A,R0           ;PRINT MESSAGE
                                        JSR     PC,TYPOUT       ;POINTED TO BY A
                                        .ENDM

                                        .MACR   PNTOL A
                                        MOV     A,R0            ;PRINT 6 OCTAL
                                        JSR     PC,PNTOCT       ;NUMBERS IN A
                                        .ENDM


                        000000          .=0
                                        .REPT   140
                                        .+2                     ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
                                        HALT
                                        .ENDR
000000  000002  000000                  .+2                     ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000002  000000                          HALT
000004  000006                          .+2                     ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000006  000000                          HALT
000010  000012                          .+2                     ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000012  000000                          HALT
000014  000016                          .+2                     ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000016  000000                          HALT
000020  000022                          .+2                     ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000022  000000                          HALT
000024  000026                          .+2                     ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000026  000000                          HALT
000030  000032                          .+2                     ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000032  000000                          HALT
000034  000036                          .+2                     ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000036  000000                          HALT
000040  000042                          .+2                     ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000042  000000                          HALT
000044  000046                          .+2                     ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000046  000000                          HALT
```

```
000050  000052          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000052  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000054  000056          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000056  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000060  000062          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000062  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000064  000066          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000066  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000070  000072          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000072  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000074  000076          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000076  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000100  000102          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000102  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000104  000106          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000106  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000110  000112          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000112  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000114  000116          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000116  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000120  000122          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000122  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000124  000126          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000126  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000130  000132          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000132  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000134  000136          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000136  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000140  000142          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000142  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000144  000146          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000146  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000150  000152          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000152  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000154  000156          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000156  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000160  000162          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000162  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000164  000166          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000166  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000170  000172          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000172  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000174  000176          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000176  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000200  000202          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000202  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000204  000206          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000206  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000210  000212          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000212  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000214  000216          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000216  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000220  000222          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000222  000000          HALT            ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000224  000226          .+2             ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
000226  000000          HALT
```

```
 515  000230  000232                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 516  000232  000000                HALT
 517  000234  000236                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 518  000236  000000                HALT
 519  000240  000242                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 520  000242  000000                HALT
 521  000244  000246                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 522  000246  000000                HALT
 523  000250  000252                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 524  000252  000000                HALT
 525  000254  000256                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 526  000256  000000                HALT
 527  000260  000262                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 528  000262  000000                HALT
 529  000264  000266                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 530  000266  000000                HALT
 531  000270  000272                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 532  000272  000000                HALT
 533  000274  000276                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 534  000276  000000                HALT
 535  000300  000302                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 536  000302  000000                HALT
 537  000304  000306                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 538  000306  000000                HALT
 539  000310  000312                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 540  000312  000000                HALT
 541  000314  000316                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 542  000316  000000                HALT
 543  000320  000322                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 544  000322  000000                HALT
 545  000324  000326                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 546  000326  000000                HALT
 547  000330  000332                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 548  000332  000000                HALT
 549  000334  000336                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 550  000336  000000                HALT
 551  000340  000342                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 552  000342  000000                HALT
 553  000344  000346                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 554  000346  000000                HALT
 555  000350  000352                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 556  000352  000000                HALT
 557  000354  000356                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 558  000356  000000                HALT
 559  000360  000362                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 560  000362  000000                HALT
 561  000364  000366                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 562  000366  000000                HALT
 563  000370  000372                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 564  000372  000000                HALT
 565  000374  000376                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 566  000376  000000                HALT
 567  000400  000402                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 568  000402  000000                HALT
 569  000404  000406                .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
 570  000406  000000                HALT
```

```
  571  000410  000412                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  572  000412  000000                    HALT
  573  000414  000416                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  574  000416  000000                    HALT
  575  000420  000422                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  576  000422  000000                    HALT
  577  000424  000426                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  578  000426  000000                    HALT
  579  000430  000432                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  580  000432  000000                    HALT
  581  000434  000436                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  582  000436  000000                    HALT
  583  000440  000442                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  584  000442  000000                    HALT
  585  000444  000446                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  586  000446  000000                    HALT
  587  000450  000452                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  588  000452  000000                    HALT
  589  000454  000456                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  590  000456  000000                    HALT
  591  000460  000462                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  592  000462  000000                    HALT
  593  000464  000466                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  594  000466  000000                    HALT
  595  000470  000472                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  596  000472  000000                    HALT
  597  000474  000476                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  598  000476  000000                    HALT
  599  000500  000502                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  600  000502  000000                    HALT
  601  000504  000506                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  602  000506  000000                    HALT
  603  000510  000512                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  604  000512  000000                    HALT
  605  000514  000516                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  606  000516  000000                    HALT
  607  000520  000522                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  608  000522  000000                    HALT
  609  000524  000526                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  610  000526  000000                    HALT
  611  000530  000532                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  612  000532  000000                    HALT
  613  000534  000536                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  614  000536  000000                    HALT
  615  000540  000542                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  616  000542  000000                    HALT
  617  000544  000546                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  618  000546  000000                    HALT
  619  000550  000552                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  620  000552  000000                    HALT
  621  000554  000556                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  622  000556  000000                    HALT
  623  000560  000562                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  624  000562  000000                    HALT
  625  000564  000566                    .+2          ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
  626  000566  000000                    HALT
```

```
   627  000570  000572                    .+2                     ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
   628  000572  000000                    HALT
   629  000574  000576                    .+2                     ;TRAPPED OR INTERRUPTED TO PREVIOUS ADDRESS
   630  000576  000000                    HALT
   631
   632          000030                    .=30
   633  000030  004664                    .WORD   ERROR
   634  000032  000340                    .WORD   340
   635  000034  004664                    .WORD   ERROR
   636  000036  000340                    .WORD   340
   637
   638
   639
   640          000200                    .=200
   641  000200  012707  000600            MOV     #START1,PC
   642          000250                    .=250
   643  000250  012707  001346            MOV     #START2,PC
   644          000300                    .=300
   645  000300  012707  002102            MOV     #START3,PC
   646          000350                    .=350
   647  000350  012707  001014            MOV     #START4,PC
   648          000600                    .=600
   649
```

```
                                        .TITLE  RP11C DISK PACK FORMATTER
                                        .SBTTL  ** STANDARD FORMATTER **

                                        ;THIS ROUTINE WILL FORMAT THE ENTIRE PACK AND THEN VERIFY
                                        ;THE HEADERS WITHIN EACH SECTOR. STARTING ADDRESS IS 200.

000600  012706  000600          START1: MOV     #START1,SP      ;INITIALIZE STACK POINTER
000604  012767  000340  177164          MOV     #P7,CC          ;LOCKOUT OTHER DEVICES
000612  000005                          RESET                   ;CLEAR THE WORLD
000614  004767  002314          IL1:    JSR     PC,UNIQ         ;GET UNIT#
000620                          URDY1:  PNTM    SWMES
000620  012700  004201                  MOV     #SWMES,R0               ;PRINT MESSAGE
000624  004767  006004                  JSR     PC,TYPOUT       ;POINTED TO BY SWMES
000630  004767  003140                  JSR     PC,RIN          ;WAIT FOR KEYBOARD RESPONSE

000634  004767  002474          NS2:    JSR     PC,HOME         ;HOME SEEK
000640  012777  000732  006200          MOV     #RPI,@RPIV      ;RP11 PI VECTO
000646  012777  000340  006174          MOV     #P7,@RPSV       ;RP11 PI STATUS
000654  012777  000001  006120          MOV     #1,@RPWC        ;ALLOW DSH BREAKS
000662  062777  014103  006106          ADD     #14103,@RPCS    ;WRITE ID/15 HEADER (FORMAT, WITH PI ON
000670  112767  000200  177100          MOVB    #P4,PS          ;LOWER CPU PRIORITY
000676  017704  006110          IL2:    MOV     @RPDA,R4        ;SAVE ADDRESS
000702  012767  177770  005776          MOV     #177770,TOG1    ;SETUP TIMEOUT
000710  020477  006076          IL3:    CMP     R4,@RPDA        ;HAS ADDRESS CHANGED?
000714  001370                          BNE     IL2             ;YES - RECYCLE
000716  005367  005764                  DEC     TOG1            ;NO - HAS 100 MSEC. TIMED OUT?
000722  001372                          BNE     IL3             ;NO - KEEP CHECKING
000724  104074                          ERR+DS+CS+ER+DA         ;DISK ADDRESS NOT CHANGING IN TIME
000726  000167  177702                  JMP     NS2             ;TRY AGAIN
000732  004567  005474          RPI:    JSR     R5,SAVDS        ;RP11 PI HANDLER - SAVE R0-5
000736  032777  100000  006032          BIT     #B15,@RPCS      ;ERROR?
000744  001407                          BEQ     PIOK1           ;NO
000746  104034                          ERR+ER+CS+DS            ;ERROR DURING FORMAT GENERATION
000750  004567  005472          RPIX:   JSR     R5,RESTDS       ;RESTORE R0-5
000754  005726                          POP                     ;POP OLD PC
000756  012746  000634                  MOV     #NS2,-(SP)      ;PUSH A NEW PC
000762  000002                          RTI                     ;EXIT
000764  032777  000200  006004  PIOK1:  BIT     #B7,@RPCS       ;DONE?
000772  001002                          BNE     .+6             ;YES
000774  104050                          ERR+CS+ER+CS            ;EXTRANEOUS PI DURING FORMAT PASS
000776  000764                          BR      RPIX            ;TRY AGAIN
001000  004567  005442                  JSR     R5,RESTDS       ;RESTORE R0-5
001004  005726                          POP                     ;POP OLD PC
001006  012746  001034                  MOV     #STR4,-(SP)     ;PUSH A NEW PC
001012  000002                          RTI                     ;EXIT TO PASS 2


001014  012706  000600          START4: MOV     #START1,SP
001020  012767  000340  176750          MOV     #P7,CC
001026  000005                          RESET
001030  004767  002100                  JSR     PC,UNIQ
001034  012767  000340  176734  STR4:   MOV     #P7,PS          ;LOCKOUT PI'S
001042                          PNTM    NSWMES
001042  012700  004423                  MOV     #NSWMES,R0              ;PRINT MESSAGE
001046  004767  005562                  JSR     PC,TYPOUT       ;POINTED TO BY NSWMES
```

```
706  001052  004767  002716                    JSR     PC,RIN          ;WAIT FOR OPERATOR
707  001056  012777  000001  005712  P2L1:     MOV     #1,@RPCS        ;RESET RP11
708  001064  116777  005636  005706            MOVB    UNIT,@RPCS1     ;LOAD UNIT #
709  001072  004767  002236                    JSR     PC,HOME         ;HOME SEEK
710  001076  005067  005630                    CLR     CYL             ;CYL=0
711  001102  016777  005624  005676  P2L2:     MOV     CYL,@RPCA       ;START AT
712  001110  005077  005676                    CLR     @RPDA           ;SAR & TAR = 0
713  001114  112777  000011  005654            MOVB    #11,@RPCS       ;SEEK
714  001122  036777  005602  005636            BIT     ATNB,@RPDS      ;WAIT FOR
715  001130  001774                            BEQ     .-6             ;ATTN.
716  001132  112777  000377  005626            MOVB    #377,@RPDS      ;CLEAR ATTN
717  001140  032777  004000  005620            BIT     #B11,@RPDS      ;DONE?
718  001146  001402                            BEQ     .+6             ;YES
719  001150  104074                            ERR+ER+CS+DS+DA         ;NO- SEEK INCOMPLETE ON PASS2 SEEK
720  001152  000741                            BR      P2L1            ;TRY AGAIN
721  001154  012777  176650  005620            MOV     #-600.,@RPWC    ;READ ONE CYLINDER OF HEADERS INTO
722  001162  012777  007252  005614            MOV     #INBUF,@RPBA    ;BUFFER
723  001170  052777  014000  005600            BIS     #14000,@RPCS    ;10/15 HEADER MODE
724  001176  112777  000005  005572            MOVB    #5,@RPCS        ;READ HEADERS
725  001204  032777  100200  005564            BIT     #B15+B7,@RPCS   ;ERROR OR DONE
726  001212  001774                            BEQ     .-6             ;NOT YET
727  001214  100002                            BPL     P2N1            ;DONE
728  001216  104074                            ERR+ER+DS+CS+DA         ;ERROR ON READ HEADER OP.
729  001220  000730                            BR      P2L2            ;RECYCLE
730
731
732
733  001222  005067  005506          P2N1:     CLR     HED             ;START ADDRESS CHECKING
734  001226  005067  005504                    CLR     SEC             ;INITIALIZE GOOD DATA
735  001232  012704  007252                    MOV     #INBUF,R4       ;POINTER TO DATA READ
736  001236  004767  002222          P2L3:     JSR     PC,CHKAD        ;CHECK DATA
737  001242  000240                            NOP                     ;NO LOOPING
738  001244  005267  005466                    INC     SEC             ;ADVANCE SEC#
739  001250  026727  005462  000011            CMP     SEC,#9.         ;OVFLO?
740  001256  101002                            BHI     .+6             ;YES
741  001260  000167  177752                    JMP     P2L3            ;NO- CHECK NEXT ADDRESS
742  001264  005067  005446                    CLR     SEC
743  001270  005267  005440                    INC     HED             ;ADVANCE HEAD#
744  001274  026727  005434  000023            CMP     HED,#19.        ;OVFLO?
745  001302  101002                            BHI     .+6             ;YES
746  001304  000167  177726                    JMP     P2L3            ;NO- CHECK NEXT ADDRESS
747  001310  005067  005420                    CLR     HED
748  001314  005267  005412                    INC     CYL             ;ADVANCE CYL#
749  001320  026727  005406  000625            CMP     CYL,#405.       ;DONE ALL?
750  001326  101002                            BHI     1$              ;YES
751  001330  000167  177546                    JMP     P2L2            ;NO- READ ANOTHER BLOCK
752  001334                           1$:       PNTM    ENDM1
753  001334  012700  006411                    MOV     #ENDM1,R0               ;PRINT MESSAGE
754  001340  004767  005270                    JSR     PC,TYPOUT       ;POINTED TO BY ENDM1
755  001344  000000                            HALT
756
757
758
```

```
                                        .SBTTL  ** SINGLE HEADER FORMATTER **
                                        ;THIS ROUTINE ALLOWS THE OPERATOR TO SPECIFY A PARTICULAR
                                        ;HEADER TO BE FORMATTED AND THEN VERIFIED. THE STARTING ADDR
                                        ;IS 250.
001346  012706  000600          START2: MOV     #START1,SP      ;SET STACK POINTER
001352  012767  000340  176416          MOV     #P7,CC          ;LOCKOUT PI
001360  000005                          RESET                   ;CLEAR THE WORLD
001362  004767  001546                  JSR     PC,UNIQ         ;GET UNIT
001366                                  PNTM    HDMS
001366  012700  006122                  MOV     #HDMS,R0                ;PRINT MESSAGE
001372  004767  005236                  JSR     PC,TYPOUT       ;POINTED TO BY HDMS
001376                          HL1:    PNTM    OLDMS
001376  012700  006213                  MOV     #OLDMS,R0               ;PRINT MESSAGE
001402  004767  005226                  JSR     PC,TYPOUT       ;POINTED TO BY OLDMS
001406  012705  000625                  MOV     #405.,R5        ;HIGHEST CYLINDER
001412  004767  001644                  JSR     PC,PARIN        ;FETCH PARAMETER
001416  000767                          BR      HL1             ;ERROR RECYCLE
001420  016767  005274  005320          MOV     WORK1,CYLA      ;SAVE VALUE
001426  012705  000023                  MOV     #19.,R5         ;HIGHEST TRACK
001432  004767  001624                  JSR     PC,PARIN        ;FETCH PARAMETER
001436  000757                          BR      HL1             ;ERROR RECYCLE
001440  016767  005254  005302          MOV     WORK1,HEDA      ;SAVE VALUE
001446  004767  002202                  JSR     PC,TTIO         ;FETCH PARAMETER
001452  000751                          BR      HL1             ;ERROR RECYCLE
001454  020027  000011                  CMP     R0,#9.          ;HIGHEST SECTOR
001460  101346                          BHI     HL1             ;TOO BIG
001462  010067  005264                  MOV     R0,SECA         ;SAVE VALUE
001466                          HL2:    PNTM    NEWMS
001466  012700  006226                  MOV     #NEWMS,R0               ;PRINT MESSAGE
001472  004767  005136                  JSR     PC,TYPOUT       ;POINTED TO BY NEWMS
001476  012705  000625                  MOV     #405.,R5        ;HIGHEST CYLINDER
001502  004767  001554                  JSR     PC,PARIN        ;FETCH PARAMETER
001506  000767                          BR      HL2             ;ERROR RECYCLE
001510  016767  005204  005214          MOV     WORK1,CYL       ;SAVE VALUE
001516  012705  000023                  MOV     #19.,R5         ;HIGHEST TRACK
001522  004767  001534                  JSR     PC,PARIN        ;FETCH PARAMETER
001526  000757                          BR      HL2             ;ERROR RECYCLE
001530  016767  005164  005176          MOV     WORK1,HED       ;SAVE VALUE
001536  004767  002112                  JSR     PC,TTIO         ;FETCH PARAMETER
001542  000751                          BR      HL2             ;ERROR RECYCLE
001544  020027  000011                  CMP     R0,#9.          ;HIGHEST SECTOR
001550  101346                          BHI     HL2             ;TOO BIG
001552  010067  005160                  MOV     R0,SEC          ;SAVE VALUE
001556  005067  005470          HGO:    CLR     INBUF           ;HWRD1=0
001562  016767  005150  005466          MOV     SEC,INBUF+4     ;HWRD3=SECTOR
001570  016767  005136  005456          MOV     CYL,INBUF+2
001576  006167  005452                  ROL     INBUF+2
001602  006167  005446                  ROL     INBUF+2
001606  006167  005442                  ROL     INBUF+2
001612  006167  005436                  ROL     INBUF+2
001616  006167  005432                  ROL     INBUF+2
```

```
  815  001622  006167  005426                    ROL     INBUF+2
  816  001626  006167  005102                    ROL     HED
  817  001632  056767  005076  005414            BIS     HED,INBUF+2
  818  001640  006067  005070                    ROR     HED
  819  001644  042767  100001  005402            BIC     #100001,INBUF+2
  820  001652  004767  001456          HGL1:     JSR     PC,HOME         ;HOME SEEK
  821  001656  012777  177775  005116            MOV     #-3,@RPWC       ;WORD COUNT
  822  001664  012777  007252  005112            MOV     #INBUF,@RPBA    ;BUFFER ADDRESS
  823  001672  052777  014000  005076            BIS     #14000,@RPCS    ;10/15 MODE HEADER OP
  824  001700  016777  005042  005100            MOV     CYLA,@RPCA      ;LOAD CYLINDER
  825  001706  116777  005036  005100            MOVB    HEDA,@RPDA1     ;TRACK,
  826  001714  116777  005032  005070            MOVB    SECA,@RPDA      ;AND SECTOR TO BE CHANGED
  827  001722  112777  000003  005046            MOVB    #3,@RPCS        ;REWRITE IT
  828  001730  032777  100200  005040            BIT     #B15+B7,@RPCS   ;ERROR OR DONE?
  829  001736  001774                            BEQ     .-6             ;NOT YET
  830  001740  100002                            BPL     HG01            ;DONE
  831  001742  104074                            ERR+ER+DS+CS+DA         ;ERROR ON WRITE HEADER OP
  832  001744  000742                            BR      HGL1            ;TRY AGAIN
  833  001746  005067  005300          HG01:     CLR     INBUF           ;DESTROY
  834  001752  005067  005276                    CLR     INBUF+2         ;OLD
  835  001756  005067  005274                    CLR     INBUF+4         ;DATA
  836  001762  004767  001346          HGL2:     JSR     PC,HOME         ;HOME SEEK
  837  001766  012777  177775  005006            MOV     #-3,@RPWC       ;WORD COUNT
  838  001774  012777  007252  005002            MOV     #INBUF,@RPBA    ;BUFFER
  839  002002  016777  004740  004776            MOV     CYLA,@RPCA      ;DISK
  840  002010  116777  004734  004776            MOVB    HEDA,@RPDA1     ;ADDRESS
  841  002016  116777  004730  004766            MOVB    SECA,@RPDA      ;TO BE FOUND
  842  002024  052777  014000  004744            BIS     #14000,@RPCS    ;10/15 MODE HEADER OP
  843  002032  112777  000005  004736            MOVB    #5,@RPCS        ;READ
  844  002040  032777  100200  004730            BIT     #B15+B7,@RPCS   ;ERROR OR DONE?
  845  002046  001774                            BEQ     .-6             ;NOT YET
  846  002050  100002                            BPL     HG02            ;DONE
  847  002052  104074                            ERR+ER+DS+CS+DA         ;ERROR ON READING NEW HEADER
  848  002054  000742                            BR      HGL2            ;TRY AGAIN
  849  002056  012704  007252          HG02:     MOV     #INBUF,R4       ;R4=DATA POINTER
  850  002062  004767  001376                    JSR     PC,CHKAD        ;CHECK REWRITTEN HEADER
  851  002066  000735                            BR      HGL2            ;ERROR - TRY AGAIN
  852  002070                                     PNTM    ENDM1
  853  002070  012700  006411                    MOV     #ENDM1,R0               ;PRINT MESSAGE
  854  002074  004767  004534                    JSR     PC,TYPOUT       ;POINTED TO BY ENDM1
  855  002100  000000                            HALT
  856
  857
  858
  859
  860
```

```
                                        .SBTTL  ** SPECIAL FORMATTER **
                                        ;THIS ROUTINE WILL FORMAT THE ENTIRE PACK USING THE SECTOR
                                        ;ADDRESS SEQUENCE SPECIFIED BY THE OPERATOR. THE STARTING
                                        ;ADDRESS IS 300.
002102  012706  000600          START3: MOV     #START1,SP      ;SET STACK
002106  012767  000340  175652          MOV     #P7,CC          ;LOCKOUT PI
002114  000005                          RESET                   ;CLEAR
002116  004767  001012                  JSR     PC,UNIQ         ;GET UNIT#
002122                          SFSL1:  PNTM    SECMES
002122  012700  004031                  MOV     #SECMES,R0              ;PRINT MESSAGE
002126  004767  004502                  JSR     PC,TYPOUT       ;POINTED TO BY SECMES
002132  004767  000452                  JSR     PC,CLRS         ;CLEAR FLAG STRING
002136  012767  177766  004542          MOV     #-10.,TOG1      ;DO BELOW 10 TIMES
002144  012705  003052                  MOV     #NSTR,R5        ;POINTER TO MESSAGE POINTERS
002150  012704  003076                  MOV     #SCSLT,R4
002154  012500                  SFSL2:  MOV     (R5)+,R0        ;FETCH POINTER
002156  004767  004452                  JSR     PC,TYPOUT       ;FOR MESSAGE
002162  004767  000442                  JSR     PC,SIN          ;GET PARAMETER
002166  000755                          BR      SFSL1           ;ERROR
002170  005267  004512                  INC     TOG1            ;DONE?
002174  001367                          BNE     SFSL2           ;NOT YET
002176  004767  000476          SFSL3:  JSR     PC,MKBUF        ;GENERATE A TABLE OF ADDRESSES
002202  116777  004520  004570          MOVB    UNIT,@RPCS1     ;RESET
002210  004767  001120                  JSR     PC,HOME         ;SELECTED UNIT
002214  005067  004512                  CLR     CYL             ;START AT CYL=0
002220  016777  004506  004560  SFSL4:  MOV     CYL,@RPCA       ;LOAD
002226  005077  004560                  CLR     @RPDA           ;DISK ADDRESS
002232  004767  000540                  JSR     PC,SEKE         ;SEEK
002236  000757                          BR      SFSL3           ;ERROR RETURN
002240  012777  176650  004534          MOV     #-600.,@RPWC    ;GOOD RETURN
002246  012777  011552  004530          MOV     #OUTBUF,@RPBA   ;WC&CA
002254  052777  014000  004514          BIS     #14000,@RPCS    ;10/15 HEADER MODE
002262  112777  000003  004506          MOVB    #3,@RPCS        ;WRITE
002270  032777  100200  004500          BIT     #B15+B7,@RPCS   ;ERROR OR DONE
002276  001774                          BEQ     .-6             ;WAIT
002300  100002                          BPL     SFSN1           ;DONE
002302  104074                          ERR+ER+DS+CS+DA         ;ERROR ON WRITE HEADER OP
002304  000745                          BR      SFSL4           ;REPEAT
002306  012767  177470  004372  SFSN1:  MOV     #-200.,TOG1
002314  012705  011554                  MOV     #OUTBUF+2,R5
002320  062715  000100          SFSL5:  ADD     #100,(R5)       ;ADVANCE CYLINDER ADDRESS
002324  062705  000006                  ADD     #6,R5           ;INDEX
002330  005267  004352                  INC     TOG1            ;DONE?
002334  001371                          BNE     SFSL5           ;NO
002336  005267  004370                  INC     CYL             ;ADVANCE CYLINDER
002342  026727  004364  000625          CMP     CYL,#405.       ;DONE?
002350  101001                          BHI     SFCHK           ;YES
002352  000722                          BR      SFSL4           ;NO
002354  012767  000340  175414  SFCHK:  MOV     #P7,PS          ;LOCKOUT PI
002362  116777  004340  004410          MOVB    UNIT,@RPCS1     ;SET UNIT
002370  004767  000740                  JSR     PC,HOME         ;HOME SEEK
002374  005067  004332                  CLR     CYL             ;CYL=0
002400  016777  004326  004400  SFCL1:  MOV     CYL,@RPCA       ;TAR=0
002406  005077  004400                  CLR     @RPDA           ;SAR=0
```

```
   917  002412  004767  000360                    JSR     PC,SEKE         ;SEEK
   918  002416  000756                            BR      SFCHK           ;ERROR RETURN
   919  002420  012777  176650  004354            MOV     #-600.,@RPWC    ;WC
   920  002426  012777  007252  004350            MOV     #INBUF,@RPBA    ;CA
   921
   922  002434  052777  014000  004334            BIS     #14000,@RPCS    ;10/15 HEADER OP
   923  002442  112777  000005  004326            MOVB    #5,@RPCS                ;READ
   924  002450  032777  100200  004320            BIT     #B15+B7,@RPCS   ;ERROR OR DONE?
   925  002456  001774                            BEQ     .-6             ;NOT YET
   926  002460  100002                            BPL     SFCN1           ;JUMP IF DONE
   927  002462  104074                            ERR+ER+DS+CS+DA         ;READ HEADER ERROR
   928  002464  000745                            BR      SFCL1           ;LOOP
   929  002466  012705  003076          SFCN1:    MOV     #SCSLT,R5       ;SETUP SECTOR LIST AND
   930  002472  012767  177766  004206            MOV     #-10.,TOG1      ;COUNTER
   931  002500  005067  004230                    CLR     HED             ;SETUP GOOD DATA
   932  002504  012704  007252                    MOV     #INBUF,R4       ;SETUP BUFFER POINTER
   933  002510  012567  004222          SFCL2:    MOV     (R5)+,SEC       ;FETCH A SECTOR
   934  002514  004767  000744                    JSR     PC,CHKAD        ;CHECK ADDRESS
   935  002520  000240                            NOP                     ;NO LOOPING
   936  002522  005267  004160                    INC     TOG1            ;DONE ONE SURFACE?
   937  002526  001370                            BNE     SFCL2           ;NO
   938  002530  012705  003076                    MOV     #SCSLT,R5       ;YES - RESET
   939  002534  012767  177766  004144            MOV     #-10.,TOG1      ;SECTOR PARAMETERS
   940  002542  005267  004166                    INC     HED             ;ADVANCE TRACK
   941  002546  026727  004162  000023            CMP     HED,#19.        ;DONE?
   942  002554  101755                            BLOS    SFCL2           ;NO
   943  002556  005067  004152                    CLR     HED             ;YES - RESET HEAD
   944  002562  005267  004144                    INC     CYL             ;ADVANCE CYLINDER
   945  002566  026727  004140  000625            CMP     CYL,#405.       ;DONE?
   946  002574  101701                            BLOS    SFCL1           ;NOT YET
   947  002576                                    PNTM    ENDM1
   948  002576  012700  006411                    MOV     #ENDM1,R0               ;PRINT MESSAGE
   949  002602  004767  004026                    JSR     PC,TYPOUT       ;POINTED TO BY ENDM1
   950  002606  000000                            HALT
   951  002610  012705  177742          CLRS:     MOV     #-30.,R5        ;CLEAR
   952  002614  012704  003076                    MOV     #SCSLT,R4       ;THE SECTOR
   953  002620  105024                  CLRS1:    CLRB    (R4)+           ;SLOTS AND
   954  002622  005205                            INC     R5              ;FLAG POINTERS
   955  002624  001375                            BNE     CLRS1           ;EXIT
   956  002626  000207                            RTS     PC              ;WHEN DONE
   957  002630  004767  001140          SIN:      JSR     PC,RIN          ;ASSEMBLE
   958  002634  004767  003662                    JSR     PC,TTO          ;ECHO
   959  002640  162700  000260                    SUB     #260,R0         ;A LIST OF
   960  002644  020027  000011                    CMP     R0,#9.          ;LOGICAL SECTOR
   961  002650  101012                            BHI     SIN1            ;NUMBERS
   962  002652  005700                            TST     R0              ;TOO SMALL?
   963  002654  100410                            BMI     SIN1            ;0-9 ARE LEGAL
   964  002656  105760  003122                    TSTB    SCFLG(R0)       ;HAS THIS NUMBER BEEN USED?
   965  002662  001005                            BNE     SIN1            ;ERROR - THIS NUMBER ALREADY USED
   966  002664  105160  003122                    COMB    SCFLG(R0)       ;SET FLAG
   967  002670  010024                            MOV     R0,(R4)+        ;STORE SEC#
   968  002672  062716  000002                    ADD     #2,(SP)         ;ADVANCE RETURN
   969  002676  000207                  SIN1:     RTS     PC              ;AND EXIT
   970  002700  012767  177754  004000  MKBUF:    MOV     #-20.,TOG1      ;TOG1=COUNTER
   971  002706  012705  011552                    MOV     #OUTBUF,R5      ;R5=POINTER TO BUFFER
   972  002712  012704  003076                    MOV     #SCSLT,R4       ;R4=POINTER TO SECTOR LIST
```

```
  973  002716  012767  177766  003764          MOV     #-10.,TOG2      ;TOG2=SECTOR COUNT
  974  002724  005067  003766                  CLR     WORK
  975  002730  005025                  MKBL1:  CLR     (R5)+           ;WORD1=0
  976  002732  016725  003760                  MOV     WORK,(R5)+      ;WORK2=CYL+HEAD
  977  002736  012425                          MOV     (R4)+,(R5)+     ;WORD3=SECTOR
  978  002740  005267  003744                  INC     TOG2            ;DONE 10?
  979  002744  001371                          BNE     MKBL1           ;NO
  980
  981  002746  012704  003076                  MOV     #SCSLT,R4       ;YES - UPDATE POINTER,
  982  002752  012767  177766  003730          MOV     #-10.,TOG2      ;COUNTER,
  983  002760  062767  000002  003730          ADD     #2,WORK         ;AND TRACK
  984  002766  005267  003714                  INC     TOG1            ;FINISHED?
  985  002772  001356                          BNE     MKBL1           ;NO
  986  002774  000207                          RTS     PC              ;EXIT
  987  002776  112777  000377  003762  SEKE:   MOVB    #377,@RPDS      ;CLEAR ATTN
  988  003004  112777  000011  003764          MOVB    #11,@RPCS       ;SEEK
  989  003012  036777  003712  003746          BIT     ATTNB,@RPDS     ;WAIT FOR
  990  003020  001774                          BEQ     .-6             ;ATTN
  991  003022  112777  000377  003736          MOVB    #377,@RPDS      ;CLEAR ATTN
  992  003030  032777  004000  003730          BIT     #B11,@RPDS      ;DONE?
  993  003036  001402                          BEQ     .+6
  994  003040  104474                          ERM+ER+CS+DS+DA         ;SEEK INCOMPLETE
  995  003042  000207                          RTS     PC              ;ERROR EXIT
  996  003044  062716  000002                  ADD     #2,(SP)         ;GOOD
  997  003050  000207                          RTS     PC              ;EXIT
  998  003052  004117                  NSTR:   N0
  999  003054  004124                          N1
 1000  003056  004131                          N2
 1001  003060  004136                          N3
 1002  003062  004143                          N4
 1003  003064  004150                          N5
 1004  003066  004155                          N6
 1005  003070  004162                          N7
 1006  003072  004167                          N8
 1007  003074  004174                          N9
 1008  003076                          SCSLT:  .REPT   12
 1009                                          .WORD   0
 1010                                          .ENDR
 1011  003076  000000                          .WORD   0
 1012  003100  000000                          .WORD   0
 1013  003102  000000                          .WORD   0
 1014  003104  000000                          .WORD   0
 1015  003106  000000                          .WORD   0
 1016  003110  000000                          .WORD   0
 1017  003112  000000                          .WORD   0
 1018  003114  000000                          .WORD   0
 1019  003116  000000                          .WORD   0
 1020  003120  000000                          .WORD   0
 1021
 1022  003122                          SCFLG:  .REPT   12
 1023                                          .BYTE   0
 1024                                          .ENDR
 1025  003122      000                         .BYTE   0
 1026  003123      000                         .BYTE   0
 1027  003124      000                         .BYTE   0
 1028  003125      000                         .BYTE   0
```

```
 1029  003126  000          .BYTE   0
 1030  003127  000          .BYTE   0
 1031  003130  000          .BYTE   0
 1032  003131  000          .BYTE   0
 1033  003132  000          .BYTE   0
 1034  003133  000          .BYTE   0
 1035
 1036
 1037
 1038  003134               UNIQ:   PNTM    UMES
 1039  003134  012700 004020         MOV     #UMES,R0                ;PRINT MESSAGE
 1040  003140  004767 003470         JSR     PC,TYPOUT       ;POINTED TO BY UMES
 1041  003144  004767 000504         JSR     PC,TTIO         ;READ UNIT #
 1042  003150  000771               BR      UNIQ            ;ERROR RECYCLE
 1043  003152  020027 000007         CMP     R0,#7           ;TOO BIG
 1044  003156  101366               BHI     UNIQ            ;YES
 1045  003160  010067 003542         MOV     R0,UNIT         ;SAVE IT
 1046  003164  012700 000001         MOV     #1,R0           ;DETERMINE ATTENTION BIT
 1047  003170  005767 003532         TST     UNIT            ;NO  ROTATION
 1048  003174  001406               BEQ     UNS1            ;IF 0
 1049  003176  016767 003524 000004 MOV     UNIT,DS1        ;NUMBER OF ROTATES
 1050  003204  004767 001426         JSR     PC,RTL          ;TO DETERMINE ATTENTION BIT
 1051  003210  000001               DS1:    .WORD   1       ;IS PUT HERE
 1052  003212  010067 003512         UNS1:   MOV     R0,ATNB         ;SAVE BIT
 1053  003216  116777 003504 003554 MOVB    UNIT,@RPCS1     ;SELECT UNIT
 1054  003224  032777 100000 003534 BIT     #B15,@RPDS      ;IS IT READY?
 1055  003232  001401               BEQ     .+4             ;NO
 1056  003234  000207               RTS     PC              ;YES - EXIT
 1057  003236  104434               ERM+DS+ER+CS            ;SELECTED UNIT READY NOT UP
 1058  003240  000766               BR      UNS1+4          ;LOOP UNTIL FIXED
 1059  003242               SPACE:  PNTM    S1
 1060  003242  012700 006160         MOV     #S1,R0          ;PRINT MESSAGE
 1061  003246  004767 003362         JSR     PC,TYPOUT       ;POINTED TO BY S1
 1062  003252  005367 003476         DEC     TTG             ;PRINT NUMBER OF SPACES
 1063  003256  001371               BNE     SPACE           ;IN TTG. THEN
 1064  003260  000207               RTS     PC              ;EXIT
 1065  003262  004767 000356 PARIN:  JSR     PC,TTIO         ;READ SOME NUMBERS
 1066  003266  000401               BR      .+4             ;THIS IS NOW THE GOOD RETURN
 1067  003270  000207               RTS     PC              ;CR IS ILLEGAL FOR THIS SEQUENCE
 1068  003272  020027 000240         CMP     R0,#240         ;IS IT A SPACE?
 1069  003276  001015               BNE     PRX             ;NO - EXIT
 1070  003300  026705 003414         CMP     WORK1,R5        ;TOO BIG?
 1071  003304  101012               BHI     PRX             ;YES - EXIT
 1072  003306  005267 003442         INC     TTG             ;TTG=# OF SPACES
 1073  003312  026727 003436 000005 CMP     TTG,#5          ;TOO MANY
 1074  003320  101004               BHI     PRX             ;YES
 1075  003322  004767 177714         JSR     PC,SPACE        ;JUSTIFY NEXT ENTRY
 1076  003326  062716 000002         ADD     #2,(SP)         ;SKIP FOR GOOD RETURN
 1077  003332  000207               PRX:    RTS     PC              ;EXIT
 1078
 1079  003334  112777 000377 003424 HOME:   MOVB    #377,@RPDS      ;CLEAR ATTN BITS
 1080  003342  112777 000015 003426 MOVB    #15,@RPCS       ;HOME SEEK
 1081  003350  012767 000005 003670 MOV     #5,DEBUG+174    ;WAIT FOR
 1082  003356  005367 003664         WWW:    DEC     DEBUG+174       ;SEEK TO
 1083  003362  001375               BNE     WWW             ;START
 1084  003364  032777 002000 003374 BIT     #B10,@RPDS      ;IS SEEK UNDERWAY?
```

```
 1085  003372  001002                          BNE     .+6             ;YES
 1086  003374  104434                          ERM+ER+DS+CS            ;SEEK NOT UNDERWAY
 1087  003376  000756                          BR      HOME            ;FIX IT
 1088  003400  036777  003324  003360          BIT     ATNB,@RPDS      ;WAIT FOR
 1089  003406  001774                          BEQ     .-6             ;ATTENTION TO SET
 1090  003410  032777  004000  003350          BIT     #B11,@RPDS      ;SEEK INCOMPLETE?
 1091  003416  001402                          BEQ     .+6             ;NO
 1092  003420  104434                          ERM+ER+DS+CS            ;DEVICE STATUS ERROR
 1093  003422  000744                          BR      HOME            ;LOOP
 1094  003424  132777  000023  003336          BITB    #23,@RPDS1      ;ANY ERRORS?
 1095  003432  001402                          BEQ     .+6             ;NO
 1096  003434  104434                          ERM+ER+CS+DS            ;DEVICE STATUS ERROR
 1097  003436  000736                          BR      HOME            ;LOOP
 1098  003440  112777  000001  003330          MOVB    #1,@RPCS        ;RESET THE RP11
 1099  003446  112777  000377  003312          MOVB    #377,@RPDS      ;CLEAR ATTN BITS
 1100  003454  116777  003246  003316          MOVB    UNIT,@RPCS1     ;RELOAD UNIT#
 1101  003462  000207                          RTS     PC              ;EXIT
 1102  003464  062704  000002          CHKAD:  ADD     #2,R4           ;SKIP 1ST WORD
 1103  003470  012467  003246                  MOV     (R4)+,HEDR      ;FETCH HEAD AND
 1104  003474  013767  003242  003236          MOV     HEDR,CYLR       ;CYLINDER READ
 1105  003502  006067  003234                  ROR     HEDR            ;JUSTIFY HEAD
 1106  003506  006067  003226                  ROR     CYLR
 1107  003512  006067  003222                  ROR     CYLR
 1108  003516  006067  003216                  ROR     CYLR
 1109  003522  006067  003212                  ROR     CYLR
 1110  003526  006067  003206                  ROR     CYLR
 1111  003532  006067  003202                  ROR     CYLR
 1112  003536  012467  003202                  MOV     (R4)+,SECR      ;FETCH SECTOR READ
 1113  003542                                  ANDI    17,SECR
 1114  003542  042767  177760  003174          BIC     #-17-1,SECR     ;MASK 17 APPLIED TO SECR
 1115  003550                                  ANDI    37,HEDR
 1116  003550  042767  177740  003164          BIC     #-37-1,HEDR     ;MASK 37 APPLIED TO HEDR
 1117  003556                                  ANDI    777,CYLR
 1118  003556  042767  177000  003154          BIC     #-777-1,CYLR    ;MASK 777 APPLIED TO CYLR
 1119  003564  026767  003142  003146          CMP     CYL,CYLR        ;IS CYL# OK?
 1120  003572  001013                          BNE     CMER            ;NO
 1121  003574  026767  003134  003140          CMP     HED,HEDR        ;IS TRACK# OK
 1122  003602  001007                          BNE     CMER            ;NO
 1123  003604  026767  003126  003132          CMP     SEC,SECR        ;IS SECTOR# OK?
 1124  003612  001003                          BNE     CMER            ;NO
 1125  003614  062716  000002                  ADD     #2,(SP)         ;ALL ADDRESSES
 1126  003620  000207                          RTS     PC              ;OK - EXIT
 1127  003622  104500                  CMER:   ERM+HD                  ;HEADER COMPARE ERROR
 1128  003624  000207                          RTS     PC              ;ERROR EXIT
 1129  003626                          SUBER:  PNTM    SUBRMS
 1130  003626  012700  006241                  MOV     #SUBRMS,R0              ;PRINT MESSAGE
 1131  003632  004767  002776                  JSR     PC,TYPOUT       ;POINTED TO BY SUBRMS
 1132  003636  016600  000022                  MOV     22(SP),R0       ;FETCH PC OF SUBROUTINE CALL
 1133  003642  162700  000004                  SUB     #4,R0           ;PC-4=ADDRESS OF SUBROUTINE CALL
 1134  003646  004767  002620                  JSR     PC,OCTPNT       ;PRINT ADDRESS
 1135  003652  000207                          RTS     PC              ;EXIT
 1136
 1137  003654  012767  000005  003072  TTIO:   MOV     #5,TTG          ;INPUT UP TO 5 OCTAL DIGITS
 1138  003662  005067  003032                  CLR     WORK1           ;CLEAR WORK REGISTER
 1139  003666  004767  000102          TTIL:   JSR     PC,RIN          ;READ TTY CHARACTER INTO R0
 1140  003672  020027  000215                  CMP     R0,#215         ;IS IT CR?
```

```
003676  001427                            BEQ     TTIX            ;YES
003700  004767  002616                    JSR     PC,TTO          ;ECHO
003704  020027  000267                    CMP     R0,#267         ;TOO BIG?
003710  101030                            BHI     TTRX            ;YES
003712  020027  000257                    CMP     R0,#257         ;TOO SMALL?
003716  101425                            BLOS    TTRX            ;YES
003720  005367  003030                    DEC     TTG             ;COUNT DIGIT
003724  100422                            BMI     TTRX            ;TOO MANY?
003726                                    ANDI    7,R0            ;NO - MASK IT
003726  042700  177770                    BIC     #-7-1,R0        ;MASK 7 APPLIED TO R0
003732  000241                            CLC                     ;AND
003734  006167  002760                    ROL     WORK1           ;SHIFT
003740  006167  002754                    ROL     WORK1           ;WORK REGISTER
003744  006167  002750                    ROL     WORK1           ;3 PLACES
003750  060067  002744                    ADD     R0,WORK1        ;ADD NEW NUMBER
003754  000744                            BR      TTIL            ;GET NEXT ONE
003756  004767  002540            TTIX:   JSR     PC,TTO
003762  062716  000002                    ADD     #2,(SP)         ;SKIP RETURN
003766  016700  002726                    MOV     WORK1,R0
003772  000207                    TTRX:   RTS     PC
003774  005267  173560            RIN:    INC     TKS             ;FETCH A CHARACTER
004000  105767  173554                    TSTB    TKS             ;WAIT
004004  100375                            BPL     .-4             ;FOR IT
004006  116700  173550                    MOVB    TKB,R0          ;READ IT INTO R0
004012                                    ANDI    377,R0
004012  042700  177400                    BIC     #-377-1,R0      ;MASK 377 APPLIED TO R0
004016  000207                            RTS     PC              ;AND EXIT



004020  023046  047125  052111    UMES:   .ASCII  /&&UNIT: @/
004026  020072     100
004031     046  044446  050116    SECMES: .ASCII  /&&INPUT THE SECTOR NUMBERS(0-9) IN THE ORDER DESIRED.@
004036  052125  052040  042510
004044  051440  041505  047524
004052  020122  052516  041115
004060  051105  024123  026460
004066  024471  044440  020116
004074  044124  020105  051117
004102  042504  020122  042504
004110  044523  042522  027104
004116     100
004117     046  035060  040040    N0:     .ASCII  /&0: @/
004124  030446  020072     100    N1:     .ASCII  /&1: @/
004131     046  035062  040040    N2:     .ASCII  /&2: @/
004136  031446  020072     100    N3:     .ASCII  /&3: @/
004143     046  035064  040040    N4:     .ASCII  /&4: @/
004150  032446  020072     100    N5:     .ASCII  /&5: @/
004155     046  035066  040040    N6:     .ASCII  /&6: @/
004162  033446  020072     100    N7:     .ASCII  /&7: @/
004167     046  035070  040040    N8:     .ASCII  /&8: @/
004174  034446  020072     100    N9:     .ASCII  /&9: @/

004201     046  051446  052105    SWMES:  .ASCII  /&&SET THE FORMAT ENABLE SWITCH./
004206  052040  042510  043040
004214  051117  040515  020124
```

```
 1197  004222  047105  041101  042514
 1198  004230  051440  044527  041524
 1199  004236  027110
 1200  004240  051446  052105  052040          .ASCII  /$SET THE RP11 WRITE ENABLE SWITCH./
 1201  004246  042510  051040  030520
 1202  004254  020061  051127  052111
 1203  004262  020105  047105  041101
 1204  004270  042514  051440  044527
 1205  004276  041524  027110
 1206  004302  051446  052105  052040          .ASCII  /$SET THE SELECTED UNIT WRITE ENABLE SWITCH./
 1207  004310  042510  051440  046105
 1208  004316  041505  042524  020104
 1209  004324  047125  052111  053440
 1210  004332  044522  042524  042440
 1211  004340  040516  046102  020105
 1212  004346  053523  052111  044103
 1213  004354     056
 1214  004355     046  052123  044522          .ASCII  /$STRIKE ANY TELETYPE KEY WHEN READY.$@/
 1215  004362  042513  040440  054516
 1216  004370  052040  046105  052105
 1217  004376  050131  020105  042513
 1218  004404  020131  044127  047105
 1219  004412  051040  040505  054504
 1220  004420  023056     100
 1221
 1222  004423     046  051046  051505  NSWMES: .ASCII  /$$RESET THE FORMAT ENABLE SWITCH TO NORMAL./
 1223  004430  052105  052040  042510
 1224  004436  043040  051117  040515
 1225  004444  020124  047105  041101
 1226  004452  042514  051440  044527
 1227  004460  041524  020110  047524
 1228  004466  047040  051117  040515
 1229  004474  027114
 1230  004476  051446  051124  045511          .ASCII  /$STRIKE ANY TELETYPE KEY WHEN READY.$@/
 1231  004504  020105  047101  020131
 1232  004512  042524  042514  054524
 1233  004520  042520  045440  054505
 1234  004526  053440  042510  020116
 1235  004534  042522  042101  027131
 1236  004542  040046
 1237
 1238                                          .EVEN
 1239
 1240  004544  032777  040000  002224  HRDER:  BIT     #B14,@RPCS      ;TEST HARD ERROR BIT
 1241  004552  001001                  BNE     HRN1            ;OK IF SET
 1242  004554  104020                  ERR+CS                  ;HARD ERROR NOT SET. C(SP) POINTS TO CAUSE
 1243  004556  032777  100000  002212  HRN1:   BIT     #B15,@RPCS      ;TEST ERROR BIT IN RPCS
 1244  004564  001401                  BEQ     .+4             ;OK IF SET
 1245  004556  000207                  RTS     PC              ;OK- EXIT
 1246  004570  104020                  ERR+CS                  ;RPCS ERROR NOT SET. C(SP) POINTS TO CAUSE
 1247  004572  000207                  RTS     PC              ;EXIT
 1248  004574  032777  040000  002174  SFTER:  BIT     #B14,@RPCS      ;TEST HARD ERROR BIT
 1249  004602  001765                  BEQ     HRN1            ;OK IF CLEAR
 1250  004604  104020                  ERR+CS                  ;SOFT ERROR SET HARD ERROR BIT
 1251  004606  000763                  BR      HRN1            ;TEST INCLUSIVE ERROR
 1252  004610  017667  000000  002144  RTR:    MOV     @(SP),ROTOG     ;FETCH SHIFT COUNT
```

```
1253  004616  062716  000002                    ADD     #2,(SP)         ;STEP RETURN VECTOR
1254  004622  000241                    RRLUP:  CLC                     ;CLEAR THE LINK
1255  004624  006000                            ROR     R0              ;SHIFT R0 RIGHT ONCE
1256  004626  005367  002130                    DEC     ROTOG           ;FINISHED?
1257  004632  001373                            BNE     RRLUP           ;NO
1258  004634  000207                            RTS     PC              ;YES- EXIT
1259  004636  017667  000000  002116  RTL:     MOV     @(SP),ROTOG     ;FETCH SHIFT COUNT
1260  004644  062716  000002                    ADD     #2,(SP)         ;STEP RETURN VECTOR
1261  004650  000241                    RLLUP:  CLC                     ;CLEAR LINK
1262  004652  006100                            ROL     R0              ;SHIFT R0 LEFT ONCE
1263  004654  005367  002102                    DEC     ROTOG           ;FINISHED?
1264  004660  001373                            BNE     RLLUP           ;NO
1265  004662  000207                            RTS     PC              ;YES- EXIT
1266
1267
1268  004664  032767  002000  172676  ERROR:  BIT     #BIT10,SR       ;RING THE BELL?
1269  004672  001404                            BEQ     1$              ;BRANCH IF NO
1270  004674                                    PNTM    BELL
1271  004674  012700  006430                    MOV     #BELL,R0                ;PRINT MESSAGE
1272  004700  004767  001730                    JSR     PC,TYPOUT       ;POINTED TO BY BELL
1273  004704  032767  020000  172656  1$:      BIT     #BIT13,SR       ;TEST TTO DELETE SWITCH
1274  004712  001103                            BNE     ERXIT1          ;EXIT NOW IF TTO DELETE SWITCH IS UP
1275  004714  004567  001512                    JSR     R5,SAVO5        ;SAVE AC0-5
1276  004720  012700  006167                    MOV     #ERMS1,R0       ;MESSAGE POINTER TO R0
1277  004724  004767  001704                    JSR     PC,TYPOUT       ;PRINT MESSAGE
1278  004730  016600  000014                    MOV     14(SP),R0       ;FETCH SAVED PC
1279  004734  162700  000002                    SUB     #2,R0           ;FIND ADDRESS OF ERROR CALL
1280  004740  010005                            MOV     R0,R5           ;PUT POINTER IN R5
1281  004742  004767  001524                    JSR     PC,OCTPNT       ;PRINT PC
1282  004746  012700  006372                    MOV     #STMS,R0        ;MESSAGE POINTER
1283  004752  004767  001656                    JSR     PC,TYPOUT       ;PRINT "PS="
1284  004756  016600  000016                    MOV     16(SP),R0       ;FETCH SAVED STATUS
1285  004762  004767  001504                    JSR     PC,OCTPNT       ;AND PRINT IT
1286  004766  032715  000400                    BIT     #B8,(R5)        ;TRAP?
1287  004772  001402                            BEQ     GOGO            ;NO
1288  004774  004767  176626                    JSR     PC,SUBER        ;SUBROUTINE ERROR
1289  005000  032715  000020          GOGO:     BIT     #B4,(R5)        ;RPCS?
1290  005004  001402                            BEQ     .+6             ;NO
1291  005006  004767  000230                    JSR     PC,CSTYPE       ;YES
1292  005012  032715  000010                    BIT     #B3,(R5)        ;RPER?
1293  005016  001402                            BEQ     .+6             ;NO
1294  005020  004767  000262                    JSR     PC,ERTYPE       ;YES
1295  005024  032715  000004                    BIT     #B2,(R5)        ;RPDS?
1296  005030  001402                            BEQ     .+6             ;NO
1297  005032  004767  000272                    JSR     PC,DSTYPE       ;YES
1298  005036  032715  000040                    BIT     #B5,(R5)        ;RPDA & RPCA?
1299  005042  001402                            BEQ     .+6             ;NO
1300  005044  004767  000302                    JSR     PC,ADTYPE       ;YES
1301  005050  032715  000100                    BIT     #HD,(R5)        ;HEADER MESSAGE?
1302  005054  001402                            BEQ     .+6             ;NO
1303  005056  004767  000616                    JSR     PC,HDTYPE       ;YES
1304  005062  032715  000001                    BIT     #BC,(R5)        ;BC(1) FOR GOOD.BAD
1305  005066  001402                            BEQ     .+6             ;SKIP IF=0
1306  005070  004767  000104                    JSR     PC,GBTYPE       ;GOOD/BAD
1307  005074  032715  000002                    BIT     #B1,(R5)        ;B1(1) FOR DATA
1308  005100  001402                            BEQ     .+6             ;SKIP IF=0
```

```
 1309  005102  004767  000156                ERXIT:  JSR     PC,DATYPE       ;DATA
 1310  005106  004567  001334                        JSR     R5,RESTO5       ;RESTORE AC0-5
 1311  005112  012700  000015                        MOV     #CR,R0          ;PRINT
 1312  005116  004767  001400                        JSR     PC,TTO          ;CR & LF
 1313  005122  105777  001650                ERXIT1: TSTB    @RPCS           ;WAIT FOR DONE
 1314  005126  100375                              BPL     ERXIT1
 1315  005130  032767  100000  172432              BIT     #B15,SR         ;HALT ON ERROR?
 1316  005136  001401                              BEQ     1$
 1317  005140  000000                              XX                      ;ERROR HALT. CONTINUE
 1318  005142  000002                        1$:   RTI                     ;EXIT ERROR ROUTINE
 1319
 1320
 1321
 1322  005144  032767  020000  172416  LERCHK: BIT     #B13,SR         ;SR13(1)=LOOP ON ERROR
 1323  005152  001002                              BNE     .+6             ;EXIT IF 1
 1324  005154  062716  000004                      ADD     #4,(SP)         ;ADVANCE RETURN VECTOR OVER LOOP JUMP
 1325  005160  000207                        LERXT:  RTS     PC              ;EXIT
 1326
 1327  005162  032767  010000  172400  LUPCHK: BIT     #B12,SR         ;SR12(1)=LOOP ALWAYS
 1328  005170  001002                              BNE     .+6             ;EXIT IF 1
 1329  005172  062716  000004                      ADD     #4,(SP)         ;ADVANCE RETURN VECTOR OVER LOOP JUMP
 1330  005176  000207                              RTS     PC              ;EXIT
 1331
 1332  005200  012700  006354                GBTYPE: MOV     #GDMS,R0        ;POINTER TO "GOOD"
 1333  005204  004767  001424                        JSR     PC,TYPOUT       ;PRINT MESSAGE
 1334  005210  016700  001462                        MOV     GOOD,R0         ;FETCH C(GOOD)
 1335  005214  004767  000354                        JSR     PC,PNTOCT       ;PRINT OCTAL NUMBER
 1336  005220  012700  006364                        MOV     #BDMS,R0        ;POINTER TO "BAD"
 1337  005224  004767  001404                        JSR     PC,TYPOUT       ;PRINT MESSAGE
 1338  005230  016700  001444                        MOV     BAD,R0          ;FETCH C(BAD)
 1339  005234  004767  000334                        JSR     PC,PNTOCT       ;PRINT OCTAL NUMBER
 1340  005240  000207                              RTS     PC              ;EXIT
 1341
 1342  005242  012700  006275                CSTYPE: MOV     #CSMS,R0        ;POINTER TO "STATUS"
 1343  005246  004767  001362                        JSR     PC,TYPOUT       ;PRINT TEXT
 1344  005252  017700  001520                        MOV     @RPCS,R0        ;FETCH C(RPCS)
 1345  005256  004767  000312                        JSR     PC,PNTOCT       ;PRINT OCTAL NUMBER
 1346  005262  000207                              RTS     PC              ;EXIT
 1347  005264  012700  006401                DATYPE: MOV     #DAMS,R0        ;POINTER TO "DATA"
 1348  005270  004767  001340                        JSR     PC,TYPOUT       ;PRINT TEST
 1349  005274  016700  001402                        MOV     DATA,R0         ;FETCH C(DATA)
 1350  005300  004767  000270                        JSR     PC,PNTOCT       ;PRINT OCTAL NUMBER
 1351  005304  000207                              RTS     PC              ;EXIT
 1352  005306  012700  006305                ERTYPE: MOV     #ERMS,R0        ;PRINT
 1353  005312  004767  001316                        JSR     PC,TYPOUT       ;"RPER="
 1354  005316  017700  001450                        MOV     @RPER,R0        ;PRINT
 1355  005322  004767  000246                        JSR     PC,PNTOCT       ;RPER
 1356  005326  000207                              RTS     PC              ;EXIT
 1357  005330  012700  006315                DSTYPE: MOV     #DSMS,R0        ;PRINT
 1358  005334  004767  001274                        JSR     PC,TYPOUT       ;"RPDS="
 1359  005340  017700  001422                        MOV     @RPDS,R0        ;PRINT
 1360  005344  004767  000224                        JSR     PC,PNTOCT       ;RPDS
 1361  005350  000207                              RTS     PC              ;EXIT
 1362  005352  032777  000001  001412  ADTYPE: BIT     #B0,@RPER       ;ADDRESS ERROR?
 1363  005360  001407                              BEQ     1$              ;BRANCH IF NO
 1364  005362  017767  001420  001334              MOV     @RPCA,WORK3     ;GET THE CLYINDER ADDREEE
```

```
 1365  005370  017767  001416  001324          MOV     @RPDA,WORK2     ;GET HEAD AND SECTOR ADDRESS
 1366  005376  000437                          BR      ADT1
 1367  005400  017767  001402  001316  1$:     MOV     @RPCA,WORK3
 1368  005406  017767  001400  001306          MOV     @RPDA,WORK2
 1369  005414  042767  160360  001300          BIC     #160360,WORK2
 1370  005422  032767  000017  001272          BIT     #17,WORK2
 1371  005430  001403                          BEQ     DECTK
 1372  005432  005367  001264                  DEC     WORK2
 1373  005436  000417                          BR      ADT1
 1374  005440  132767  000037  001255  DECTK:  BITB    #37,WORK2+1
 1375  005446  001406                          BEQ     DECCY
 1376  005450  105367  001247                  DECB    WORK2+1
 1377  005454  052767  000011  001240          BIS     #11,WORK2
 1378  005462  000405                          BR      ADT1
 1379  005464  012767  011411  001230  DECCY:  MOV     #11411,WORK2
 1380  005472  005367  001226                  DEC     WORK3
 1381  005476  012700  006325          ADT1:   MOV     #CYMS,R0        ;PRINT
 1382  005502  004767  001126                  JSR     PC,TYPOUT       ;"CAR="
 1383  005506  016700  001212                  MOV     WORK3,R0        ;PRINT
 1384  005512                                  ANDI    777,R0
 1385  005512  042700  177000                  BIC     #-777-1,R0      ;MASK 777 APPLIED TO R0
 1386  005516  004767  000750                  JSR     PC,OCTPNT       ;CAR
 1387  005522  012700  006334                  MOV     #TAMS,R0        ;PRINT
 1388  005526  004767  001102                  JSR     PC,TYPOUT       ;"TAR="
 1389  005532  116700  001165                  MOVB    WORK2+1,R0      ;PRINT
 1390  005536                                  ANDI    37,R0
 1391  005536  042700  177740                  BIC     #-37-1,R0       ;MASK 37 APPLIED TO R0
 1392  005542  004767  000724                  JSR     PC,OCTPNT       ;TAR
 1393  005546  012700  006344                  MOV     #SEMS,R0        ;PRINT
 1394  005552  004767  001056                  JSR     PC,TYPOUT       ;"SAR="
 1395  005556  116700  001140                  MOVB    WORK2,R0        ;PRINT
 1396  005562                                  ANDI    17,R0
 1397  005562  042700  177760                  BIC     #-17-1,R0       ;MASK 17 APPLIED TO R0
 1398  005566  004767  000700                  JSR     PC,OCTPNT       ;SAR
 1399  005572  000207                          RTS     PC              ;EXIT
 1400  005574  012767  000006  001112  PNTOCT: MOV     #6,TOG4
 1401  005602  010067  001110          OLUP:   MOV     R0,WORK
 1402  005606                                  ANDI    7,WORK
 1403  005606  042767  177770  001102          BIC     #-7-1,WORK      ;MASK 7 APPLIED TO WORK
 1404  005614  062767  000060  001074          ADD     #60,WORK
 1405  005622  016746  001070                  MOV     WORK,-(SP)
 1406  005626  006000                          ROR     R0
 1407  005630  006000                          ROR     R0
 1408  005632  006000                          ROR     R0
 1409  005634  005367  001054                  DEC     TOG4
 1410  005640  003360                          BGT     OLUP
 1411  005642  012767  000005  001044          MOV     #5,TOG4
 1412  005650  012600                          MOV     (SP)+,R0
 1413  005652                                  ANDI    61,R0
 1414  005652  042700  177716                  BIC     #-61-1,R0       ;MASK 61 APPLIED TO R0
 1415  005656  004767  000640                  JSR     PC,TTO
 1416  005662  012600                  TOLUPO: MOV     (SP)+,R0
 1417  005664  004767  000632                  JSR     PC,TTO
 1418  005670  005367  001020                  DEC     TOG4
 1419  005674  003372                          BGT     TOLUPO
 1420  005676  000207                          RTS     PC
```

```
1421
1422  005700                          HDTYPE: PNTM    HDMS
1423  005700  012700  006122                  MOV     #HDMS,R0                ;PRINT MESSAGE
1424  005704  004767  000724                  JSR     PC,TYPOUT       ;POINTED TO BY HDMS
1425  005710                                  PNTM    GDMS
1426  005710  012700  006354                  MOV     #GDMS,R0                ;PRINT MESSAGE
1427  005714  004767  000714                  JSR     PC,TYPOUT       ;POINTED TO BY GDMS
1428  005720                                  PNTM    S2
1429  005720  012700  006162                  MOV     #S2,R0          ;PRINT MESSAGE
1430  005724  004767  000704                  JSR     PC,TYPOUT       ;POINTED TO BY S2
1431  005730                                  PNTOL   CYL
1432  005730  016700  000776                  MOV     CYL,R0          ;PRINT & OCTAL
1433  005734  004767  177634                  JSR     PC,PNTOCT       ;NUMBERS IN CYL
1434  005740                                  PNTM    S1
1435  005740  012700  006160                  MOV     #S1,R0          ;PRINT MESSAGE
1436  005744  004767  000664                  JSR     PC,TYPOUT       ;POINTED TO BY S1
1437  005750                                  PNTOL   HED
1438  005750  016700  000760                  MOV     HED,R0          ;PRINT & OCTAL
1439  005754  004767  177614                  JSR     PC,PNTOCT       ;NUMBERS IN HED
1440  005760                                  PNTM    S1
1441  005760  012700  006160                  MOV     #S1,R0          ;PRINT MESSAGE
1442  005764  004767  000644                  JSR     PC,TYPOUT       ;POINTED TO BY S1
1443  005770                                  PNTOL   SEC
1444  005770  016700  000742                  MOV     SEC,R0          ;PRINT & OCTAL
1445  005774  004767  177574                  JSR     PC,PNTOCT       ;NUMBERS IN SEC
1446  006000                                  PNTM    CARET
1447  006000  012700  006165                  MOV     #CARET,R0               ;PRINT MESSAGE
1448  006004  004767  000624                  JSR     PC,TYPOUT       ;POINTED TO BY CARET
1449  006010                                  PNTM    S1
1450  006010  012700  006160                  MOV     #S1,R0          ;PRINT MESSAGE
1451  006014  004767  000614                  JSR     PC,TYPOUT       ;POINTED TO BY S1
1452  006020                                  PNTM    BDMS
1453  006020  012700  006364                  MOV     #BDMS,R0                ;PRINT MESSAGE
1454  006024  004767  000604                  JSR     PC,TYPOUT       ;POINTED TO BY BDMS
1455  006030                                  PNTM    S2
1456  006030  012700  006162                  MOV     #S2,R0          ;PRINT MESSAGE
1457  006034  004767  000574                  JSR     PC,TYPOLT       ;POINTED TO BY S2
1458  006040                                  PNTOL   CYLR
1459  006040  016700  000674                  MOV     CYLR,R0         ;PRINT & OCTAL
1460  006044  004767  177524                  JSR     PC,PNTOCT       ;NUMBERS IN CYLR
1461  006050                                  PNTM    S1
1462  006050  012700  006160                  MOV     #S1,R0          ;PRINT MESSAGE
1463  006054  004767  000554                  JSR     PC,TYPOUT       ;POINTED TO BY S1
1464  006060                                  PNTOL   HEDR
1465  006060  016700  000656                  MOV     HEDR,R0         ;PRINT & OCTAL
1466  006064  004767  177504                  JSR     PC,PNTOCT       ;NUMBERS IN HEDR
1467  006070                                  PNTM    S1
1468  006070  012700  006160                  MOV     #S1,R0          ;PRINT MESSAGE
1469  006074  004767  000534                  JSR     PC,TYPOUT       ;POINTED TO BY S1
1470  006100                                  PNTOL   SECR
1471  006100  016700  000640                  MOV     SECR,R0         ;PRINT & OCTAL
1472  006104  004767  177464                  JSR     PC,PNTOCT       ;NUMBERS IN SECR
1473  006110                                  PNTM    CARET
1474  006110  012700  006165                  MOV     #CARET,R0               ;PRINT MESSAGE
1475  006114  004767  000514                  JSR     PC,TYPOUT       ;POINTED TO BY CARET
1476  006120  000207                          RTS     PC
```

```
1477
1478
1479  006122  020046  020040  020040  HDMS:   .ASCII  /&      CYLINDER  TRACK SECTOR@/
1480  006130  041440  046131  047111
1481  006136  042504  020122  052040
1482  006144  040522  045503  051440
1483  006152  041505  047524  040122
1484
1485  006160  040040                  S1:     .ASCII  / @/
1486
1487  006162  020040     100          S2:     .ASCII  /  @/
1488
1489  006165     046     100          CARET:  .ASCII  /&@/
1490
1491
1492  006167     046  042446  051122  ERMS1:  .ASCII  /&&ERROR AT ADDRESS @/
1493  006174  051117  040440  020124
1494  006202  042101  051104  051505
1495  006210  020123     100
1496
1497
1498  006213     046  046117  035104  OLDMS:  .ASCII  /&OLD:     @/
1499  006220  020040  020040  040040
1500  006226  047046  053505  020072  NEWMS:  .ASCII  /&NEW:     @/
1501  006234  020040  020040     100
1502  006241     046  040503  046114  SUBRMS: .ASCII  /&CALLED FROM SUBROUTINE AT @/
1503  006246  042105  043040  047522
1504  006254  020115  052523  051102
1505  006262  052517  044524  042516
1506  006270  040440  020124     100
1507  006275     046  050122  051503  CSMS:   .ASCII  /&RPCS= @/
1508  006302  020075     100
1509
1510  006305     046  050122  051105  ERMS:   .ASCII  /&RPER= @/
1511  006312  020075     100
1512
1513  006315     046  050122  051504  DSMS:   .ASCII  /&RPDS= @/
1514  006322  020075     100
1515
1516  006325     046  040503  036522  CYMS:   .ASCII  /&CAR= @/
1517  006332  040040
1518
1519  006334  020040  040524  036522  TAMS:   .ASCII  /  TAR= @/
1520  006342  040040
1521
1522  006344  020040  040523  036522  SEMS:   .ASCII  /  SAR= @/
1523  006352  040040
1524
1525  006354  043446  047517  036504  GDMS:   .ASCII  /&GOOD= @/
1526  006362  040040
1527
1528  006364  040502  036504  040040  BDMS:   .ASCII  /BAD= @/
1529
1530  006372  020040  051520  020075  STMS:   .ASCII  /  PS= @/
1531  006400     100
1532
```

```
1533  006401  000046  040504  040524  DAMS:   .ASCII  /&DATA= @/
1534  006406  020075  000100
1535
1536  006411  000046  042524  052123  ENDM1:  .ASCII  /&TEST COMPLETE@/
1537  006416  041440  046517  046120
1538  006424  052105  040105
1539
1540  006430  040007                  BELL:   .ASCII  <7>/@/
1541
1542                                          .EVEN
1543
1544  006432  010446                  SAVOS:  MOV     R4,-(SP)        ;SAVE R0-R5 ON THE STACK
1545  006434  010346                          MOV     R3,-(SP)        ;R5 WAS STACKED BY THE JSR
1546  006436  010246                          MOV     R2,-(SP)        ;R4-R3 ARE STACKED ABOVE IT
1547  006440  010146                          MOV     R1,-(SP)        ;WITH R0 ON TOP
1548  006442  010046                          MOV     R0,-(SP)        ;R5 HOLDS THE RETURN PC, BUT AN
1549  006444  000115                          JMP     (R5)            ;RTS WOULD POP THE STACK-SO JUMP OUT
1550
1551  006446  005726                  RESTOS: TST     (SP)+           ;MOVE SP OVER WORD SAVED BY JSR
1552  006450  012600                          MOV     (SP)+,R0        ;R0-4
1553  006452  012601                          MOV     (SP)+,R1        ;ARE POPPED
1554  006454  012602                          MOV     (SP)+,R2        ;IN LIFO
1555  006456  012603                          MOV     (SP)+,R3        ;SEQUENCE
1556  006460  012604                          MOV     (SP)+,R4        ;R5 IS POPPED BY THE RTS AND
1557  006462  000205                          RTS     R5              ;THE PC IS TAKEN FROM R5
1558
1559  006464  012702  000012          DECPNT: MOV     #10.,R2         ;DIVISOR OF 10 FOR DECIMAL PRINT
1560  006470  000402                          BR      DECREM          ;PROCESS AND PRINT NUMBER
1561  006472  012702  000010          OCTPNT: MOV     #8.,R2          ;DIVISOR OF 8 FOR OCTAL PRINT
1562  006476  004767  000060          DECREM: JSR     PC,IDIVR        ;DIVIDE (R0) BY (R2) WITH REMAINDER IN R1
1563  006502  010146                          MOV     R1,-(SP)        ;STACK REMAINDER
1564  006504  005700                          TST     R0              ;HAS NUMBER DEFLATED BELOW RADIX?
1565  006506  001402                          BEQ     POPTT           ;YES - POP AND PRINT
1566  006510  004767  177762                  JSR     PC,DECREM       ;NO - DIVIDE NUMBER BY RADIX
1567  006514  012600                  POPTT:  MOV     (SP)+,R0        ;POP NUMBER FROM STACK
1568  006516  062700  000060                  ADD     #60,R0          ;MAKE ASCII
1569  006522  032767  040000  171040  TTO:    BIT     #B14,SR         ;IF SR14=1,DELETE TYPEOUT
1570  006530  001010                          BNE     TTOLF-2         ;EXIT
1571  006532  010067  171030                  MOV     R0,TPB          ;PRINT CONTENTS OF R0
1572  006536  105767  171022          TTOLP:  TSTB    TPS             ;DONE YET?
1573  006542  100375                          BPL     TTOLP           ;NO - KEEP LOOPING
1574  006544  022700  000015                  CMP     #CR,R0          ;WAS CHARACTER A CR!
1575  006550  001401                          BEQ     TTOLF           ;YES - PRINT LINE FEED
1576  006552  000207                          RTS     PC              ;RETURN TO POPTT OR MAIN PROGRAM
1577  006554  012700  000012          TTOLF:  MOV     #LF,R0          ;PRINT LF
1578  006560  000760                          BR      TTO             ;EXECUTE PRINT
1579
1580  006562  010067  000116          IDIVR:  MOV     R0,DIVID        ;SAVE DIVIDEND
1581  006566  005000                          CLR     R0              ;CLEAR QUOTIENT AREA
1582  006570  005001                          CLR     R1              ;CLEAR ACCUM.
1583  006572  060201                  DIVLP:  ADD     R2,R1           ;ADD DIVISOR TO ACCUM.
1584  006574  020167  000104                  CMP     R1,DIVID        ;COMPARE TO DIVIDEND
1585  006600  100002                          BPL     DVEND           ;WHEN ACCUM PASSES DIVIDEND - EXIT
1586  006602  005200                          INC     R0              ;INCREMENT QUOTIENT THEN
1587  006604  000772                          BR      DIVLP           ;ADD AGAIN
1588  006606  001003                  DVEND:  BNE     DIVN1           ;JUMP TO GET REMAINDER
```

```
;589  006610  005200                        INC     R0              ;NO REMAINDER - INCREMENT QUOTIENT
1590  006612  005001                        CLR     R1              ;REMAINDER OF 0
1591  006614  000207                        RTS     PC              ;EXIT
1592  006616  160167  000062      DIVN1:    SUB     R1,DIVID        ;FANCY FINAGLING TO
1593  006622  060267  000056              ADD     R2,DIVID        ;DETERMINE THE REMAINDER
1594  006626  016701  000052              MOV     DIVID,R1                ;REMAINDER TO R1
1595  006632  000207                        RTS     PC              ;EXIT WITH QUOTIENT IN R0
;596
1597  006634  010046      TYPOUT:   MOV     R0,-(SP)        ;STACK ADDRESS POINTER FOR MESSAGE
1598  006636  117600  000000      TPOFCH:   MOVB    @(SP),R0        ;FETCH ASCII BYTE
1599  006642  022700  000100              CMP     #100,R0         ;IS IT @(TERMINATOR)?
1600  006646  001411                        BEQ     TPOUTX          ;YES - EXIT
1601  006650  022700  000046              CMP     #46,R0          ;IS IT CRLF FLAG?
1602  006654  001002                        BNE     .+6             ;NO
1603  006656  012700  000015              MOV     #CR,R0          ;YES- CHANGE DATA TO CRLF
1604  006662  004767  177634              JSR     PC,TTO          ; PRINT
1605  006666  005216                        INC     (SP)            ;MOVE POINTER TO NEXT BYTE
1606  006670  000762                        BR      TPOFCH          ;FETCH NEXT CHARACTER
1607  006672  005726      TPOUTX:   POP                             ;POP STACK TO REACH RETURN VECTOR
1608  006674  000207                        RTS     PC              ;EXIT
1609
1610  006676  000000      GOOD:     XX
1611  006700  000000      BAD:      XX
1612  006702  000000      DATA:     XX
1613  006704  000000      DIVID:    XX
1614  006706  000000      TOG1:     XX
1615  006710  000000      TOG2:     XX
1616  006712  000000      TOG3:     XX
1617  006714  000000      TOG4:     XX
1618  006716  000000      WORK:     XX
1619  006720  000000      WORK1:    XX
1620  006722  000000      WORK2:    XX
1621  006724  000000      WORK3:    XX
1622  006726  000000      UNIT:     XX
1623  006730  000000      ATNB:     XX
1624  006732  000000      CYL:      XX
1625  006734  000000      HED:      XX
1626  006736  000000      SEC:      XX
1627  006740  000000      CYLR:     XX
1628  006742  000000      HEDR:     XX
1629  006744  000000      SECR:     XX
1630  006746  000000      CYLA:     XX
1631  006750  000000      HEDA:     XX
1632  006752  000000      SECA:     XX
1633  006754  000000      TTG:      XX
1634  006756  000000      TEMP1:    XX
1635  006760  000000      MASK:     XX
1636  006762  000000      ROTOG:    XX
1637  006764  000000      LERR:     XX
1638  006766  176710      RPDS:     176710
1639  006770  176711      RPDS1:    176711
1640  006772  176712      RPER:     176712
1641  006774  176713      RPER1:    176713
1642  006776  176714      RPCS:     176714
1643  007000  176715      RPCS1:    176715
1644  007002  176716      RPWC:     176716
```

```
 1645  007004  176720                  RPBA:   176720
 1646  007006  176722                  RPCA:   176722
 1647  007010  176723                  RPSQ1:  176723
 1648  007012  176724                  RPDA:   176724
 1649  007014  176725                  RPDA1:  176725
 1650  007016  176726                  RPM1:   176726
 1651  007020  176727                  RPM11:  176727
 1652  007022  176730                  RPM2:   176730
 1653  007024  176731                  RPM21:  176731
 1654  007026  176732                  RPM3:   176732
 1655  007030  176733                  RPM31:  176733
 1656  007032  176734                  RPB1:   176734
 1657  007034  176735                  RPB11:  176735
 1658  007036  176736                  RPB2:   176736
 1659  007040  176737                  RPB21:  176737
 1660  007042  176740                  RPB3:   176740
 1661  007044  176741                  RPB31:  176741
 1662  007046  000254                  RPIV:   .WORD   254
 1663  007050  000256                  RPSV:   .WORD   256
 1664  007052  000000                  DEBUG:  XX
 1665          007252                  INBUF=DEBUG+200
 1666          011552                  OUTBUF=INBUF+2300
 1667
 1668
 1669          000001                          .END                    ;THAT'S ALL FOLKS!
```

```
ADTYPE  005352          1300    1362*
ADT1    005476          1366    1373    1378    1381*
ATN8    006730           714     989    1052*   1088    1623*
BAD     006700          1338    1611*
BDMS    006364          1336    1453    1528*
BELL    006430          1271    1540*
B0      =  000001        388*    406    1304    1362
B1      =  000002        389*    407    1307
B10     =  002000        398*   1084    1268
B11     =  004000        399*    717     992    1090
B12     =  010000        400*   1327
B13     =  020000        401*   1273    1322
B14     =  040000        402*   1240    1248    1569
B15     =  100000        403*    681     725     828     844     896     924    1054    1243    1315
B2      =  000004        390*    408    1295
B3      =  000010        391*    409    1292
B4      =  000020        392*    410    1289
B5      =  000040        393*    411    1298
B6      =  000100        394*    412
B7      =  000200        395*    688     725     828     844     896     924
B8      =  000400        396*   1286
B9      =  001000        397*
CARET   006165          1447    1474    1489*
CC      =  177776        357*    378     657*    699*    766*    868*
CHKAD   003464           736     850     934    1102*
CLRS    002610           874     951*
CLRS1   002620           953*    955
CMER    003622          1120    1122    1124    1127*
CR      =  000015        365*   1311    1574    1603
CS      =  000020        410*    678     683     690     719     728     831     847     899     927     994    1057    1086
                        1092    1096    1242    1246    1250
CSMS    006275          1342    1507*
CSTYPE  005242          1291    1342*
CYL     006732           710*    711     748*    749     794*    809     887*    888     907*    908     914*    915     944*
                         945    1119    1432    1624*
CYLA    006746           778*    824     839    1630*
CYLR    006740          1104*   1106*   1107*   1108*   1109*   1110*   1111*   1118*   1119    1459    1627*
CYMS    006325          1381    1516*
DA      =  000040        411*    678     719     728     831     847     899     927     994
DAMS    006401          1347    1533*
DATA    006702          1349    1612*
DATYPE  005264          1309    1347*
DD      =  000002        407*
DEBUG   007052          1081*   1082*   1664*   1665
DECCY   005464          1375    1379*
DECPNT  006464          1559*
DECREM  006476          1560    1562*   1566
DECTK   005440          1371    1374*
DIVID   006704          1580*   1584    1592*   1593*   1594    1613*
DIVLP   006572          1583*   1587
DIVN1   006616          1588    1592*
DS      =  000004        408*    678     683     719     728     831     847     899     927     994    1057    1086    1092
                        1096
DSMS    006315          1357    1513*
DSTYPE  005330          1297    1357*
DS1     003210          1049*   1051*
```

```
CVEND   006606          1585   1588#
ENDM1   006411           753    853    948   1536#
ER    = 000010           409#   678    683    690    719    728    831    847    899    927    994   1057   1086
                        1092   1096
ERM   = 104400           405#   994   1057   1096   1092   1096   1127
ERMS    006305          1352   1510#
ERMS1   006167          1276   1492#
ERR   = 104000           404#   678    683    690    719    728    831    847    899    927   1242   1246   1250
ERROR   004664           633    635   1268#
ERTYPE  005306          1294   1352#
ERXIT   005106          1310#
ERXIT1  005122          1274   1313#  1314
GB    = 000001           406#
GBTYPE  005200          1306   1332#
GDMS    006354          1332   1426   1525#
GOGO    005000          1287   1289#
GOOD    006676          1334   1610#
HD    = 000100           412#   1127   1301
HDMS    006122           770   1423   1479#
HDTYPE  005700          1303   1422#
HED     006734           733#   743#   744    747#   798#   816#   817    818#   931#   940#   941    943#  1121
                        1438   1625#
HEDA    006750           782#   825    840   1631#
HEDR    006742          1103#  1104   1105#  1116#  1121   1465   1628#
HGL1    001652           820#   832
HGL2    001762           836#   848    851
HGO     001556           807#
HGO1    001746           830    833#
HGO2    002056           846    849#
HL1     001376           772#   777    781    784    785
HL2     001466           788#   793    797    800    802
HOME    003334           666    709    920    836    886    913   1079#  1087   1093   1097
HRDER   004544          1240#
HRN1    004556          1241   1243#  1249   1251
IDIVR   006562          1562   1580#
IL1     000614           659#
IL2     000676           672#   675
IL3     000710           674#   677
INBUF = 007252           722    735   807#   808#   809#   810#   811#   812#   813#   814#   815#   817#   819#
                         822    833#  834#   835#   838    849    920    932   1665#  1666
LERCHK  005144          1322#
LERR    006764          1637#
LERXT   005160          1325#
LF    = 000012           366#  1577
LUPCHK  005162          1327#
MASK    006760          1635#
MKBL1   002730           975#   979    985
MKBUF   002700           884    970#
NEWMS   006226           789   1500#
NOP   = 000240           379#
NSTR    003052           876    998#
NSWMES  004423           704   1222#
NS2     000634           666#   679    686
N0      004117           998   1183#
N1      004124           999   1184#
N2      004131          1000   1185#
```

```
N3        004136            1001    1186*
N4        004143            1002    1187*
N5        004150            1003    1188*
N6        004155            1004    1189*
N7        004162            1005    1190*
N8        004167            1006    1191*
N9        004174            1007    1192*
OCTPNT    006472            1134    1281    1285    1386    1392    1398    1561*
OLDMS     006213             773    1498*
OLUP      005602            1401*   1410
OUTBUF=   011552             893     902     971    1666*
PARIN     003262             776     780     792     796    1065*
PC     =%000007              376*    641*    643*    645*    647*    659*    662*    663*    666*    701*    705*    706*    709*
                             736*    754*    768*    771*    774*    776*    780*    783*    790*    792*    796*    799*    820*
                             936*    850*    854*    870*    873*    874*    879*    880*    884*    886*    890*    913*    917*
                             934*    949*    956*    957*    958*    969*    986*    995*    997*   1040*   1041*   1050*   1056*
                            1061*   1064*   1065*   1067*   1075*   1077*   1101*   1126*   1128*   1131*   1134*   1135*   1139*
                            1142*   1157*   1160*   1167*   1245*   1247*   1258*   1265*   1272*   1277*   1281*   1283*   1285*
                            1288*   1291*   1294*   1297*   1300*   1303*   1306*   1309*   1312*   1325*   1330*   1333*   1335*
                            1337*   1339*   1340*   1343*   1345*   1346*   1348*   1350*   1351*   1353*   1355*   1356*   1358*
                            1360*   1371*   1382*   1386*   1388*   1392*   1394*   1398*   1399*   1415*   1417*   1420*   1424*
                            1427*   1430*   1433*   1436*   1439*   1442*   1445*   1448*   1451*   1454*   1457*   1460*   1463*
                            1466*   1469*   1472*   1475*   1476*   1562*   1566*   1576*   1591*   1595*   1604*   1608*
PIOK1     000764             682     688*
PNTOCT    005574            1335    1339    1345    1350    1355    1360    1400*   1433    1439    1445    1460    1466    1472
POP    =  005726             413*    685     693    1607
POPPOP=   022626             414*
POPTT     006514            1565    1567*
PRX       003332            1069    1071    1074    1077*
PS     =  177776             378*    671*    702*    911*
P0     =  000000             380*
P1     =  000040             381*
P2     =  000100             382*
P2L1      001056             707*    720
P2L2      001102             711*    729     751
P2L3      001236             736*    741     746
P2N1      001222             727     733*
P3     =  000140             383*
P4     =  000200             384*    671
P5     =  000240             385*
P6     =  000300             386*
P7     =  000340             387*    657     668     699     702     755     868     911
RESTOS    006446             684     692    1310    1551*
RIN       003774             663     706     957    1139    1161*
RLLUP     004650            1261*   1264
ROTOG     006762            1252*   1256*   1259*   1263*   1636*
RPBA      007004             722*    822*    838*    893*    920*   1645*
RPB1      007032            1656*
RPB11     007034            1657*
RPB2      007036            1658*
RPB21     007040            1659*
RPB3      007042            1660*
RPB31     007044            1661*
RPCA      007006             711*    824*    839*    888*    915*   1364    1367    1646*
RPCS      006776             670*    681     688     707*    713*    723*    724*    725     823*    827*    828     942*    943*
                             844     894*    895*    896     922*    923*    924     988*   1080*   1098*   1240    1243    1243
```

804


```
                         1313    1344    1642#
RPCS1    007000           708*    885*    912*   1053*   1100*   1643#
RPDA     007012           672     674     712*    826*    941*    889*    916*   1365    1368    1648#
RPDA1    007014           825*    840*   1649#
RPDS     006766           714     716*    717     987*    989     991*    992    1054    1079*   1094    1098    1090    1099*
                         1359    1638#
RPDS1    006770          1094    1639#
RPER     006772          1354    1362    1640#
RPER1    006774          1641#
RPI      000732           667     680#
RPIN     007046           667*   1662#
RPIX     000750           694#    691
RPM1     007016          1650#
RPM11    007020          1651#
RPM2     007022          1652#
RPM21    007024          1653#
RPM3     007026          1654#
RPM31    007030          1655#
RPSQ1    007010          1647#
RPSV     007050           668*   1663#
RPWC     007002           669*    721*    821*    837*    892*    919*   1644#
RSLUP    004622          1254#   1257
RTL      004636          1050    1259#
RTR      004610          1252#
RC       =%000000         369#    561*    704*    753*    770*    773*    785     787     789*    801     903     953*    872*
                          878*    948*    959*    960     962     964     966*    967    1039*   1043    1045    1046*   1052
                         1060*   1068    1130*   1132*   1133*   1140    1143    1145    1150*   1155    1159*   1164*   1166*
                         1255*   1262*   1271*   1276*   1278*   1279*   1280    1282*   1284*   1311*   1332*   1334*   1336*
                         1338*   1342*   1344*   1347*   1349*   1352*   1354*   1357*   1359*   1381*   1383*   1385*   1397*
                         1389*   1391*   1393*   1395*   1397*   1401    1406*   1407*   1408*   1412*   1414*   1416*   1423*
                         1426*   1429*   1432*   1435*   1438*   1441*   1444*   1447*   1450*   1453*   1456*   1459*   1462*
                         1465*   1468*   1471*   1474*   1548    1552*   1564    1567*   1568*   1571    1574    1577*   1580
                         1581*   1586*   1589*   1597    1598*   1599    1601    1603*
R1       =%000001         369#   1547    1553*   1563    1582*   1583*   1584    1590*   1592    1594*
R2       =%000002         370#   1546    1554*   1559*   1561*   1583    1593
R3       =%000003         371#   1545    1555*
R4       =%000004         372#    672*    674     735*    849*    877*    932*    952*    953*    967*    972*    977     981*
                         1102*   1103    1112    1544    1556*
R5       =%000005         373#    680*    684*    692*    775*    779*    791*    795*    876*    879     902*    903*    904*
                          929*    933     938*    951*    954*    971*    975*    976*    977*   1070    1275*   1280*   1286
                         1289    1292    1295    1298    1301    1304    1307    1310*   1549    1557*
R6       =%000006         374#
R7       =%000007         375#
SAVDS    006432           680    1275    1544#
SCFLG    003122           964     966*   1022#
SCSLT    003076           877     929     938     952     972     981    1008#
SEC      006736           734*    738*    739     742*    803*    908     933*   1123    1444    1626#
SECA     006752           787*    826     841    1632#
SECMES   004031           872    1173#
SECR     006744          1112*   1114*   1123    1471    1629#
SEKE     002776           890     917     987#
SEMS     006344          1393    1522#
SFCHK    002354           909     911#    918
SFCL1    002400           915#    928     946
SFCL2    002510           933#    937     942
SFCN1    002466           926     929#
```

```
SFSL1   002122            871#    881
SFSL2   002154            878#    883
SFSL3   002176            884#    891
SFSL4   002220            888#    900     910
SFSL5   002320            903#    906
SFSNI   002306            898     901#
SFTER   004574           1248#
SIN     002630            880     957#
SINI    002676            961     963     965     969#
SP    = 000006            367#    656#    686#    694#    698#    765#    867#    968#    996#   1076#   1125#   1132    1158#
                         1252    1253#   1259    1260#   1278    1284    1324#   1329#   1405#   1412    1416    1544#   1545#
                         1546#   1547#   1548#   1551    1552    1553    1554    1555    1556    1563#   1567    1597#   1598
                         1605#
SPACE   003242           1059#   1063    1075
SR    = 177570            356#   1268    1273    1315    1322    1327    1569
START1  000600            641     656#    698     765     867
START2  001346            643     765#
START3  002102            645     867#
START4  001014            647     698#
STMS    006372           1282    1530#
STR4    001034            694     702#
SUBER   003626           1129#   1288
SUBRMS  006241           1130    1502#
SWMES   004201            661    1194#
S1      006160           1060    1435    1441    1450    1462    1468    1485#
S2      006162           1429    1456    1487#
TAMS    006334           1387    1519#
TEMP1   006756           1634#
TKB   = 177562            359#   1164
TKS   = 177560            358#   1161#   1162
TKV   = 000060            362#
TOG1    006706            673#    676#    875#    882#    901#    905#    930#    936#    939#    970#    984#   1614#
TOG2    006710            973#    978#    982#   1615#
TOG3    006712           1616#
TOG4    006714           1400#   1409#   1411#   1418#   1617#
TOLUPC  005662           1416#   1419
TPB   = 177566            361#   1571#
TPCFCH  006636           1598#   1606
TPOUTX  006672           1600    1607#
TPS   = 177564            360#   1572
TPV   = 000064            363#
TTG     006754           1062#   1072#   1073    1137#   1147#   1633#
TTIL    003666           1139#   1156
TTIO    003654            783     799    1041    1065    1137#
TTIX    003756           1141    1157#
TTO     006522            958    1142    1157    1312    1415    1417    1569#   1578    1604
TTOLF   006554           1570    1575    1577#
TTOLP   006536           1572#   1573
TTRX    003772           1144    1146    1148    1160#
TYPOUT  006634            662     705     754     771     774     790     854     873     879     949    1040    1061    1131
                         1272    1277    1283    1333    1337    1343    1348    1353    1359    1382    1388    1394    1424
                         1427    1430    1436    1442    1448    1451    1454    1457    1463    1469    1475    1597#
UMES    004020           1039    1171#
UNIQ    003134            659     701     768     870    1038#   1042    1044
UNIT    006726            708     885     912    1045#   1047    1049    1053    1100    1622#
UNSI    003212           1048    1052#   1058
```

DO4


```
URDY1   000620          660#
WORK    006716          974*    976     983*    1401*   1403*   1404*   1405    1618#
WORK1   006720          778     782     794     798     1070    1138*   1152*   1153*   1154*   1155*   1159    1619#
WORK2   006722         1365*   1368*   1369*   1370    1372*   1374    1376*   1377*   1379*   1389    1395    1620#
WORK3   006724         1364*   1367*   1380*   1383    1621#
WWW     003356         1082#   1083
XX      = 000000        377#   1317    1610    1611    1612    1613    1614    1615    1616    1617    1618    1619    1620
                       1621    1622    1623    1624    1625    1626    1627    1628    1629    1630    1631    1632    1633
                       1634    1635    1636    1637    1664
.       = 007054        434#    439     441     443     445     447     449     451     453     455     457     459     461
                        463     465     467     469     471     473     475     477     479     481     483     485     487
                        489     491     493     495     497     499     501     503     505     507     509     511     513
                        515     517     519     521     523     525     527     529     531     533     535     537     539
                        541     543     545     547     549     551     553     555     557     559     561     563     565
                        567     569     571     573     575     577     579     581     583     585     587     589     591
                        593     595     597     599     601     603     605     607     609     611     613     615     617
                        619     621     623     625     627     629     632*    640*    642*    644*    646*    648*    689
                        715     718     726     740     745     829     845     997     925     990     993    1055    1066
                       1085    1089    1091    1095    1163    1244    1290    1293    1296    1299    1302    1305    1309
                       1323    1328    1602
```

ANDI	416#	1113	1115	1117	1149	1165	1384	1390	1396	1402	1413				
PNTM	421#	660	703	752	769	772	788	852	871	947	1038	1059	1129	1270	1422
	1425	1428	1434	1440	1446	1449	1452	1455	1461	1467	1473				
PNTOL	426#	1431	1437	1443	1458	1464	1470								

F04

```
            1311    1332    1334    1336    1338    1342    1344    1347    1349    1352    1354    1357    1359    1364    1365
            1367    1368    1379    1381    1383    1387    1393    1400    1401    1405    1411    1412    1416    1423    1426
            1429    1432    1435    1438    1441    1444    1447    1450    1453    1456    1459    1462    1465    1468    1471
            1474    1544    1545    1546    1547    1548    1552    1553    1554    1555    1556    1559    1561    1563    1567
            1571    1577    1580    1594    1597    1603
MOVB         671     708     713     716     724     825     826     827     84C     841     843     895     895     912     923
             987     988     991    1053    1079    1080    1098    1099    11C    1164    1389    1395    1538
NOP          737     935
RESET        658     700     767     869
ROL          810     811     812     813     814     815     816    1152    1153    1154    1262
ROR          818    1105    1106    1107    1108    1109    1110    1111    1255    1406    1407    1408
RTI          687     695    1318
RTS          956     969     986     995     997    1056    1064    1067    1077    1101    1126    1128    1135    1160    1167
            1245    1247    1258    1265    1325    1330    1340    1346    1351    1356    1361    1399    1420    1476    1557
            1576    1591    1595    1608
SUB          959    1133    1279    1592
TRAP         405
TST          962    1047    1551    1564
TSTB         964    1162    1313    1572
.ASCII      1171    1173    1183    1184    1185    1186    1187    1188    1189    1190    1191    1192    1194    1200    1206
            1214    1222    1230    1479    1485    1487    1489    1492    1498    1500    1502    1507    1510    1513    1515
            1519    1522    1525    1528    1530    1533    1536    1540
.BYTE       1025    1026    1027    1028    1029    1030    1031    1032    1033    1034
.ENABL       355
.END        1669
.EVEN       1238    1542
.LIST        355
.MACR        416     421     426
.NLIST       355
.PAGE        650     759     861
.REM           4
.REPT        435    1008    1022
.SBTTL       651     759     861
.TITLE       650
.WORD        633     634     635     636    1011    1012    1013    1014    1015    1016    1017    1018    1019    1020    1051
            1662    1663

ERRORS DETECTED:  0
DEFAULT GLOBALS GENERATED:  0

*,DZRPD/SOL/CRF/PAGNUM=DZRPD
RUN-TIME: 4 9 3 SECONDS
RUN-TIME RATIO: 66/17=3.7
CORE USED:  8K  (15 PAGES)
```

Spooler runtime 5 Seconds, 30 KCS, 166 disk reads, 4 disk writes, 45 pages