

\*START\* Job VDIR Req #913 for KSPROUL Date 11-Sep-82 20:43:43 Monitor: Rutgers/LCSR DEC-20 (Red), TOPS-20 Monit \*START\*

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```
K K SSSS PPPP RRRR 000 U U L
K K S P P R R 0 0 U U L
K K S P P R R 0 0 U U L
KKK SSS PPPP RRRR 0 0 U U L
K K S P R R 0 0 U U L
K K S P R R 0 0 U U L
K K SSSS P R R 000 UUUUU LLLLL
```

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```
N N SSSS 999 1 000 H H 000 L EEEEE SSSS
N N t S 9 9 11 0 0 H H 0 0 L E S
NN N ooo ttt eee ## S 9 9 1 0 00 H H 0 0 L E S
N N N o o t e e e ## SSS 9999 1 0 0 0 ----- HHHH 0 0 L EEEE SSS
N NN o o t eeee S 9 1 00 0 H H 0 0 L E S
N N o o t e ## S 9 1 0 0 H H 0 0 L E S
N N ooo tt eeee ## SSSS 999 111 000 H H 000 LLLLL EEEEE SSSS
```

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\*\*\*\*\*  
\*  
\* \* \* \* \* N O T I C E \* \* \* \* \* \*  
\*  
\* ATTENTION!! NEW BIN NUMBERS AT HILL CENTER! \*  
\* -STARTS AUGUST 29- CHECK CAMPUS MAIL \*  
\* FOR DESCRIPTIVE MEMO OR PICK ONE UP AT HILL \*  
\* I/O COUNTER OR AID STATION- \*  
\* RESET BIN IN WYLBUR TO CONFORM! \*  
\*  
\*\*\*\*\*



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Bottom section of faint, illegible text, possibly a footer or summary.

.MAIN. CROSS 6(54) 11-SEP-82 20:29  
VDIR.M65 Table of contents

1	Documentation & History
11	System Equates
72	Main Program
230	Disk Subroutines
304	System I/O
356	Disk Drivers - Command Tables

1 .SBTTL Documentation & History  
2 .TITLE Codos V-Directory  
3  
4  
5 ; 24-JAN-82 STARTED PGM  
6 ; 04-MAR-82 ADDED MTU VERSION  
7  
8  
9

```

11          .SBTTL System Equates
12
13          .LIST  CND
14
15          0001      KSV      =      1          ; KSPROUL VERSION
16          0000      KIM      =      0          ; KIM VERSION
17          0000      KIMA     =      0          ; KIM USER RAM AT $A000
18          0000      AIM      =      0          ; AIM VERSION
19          0000      MTU      =      0          ; MTU-130 VERSION
20
21          01        .IFEQ    KSV-1          ; K-SPROUL VERSION
22          .IFT
23          0000      SYSRAM   =      $C000
24          8000      USRRAM   =      $8000
25          8000      ORG      =      $8000
26          00        .ENDC
27
28          01        .IFEQ    KIM-1          ; STANDARD KIM VERSION
29          .IFT
30          SYSRAM   =      $C000
31          USRRAM   =      $6000
32          ORG      =      $6000
33          00        .ENDC
34
35          01        .IFEQ    KIMA-1        ; STANDARD KIM VERSION
36          .IFT
37          SYSRAM   =      $C000
38          USRRAM   =      $A000
39          ORG      =      $A000
40          00        .ENDC
41
42          01        .IFEQ    AIM-1          ; STANDARD AIM VERSION
43          .IFT
44          SYSRAM   =      $8000
45          USRRAM   =      $4000
46          ORG      =      $4000
47          00        .ENDC
48
49          01        .IFEQ    MTU-1          ; MTU-130 VERSION
50          .IFT
51          SYSRAM   =      $E000
52          USRRAM   =      $C000
53          ORG      =      $B400
54          00        .ENDC
55
56

```



```

58
59          .LIST    ME
60          .MCALL  MACDEF, DSKEQU, SVCDEF
61 0000     DSKEQU
(1)        ;***** FLOPPY DISK CONTROLLER REGISTER ADDRESSES *****
(1)
(1)        C603     CODOS   =     SYSRAM+$0603   ; CODOS WARM START ADDRESS
(1)        DFOO     DSKIPL =     SYSRAM+$1FOO   ; DISK BOOT ENTRY POINT
(1)        DFE8     FDCIRQ =     SYSRAM+$1FE8   ; K-1013 INTERRUPT REG.          (READ-ONLY)
(1)        DFE8     FDCHWC =     SYSRAM+$1FE8   ; DMA MODE (BO) WRITE PROT (B1) (WRITE-ONLY)
(1)        DFEA     FDCDMA =     SYSRAM+$1FEA   ; FDC DMA ADDRESS REGISTER
(1)        DFEE     FDCMSR =     SYSRAM+$1FEE   ; FDC NEC-765 MAIN STATUS REGISTER
(1)        DFEF     FDCDR  =     SYSRAM+$1FEF   ; FDC NEC-765 DATA REGISTER
(1)
(1)        ;*****
62 0000     SVCDEF
(1)
(1)          .MCALL  SVC, SVCBYT
(1)          . =     $00B0
(1) 00B0 0001     U0:   .BLKW  1           ; NUMERIC VALUES
(1) 00B2 0001     U1:   .BLKW  1           ; ADDRESSES
(1) 00B4 0001     U2:   .BLKW  1           ; ADDRESSES / SIZE
(1) 00B6 0001     U3:   .BLKW  1           ; FILE NAME POINTER
(1) 00B8 0001     U4:   .BLKW  1           ;
(1) 00BA 0001     U5:   .BLKW  1           ; POINT TO START OF INPUT LINE BUFFER
(1) 00BC 0001     U6:   .BLKW  1           ; POINT TO START OF OUTPUT LINE BUFFER
(1) 00BE 0003     U7:   .BLKB  3           ; 24 BIT FILE ORDINAL POINTER
(1) 00EE         SVCENA =     $00EE       ; MUST BE SET TO $80 TO ENABLE SVCS
(1)
63          .NLIST  ME
64
65
66 0009     TAB     =     $09
67 000D     CR      =     $0D           ; CARRIAGE-RETURN
68
69
70

```



```

72          .SBTTL  Main Program
73
74
75          8000          . =      ORG
76
77
78 8000  A9  80          VDIR:  LDA  #$80
79 8002  85  EE          STA  SVCENA
80
81          01          .IFEQ  MTU-1
82          .IFT
83          LDA  #$0C
84          JSR  CTYOUT
85          .ENDC
86 8004          SVC  2
87 8006  02  OD  43     .ASCIZ <2><CR>'CODOS BLOCK DIRECTORY'
88
89 801E          SVC  12          ; QUERRY DEFAULT BUFFER ADDRESS
90          .; U5,U6,Y
91 8020          SVC  8          ; DECODE ASCII HEX
92 8022  A5  B0          LDA  UO+O
93 8024  8D  86  83     STA  DRIVE
94
95
96 8027  AD  86  83     LDA  DRIVE
97 802A  A2  OC          LDX  #12          ; DIRECTORY TRACK
98 802C  8E  87  83     STX  TRACK
99 802F  20  4C  82     JSR  SEEK
100
101 8032  AD  86  83     LDA  DRIVE
102 8035  AE  87  83     LDX  TRACK
103 8038  A0  00          LDY  #0
104 803A  20  87  81     JSR  RDSCTR
105 803D  A2  00          LDX  #0
106 803F  BD  00  86     MOVBLK: LDA  DMABUF,X
107 8042  9D  00  85     STA  BLKBUF,X
108 8045  E8          INX
109 8046  DO  F7          BNE  MOVBLK
110
111 8048          SVC  2
112 804A  02  OD  56     .ASCIZ <2><CR>'VSN:='<TAB>
113 8053  AD  FB  85     LDA  BLKBUF+$FB          ; VSN HIGH BYTE
114 8056  20  22  83     JSR  PRTBYT
115 8059  AD  FA  85     LDA  BLKBUF+$FA          ; VSN LOW BYTE
116 805C  20  22  83     JSR  PRTBYT
117          ; LDA  DMABUF+$FD          ; # OF FILES
118
119 805F          SVC  2
120 8061  02  OD  46     .ASCIZ <2><CR>'FILENAME          BLOCKS'<CR>
121
122 807C  A9  00          LDA  #0          ; ZERO OUT # OF FILES
123 807E  8D  9D  83     STA  NOFILE
124 8081  A9  01          LDA  #1          ; FIRST DIRECTORY INFO SECTOR
125 8083  8D  88  83     STA  SECTOR
126 8086  AD  86  83     DIRLPO: LDA  DRIVE

```

```

127 8089 AE 87 83          LDX    TRACK
128 808C AC 88 83          LDY    SECTOR
129 808F 20 87 81          JSR    RDSCTR
130 8092 A2 00              LDX    #0          ; INIT INDEX POINTER
131 8094 BD 00 86          DIRLP1: LDA    DMABUF,X      ; CODOS DIRECTORY LOOP
132 8097 FO 68              DIRLP2: BEQ    EODIR        ; CODOS DIR EXIT
133 8099 E8                INX
134 809A BD 00 86          LDA    DMABUF,X      ; CHECK IF ACTIVE ENTRY
135 809D DO 09              BNE    ACTIVE        ; BRANCH IF ACTIVE
136 809F 8A                TXA          ; FALL THROUGH IF NOT
137 80A0 18                CLC
138 80A1 69 0F            ADC    #16-1
139 80A3 AA                TAX
140 80A4 DO F1            BNE    DIRLP2
141 80A6 FO 4F            BEQ    CDSDE1        ; ONLY IF LAST ENTRY IN SECTOR IS DELETED
142
143 80A8 20 4E 83          ACTIVE: JSR    CRLF      ; NEW LINE
144 80AB EE 9D 83          NOFILE INC     ; BUMP UP # OF FILES
145 80AE AO 0E              LDY    #14          ; 14 CHARS IN NAME
146 80B0 BD 00 86          NAMELP: LDA    DMABUF,X      ; CODOS DIRECTORY NAME PRINT LOOP
147 80B3 20 55 83          JSR    CTYOUT        ; PRINT VALID CHAR
148 80B6 C9 2E              CMP    #'.'         ; CHECK IF END OF NAME
149 80B8 FO 06              BEQ    DIREXT        ; IF SO GO DO EXTENSION (DONE SO EXTRA CHRS
150 80BA E8                INX          ; ADVANCE POINTER          DON'T GET PRINTED)
151 80BB 88                DEY
152 80BC DO F2            BNE    NAMELP
153 80BE                SVC    0          ; IF IT GETS HERE THEN INVALID FILENAME
154
155
156 80C0 BD 01 86          DIREXT: LDA    DMABUF+1,X    ; Get File Extension
157 80C3 20 55 83          JSR    CTYOUT        ; PRINT THE FILE NAME EXTENSION
158 80C6 E8                SPACEL: INX         ; FILL THE REST OF THE SPACE WITH SPACES
159 80C7 20 53 83          JSR    CTYSPA        ; <space>
160 80CA 88                DEY
161 80CB DO F9            BNE    SPACEL
162 80CD 20 53 83          JSR    CTYSPA
163
164 80D0 BD 00 86          LDA    DMABUF,X
165 80D3 20 22 83          JSR    PRTBYT        ; GET & PRINT (& INX) BAT ENTRY FOR FILE
166 80D6 20 53 83          JSR    CTYSPA
167 80D9 8A                TXA
168 80DA 48                PHA          ; SAVE SECTOR POINTER
169
170 80DB BD 00 86          LDA    DMABUF,X
171 80DE AA                TAX          ; GET BLK POINTER INTO X REG
172 80DF BD 00 85          BLK.LP: LDA    BLKBUF,X
173 80E2 C9 FC            CMP    # $FC
174 80E4 FO 0C            BEQ    BLKEND
175 80E6 48                PHA          ; SAVE BLOCK #
176 80E7 20 22 83          JSR    PRTBYT
177 80EA 20 53 83          JSR    CTYSPA
178 80ED 68                PLA          ; RESTORE BLOCK #
179 80EE AA                TAX
180 80EF 4C DF 80          JMP    BLK.LP
181

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182 80F2 68          BLKEND: PLA
183 80F3 AA          TAX
184 80F4 E8          INX
185 80F5 DO 9D          BNE   DIRLP1      ; IF NOT CONTINUE WITH DIRECTORY
186 80F7 EE 88 83    CDSDE1: INC   SECTOR    ; ADVANCE TO NEXT SECTOR
187 80FA AD 88 83    LDA   SECTOR
188 80FD C9 11          CMP   #17      ; CHECK IF DONE
189 80FF 90 85          BLT   DIRLPO    ; GO BACK IF NOT
190
191 8101 A2 00          EODIR: LDX   #0      ; ELSE FALL THROUGH IF DONE
192 8103 8E 9C 83    STX   FREBLK
193 8106 BD 00 85    BLKFRE: LDA   BLKBUF,X
194 8109 DO 03          BNE   BLKUSD
195 810B EE 9C 83    INC   FREBLK
196 810E E8          BLKUSD: INX
197 810F EO F8          CPX   #$F8
198 8111 90 F3          BLT   BLKFRE
199 8113          SVC   2
200 8115 02 0D 0D    .ASCIZ <2><CR><CR>'NUMBER OF FILES:'<TAB>
201 812A AD 9D 83    LDA   NOFILE
202 812D 20 3F 83    JSR   PRTDEC      ; PRINT IN DECIMAL
203
204 8130          SVC   2
205 8132 02 0D 0D    .ASCIZ <2><CR><CR>'LAST BLOCK USED:'<TAB>
206 8147 A9 24          LDA   #'$
207 8149 20 55 83    JSR   CTYOUT
208 814C AD FF 85    LDA   BLKBUF+255
209 814F 20 22 83    JSR   PRTBYT
210
211 8152          SVC   2
212 8154 02 0D 0D    .ASCIZ <2><CR><CR>'FREE BLOCKS:='<TAB>
213 8166 AD 9C 83    LDA   FREBLK
214 8169 20 3F 83    JSR   PRTDEC      ; PRINT IN DECIMAL
215 816C A9 09          LDA   #TAB
216 816E 20 55 83    JSR   CTYOUT
217 8171 A9 28          LDA   #'(
218 8173 20 55 83    JSR   CTYOUT
219 8176 A9 24          LDA   #'$
220 8178 20 55 83    JSR   CTYOUT
221 817B AD 9C 83    LDA   FREBLK
222 817E 20 22 83    JSR   PRTBYT
223 8181 A9 29          LDA   #' )
224 8183 20 55 83    JSR   CTYOUT
225 8186 60          RTS
226
227
228

```

```

230          .SBTTL  Disk Subroutines
231
232
233          ; ENTER A = DRIVE
234          ;       X = TRACK
235          ;       Y = SECTOR
236
237 8187          RDSCTR:          ; READ SECTOR
238 8187 29 07          AND    #$07          ; JUST TO BE SAFE
239 8189 8D 7E 83          STA    READCM+2          ; DRV
240 818C 4A          LSR    A          ; ISOLATE HEAD # & PUT INTO H FIELD
241 818D 4A          LSR    A
242 818E 8D 80 83          STA    READCM+4          ; H
243 8191 8E 7F 83          STX    READCM+3          ; C
244 8194 8C 81 83          STY    READCM+5          ; R
245 8197 8C 83 83          STY    READCM+7          ; EOT
246 819A A9 86          LDA    #DMABUF^
247 819C 20 ED 82          JSR    DMASET
248 819F A9 01          LDA    #$01          ; SET DMA DIRECTION TO READ
249 81A1 8D E8 DF          STA    FDCHWC
250 81A4 A2 10          LDX    #READCM-DSKCMD          ; RELAITIVE ADDRESS OF CMD
251 81A6 20 83 82          JSR    COMAND
252 81A9 AD E8 DF          RDSCL1: LDA    FDCIRQ          ; WAIT FOR IRQ FROM FDC
253 81AC 30 FB          BMI    RDSCL1
254 81AE 20 A8 82          JSR    RESULT          ; GET FDC RESULTS
255 81B1 20 CB 82          JSR    RERROR          ; CHECK IF ERROR
256 81B4 90 1C          BCC    RDSCOK
257          ;*****
258          ;**** RE-TRY ****
259          ;*****
260          ;       INC    ERRCNT          ; KEEP TRACK OF # OF ERRORS
261          ;       LDA    #'?
262          ;       JSR    CTYOUT
263          ;       LDA    SECTOR
264          ;       JSR    PRTBYT
265          ;       LDA    #$20
266          ;       JSR    CTYOUT
267
268 81B6 A9 86          LDA    #DMABUF^
269 81B8 20 ED 82          JSR    DMASET
270 81BB A9 01          LDA    #$01          ; SET DMA DIRECTION TO READ
271 81BD 8D E8 DF          STA    FDCHWC
272 81C0 A2 10          LDX    #READCM-DSKCMD          ; RELAITIVE ADDRESS OF CMD
273 81C2 20 83 82          JSR    COMAND
274 81C5 AD E8 DF          RDSCL2: LDA    FDCIRQ          ; WAIT FOR IRQ FROM FDC
275 81C8 30 FB          BMI    RDSCL2
276 81CA 20 A8 82          JSR    RESULT          ; GET FDC RESULTS
277 81CD 20 CB 82          JSR    RERROR          ; CHECK IF ERROR
278 81D0 B0 01          BCS    RDSCER          ; *** IF 2 ERRORS, THEN QUIT
279 81D2 60          RDSCOK: RTS          ; READ-SECTOR-OKAY
280
281 81D3 38          RDSCER: SEC
282 81D4 60          RTS
283
284 81D5 48          ERROR: PHA

```

285	81D6	20	4E	83	JSR	CRLF		
286	81D9				SVC	2		
287	81DB	02	44	49	.ASCIZ	<2>'DISK ERROR # '		
288	81EA	68			PLA			
289	81EB	20	22	83	JSR	PRTBYT		
290	81EE				SVC	1		
291								
292								
293		0005			SEKERR	=	\$05	; Seek Error
294		0006			RCLERR	=	\$06	; Recalibrate Error
295		000F			FCMDER	=	\$0F	; FDC Comand Error
296		0010			FRSLER	=	\$10	; FDC Result Error
297		0016			DMAERR	=	\$16	; DMA Page Error
298								
299					.MCALL	DISKSR		
300	81FO				DISKSR			
301								
302								



```

304 .SBTTL System I/O
305
306
307 8322 48 PRTBYT: PHA ; PRINT ACC AS 2 HEX CHARS
308 8323 48 PHA ; SAVE BYTE TWICE
309 8324 4A LSR A ; GET HIGH NIBBLE
310 8325 4A LSR A
311 8326 4A LSR A
312 8327 4A LSR A
313 8328 20 31 83 JSR HEXASC ; PRINT 1st NIBBLE
314 832B 68 PLA ; RESTORE BYTE
315 832C 20 31 83 JSR HEXASC ; PRINT 2nd NIBBLE
316 832F 68 PLA ; RESTORE BYTE
317 8330 60 RTS ; RTS X = X Y = Y A = A ??
318
319 8331 29 OF HEXASC: AND #$0F ; CONVERT NIBBLE TO ASCII CHAR
320 8333 C9 OA CMP #$0A
321 8335 18 CLC
322 8336 30 O2 BMI HEXASI
323 8338 69 O7 ADC #$07
324 833A 69 30 HEXASI: ADC #$30
325 833C 4C 55 83 JMP CTYOUT
326
327
328 833F 85 B0 PRTDEC: STA UO+0 ; PRINT ACC IN DECIMAL
329 8341 A9 00 LDA #0
330 8343 85 B1 STA UO+1
331 8345 A0 00 LDY #0
332 8347 SVC 11 ; ENCODE TO ASCII DECIMAL
333 8349 A2 02 LDX #2
334 834B SVC 7
335 834D 60 RTS
336
337
338
339
340 834E A9 0D CRLF: LDA #CR
341 8350 4C 55 83 JMP CTYOUT
342
343 8353 A9 20 CTYSPA: LDA #$20
344
345 8355 8D 99 83 CTYOUT: STA SYS.A
346 8358 8E 9A 83 STX SYS.X
347 835B 8C 9B 83 STY SYS.Y
348 835E A2 02 LDX #2
349 8360 SVC 4
350 8362 AC 9B 83 LDY SYS.Y
351 8365 AE 9A 83 LDX SYS.X
352 8368 AD 99 83 LDA SYS.A
353 836B 60 RTS
354

```

```

356          .SBTTL  Disk Drivers - Command Tables
357
358
359          ;      LIST OF DISK COMMANDS, STARTS IN PROGRAM AREA BUT MUST BE IN
360          ;      RAM SO THAT CERTAIN BYTES OF THE COMMANDS CAN BE CHANGED
361
362 836C      DSKCMD:          ; START OF PREFORMATTED DISK COMMANDS
363
364 836C 03    SPECCM: .BYTE 3      ; #      ; THREE BYTES IN SPECIFY COMMAND
365 836D 03    .BYTE $03      ; CMD   ; SPECIFY COMMAND
366 836E AF    .BYTE $AF      ; SRT   ; SEEK SPEED=6ms HEAD UNLOAD TIME=240ms
367 836F 24    .BYTE $24      ; HLT   ; HEAD LOAD TIME=40ms  DMA MODE
368
369 8370 01    SNSICM: .BYTE 1      ; #      ; 1 BYTE IN SENSE INT. CMD
370 8371 08    .BYTE $08      ; CMD   ; SENSE INTERRUPT STATUS COMMAND
371
372 8372 02    RECLCM: .BYTE 2      ; #      ; 2 BYTES IN RECALIBRATE CMD
373 8373 07    .BYTE $07      ; CMD   ; RECALIBRATE COMMAND
374 8374 00    .BYTE 00       ; DRV   ; DRIVE NUMBER IN BITS 0-1
375
376 8375 03    SEEKCM: .BYTE 3      ; #      ; 3 BYTES IN SEEK CMD
377 8376 0F    .BYTE $0F      ; CMD   ; SEEK COMMAND
378 8377 00    .BYTE 0        ; DRV   ; DRIVE NUMBER IN BITS 0-1, SIDE NUMBER B2
379 8378 00    .BYTE 0        ; NCN   ; NEW CYLINDER NUMBER
380
381 8379 02    SDSTCM: .BYTE 2      ; #      ; 2 BYTES IN SENSE DRIVE STATUS CMD
382 837A 04    .BYTE $04      ; CMD   ; SENSE DISK STATUS COMMAND
383 837B 00    .BYTE 0        ; DRV   ; DRIVE NUMBER IN BITS 0-1, SIDE NUMBER B2
384
385 837C 09    READCM: .BYTE 9      ; #      ; 9 BYTES IN READ DATA CMD
386 837D 46    .BYTE $46      ; CMD   ; READ DATA, MFM, READ DEL DATA
387 837E 00    .BYTE 0        ; DRV   ; HEAD ZERO, DRIVE NUMBER IN BITS 0-1
388 837F 00    .BYTE 0        ; C      ; NEEDS PRESENT CYLINDER NUMBER
389 8380 00    .BYTE 0        ; H      ; NEEDS HEAD NUMBER
390 8381 00    .BYTE 0        ; R      ; NEEDS SECTOR NUMBER TO READ
391 8382 01    .BYTE 01       ; N      ; CODE FOR 256 BYTES PER SECTOR
392 8383 00    .BYTE 0        ; EOT   ; LAST SECTOR TO READ
393 8384 0E    .BYTE $0E      ; GPL   ; GAP LENGTH FOR 26 SECTORS, 256 BYTES/SECT
394 8385 FF    .BYTE $FF      ; DTL   ; DATA LENGTH = $FF SINCE N IS NON-ZERO
395
396
397
398
399
400 8386 0001  DRIVE:  .BLKB  1
401 8387 0001  TRACK:  .BLKB  1
402 8388 0001  SECTOR: .BLKB  1
403
404
405
406 8389 0010  DSKSTS: .BLKB  16
407 8399 0001  SYS.A:  .BLKB  1
408 839A 0001  SYS.X:  .BLKB  1
409 839B 0001  SYS.Y:  .BLKB  1
410

```



411	839C	0001	FREBLK:	.BLKB	1
412	839D	0001	NOFILE:	.BLKB	1
413					
414		8500	.	=	<<./256>+1>*256
415	8500	0100	BLKBUF:	.BLKB	256
416	8600	0100	DMABUF:	.BLKB	256
417		8000	.	END	VDIR

ACTIVE	80A8	135	143#								
AIM	= 0000	18#	42								
BLKBUF	8500	107*	113	115	172	193	208	415#			
BLKEND	80F2	174	182#								
BLKFRE	8106	193#	198								
BLKUSD	810E	194	196#								
BLK LP	80DF	172#	180								
CDSDE1	80F7	141	186#								
CMDPHE	82A3	300#									
CMDPH1	828E	300#									
CODOS	= C603	61#									
COMAND	8283	251	273	300#							
CR	= 000D	67#	87	112	120	200	205	212	340		
CRLF	834E	143	285	340#							
CTYOUT	8355	147	157	207	216	218	220	224	325	341	345#
CTYSPA	8353	159	162	166	177	343#					
DIREXT	80C0	149	156#								
DIRLPO	8086	126#	189								
DIRLP1	8094	131#	185								
DIRLP2	8097	132#	140								
DMABUF	8600	106	131	134	146	156	164	170	246	268	416#
DMAERR	= 0016	297#	300								
DMASET	82ED	247	269	300#							
DMASTE	831D	300#									
DMAST1	82FF	300#									
DMAST2	830F	300#									
DMAST3	8315	300#									
DMAST4	8316	300#									
DRIVE	8386	93*	96	101	126	400#					
DSKCMD	836C	250	272	300	362#						
DSKINI	81F0	300#									
DSKIPL	= DF00	61#									
DSKSTS	8389	300*	406#								
EODIR	8101	132	191#								
ERROR	81D5	284#	300								
FCMDER	= 000F	295#	300								
FDCDMA	= DFEA	61#	300*								
FDCDR	= DFEF	61#	300*								
FDCHWC	= DFEB	61#	249*	271*	300*						
FDCIRQ	= DFEB	61#	252	274	300						
FDCMSR	= DFEE	61#	300								
FREBLK	839C	192*	195*	213	221	411#					
FRSLER	= 0010	296#	300								
HEXASC	8331	313	315	319#							
HEXASI	833A	322	324#								
KIM	= 0000	16#	28								
KIMA	= 0000	17#	35								
KSV	= 0001	15#	21								
MOVBLK	803F	106#	109								
MTU	= 0000	19#	49	81							
NAMELP	80B0	146#	152								
NOFILE	839D	123*	144*	201	412#						
ORG	= 8000	25#	75								
PRTBYT	8322	114	116	165	176	209	222	289	307#		
PRTDEC	833F	202	214	328#							







Errors detected: 0

\*,VDIR=VDIR

Run-time: 2 1 0 Seconds

Core used: 11K

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1964  
1965



\*\*END\*\* Job VDIR Req #913 for KSPROUL Date 11-Sep-82 20:44:44 Monitor: Rutgers/LCSR DEC-20 (Red), TOPS-20 Monit \*\*END\*\*

\*\*END\*\* Job VDIR Req #913 for KSPROUL Date 11-Sep-82 20:44:44 Monitor: Rutgers/LCSR DEC-20 (Red), TOPS-20 Monit \*\*END\*\*

\* \* \* L P T S P L R u n L o g \* \* \*

20:43:43 LPDAT LPTSPL version 104(16650) Rutgers/LCSR DEC-20 (Red), TOPS-20 Monit  
20:43:43 LPDAT Job VDIR sequence #1428 on Printer 0 [LOCAL] at 11-Sep-82 20:43:43  
20:43:50 LPMSG Starting File PS:<KSPROUL>VDIR.LST.1  
20:44:44 LPMSG Finished File PS:<KSPROUL>VDIR.LST.1  
20:44:44 LPEND Summary: 17 Pages of Output  
20:44:44 LPEND 6 Disk Pages Read  
20:44:44 LPEND 7.657 Seconds CPU Time Used

\*\*END\*\* Job VDIR Req #913 for KSPROUL Date 11-Sep-82 20:44:44 Monitor: Rutgers/LCSR DEC-20 (Red), TOPS-20 Monit \*\*END\*\*

\*\*END\*\* Job VDIR Req #913 for KSPROUL Date 11-Sep-82 20:44:44 Monitor: Rutgers/LCSR DEC-20 (Red), TOPS-20 Monit \*\*END\*\*

\*\*END\*\* Job VDIR Req #913 for KSPROUL Date 11-Sep-82 20:44:44 Monitor: Rutgers/LCSR DEC-20 (Red), TOPS-20 Monit \*\*END\*\*

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