

APPENDIX A

USER COMMAND SUMMARY

APPEND FILE	AF <file1>,<file2>
BAUD PORT	BP <port #>,<baud rate>{,<CRU base>}
COPY FILE	CF <file1>,<file2>
CHECKSUM MEMORY	CS
CREATE TASK	CT <task>{,<size>}{,<time>},{<port>}
DEFINE FILE	DF <file>{,<sectors>}
DELETE FILE	DL <file>
SET/RESET EVENT	EV {<event>}
PDOS BASIC	EX
FILE SLOT USAGE	FS
EXECUTE	GO {<address>}
HELP	HE <parameter>
INITIALIZE DATE	ID
INTERRUPT MASK	IM <interrupt mask>
KILL TASK	KT <task #>
AVAILABLE MEMORY	LM
LIST DIRECTORY	LS {<list string>}
LIST TASKS	LT
DIRECTORY LEVEL	LV {<level>}
RESET CONSOLE	RC
RENAME FILE	RN <file1>,<file2>
RESET	RS {<disk #>}
RESTORE TASK	RT <file name>
SET FILE ATTRIBUTES	SA <file>{,<attributes>}
SHOW FILE	SF <file name>
DISK SPACE	SP {<disk #>}
SAVE TASK	ST <file name>
SPOOL UNIT	SU <unit>,<file>
SYSTEM DISK	SY {<disk #>}
SET OUTPUT UNIT	UN <#>

APPENDIX B

PRIMITIVE COMMAND SUMMARY

```
1 *****
2 *      ALPHABETIZED PDOS COMMAND SUMMARY
3 *
4 0000: 2F40      XAPF      ;APPEND FILE
5 0002: 2F49      XBCP      ;BAUD CONSOLE PORT
6 0004: 2F54      XCBC      ;CHECK FOR BREAK CHARACTER
7 0006: 2FD6      XCBD      ;CONVERT BINARY TO DECIMAL
8 0008: 2FD7      XCBH      ;CONVERT BINARY TO HEX
9 000A: 2FD8      XCBM      ;CONVERT BINARY TO DECIMAL WITH MESSAGE
10 000C: 2FD9      XCDB      ;CONVERT DECIMAL TO BINARY
11 000E: 2F87      XCFA      ;CLOSE FILE WITH NEW ATTRIBUTES
12 0010: 2F41      XCHF      ;CHAIN FILE
13 0012: 2F86      XCLF      ;CLOSE FILE
14 0014: 2F5C      XCLS      ;CLEAR SCREEN
15 0016: 2F42      XCPY      ;COPY FILE
16 0018: 2FDD      XCTB      ;CREATE TASK BLOCK
17 001A: 2F80      XDFL      ;DEFINE FILE
18 001C: 2F81      XDLF      ;DELETE FILE
19 001E: 2FC4      XERR      ;MONITOR ERROR CALL
20 0020: 2FC3      XERS      ;ERROR #, RTWP/SHAP
21 0022: 2FC5      XEXT      ;EXIT TO MONITOR
22 0024: 2F48      XFFN      ;FIX FILE NAME
23 0026: 2FD5      XFTD      ;FIX TIME & DATE INTO R0,R1
24 0028: 2F55      XGCC      ;GET CONSOLE CHARACTER CONDITIONAL
25 002A: 2F56      XGCR      ;GET CONSOLE CHARACTER
26 002C: 2F4A      XGLB      ;GET LINE IN BUFFER
27 002E: 2F48      XGLM      ;GET LINE IN MONITOR BUFFER
28 0030: 2F4C      XGLU      ;GET LINE IN USER BUFFER
29 0032: 2F43      XGML      ;GET MEMORY LIMITS
30 0034: 2FD0      XGNP      ;GET NEXT PARAMETER
31 0036: 2FCB      XGTM      ;GET TASK MESSAGE
32 0038: 2F5E      XIPL      ;INTERRUPT DRIVEN PUT LINE
33 003A: 2FCC      XISE      ;INIT SECTOR
34 003C: 2F50      XKTB      ;KILL TASK BLOCK
35 003E: 2F44      XLDF      ;LOAD FILE
36 0040: 2FDC      XLFN      ;LOOK FOR NAME IN FILE SLOTS
37 0042: 2F91      XLKF      ;LOCK FILE
38 0044: 2FC9      XLKT      ;LOCK TASK
39 0046: 2F45      XLST      ;LIST FILE DIRECTORY
40 0048: 2F85      XNOP      ;OPEN NON-EXCLUSIVE RANDOM
41 004A: 2F57      XPBC      ;PUT USER BUFFER TO CONSOLE (*R9)
42 004C: 2F58      XPCC      ;PUT CHARACTER TO CONSOLE
43 004E: 2F59      XPCL      ;PUT CRLF TO CONSOLE
44 0050: 2F5A      XPLC      ;PUT LINE TO CONSOLE
45 0052: 2F5B      XPMC      ;PUT MESSAGE TO CONSOLE
```

(APPENDIX B PRIMITIVE COMMAND SUMMARY continued)

1 0054: 2F5D	XPSC	;POSITION CURSOR
2 0056: 2F8C	XPSF	;POSITION FILE
3 0058: 2F88	XRBF	;READ BLOCK
4 005A: 2F4D	XRDE	;READ DIRECTORY ENTRY
5 005C: 2F4E	XRDN	;READ DIRECTORY NAME
6 005E: 2FD3	XRDT	;READ DATE
7 0060: 2F8E	XRFA	;READ FILE ATTRIBUTES
8 0062: 2F89	XRLF	;READ LINE
9 0064: 2F90	XRNF	;RENAME FILE
10 0066: 2F82	XROO	;OPEN READ ONLY RANDOM
11 0068: 2F83	XROP	;OPEN RANDOM FILE
12 006A: 2FCD	XRSE	;READ SECTOR
13 006C: 2F46	XRST	;RESET FILES
14 006E: 2FCF	XRSZ	;READ SECTOR ZERO
15 0070: 2FD1	XRTM	;READ TIME
16 0072: 2FDF	XRTS	;READ TASK STATUS
17 0074: 2F8D	XRWF	;REWIND FILE
18 0076: 2FC6	XSEF	;SET EVENT FLAG
19 0078: 2FC2	XSER	;ERROR RTWP/SWAP
20 007A: 2F84	XSOP	;OPEN SEQUENTIAL FILE
21 007C: 2FDE	XSTM	;SEND TASK MESSAGE
22 007E: 2FC7	XSUI	;SUSPEND UNTIL INTERRUPT
23 0080: 2FC0	XSWP	;SWAP TO NEXT PROCESS
24 0082: 2FC1	XSWR	;RTWP/SWAP
25 0084: 2F47	XSZF	;SIZE DISK
26 0086: 2F4F	XTAB	;TAB
27 0088: 2FC8	XTEF	;TEST EVENT FLAG
28 008A: 2FDA	XUDT	;UNPACK DATE
29 008C: 2F92	XULF	;UNLOCK FILE
30 008E: 2FCA	XULT	;UNLOCK TASK
31 0090: 2FDB	XUTH	;UNPACK TIME
32 0092: 2F8A	XWBF	;WRITE BLOCK
33 0094: 2FD4	XWDT	;WRITE DATE
34 0096: 2F8F	XWFA	;WRITE FILE ATTRIBUTES
35 0098: 2F8B	XWLF	;WRITE LINE
36 009A: 2FCE	XWSE	;WRITE SECTOR
37 009C: 2FD2	XWTH	;WRITE TIME

(APPENDIX B PRIMITIVE COMMAND SUMMARY continued)

```
1 *****
2 * PDOS COMMAND SUMMARY ORDERED BY XOPS
3 *
4 0000: 2F40 XAPF ;APPEND FILE
5 0002: 2F41 XCHF ;CHAIN FILE
6 0004: 2F42 XCPY ;COPY FILE
7 0006: 2F43 XGML ;GET MEMORY LIMITS
8 0008: 2F44 XLDF ;LOAD FILE
9 000A: 2F45 XLST ;LIST FILE DIRECTORY
10 000C: 2F46 XRST ;RESET FILES
11 000E: 2F47 XSZF ;SIZE DISK
12 0010: 2F48 XFFN ;FIX FILE NAME
13 0012: 2F49 XBCP ;BAUD CONSOLE PORT
14 0014: 2F4A XGLB ;GET LINE IN BUFFER
15 0016: 2F4B XGLM ;GET LINE IN MONITOR BUFFER
16 0018: 2F4C XGLU ;GET LINE IN USER BUFFER
17 001A: 2F4D XRDE ;READ DIRECTORY ENTRY
18 001C: 2F4E XRDN ;READ DIRECTORY NAME
19 001E: 2F4F XTAB ;TAB
20 0020: 2F50 KXTB ;KILL TASK BLOCK
21 0022: 2F51 DATA >2F51 ;SPARE
22 0024: 2F52 DATA >2F52 ;SPARE
23 0026: 2F53 DATA >2F53 ;SPARE
24 0028: 2F54 XCBC ;CHECK FOR BREAK CHARACTER
25 002A: 2F55 XGCC ;GET CONSOLE CHARACTER CONDITIONAL
26 002C: 2F56 XGCR ;GET CONSOLE CHARACTER
27 002E: 2F57 XPBC ;PUT USER BUFFER TO CONSOLE (*R9)
28 0030: 2F58 XPCC ;PUT CHARACTER TO CONSOLE
29 0032: 2F59 XPCL ;PUT CRLF TO CONSOLE
30 0034: 2F5A XPLC ;PUT LINE TO CONSOLE
31 0036: 2F5B XPMC ;PUT MESSAGE TO CONSOLE
32 0038: 2F5C XCLS ;CLEAR SCREEN
33 003A: 2F5D XPSC ;POSITION CURSOR
34 003C: 2F5E XIPL ;INTERRUPT DRIVEN PUT LINE
35 003E: 2F5F DATA >2F5F ;SPARE
36 0040: 2F80 XDFL ;DEFINE FILE
37 0042: 2F81 XDLF ;DELETE FILE
38 0044: 2F82 XROO ;OPEN READ ONLY RANDOM
39 0046: 2F83 XROP ;OPEN RANDOM FILE
40 0048: 2F84 XSOP ;OPEN SEQUENTIAL FILE
41 004A: 2F85 XNOP ;OPEN NON-EXCLUSIVE RANDOM
42 004C: 2F86 XCLF ;CLOSE FILE
43 004E: 2F87 XCFA ;CLOSE FILE WITH NEW ATTRIBUTES
44 0050: 2F88 XRBf ;READ BLOCK
45 0052: 2F89 XRLF ;READ LINE
46 0054: 2F8A XWBF ;WRITE BLOCK
47 0056: 2F8B XWLF ;WRITE LINE
48 0058: 2F8C XPSF ;POSITION FILE
49 005A: 2F8D XRWF ;REWIND FILE
```

(APPENDIX B PRIMITIVE COMMAND SUMMARY continued)

1 005C: 2F8E	XRFA	;READ FILE ATTRIBUTES
2 005E: 2F8F	XWFA	;WRITE FILE ATTRIBUTES
3 0060: 2F90	XRNF	;RENAME FILE
4 0062: 2F91	XLKF	;LOCK FILE
5 0064: 2F92	XULF	;UNLOCK FILE
6 0066: 2F93	DATA >2F93	;SPARE
7 0068: 2F94	DATA >2F94	;SPARE
8 006A: 2F95	DATA >2F95	;SPARE
9 006C: 2F96	DATA >2F96	;SPARE
10 006E: 2F97	DATA >2F97	;SPARE
11 0070: 2F98	DATA >2F98	;SPARE
12 0072: 2F99	DATA >2F99	;SPARE
13 0074: 2F9A	DATA >2F9A	;SPARE
14 0076: 2F9B	DATA >2F9B	;SPARE
15 0078: 2F9C	DATA >2F9C	;SPARE
16 007A: 2F9D	DATA >2F9D	;SPARE
17 007C: 2F9E	DATA >2F9E	;SPARE
18 007E: 2F9F	DATA >2F9F	;SPARE
19 0080: 2FC0	XSMP	;SWAP TO NEXT PROCESS
20 0082: 2FC1	XSHR	;RTMP/SWAP
21 0084: 2FC2	XSER	;ERROR RTMP/SWAP
22 0086: 2FC3	XERS	;ERROR #, RTMP/SWAP
23 0088: 2FC4	XERR	;MONITOR ERROR CALL
24 008A: 2FC5	XEXT	;EXIT TO MONITOR
25 008C: 2FC6	XSEF	;SET EVENT FLAG
26 008E: 2FC7	XSUI	;SUSPEND UNTIL INTERRUPT
27 0090: 2FC8	XTEF	;TEST EVENT FLAG
28 0092: 2FC9	XLKT	;LOCK TASK
29 0094: 2FCA	XULT	;UNLOCK TASK
30 0096: 2FCB	XGTM	;GET TASK MESSAGE
31 0098: 2FCC	XISE	;INIT SECTOR
32 009A: 2FCD	XRSE	;READ SECTOR
33 009C: 2FCE	XWSE	;WRITE SECTOR
34 009E: 2FCF	XRSZ	;READ SECTOR ZERO
35 00A0: 2FDD	XGNP	;GET NEXT PARAMETER
36 00A2: 2FD1	XRTM	;READ TIME
37 00A4: 2FD2	XWTM	;WRITE TIME
38 00A6: 2FD3	XRDT	;READ DATE
39 00A8: 2FD4	XWDT	;WRITE DATE
40 00AA: 2FD5	XFTD	;FIX TIME & DATE INTO R0,R1
41 00AC: 2FD6	XCBD	;CONVERT BINARY TO DECIMAL
42 00AE: 2FD7	XCBH	;CONVERT BINARY TO HEX
43 00B0: 2FD8	XCBM	;CONVERT BINARY TO DECIMAL WITH MESSAGE
44 00B2: 2FD9	XCOB	;CONVERT DECIMAL TO BINARY
45 00B4: 2FDA	XUDT	;UNPACK DATE
46 00B6: 2FDB	XUTM	;UNPACK TIME
47 00B8: 2FDC	XLFN	;LOOK FOR NAME IN FILE SLOTS
48 00BA: 2FDD	XCTB	;CREATE TASK BLOCK
49 00BC: 2FDE	XSTM	;SEND TASK MESSAGE
50 00BE: 2FDF	XRTS	;READ TASK STATUS

APPENDIX C

PDOS ERROR NUMBERS

PDOS BASIC ERRORS

01 = SYNTAX ERROR
02 = UNMATCHED PARENTHESIS
03 = NO SUCH LINE NUMBER (INVALID)
04 = TOO MANY VARIABLES
05 = ILLEGAL CHARACTER
06 = MISSING ASSIGNMENT OPERATOR

07 = SUBSCRIPT OUT OF RANGE
08 = TOO FEW SUBSCRIPTS
09 = TOO MANY SUBSCRIPTS

10 = STORAGE OVERFLOW
11 = STACK OVERFLOW
12 = STACK UNDERFLOW
13 = ILLEGAL DELIMITER

14 = EXPECTING DELIMITER OR OPERATOR
15 = EXPECTING VARIABLE
16 = EXPECTING SIMPLE VARIABLE
17 = EXPECTING DIMENSIONED VARIABLE
18 = EXPECTING STRING
19 = EXPECTING STRING VARIABLE

20 = PARAMETER ERROR
21 = READ OUT OF DATA
22 = READ TYPE DIFFERS FROM DATA TYPE
23 = FOR W/O NEXT
24 = NEXT W/O FOR

25 = ILLEGAL FUNCTION NAME
26 = ILLEGAL FUNCTION OR LOCAL ARGUMENT
27 = UNDEFINED FUNCTION OR FUNCTION W/O FNEND

28 = DIVISION BY ZERO
29 = FLOATING POINT OVERFLOW
30 = FIX ERROR
31 = SQUARE ROOT OF NEGATIVE NUMBER
32 = LOG OF NON-POSITIVE NUMBER
33 = INVALID SYS FUNCTION ARGUMENT
34 = UNIMPLEMENTED BASIC COMMAND

PDOS ERROR NUMBERS

50 = INVALID FILE NAME
51 = FILE ALREADY DEFINED
52 = FILE NOT OPEN
53 = FILE NOT DEFINED
54 = INVALID FILE TYPE
55 = FRAGMENTATION ERROR
56 = END-OF-FILE
57 = FILE DIRECTORY FULL
58 = FILE DELETE PROTECTED
59 = INVALID SLOT #
60 = FILE SPACE FULL
61 = NO START ADDRESS
62 = FILE ALREADY OPEN
63 = ILLEGAL OBJECT TAG
64 = ILLEGAL PORT OR BAUD RATE
65 = EXCEEDS TASK SIZE
66 = FILE NOT LOADABLE
67 = INVALID PARAMETER
68 = NOT PDOS DISK
69 = NOT ENOUGH FILE SLOTS
70 = POSITION ERROR
71 = SYSTEM FILE ERROR
72 = TOO MANY TASKS
73 = NOT ENOUGH MEMORY
74 = NO SUCH TASK
75 = FILE LOCKED
76 = TASK LOCKED
77 = PROCEDURE NOT MEMORY RESIDENT
78 = MESSAGE BUFFER FULL
79 = MEMORY PAGE ERROR
80 = CHECKSUM ERROR
81 = UNIMPLEMENTED PDOS PRIMITIVE
82 = SYSTEM TIMEOUT ERROR

100 = ILLEGAL DISK #
101 = SECTOR # TOO LARGE
102 = NOT READY
103 = WRITE PROTECTED
104 = WRITE FAULT
105 = RNF/SEEK ERROR
106 = CRC ERROR
107 = DATA COMPARE ERROR

APPENDIX D

PDOS DISK LAYOUT

The following disk sector listings define the PDOS disk formats including the header sector, directory entries, and data storage.

.DDUMP

DISK DUMP R2.1

UNIT=0

START SECTOR=0

END SECTOR=1

SECTOR/UNIT=>0000 (0)/0

```
000-00F 5041 554C 2023 3237 4044 0000 0000 0000 PAUL #27H.....
010-01F FFFF 0029 0000 0000 0040 02C8 A55A FFFF ...).....@.HXZ..
020-02F FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF .....
030-03F FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF .....
040-04F FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF .....
050-05F FFFF FFFF FFFF FFFF FFFF FFFF FFFF 0000 .....
060-06F 0000 0000 0000 0000 0000 0000 0000 0000 .....
070-07F 0000 0000 0000 0000 00FF FFFF FFFF FFFF .....
080-08F FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF .....
090-09F FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF .....
0A0-0AF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF .....
0B0-0BF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF .....
0C0-0CF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF .....
0D0-0DF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF .....
0E0-0EF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF .....
0F0-0FF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF .....
```

Disk name

-,# files,date,,NDE,NPS,PDOS,Sides/density

Sector bit map

(Free sectors)

SECTOR/UNIT=>0001 (1)/0

```
000-00F 4153 4000 0000 0000 0000 0000 1000 0009 ASM.....
010-01F 0000 002A 002A 0090 0486 2DD1 0782 2E51 ...*...6-Q...Q
020-02F 4A45 4459 0000 0000 0000 0000 1000 0034 JEDY.....4
030-03F 0000 0019 0018 006F 0487 2DD1 0487 2DD1 .....o.7-Q.7-Q
040-04F 4644 554D 5000 0000 5352 0002 0000 004D FDUMP...SR....M
050-05F 0000 000C 000C 0022 048A 2DD1 0523 2DD1 .....".:-Q.#-Q
060-06F 4653 4156 4500 0000 5352 0002 0000 005A FSAVE...SR....Z
070-07F 0000 0008 0008 0020 0502 2DD1 0502 2DD1 .....-Q.-Q
080-08F 5452 414E 5300 0000 5352 0002 0000 0063 TRANS...SR....c
090-09F 0000 0022 0022 0020 0504 2DD1 0505 2DD1 ...".-Q.-Q
0A0-0AF 4452 474E 0000 0000 5352 0002 0000 0086 DRGN...SR.....
0B0-0BF 0000 0017 0017 0063 0507 2DD1 0508 2DD1 .....c.-Q.-Q
0C0-0CF 4444 5545 5000 0000 5352 0002 0000 009E DDUMP...SR.....
0D0-0DF 0000 0015 0015 00B1 0509 2DD1 0509 2DD1 .....1.-Q.-Q
0E0-0EF 4455 5045 0000 0000 5352 0002 0000 00B4 DUPE...SR....4
0F0-0FF 0000 0011 0011 0072 050B 2DD1 050C 2DD1 .....r.-Q.-Q
```

file name,,,,,level,type,start sector

-,sectors,EOF sector,EOF bytes,dates,,,

(APPENDIX D PDOS DISK LAYOUT continued)

START SECTOR=9

END SECTOR=10

SECTOR/UNIT=>0009 (9)/0

000-00F	000A 0000 4100 0042 0205 4300 1242 2F54A..B..C..B/T	Forward link,backward link (null)
010-01F	4211 7042 1A72 422F 4342 C009 4202 2042 B.pB.rB/CB@.B. B	
020-02F	1B9A 4204 F042 8040 4212 FD42 CA41 421C ..B.pB.@B.)BJAB.	
030-03F	8A42 0707 422F 5B43 18FF 422F CC42 1B08 :B..B/([C..B/LB..	
040-04F	4213 0442 04C7 422F 4C42 D011 4216 0442 B..B.GB/LBP.B..B	
050-05F	2F5B 4318 E242 10F3 422F 5A42 C0B9 4202 /[C.bB.sB/ZB@.B.	
060-06F	2242 106E 42C1 0942 0224 421D 4642 DC91 "B.nBA.B.\$B.FB\.	
070-07F	42DD 3142 16FD 4206 A043 00F8 421C A843 B]1B.)B. C.xB.(C	
080-08F	1912 4206 A043 00F8 421C AA43 1919 4206 ..B. C.xB.*C..B.	
090-09F	A043 00F8 421C AC43 1921 4206 A043 00F8 C.xB.,C.!B. C.x	
0A0-0AF	421C AE43 192B 422F 5942 C049 4202 2142 B..C.(B/YB@IB.IB	
0B0-0BF	106E 422F 8442 1055 42CA 4142 1CA6 4209 .nB/.B.UBJAB.&BY	
0C0-0CF	2043 119E 42FF FF42 C001 4209 8042 2FC9 C..B..B@.B..B/I	
0D0-0DF	4210 4C42 C0C9 42DD 3342 16FE 4202 0342 B.LB@IB]3B.B..B	
0E0-0EF	0028 4202 0042 7488 4204 C142 C0B9 4202 .(B..Bt8B.AB@.B.	
0F0-0FF	2242 1E08 42CC 8042 04F2 42CC 8142 04F2 "B..BL.L.B.rBL.B.r	

SECTOR/UNIT=>000A (10)/0

000-00F	000B 0009 42A0 0342 0581 4202 8142 000AB .B..B..B..	Forward link,backward link
010-01F	4216 0642 0200 4274 FB42 0203 4200 0142 B..B..Bt(B..B..B	
020-02F	0222 42FF 9042 0281 4200 0242 1602 4202 ."B..B..B..B..B.	
030-03F	2242 0030 4202 8142 0010 4211 E942 CA41 "B.OB..B..B.iBJA	
040-04F	421E 0042 C049 4202 2142 1B9A 4202 0243 B..B@IB.IB..B..C	
050-05F	18AE 42C4 7242 1303 42AC 4942 CC72 4210 ..BDrB..B,iBLrB.	
060-06F	FB42 0460 4302 DA42 2FC5 422F 5B43 18E2 {B.`C.ZB/EB/[C.b	
070-07F	422F CC42 14FE 4204 C742 0465 42FF F842 B/LB.B.GB.eB.xB	
080-08F	C14B 42C1 8942 A1B5 4207 1642 C075 422F AKBA.B!5B..B@UB/	
090-09F	5A42 2FCC 421B 0742 1305 42C1 C742 1608 ZB/LB..B..BAGB..	
0A0-0AF	422F 4C42 D011 4216 0242 0455 422F 5A42 B/LBP.B..B.UB/ZB	
0B0-0BF	2F84 4210 E742 C5B1 4204 5542 0460 4312 /.B.gBE.B.UB.`C.	
0C0-0CF	8442 C0B9 4202 2242 1CC2 42C0 C242 C029 .B@.B."B.BB@BB@)	
0D0-0DF	421C A442 130C 42C0 6942 1C8E 4216 0942 B.\$B..B@iB..B..B	
0E0-0EF	C069 421C AA42 1106 422F 8B42 10EF 4202 @iB.*B..B/.B.oB.	
0F0-0FF	0243 194A 422F 8B42 10EB 422F 5B43 194D .C.JB/.B.kB/[C.M	

START SECTOR=>C6

END SECTOR=>C6

SECTOR/UNIT=>00C6 (198)/0

000-00F	00C7 0000 2A09 4C4F 474F 3A53 5209 0930 .G..*.LOGO:SR..0
010-01F	322F 3237 2F3B 310D 2A2A 2A2A 2A2A 2A2A 2/27/81.*****
020-02F	2A2A 2A2A 2A2A 2A2A 2A2A 2A2A 2A2A 2A2A *****
030-03F	2A2A 2A2A 2A2A 2A2A 2A2A 2A2A 2A2A 2A2A *****
040-04F	2A0D 2A09 0909 0909 2A0D 2A09 4C4F 4144 *.*.*. *.LOAD
050-05F	2041 4E44 2047 4F2D 544F 204F 424A 4543 AND GO TO OBJEC
060-06F	542D 4649 4C45 092A 0D2A 0957 5249 5454 T FILE.*.*.WRITT
070-07F	454E 2042 593A 0909 092A 0D2A 0909 5041 EN BY:...*. *.PA
080-08F	554C 2052 4F53 532D 524F 5045 5209 092A UL ROSS ROPER..*
090-09F	0D2A 0909 0909 092A 0D2A 2A2A 2A2A 2A2A *.*. *****
0A0-0AF	2A2A 2A2A 2A2A 2A2A 2A2A 2A2A 2A2A 2A2A *****
0B0-0BF	2A2A 2A2A 2A2A 2A2A 2A2A 2A2A 2A2A 2A2A *****
....	

APPENDIX E

ASM OUTPUT EXAMPLES

The assembler has four types of outputs, namely: object file, list file, error file, and cross reference. The following example shows the many different features of ASM.

<SOURCE FILE>

```

        TITL 'ASM DEMONSTRATION PROGRAM'
        IDT 'ASM DEMO'
PEND    EQU >200
D       EQU -PEND
AEXP$   EQU PEND+ASME-ASMB
A       EQU 1+2+3+4+5+>10+>%10101010
        DXOP RICH,15
ADAMS   EQU 15
B       EQU %11111111
C       EQU ->300+>2FF+>%1110
        RORG 0
ASMB    XGLU
        MOV RO,&5(17)    ;FIELD OVERFLOW
        MOV RO,         ;MISSING OPERAND
        DATA >4000*10   ;NUMERIC OVERFLOW
        DATA %011001021 ;ILLEGAL #
        MOVB @UNDEF,RO   ;UNDEFINED SYMBOL
        MOV @A2345?,R1   ;ILLEGAL SYMBOL
        LI RO,'ABC'      ;ILLEGAL ASCII CONSTANT
        JMP $+>220       ;JUMP OUT OF RANGE
BIT     EQU 200
        TB BIT-100
        SBO BIT         ;BIT OUT OF RANGE
        BYTE 127*2*2,0   ;BYTE OVERFLOW
D       EQU %010101001    ;MULTIPLY-DEFINED SYMBOL
        BLWP @AEXP$(9)
        DATA B,C,D,PEND,-ASME ;MULTIPLY-DEFINED SYMBOL REFERENCED
        TEXT 'HELLO'      ;TEXT DELIMITER ERROR
        EVEN
        LI RO,-'0'*256
        DATA >100->108/2+>1300+>0100
        ANDI R2,'A'''
B41     EQU $-6
        TEXT -'HELP ME! IM CAUGHT IN THIS COMPUTER'
        BYTE >44,%1010010
        TEXT -'LIST'      ;REMARK
        BYTE B41-HELP/2
HELP    EQU $
        EVEN
ASME    END ASMB+8

```

(APPENDIX E ASM OUTPUT EXAMPLES continued)

<OBJECT FILE>

```
0007EASH DEM0A0000B2F4C8C80080005BC00088000800008D02080000BC060F
B00008020080000B1000B1F6481D008FC00B0429B027EB007F8000DB00A9B0200CFF82B4845F
B4C4CB4F098093B8544585854820448454CB494DB495484552B204585252B4F52B02008D000F
B13FCB0242B4127B4845B4C50B204DB4521B2049B4D20B4341B5547B485482049B4E20B5448F
B4953B2043B4F4DB505585445BAE00A0077B4452B4C49B53ACBE800A007E20008F
```

<ERROR FILE>

```
1500002: C800 0005      MOV R0,05(17) ;FIELD OVERFLOW
16X0006: C000           MOV R0, ;MISSING OPERAND
18E000A: 0000           DATA %011001021 ;ILLEGAL #
20S0010: C060 0000      MOV @A2345?,R1 ;ILLEGAL SYMBOL
21C0014: 0200 0000      LI R0,'ABC' ;ILLEGAL ASCII CONSTANT
27M      00A9          EQU %010101001 ;MULTIPLY-DEFINED SYMBOL
29m0024: 007F 000D 00A9  DATA B,C,D,PEND,-ASME ;MULTIPLY-DEFINED SYMBOL REFERENCED
3 M      FE00          EQU -PEND
1400002: C800 0005      MOV R0,05(17) ;FIELD OVERFLOW
15X0006: C000           MOV R0, ;MISSING OPERAND
16N0008: 8000           DATA >4000*10 ;NUMERIC OVERFLOW
17E000A: 0000           DATA %011001021 ;ILLEGAL #
18U000C: D020 0000      MOVB @UNDEF,R0 ;UNDEFINED SYMBOL
19S0010: C060 0000      MOV @A2345?,R1 ;ILLEGAL SYMBOL
20C0014: 0200 0000      LI R0,'ABC' ;ILLEGAL ASCII CONSTANT
21R0018: 1000           JMP $+220 ;JUMP OUT OF RANGE
24R001C: 1000           SBO BIT ;BIT OUT OF RANGE
25B001E: FC00           BYTE 127*2*2,0 ;BYTE OVERFLOW
26M      00A9          EQU %010101001 ;MULTIPLY-DEFINED SYMBOL
28m0024: 007F 000D 00A9  DATA B,C,D,PEND,-ASME ;MULTIPLY-DEFINED SYMBOL REFERENCED
```

(APPENDIX E ASM OUTPUT EXAMPLES continued)

<LIST FILE>

ASM DEMONSTRATION PROGRAM

PDOS ASM R2.4

PAGE: 1

15:02 09/27/82

FILE: TEMP.WINC #4

```

1          IDT 'ASM DEMO'
2      0200      PEND      EQU >200
3 M      FE00      D        EQU -PEND
4          *
5      027E      AEXP$     EQU PEND+ASME-ASMB
6      00C9      A        EQU 1+2+3+4+5+>10+>10101010
7      2FC0      DXOP     RICH,15
8      000F      ADAMS     EQU 15
9      007F      B        EQU %11111111
10     0000      C        EQU ->300+>2FF+>1110
11     *
12     0000'0000'      RORG 0
13 0000: 2F4C      ASMB     XGLU
1400002: C800 0005      MOV RO,&5(17) ;FIELD OVERFLOW
15X0006: C000      MOV RO, ;MISSING OPERAND
16N0008: 8000      DATA >4000*10 ;NUMERIC OVERFLOW
17E000A: 0000      DATA %011001021 ;ILLEGAL #
18U000C: D020 0000      MOVB @UNDEF,RO ;UNDEFINED SYMBOL
19S0010: C060 0000      MOV @A2345?,R1 ;ILLEGAL SYMBOL
20C0014: 0200 0000      LI RO,'ABC' ;ILLEGAL ASCII CONSTANT
21R0018: 1000      JMP $+>220 ;JUMP OUT OF RANGE
22     00C8      BIT      EQU 200
23 001A: 1F64      TB BIT-100
24R001C: 1000      SBO BIT ;BIT OUT OF RANGE
25B001E: FC00      BYTE 127*2*2,0 ;BYTE OVERFLOW
26M     00A9      D        EQU %010101001 ;MULTIPLY-DEFINED SYMBOL
27 0020: 0429 027E      BLMP @AEXP$(9)
28m0024: 007F 0000 00A9      DATA B,C,D,PEND,-ASME ;MULTIPLY-DEFINED SYMBOL REFERENCED
      002A: 0200 FF82'
29 002E: 4845 4C4C 4F09      TEXT 'HELLO ;TEXT DELIMITER ERROR
      0034: 093B 5445 5854
      003A: 2044 454C 494D
      0040: 4954 4552 2045
      0046: 5252 4F52
30     004A'      EVEN
31 004A: 0200 D000      LI RO,-'0'*256
32 004E: 13FC      DATA >100->108/2+>1300+>0100
33 0050: 0242 4127      ANDI R2,'A'''
34     004E'      B41      EQU $-6
35 0054: 4845 4C50 204D      TEXT --'HELP ME! IM CAUGHT IN THIS COMPUTER'
      005A: 4521 2049 4D20
      0060: 4341 5547 4854
      0066: 2049 4E20 5448
      006C: 4953 2043 4F4D
      0072: 5055 5445 AE00

```

(APPENDIX E ASM OUTPUT EXAMPLES continued)

```
36 0077: 4452          BYTE >44,%1010010
37 0079: 4649 53AC      TEXT -'LIST'          ;REMARK
38 007D: E800          BYTE B41-HELP/2
39      007E'          HELP EQU $
40      007E'          EVEN
41 007E:      0008'     ASME  END ASMB+8
```

<XREF FILE>

ASM DEMONSTRATION PROGRAM

PDOS ASM R2.4

PAGE: 2

15:02 09/27/82

FILE: TEMP,MINC #4

```
A      A 00C9 1/6*
ADAMS  A 000F 1/8*
AEXP$  A 027E 1/5* 1/27
ASMB   R 0000 1/5 1/13* 1/41
ASME   R 007E 1/5 1/28 1/41*
B      A 007F 1/9* 1/28
BIT    A 00C8 1/22* 1/23 1/24
B41    R 004E 1/34* 1/38
C      A 000D 1/10* 1/28
D      M 00A9 1/3* 1/26* 1/28
HELP   R 007E 1/38 1/39*
PEND   A 0200 1/2* 1/3 1/5 1/28
UNDEF  U 0000 1/18
```

APPENDIX F

DRGN SOURCE LISTING

Chapter 7 explained how I/O drivers are added to PDOS. After a source file has been assembled, the resultant object file must be processed by DRGN in order to create a driver file.

A sample of DRGN configurating \$TTA follows:

```
.DRGN
DRIVER CONFIGURATOR R2.4
BINARY FILE=TTA:RB
DRIVER SIZE=182 BYTES
DRIVER FILE=TTA
.RN TTA,$TTA;0
```

PDOS ASM R2.4

FILE: DRGN:SR,WINC #4

PAGE: 1

15:08 09/27/82

```
1          *      DRGN:SR      09/14/82
2          *****
3          *
4          *      PDOS DRIVER CONFIGURATOR      *
5          *
6          *      PROGRAMMED BY PAUL ROSS ROPER  *
7          *
8          *****
9          *
10         0032      RL1      EQU '2'
11         0034      RL2      EQU '4'
12         0020      RL3      EQU ' '
13
14         IDT 'DRGN2.4 '
15
16         0000'0000'      RORG 0
17         00FC      BPC      EQU 252      ;BYTES/CHANNEL
18
19         *
20         *      R8 = PC
21         *      R13 = CHECKSUM
22         *      R14 = BEGIN BUFFER
23         *      R15 = END BUFFER
```

(APPENDIX F DRGN SOURCE LISTING continued)

DRIVER CONFIGURATOR R2.4

PDOS ASM R2.4

PAGE: 2

15:08 09/27/82

FILE: DRGN:SR,HINC #4

```
1 *****
2 *
3 0000: 2F43      DRCF   XGML           ;GET MEMORY LIMIT
4 0002: 020E 0295' LI R14,DRBUF   ;GET BUFFER ADDRESS
5 0006: C3C1      MOV R1,R15      ;GET END
6 0008: 2F5B      XPMC           ;PROMPT FOR FILE NAME
7 000A: 015A'     DATA MES1
8 000C: 2F4C      XGLU           ;GET REPLY
9 000E: 2F84      XSOP           ;OPEN FILE
10 0010: 2FC4      XERR           ;ERROR
11 0012: C801 0158' MOV R1,@SLTN   ;SAVE FILE ID
12 0016: C20E      MOV R14,R8     ;GET PC
13 *
14 0018: C089      DRCF2  MOV R9,R2   ;SET FOR INITIAL READ
15 001A: 6492      S *R2,*R2       ;FORCE READ
16 *
17 *****
18 * TAG 8 - IGNOR CHECKSUM
19 *
20 001C: 04CD      DRCT8  CLR R13     ;CLEAR CHECKSUM
21 *
22 001E: 06A0 00F8' DRCLP  BL @DRCGD   ;GET HEX DIGIT
23 0022: 01A4 0032' MOVB @DRCP(4),R6 ;GET DISPLACEMENT
24 0026: 130D      JEQ DRCTF       ;TAG F - END OF RECORD
25 0028: 06A0 00F4' BL @DRCGN   ;GET NUMBER
26 002C: 0876      SRA R6,7        ;GET DISPLACEMENT
27 002E: 0466 002E' DRCJMP B @DRCJMP(6) ;GOTO TAG
28 0032: 0D0D      DRCOP  BYTE DRCT0-DRCJMP/2 ;0 = PROGRAM START
29 0033: 2700      BYTE DRCT1-DRCJMP/2 ;1 = ABS ENTRY ADDRESS
30 0034: 3400      BYTE DRCT2-DRCJMP/2 ;2 = REL ENTRY ADDRESS
31 0035: 2700      BYTE DRCT3-DRCJMP/2 ;3 = EXT REFERENCE
32 0036: 2700      BYTE DRCT4-DRCJMP/2 ;4 = EXT REFERENCE
33 0037: 2700      BYTE DRCT5-DRCJMP/2 ;5 = REL EXT DEFINITION
34 0038: 2700      BYTE DRCT6-DRCJMP/2 ;6 = ABS EXT DEFINITION
35 0039: 1600      DRCT7B BYTE DRCT7-DRCJMP/2 ;7 = CHECKSUM
36 003A: F700      BYTE DRCT8-DRCJMP/2 ;8 = IGNORE CHECKSUM
37 003B: 2700      BYTE DRCT9-DRCJMP/2 ;9 = ABS LOAD ADDRESS
38 003C: 1800      BYTE DRCTA-DRCJMP/2 ;A = REL LOAD ADDRESS
39 003D: 1E00      BYTE DRCTB-DRCJMP/2 ;B = ABS DATA
40 003E: 2700      BYTE DRCTC-DRCJMP/2 ;C = REL DATA
41 003F: 2700      BYTE DRCTD-DRCJMP/2 ;D = LOAD BIAS
42 0040: 2700      BYTE DRCTE-DRCJMP/2 ;E = ILLEGAL
43 0041: 000D      BYTE 0          ;F = END OF RECORD
44 0042'          EVEN
```


(APPENDIX F DRGN SOURCE LISTING continued)

DRIVER CONFIGURATOR R2.4

PDOS ASM R2.4

PAGE: 3

15:08 09/27/82

FILE: DRGN:SR,WINC #4

```
1          *****
2          * TAG F - END OF RECORD
3          *
4 0042: 0132      DRCTF  MOVB *R2+,R4      ;LOOK FOR EOL (NULL)
5 0044: 18FE              JNE DRCTF      ;NOT YET
6 0046: 10E8              JMP DRCF2      ;CLEAR CHECKSUM AND CONTINUE
7          *
8          *****
9          * TAG 0 - PROGRAM START
10         *
11 0048: 0203 0008      DRCT0  LI R3,8      ;IGNORE 4+8 CHARACTERS
12         *
13 004C: 06A0 0140'      DRCT01 BL @DRCGC      ;GET CHARACTER
14 0050: 0984              SRL R4,8
15 0052: A344              A R4,R13      ;UPDATE CHECKSUM
16 0054: 0603              DEC R3      ;DONE?
17 0056: 15FA              JGT DRCT01      ;N
18 0058: 10E2              JMP DRCLP      ;Y, GOTO LOOP
19         *
20         *****
21         * TAG 7 - CHECKSUM
22         *
23 005A: A14D      DRCT7  A R13,R5      ;OK?
24 005C: 13E0              JEQ DRCLP      ;Y
25 005E: 0201 01BF'      LI R1,ERM2      ;CHECKSUM ERROR
26 0062: 100E              JMP DRCER
27         *
28         *****
29         * TAG A - REL LOAD ADDRESS
30         *
31 0064: C20E      DRCTA  MOV R14,R8      ;GET BASE
32 0066: A205              A R5,R8      ;ADD BIAS
33 0068: 10DA              JMP DRCLP
```

(APPENDIX F DRGN SOURCE LISTING continued)

DRIVER CONFIGURATOR R2.4

PDOS ASM R2.4

PAGE: 4

15:08 09/27/82

FILE: DRGN:SR,WINC #4

```
1          *****
2          * TAG B - ABS DATA
3          *
4 006A: 83C8      DRCTB  C R8,R15      ;OK TO STORE?
5 006C: 1404              JHE DRCTB1   ;N
6 006E: DE05              MOV B R5,*R8+
7 0070: 06C5              SHPB R5
8 0072: DE05              MOV B R5,*R8+
9 0074: 10D4              JMP DRCLP
10         *
11 0076: 0201 01D1'      DRCTB1 LI R1,ERM3      ;NOT ENOUGH ROOM
12 007A: 1002              JMP DRCER
13         *
14         *****
15         * ILLEGAL TAGS
16         *
17 007C'          DRCT1  EQU $          ;ABS ENTRY ADDRESS
18 007C'          DRCT3  EQU $          ;EXT REL REFERENCE
19 007C'          DRCT4  EQU $          ;EXT ABS REFERENCE
20 007C'          DRCT5  EQU $          ;REL EXT DEFINITION
21 007C'          DRCT6  EQU $          ;ABS EXT DEFINITION
22 007C'          DRCT9  EQU $          ;ABS LOAD ADDR
23 007C'          DRCTC  EQU $          ;REL DATA
24 007C'          DRCTD  EQU $          ;LOAD BIAS
25 007C'          DRCTE  EQU $          ;ILLEGAL
26         *
27 007C: 0201 01E9'      DRCE63 LI R1,ERM4      ;ILLEGAL TAG OR CHARACTER
28         *
29 0080: 2F5A          DRCER  XPLC          ;OUTPUT ERROR MESSAGE
30 0082: 2F59              XPCL          ;OUTPUT CRLF
31 0084: C049              MOV R9,R1
32 0086: 2F5A          XPLC          ;OUTPUT BUFFER
33 0088: 2F5B          XPMC
34 008A: 01F7'          DATA ERM5
35 008C: C060 0158'      MOV @SLTN,R1      ;GET FILE ID
36 0090: 2F86          XCLF
37 0092: 2FC4          XERR
38 0094: 2FC5          XEXT          ;RETURN
```

(APPENDIX F DRGN SOURCE LISTING continued)

DRIVER CONFIGURATOR R2.4

PDOS ASM R2.4

PAGE: 5

15:08 09/27/82

FILE: DRGN:SR,WINC #4

```
1 *****
2 * TAG 2 - REL ENTRY ADDR
3 *
4 0096: 2F86 DRCT2 XCLF ;CLOSE FILE
5 0098: 2FC4 XERR ;ERROR
6 *
7 *****
8 * WRITE TO DISK
9 *
10 009A: 2F5B DRCHT XPMC
11 009C: 0184' DATA MES2
12 009E: C048 MOV R8,R1 ;OUTPUT DRIVER SIZE
13 00A0: 0200 0295' LI R0,DRBUF
14 00A4: 6040 S R0,R1
15 00A6: 2FD6 XCBD ;CONVERT
16 00A8: 2F5A XPLC ;OUTPUT
17 00AA: 2F5B XPMC
18 00AC: 0193' DATA MES3 ;BYTES
19 00AE: 0288 0391' CI R8,DRBUF+BPC ;OK?
20 00B2: 1202 JLE DRCHT2 ;Y
21 00B4: 2F5B XPMC ;N
22 00B6: 0209' DATA ERM6
23 *
24 00B8: 2F5B DRCHT2 XPMC ;REQUEST FILE NAME
25 00BA: 019A' DATA MES4
26 00BC: 0202 0245' LI R2,TBUF
27 00C0: 2F4A XGLB ;GET REPLY
28 00C2: 9811 0244' CB *R1,0B24 ;IS INPUT A DRIVER (= "$")?
29 00C6: 1603 JNE DRCHT4 ;N, GO ON
30 00C8: 2F5B XPMC ;Y, NORMAL FILE ONLY
31 00CA: 022D' DATA ERM7
32 00CC: 10F5 JMP DRCHT2
33 *
34 00CE: 2F84 DRCHT4 XSOP ;OPEN FILE
35 00D0: 100A JMP DRCHT6 ;ERROR
36 00D2: 0200 00FC LI R0,BPC ;GET COUNT
37 00D6: C08E MOV R14,R2 ;SET ADDRESS
38 00D8: 2F8A XMBF ;WRITE TO FILE
39 00DA: 2FC4 XERR ;ERROR
40 00DC: 0202 4000 LI R2,>4000 ;AS BINARY
41 00E0: 2F87 XCFA
42 00E2: 2FC4 DRERR XERR ;PROBLEM
43 00E4: 2FC5 XEXT ;RETURN
44 *
45 00E6: 0280 0035 DRCHT6 CI R0,53 ;FILE NOT DEFINED?
46 00EA: 16FB JNE DRERR ;N
47 00EC: 04C0 CLR R0 ;Y
48 00EE: 2F80 XDFL ;DEFINE FILE
49 00F0: 2FC4 XERR
50 00F2: 10ED JMP DRCHT4 ;TRY AGAIN
```

(APPENDIX F DRGN SOURCE LISTING continued)

DRIVER CONFIGURATOR R2.4

PDOS ASM R2.4

PAGE: 6

15:08 09/27/82

FILE: DRGN:SR,MINC #4

```
1 *****
2 * GET HEX CHARACTER OR NUMBER
3 *
4 *      R5 = #
5 *
6 00F4: 0703      DRCG1  SET0 R3      ;GET 4 DIGIT NUMBER
7 00F6: 1001      JMP DRCG1
8 *
9 00F8: 04C3      DRCG0  CLR R3      ;GET HEX DIGIT
10 *
11 00FA: 04C5      DRCG1  CLR R5      ;ACCUMULATE IN R5
12 00FC: C30B      MOV R11,R12      ;SAVE RETURN
13 *
14 00FE: 06A0 0140' DRCG2  BL @DRCGC    ;GET CHAR
15 0102: 0284 2000      CI R4,' '*256 ;CONTROL CHAR?
16 0106: 1AFB      JL DRCG2      ;Y, GET AGAIN
17 0108: 0284 5A00      CI R4,'Z'*256 ;ASCII?
18 010C: 1BF8      JH DRCG2      ;N, IGNORE
19 010E: 0984      SRL R4,8      ;RIGHT JUSTIFY
20 0110: 9806 0039'      CB R6,@DRCT7B ;TAG ??
21 0114: 1301      JEQ DRCG3      ;Y, IGNORE CHECKSUM
22 0116: A344      A R4,R13      ;UPDATE CHECKSUM
23 *
24 0118: 0224 FF00      DRCG3  AI R4,-'0' ;<"0?
25 011C: 11AF      JLT DRCE63      ;Y,ERROR
26 011E: 0284 000A      CI R4,10      ;>"9?
27 0122: 1109      JLT DRCG4      ;N, DIGIT 0-9
28 0124: 13B8      JEQ DRCT2      ;":, DONE!
29 0126: 0224 FFF9      AI R4,-7
30 012A: 0284 000A      CI R4,>A      ;<"A?
31 012E: 11A6      JLT DRCE63      ;Y, ERROR
32 0130: 0284 000F      CI R4,>F      ;>"F?
33 0134: 15A3      JGT DRCE63      ;Y, ERROR
34 *
35 0136: 0A45      DRCG4  SLA R5,4      ;ADJUST ACCUM
36 0138: A144      A R4,R5      ;ADD IN NEW DIGIT
37 013A: 0943      SRL R3,4      ;DONE?
38 013C: 16E0      JNE DRCG2      ;N
39 013E: 045C      B *R12      ;Y, RETURN
```

(APPENDIX F DRGN SOURCE LISTING continued)

DRIVER CONFIGURATOR R2.4

PDOS ASM R2.4

PAGE: 7

15:08 09/27/82

FILE: DRGN:SR,HINC #4

```
1          *****
2          * GET CHARACTER
3          *
4          *      R4 = CHARACTER
5          *
6 0140: 04C4      DRCGC  CLR R4
7 0142: 0132          MOVW *R2+,R4      ;GET CHAR
8 0144: 1608          JNE DRCGC2      ;OK
9 0146: C089          MOV R8,R2      ;GET BUFFER ADDR
10 0148: 2F89          XRLF          ;READ LINE
11 014A: 1001          JMP DRCGC1      ;ERROR
12 014C: 10F9          JMP DRCGC
13          *
14 014E: 0280 0038      DRCGC1 CI R0,56      ;EOF?
15 0152: 13A1          JEQ DRCT2      ;Y, PROBLEM
16 0154: 1095          JMP DRCER      ;N, PROBLEM
17          *
18 0156: 045B          DRCGC2 B *R11      ;RETURN
19          *
20          *****
21          * MESSAGES
22          *
23 0158: 0000          SLTN  DATA 0
24 015A: 0A0D          MES1  BYTE >0A,>0D
25 015C: 4452 4956 4552      TEXT 'DRIVER CONFIGURATOR R'
    0162: 2043 4F4E 4649
    0168: 4755 5241 544F
    016E: 5220 5200
26 0171: 322E 3420          BYTE RL1,'.',RL2,RL3
27 0175: 0A0D          BYTE >0A,>0D
28 0177: 4249 4E41 5259      TEXT 'BINARY FILE='
    017D: 2046 494C 453D
29 0183: 0000          BYTE 0
30 0184: 0A0D          MES2  BYTE >0A,>0D
31 0186: 4452 4956 4552      TEXT 'DRIVER SIZE='
    018C: 2053 495A 453D
32 0192: 0000          BYTE 0
33 0193: 2042 5954 4553 MES3  TEXT ' BYTES'
34 0199: 0000          BYTE 0
35 019A: 0A0D          MES4  BYTE >0A,>0D
36 019C: 4452 4956 4552      TEXT 'DRIVER FILE='
    01A2: 2046 494C 453D
37 01A8: 0000          BYTE 0
```

(APPENDIX F DRGN SOURCE LISTING continued)

DRIVER CONFIGURATOR R2.4

PDDS ASM R2.4

PAGE: 8

15:08 09/27/82

FILE: DRGN:SR,HINC #4

```
1 01A9: 0A0D          ERM1  BYTE >0A,>0D
2 01AB: 434F 4E46 4947      TEXT 'CONFIGURATOR ERROR='
  01B1: 5552 4154 4F52
  01B7: 2045 5252 4F52
  01BD: 3D00
3 01BE: 0000          BYTE 0
4 01BF: 0A0D          ERM2  BYTE >0A,>0D
5 01C1: 4348 4543 4820      TEXT 'CHECK SUM ERROR'
  01C7: 5355 4020 4552
  01CD: 524F 5200
6 01D0: 0000          BYTE 0
7 01D1: 0A0D          ERM3  BYTE >0A,>0D
8 01D3: 4045 4D4F 5259      TEXT 'MEMORY SPACE EXCEEDED'
  01D9: 2053 5041 4345
  01DF: 2045 5843 4545
  01E5: 4445 4400
9 01E8: 0000          BYTE 0
10 01E9: 0A0D          ERM4  BYTE >0A,>0D
11 01EB: 494C 4C45 4741      TEXT 'ILLEGAL TAG'
  01F1: 4C20 5441 4700
12 01F6: 0000          BYTE 0
13 01F7: 0A0D          ERM5  BYTE >0A,>0D
14 01F9: 4C4F 4144 2054      TEXT 'LOAD TERMINATED'
  01FF: 4552 4D49 4E41
  0205: 5445 4400
15 0208: 0000          BYTE 0
16 0209: 0A0D          ERM6  BYTE >0A,>0D
17 020B: 2A2A 2045 5843      TEXT '*** EXCEEDS CHANNEL BUFFER SIZE ***'
  0211: 4545 4453 2043
  0217: 4841 4E4E 454C
  021D: 2042 5546 4645
  0223: 5220 5349 5A45
  0229: 202A 2A00
18 022C: 0000          BYTE 0
19 022D: 0A0D          ERM7  BYTE >0A,>0D
20 022F: 4E4F 4E2D 4452      TEXT 'NON-DRIVER FILE ONLY'
  0235: 4956 4552 2046
  023B: 494C 452D 4F4E
  0241: 4C59
21 0243: 0000          BYTE 0
22 0244: 2400          B24   BYTE '$'
23                                *
24                                * BUFFERS
25                                *
26 0245: 0295'          TBUF  BSS 80          ;TEMPORARY BUFFER
27 0295'          DRBUF  EQU $
28 0295: 0000'          END DRCF
```

(APPENDIX F DRGN SOURCE LISTING continued)

DRIVER CONFIGURATOR R2.4

PDOS ASM R2.4

PAGE: 9

15:08 09/27/82

FILE: DRGN:SR,WINC #4

75 SYMBOLS

BPC	A 00FC	B24	R 0244	DRBUF	R 0295	DRCER	R 0080
DRCE63	R 007C	DRCF	R 0000	DRCF2	R 0018	DRCGC	R 0140
DRCGC1	R 014E	DRCGC2	R 0156	DRCGD	R 00F8	DRCGN	R 00F4
DRCG1	R 00FA	DRCG2	R 00FE	DRCG3	R 0118	DRCG4	R 0136
DRCJMP	R 002E	DRCLP	R 001E	DRCOP	R 0032	DRCTA	R 0064
DRCTB	R 006A	DRCTB1	R 0076	DRCTC	R 007C	DRCTD	R 007C
DRCTE	R 007C	DRCTF	R 0042	DRCT0	R 0048	DRCT01	R 004C
DRCT1	R 007C	DRCT2	R 0096	DRCT3	R 007C	DRCT4	R 007C
DRCT5	R 007C	DRCT6	R 007C	DRCT7	R 005A	DRCT7B	R 0039
DRCT8	R 001C	DRCT9	R 007C	DRCHT	R 009A	DRCHT2	R 00B8
DRCHT4	R 00CE	DRCHT6	R 00E6	DRERR	R 00E2	ERM1	R 01A9
ERM2	R 01BF	ERM3	R 01D1	ERM4	R 01E9	ERM5	R 01F7
ERM6	R 0209	ERM7	R 022D	MES1	R 015A	MES2	R 0184
MES3	R 0193	MES4	R 019A	RL1	A 0032	RL2	A 0034
RL3	A 002D	R0	A 0000	R1	A 0001	R10	A 000A
R11	A 000B	R12	A 000C	R13	A 000D	R14	A 000E
R15	A 000F	R2	A 0002	R3	A 0003	R4	A 0004
R5	A 0005	R6	A 0006	R7	A 0007	R8	A 0008
R9	A 0009	SLTN	R 0158	TBUF	R 0245		

APPENDIX G

\$TTA DRIVER LISTING

The following is an assembled listing of the \$TTA driver. The code is position independent (ie. can execute anywhere in memory), and is less than 252 bytes in length. The \$TTA driver is for character output only to the aux port of the TM990/101MA computer module.

(APPENDIX G \$TTA DRIVER LISTING continued)

PDOS ASH R2.4

FILE: TTA:SR,HINC #4

PAGE: 1

15:13 09/27/82

```
1      *      TTA:SR      04/06/82
2      *****
3      *
4      *      $TTA DRIVER      *
5      *
6      *      DESCRIPTION: AUX PORT DRIVER      *
7      *
8      *****
9      *
10     IDT 'TTAR2.3a'
11
12     *
13     0180      CRU2      EQU >0180      ;AUX CRU BASE
14     0074      OEVRT      EQU 116      ;OUTPUT EVENT BIT
15     01FA      CCNT      EQU >01FA      ;TSE1
16
17     *      IN R4 = STATUS
18     *      R5 = CHARACTER COUNT
19     *      R7 = BUFFER ADDRESS
20     *      R8 = FILE SLOT ADDRESS
21     *      R10 = CHANNEL BUFFER BEGINNING
22     *      R11 = RETURN ADDRESS
23     *      R13-R15 = RTWP VECTOR
24     *
25     0000'0000'      RORG 0
26     0000: 1000      DROP      JMP OPEN      ;0 OPEN ENTRY
27     0002: 1012      DRCL      JMP CLOSE      ;2 CLOSE ENTRY
28     0004: 1008      DRRD      JMP READ      ;4 READ ENTRY (ERROR 72)
29     0006: 1022      DRWR      JMP WRITE      ;6 WRITE ENTRY
30     0008: 0200 0046      DRPS      LI R0,70      ;8 POSITION ENTRY (ERROR 70)
31     *
32     000C: C740      DRER      MOV R0,*R13      ;ERROR RETURN
33     000E: 0201 0074      LI R1,OEVRT
34     0012: 2FC6      XSEF      ;SET EVENT
35     0014: 0458      RT
36     *
37     0016: 0200 0048      READ      LI R0,72      ;CANNOT READ DEVICE
38     001A: 10F8      JMP DRER
39     *
40     *****
41     *      OPEN DRIVER
42     *      CLEAR COLUMN COUNTER
43     *
44     001C: 0201 0074      OPEN      LI R1,OEVRT      ;GET OUTPUT EVENT
45     0020: 2FC7      XSUI      ;SUSPEND UNTIL AVAILABLE
46     0022: 04E9 01FA      CLR @CCNT(9)      ;CLEAR COLUMN COUNTER
47     0026: 1010      JMP DRRT
```

(APPENDIX G \$TTA DRIVER LISTING continued)

TTA DRIVER R2.3a

PDOS ASM R2.4

PAGE: 2

15:13 09/27/82

FILE: TTA:SR,MINC #4

```
1 *****
2 *      CLOSE DRIVER
3 *      OUTPUT FORM FEED
4 *
5 0028: 020C 0180   CLOSE   LI R12,CRU2      ;GET CRU BASE
6 002C: 0200 0C00       LI R0,>0C00      ;OUTPUT FF
7 0030: 1010         SBO 16          ;SET RTS ON
8 0032: 1001         JMP CLOSE4
9 *
10 0034: 2FC0       CLOSE2  XSWP          ;SWAP WHILE WAITING
11 *
12 0036: 1F1B       CLOSE4  TB 27          ;CHECK DSR
13 0038: 16FD             JNE CLOSE2      ;WAIT
14 003A: 1F16             TB 22          ;READY?
15 003C: 16FB             JNE CLOSE2      ;N
16 003E: 3200             LDCR R0,8       ;Y, OUT CHAR
17 0040: 1E10             SBZ 16          ;SET RTS OFF
18 0042: 0201 0074     LI R1,DEVNT
19 0046: 2FC6             XSEF            ;SET EVENT
20 *
21 0048: 05CB       DRRT   INCT R11        ;NORMAL RETURN
22 004A: 045B             RT
23 *
24 *****
25 *      WRITE TO TTA
26 *
27 004C: 020C 0180   WRITE   LI R12,CRU2      ;GET CRU BASE
28 *
29 0050: D137       WRITE2  MOVB *R7+,R4      ;GET CHARACTER, DONE?
30 0052: 13FA             JEQ DRRT          ;Y
31 0054: 0244 7F00     ANDI R4,>7F00      ;N, MASK TO 7 BITS
32 0058: 0284 0A00     CI R4,>0A00        ;LF?
33 005C: 1329             JEQ WRITE9        ;Y
34 005E: 0284 0800     CI R4,>0800        ;N, BS?
35 0062: 1602             JNE WRITE3        ;N
36 0064: 0629 01FA     DEC @CCNT(9)       ;Y, BACKUP COUNT
37 *
38 0068: 0284 0900     WRITE3  CI R4,>0900      ;TAB?
39 006C: 160A             JNE WRITE5        ;N
40 006E: C129 01FA     MOV @CCNT(9),R4      ;Y, GET COLUMN COUNT
41 0072: 0584             INC R4            ;INCREMENT
42 0074: 0244 0007     ANDI R4,>0007      ;TAB FIELD?
43 0078: 1302             JEQ WRITE4        ;Y
44 007A: 0607             DEC R7            ;N, DO BACK UP AND DO AGAIN
45 007C: 0586             INC R5            ;ALLOW AN EXTRA CHARACTER
46 *
47 007E: 0204 2000     WRITE4  LI R4,>2000      ;OUTPUT A BLANK
```

(APPENDIX G \$TTA DRIVER LISTING continued)

TTA DRIVER R2.3a

PDOS ASM R2.4

PAGE: 3

15:13 09/27/82

FILE: TTA:SR,WINC #4

```

1 0082: 0284 0000    WRITE5 CI R4,>0000    ;CR?
2 0086: 1604                JNE WRITE6    ;N
3 0088: 04E9 01FA                CLR @CCNT(9)    ;Y, CLEAR COUNT
4 008C: 0204 0A0D                LI R4,>0A0D    ;OUTPUT CRLF
5                                *
6 0090: 0284 2000    WRITE6 CI R4,>2000    ;CONTROL CHAR?
7 0094: 1A04                JL WRITE8    ;Y
8 0096: 05A9 01FA                INC @CCNT(9)    ;N, UP COUNT
9 009A: 1001                JMP WRITE8
10                               *
11 009C: 2FC0    WRITE7 XSMP
12                               *
13 009E: 1F1B    WRITE8 TB 27                ;CHECK DSR
14 00A0: 16FD                JNE WRITE7    ;WAIT
15 00A2: 1F16                TB 22                ;READY?
16 00A4: 16FB                JNE WRITE7
17 00A6: 1D10                SBO 16                ;Y
18 00A8: 3204                LDCR R4,8
19 00AA: 0A84                SLA R4,8                ;ANOTHER CHARACTER?
20 00AC: 16F8                JNE WRITE8    ;Y
21 00AE: 1E10                SBZ 16                ;N
22                               *
23 00B0: 0605    WRITE9 DEC R5                ;ANY MORE CHARACTERS?
24 00B2: 16CE                JNE WRITE2    ;Y
25 00B4: 10C9                JMP DRRT    ;N, RETURN
26 00B6: 0000'    END DROP

```

TTA DRIVER R2.3a

PDOS ASM R2.4

PAGE: 4

15:13 09/27/82

FILE: TTA:SR,WINC #4

40 SYMBOLS

```

CCNT  A 01FA  CLOSE R 0028  CLOSE2 R 0034  CLOSE4 R 0036
CRU2  A 0180  DRCL  R 0002  DRER   R 000C  DROP   R 0000
DRPS  R 0008  DRRD  R 0004  DRRT   R 0048  DRWR   R 0006
OEVRT  A 0074  OPEN  R 001C  READ   R 0016  RO     A 0000
R1    A 0001  R10   A 000A  R11    A 000B  R12    A 000C
R13   A 000D  R14   A 000E  R15    A 000F  R2     A 0002
R3    A 0003  R4    A 0004  R5     A 0005  R6     A 0006
R7    A 0007  R8    A 0008  R9     A 0009  WRITE  R 004C
WRITE2 R 0050  WRITE3 R 0068  WRITE4 R 007E  WRITE5 R 0082
WRITE6 R 0090  WRITE7 R 009C  WRITE8 R 009E  WRITE9 R 00B0

```

APPENDIX H

BOOT:SR SOURCE LISTING

PDOS ASH R2.4

PAGE: 1

15:17 09/27/82

FILE: BOOT:SR, WINC #4

```
1      *      BOOT:SR      09/17/82
2      *****
3      *
4      *      PDOS BOOT EPROM DRIVER      *
5      *      PROGRAMMED BY PAUL ROSS ROPER      *
6      *
7      *****
8      *
9      0032      RL1      EQU '2'      ;BOOT REVISION
10     0034      RL2      EQU '4'
11     0020      RL3      EQU ' '
12
13             IOT 'BOOT2.4 '
14
15             *
16             COPY BTFLG:SR      ;GET CONFIGURATION FLAGS
17             *      BTFLG:SR      09/17/82
18             *****
19             *      SYSTEM CONFIGURATION FLAGS
20             *****
21             *
22     0001      FLG101 EQU 1      ;TM990/101H
23     0000      FLG102 EQU 0      ;TM990/102
24     0000      FLG95S EQU 0      ;STD TMS9995
25     0000      FLG95V EQU 0      ;VIDEO GAMES TMS9995
26
27     0000      *
28     0000      FLGROM EQU 0      ;0=RAM, 1=EPROM
29     0000      FLGAB EQU 0      ;0=AUTO-BAUD, 1=AUTO-BOOT
30     0001      FLGSH EQU 1      ;0=NO SWITCHES, 1=SWITCHES
31     0001      LDV1 EQU 1      ;LOGICAL DEVICE #1 (XDLT01)
32     0001      LDV2 EQU 1      ;LOGICAL DEVICE #2 (XDLT02)
33     0000      LDV3 EQU 0      ;LOGICAL DEVICE #3 (XDLT03)
34     0000      LDV4 EQU 0      ;LOGICAL DEVICE #4 (XDLT04)
35
36     0000      *
37     0000      NOFF EQU 0      ;DISK OFF DEVICE #
38
39     0000      *
40     0000      FLG95 EQU FLG95S!FLG95V
41     0003      DVSEL EQU LDV4*2+LDV3*2+LDV2*2+LDV1
42             OPT #=FLGSH      ;0=NO SWITCHES, 1=SWITCHES
```

(APPENDIX H BOOT:SR LISTING continued)

```
39      *
40      *****
41      *      SYSTEM REF AND DEF VARIABLES
42      *****
43      *
44          DEF TICS2,TIME,TPS
45          DEF D303C,L3LOCK,SHLOCK
46          DEF DSFLG,DDFLG,MOFLG
47          DEF BAUD,BMS,BUFF
48      *
49          DEF MAIN,PARMS
50          DEF BTTO,BBTO,BTGC
51          DEF BTGN,BOUTH,BTPM
52      *
53      * USER ROUTINES
54      *
55          REF USER$      ;USER UTILITIES
56          REF ISYS$      ;SPECIAL INITIALIZATION
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 2

15:17 09/27/82

PDOS ASM R2.4

FILE: BOOT:SR,WINC #4

```
1 *****
2 *      REQUIRED LINK PARAMETER LIST
3 *****
4 *
5 *                      ;UNIT  TM990      STD95
6 *
7 *      REF XDLT01      ;0-3   TM990/303A  FDC/1
8 *      REF XDLT02      ;4-7   ER3314     SASI
9 *      REF XDLT03      ;8-11  TM990/210   RS232
10 *      REF XDLT04      ;12-99 ER3300
11 *
12 *****
13 *      LINK FORMAT:
14 *
15 *      XDLTxx  JMP DINIT      ;INITIALIZE DEVICE
16 *              JMP DREAD      ;READ LOGICAL SECTOR
17 *              JMP DWRIT      ;WRITE LOGICAL SECTOR
18 *              JMP DSCOF      ;DRIVE OFF (1 SEC)
19 *              DATA BS00,BS01 ;BOOT SECTOR (0-1)
20 *              DATA BS02,BS03 ;BOOT SECTOR (2-3)
21 *              TEXT '...',0    ;DRIVER NAME
22 *
23 *
24 *      DINIT   ....          ;INITIALIZE DEVICE
25 *              ....          ;(USE ONLY R0-R13)
26 *              RT
27 *
28 *
29 *      DREAD   ....          ;READ LOGICAL SECTOR
30 *      DWRIT   ....          ;WRITE LOGICAL SECTOR
31 *              CLR @L3LOCK    ;CLEAR LEVEL 3 LOCK
32 *              INCT R14       ;NORMAL RETURN
33 *              RTWP
34 *
35 *
36 *      DSCOF   ....          ;DRIVE OFF ROUTINES
37 *              ....          ;(USE ONLY R1-R2,R12)
38 *              RT
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PDOS ASM R2.4

PAGE: 3

15:17 09/27/82

FILE: BOOT:SR,WINC #4

```
1          *****
2          * PDOS SYSTEM MEMORY CONFIGURATION
3          *****
4          *
5          0000      RB      EQU >0000*FLGROM
6          0070      PSFLG   EQU >0070          ;PDOS AUTO START FLAG (XOP 12)
7          2F88      TICS2   EQU >2F88+RB      ;TICS+2
8          2FBC      D303C   EQU >2FBC+RB      ;303 COMMAND LIST
9          2FD0      DSFLG   EQU >2FD0+RB      ;DOUBLE SIDED FLAGS
10         2FD4      DDFLG   EQU >2FD4+RB      ;DOUBLE DENSITY FLAGS
11         2FD8      MOFLG   EQU >2FD8+RB      ;MOTOR ON FLAGS
12         2FE8      L3LOCK  EQU >2FE8+RB      ;LEVEL 3 LOCK
13         2FEA      SHLOCK  EQU >2FEA+RB      ;TASK LOCK
14         2FEC      TIME    EQU >2FEC+RB      ;TASK TIMER
15         2FFE      DSEL    EQU >2FFE+RB      ;DISK SELECT BITS
16         0070      TPS     EQU 125          ;TICS/SECOND
17         0100      BPS     EQU 256          ;BYTES/SECTOR
18         *
19         *****
20         * BOOT MEMORY CONFIGURATION
21         *****
22         *
23         0080      CRU1     EQU >0080          ;MAIN CRU PORT
24         6000      EBRAM   EQU >6000          ;END OF BOOT RAM
25         7000      BWS     EQU >8080*FLG95+>7000
26         7020      ABFLG   EQU BWS+32        ;AUTO-BOOT FLAG
27         7022      DRSEL   EQU BWS+34        ;DRIVE SELECTION (NO SWITCHES)
28         7024      PARMS   EQU BWS+36        ;INPUT PARAMETERS
29         7040      IBWS    EQU BWS+64        ;INTERNAL WORKSPACE
30         7060      BUFF    EQU BWS+96        ;BUFFER
31         0000      AXROM    EQU >0000          ;AUX EPROM
32         0800      BBROM   EQU >0800          ;BOOT EPROM LINK TABLE
33         6000      SWADR    EQU FLGROM*>9000+>6000 ;SWAP RAM LIMIT
```


(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 4

15:17 09/27/82

PDOS ASM R2.4

FILE: BOOT:SR,WINC #4

```

0001      IFZ FLG101,LB01%
*****
2          *           TM990/101MA SYSTEM CONFIGURATION
3          *
4          *
5          *   TM990/101MA:
6          *
7          *               P4             P3             P2
8          *   -----|-----XX--XX--XX--XX--XX--XX--|
9          *   |                                           |
10          *   |                                           |
11          *   |                                           |
12          *   |       S12345                               |
13          *   |                                           |
14          *   |                                           |
15          *   |                                           |
16          *   |                                           |
17          *   |-----|-----|-----|-----|-----|
18          *               P1
19          *
20          *****
21          *
22          *   SWITCH DEFINITIONS:
23          *
24          0000      SCRUB    EQU 0              ;SWITCH CRU BASE
25          0024      ABTB     EQU 36             ;S1 = ON  AUTO BOOT & EXECUTE 'SY$STRT'
26          0023      D1TB     EQU 35             ;S2 = ON  303A CONTROLLER (UNITS 0-3)
27          0022      D2TB     EQU 34             ;S3 = ON  3314 WINCHESTER CONTROLLER (UNITS 4-7)
28          0021      D3TB     EQU 33             ;S4 = ON  210 BUBBLE CONTROLLER (UNITS 8-11)
29          0020      D4TB     EQU 32             ;S5 = ON  3300 FLOPPY CONTROLLER
30          *
31          0000'      LB01%    EQU $

```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 5

15:17 09/27/82

PDOS ASH R2.4

FILE: BOOT:SR,HINC #4

```
1      0000      IFZ FLG102,LB02%
2      *****
3      *      TM990/102 SYSTEM CONFIGURATION
4      *
5      * CPU SWITCH ASSIGNMENTS ON 307 PACK S8
6      *
7      SCRU      EQU >0580      ;SWITCH CRU BASE (307 PORT B)
8      ABTB      EQU ->80/2+D2TB ;S8 = OFF  AUTO BOOT & EXECUTE 'SY$STRT'
9      D1TB      EQU ->80/2+D3TB ;S7 = OFF  303A CONTROLLER (UNITS 0-3)
10     D2TB      EQU 37          ;S6 = OFF  3314 WINCHESTER CONTROLLER (UNITS 4-7)
11     D3TB      EQU 36          ;S5 = OFF  210 BUBBLE CONTROLLER (UNITS 8-11)
12     D4TB      EQU >80/2+D2TB ;S4 = OFF  3300 FLOPPY CONTROLLER
13     *
14     *****
15     * SYSTEM MAPPER INITIALIZATION
16     *****
17     *
18     *      (1)      (2)      (3)
19     *
20     *>0080 >00 EP >01      >06      PDOS
21     *      >01      >01      >01
22     *      >02      >02      >02
23     *      >03      >03      >03      BASIC
24     *      >04      >04      >04
25     *      >05      >05      >05
26     *>6000 >06      >07      >07
27     *      >07      >07      >08 (CHANGE AFTER IB)
28     *      >08      >09      >09
29     *      >09      >0A      >0A
30     *      >0A      >0B      >0B
31     *      >0B      >0C      >0C
32     *      >0C      >0D      >0D
33     *      >0D      >0E      >0E
34     *      >0E      >8E I/O >8E I/O
35     *>008E >0F      >00 EP >00 EP
36     *
37     0000'      LB02% EQU $
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 6

15:17 09/27/82

PDOS ASM R2.4

FILE: BOOT:SR,HINC #4

```
1      0000          IFZ FLG102,LB03%
2          *****
3          * TH990/102 START CODE
4          *
5          RORG AXROM
6          STRTZ DATA BMS,STRT-STRTZ
7          *
8          STRT CKOF          ;ENABLE MAP REGISTER
9          LI R0,STRTB        ;POINT TO TABLE
10         LI R1,>0080         ;POINT TO MAP REGISTERS
11         *
12         STRT02 MOV *R0+,*R1+ ;GET BYTE, DONE?
13             JNE STRT02      ;N
14             LI R0,>03A0      ;Y, CKON
15             LI R1,>0460      ;B @STRT04
16             LI R2,STRT04
17             B R0            ;GO!!!!!!!!!!!!!!
18         *
19         STRTB EQU $-STRTZ
20             DATA >0106,>0101,>0102 ;PDOS
21             DATA >0103,>0104,>0105 ;BASIC
22             DATA >0007,>0007,>0009
23             DATA >000A,>000B,>000C
24             DATA >000D,>000E,>018E
25             DATA >0000          ;BOOT EPROMS
26         *
27         STRT04 LI R0,>0008      ;FINISH RUN MAP
28             MOV R0,@>008E
29             B @BAUD          ;GOTO BOOT ROUTINE
30         *
31      0000'      LB03% EQU $
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 7

15:17 09/27/82

PDOS ASM R2.4

FILE: BOOT:SR, WINC #4

```
1      0000          IFZ FLG95S, LB04%
2
3      *****
4      * SBC95/1 9995 START CODE
5      *****
6      *
7      RORG AXROM
8      STRTZ DATA >F000, STRT-STRTZ
9      *
10     STRT  STHP RO          ;POINT TO ON CHIP RAM
11     INCT RO
12     *
13     STRT02 CLR *RO+        ;CLEAR RAM
14     CI RO, >F100          ;DONE?
15     JL STRT02             ;N
16     LI RO, >1000          ;Y, 'SBO 0'
17     LI R1, >0460          ; 'B @BAUD'
18     LI R2, BAUD
19     B RO
20     *
20     LB04% EQU $
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 8

15:17 09/27/82

PDOS ASM R2.4

FILE: BOOT:SR,HINC #4

```
1      0000      IFZ FLG95V, LB05%
2      *****
3      * VIDEO GAMES 9995 START CODE
4      *****
5      *
6      CRU2      EQU >0040      ;AUX 9902
7      MCRU      EQU >0140      ;MAP CRU
8      VMAP      EQU >0E00      ;VIDEO GAMES MEMORY MAP
9      *
10     RORG AXROM
11     STRTZ      DATA >F000, STRT-STRTZ
12     *
13     STRT      STWP R0      ;POINT TO ON CHIP RAM
14             INCT R0
15     *
16     STRT02     CLR *R0+      ;CLEAR RAM
17             CI R0, >F100      ;DONE?
18             JL STRT02      ;N
19             LI R12, CRU2      ;Y, POINT TO AUX PORT
20             SBO 31      ;RESET 9902
21             LI R12, MCRU      ;POINT AT MAP BITS
22             SBZ 6      ;TURN OFF MOTOR
23             SBO 8      ;ENABLE AUX 9902
24             LI R2, >1AED
25             LDCR R2, 5      ;OUTPUT MAP >0A+>10, (WINDOW OFF)
26             SLA R2, 8      ;Y, GET DESTINATION >E000
27     *
28     STRT04     MOV *R1+, *R2+ ;MOVE
29             CI R1, >1000      ;DONE?
30             JL STRT04      ;N
31             LI R0, >3103      ;Y, 'LDCR R3, 4'
32             LI R1, >0460      ; 'B @BAUD'
33             LI R2, BAUD
34             LI R3, VMAP      ;R3=CRU MEMORY MAP CONSTANT
35             B R0      ;GOTO TO BAUD PORT
36     *
37     0000'      LB05%      EQU $
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 9

15:17 09/27/82

PDOS ASM R2.4

FILE: BOOT:SR,HINC #4

```
1 *****
2 *      EPROM ENTRY ADDRESSES
3 *****
4 *
5      0000'0800'      RORG BBROM
6 0800: 102D      BOOTV  JMP XRSED      ;>F800 READ SECTOR
7 0802: 0004      C4      DATA 4
8 0804: 101D      JMP XMSED      ;>F804 WRITE SECTOR
9 0806: 000A      C10     DATA 10
10 0808: 1026      JMP XISED      ;>F808 INITIALIZE SECTOR
11 080A: 0000      DATA 0
12 080C: 1005      JMP XDIT      ;>F80C INITIALIZE DISK CONTROLLER
13 080E: A55A      XPID   DATA >A55A      ; PDOS ID (FREE)
14 0810: 1013      JMP XD0F      ;>F810 DISK OFF
15 0812: FFFF      CKSUM  DATA -1      ;>F812 BOOT CHECKSUM
16 0814: 0460 08FE' B @MAIN      ;>F814 RETURN
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 10

15:17 09/27/82

PDOS ASM R2.4

FILE: BOOT:SR,HINC #4

```
1 *****
2 *      SECONDARY STORAGE INITIALIZATION
3 *
4      0001      XDITB  IFN FLGSW,XDIT ;BOOT INITIALIZE CALL
5                  MOV  @DSEL,@DSEL
6 *
7 0818: C388      XDIT  MOV  R11,R14      ;SAVE RETURN
8      0001      IFZ LDV1,XDIT02
9 081A: 020C 0000  #      LI  R12,SCRU   #      MOV  @DSEL,R12  ;GET DEVICE FLAG
10 081E: 1F23      #      TB  D1TB      #      SRL  R12,1      ;DEVICE #1?
11 0820: 1303      #      JEQ  XDIT02    #      JNC  XDIT02    ;N
12 0822: C060 08E8'  MOV  @DVTB2,R1      ;Y
13 0826: 0691      BL  *R1      ;INIT UNITS 0-3
14 *
15      0001      XDIT02 IFZ LDV2,XDIT04
16 0828: 020C 0000  #      LI  R12,SCRU   #      MOV  @DSEL,R12  ;GET DEVICE FLAG
17 082C: 1F22      #      TB  D2TB      #      SRL  R12,2      ;DEVICE #2?
18 082E: 1303      #      JEQ  XDIT04    #      JNC  XDIT04    ;N
19 0830: C060 08EA'  MOV  @DVTB2+2,R1 ;Y
20 0834: 0691      BL  *R1      ;INIT UNITS 4-7
21 *
22      0000      XDIT04 IFZ LDV3,XDIT06
23      #      LI  R12,SCRU   #      MOV  @DSEL,R12  ;GET DEVICE FLAG
24      #      TB  D3TB      #      SRL  R12,3      ;DEVICE #3?
25      #      JEQ  XDIT06    #      JNC  XDIT06    ;N
26      MOV  @DVTB2+4,R1 ;Y
27      BL  *R1      ;INIT UNITS 8-11
28 *
29      0000      XDIT06 IFZ LDV4,XDIT10
30      #      LI  R12,SCRU   #      MOV  @DSEL,R12  ;GET DEVICE FLAG
31      #      TB  D4TB      #      SRL  R12,4      ;DEVICE #4?
32      #      JEQ  XDIT10    #      JNC  XDIT10    ;N
33      MOV  @DVTB2+6,R1 ;Y
34      BL  *R1      ;INIT UNITS 12-99
35 *
36 * ADD OTHER DEVICES HERE
37 *
38 0836: 045E      XDIT10 B *R14
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 11

15:17 09/27/82

PDOS ASM R2.4

FILE: BOOT:SR,HINC #4

```
1 *****
2 *      MOTOR OFF DEVICES
3 *
4     FFFE      TNOFF EQU NOFF*2-2 ;MOTOR OFF DEVICE SELECT DISPLACEMENT
5     0000      XDOF  IFZ NOFF,XDOF02
6              #      LI R12,SCRU #      MOV @DSEL,R12 ;GET DEVICE FLAG
7              #      X @TNOFF+DVTB1 #      SRL R12,NOFF ;MOTOR-OFF DEVICE?
8              #      JEQ XDOF02 #      JNC XDOF02 ;N
9              MOV @TNOFF+DVTB2,R1
10             B @6(1) ;CHECK MOTOR OFF
11 *
12     0838'     XDOF02 EQU $ ;RT
13 *
14 *****
15 *      UNLINKED DEVICE ERROR TABLE
16 *
17 0838: 045B    ERRTB RT ;INITIALIZE DEVICE
18 083A: 102A    JMP ER100 ;READ
19 083C: 1029    JMP ER100 ;WRITE
20 083E: 045B    RT ;DRIVE OFF
21 *
22 *****
23 *      WRITE SECTOR
24 *
25 *      DATA XHSE$
26 *      ERROR
27 *
28 0840: C2ED 0002 XHSEO MOV @2(13),R11 ;SECTOR 0?
29 0844: 1608     JNE XISE0 ;N
30 0846: C0AD 0004     MOV @4(13),R2 ;Y, GET BUFFER ADR
31 084A: 0200 0044     LI R0,68
32 084E: 8822 001C 080E' C @28(2),@XPID ;PDOS DISK?
33 0854: 161F     JNE XRSE10 ;N, ERROR 68
34 *
35 *****
36 *      INIT SECTOR
37 *
38 *      DATA XISE$
39 *      ERROR
40 *
41 0856: 0203 0004 XISE0 LI R3,4 ;WRITE COMMAND
42 085A: 1002     JMP XRSE02 ;PROCESS
```


(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PDOS ASM R2.4

PAGE: 12

15:17 09/27/82

FILE: BOOT:SR,WINC #4

```

1          *****
2          *      READ SECTOR
3          *
4          *      DATA XRSE$
5          *      ERROR
6          *
7 085C: 0203 0002  XRSE0  LI R3,2      ;READ COMMAND
8          *
9          0000     XRSE02 IFN FLG102,XRSE04
10 0860: C0AD 0004      MOV @4(13),R2  ;GET BUFFER ADDRESS
11 0864: 0282 6000      CI R2,SHADR   ;PAGED MEMORY SHAPABLE?
12          0001      DUP 1-FLGROM
13 0868: 1402          JHE XRSE04    ;N
14          0000      DUP FLGROM
15          JL XRSE04    ;N
16 086A: 0760 2FE8      ABS @L3LOCK  ;Y, ALLOW PAGE SHAPS
17          *
18 086E: C01D      XRSE04 MOV *R13,R0  ;GET UNIT
19 0870: 04CB      CLR R11    ;CLEAR POINTER
20 0872: 070C      SET0 R12
21          *
22 0874: 6020 0802'    XRSE06 S @C4,R0  ;FOUND?
23 0878: 1103          JLT XRSE08    ;Y
24 087A: 05CB      INCT R11    ;N, MOVE TO NEXT DEVICE
25 087C: 096C      SRL R12,6    ;MORE?
26 087E: 16FA      JNE XRSE06    ;Y
27          *
28          0880'    XRSE08 EQU $      ;CHECK FOR DEVICE
29 0880: 020C 0000      # LI R12,SCRU  # MOV @DSEL,R12
30 0884: 04AB 0BE0'    # X @DVTB1(11) # X @DVTB1(11) ;DEVICE IN SYSTEM?
31 0888: 1303          # JEQ ER100    # JNC ER100    ;N
32 088A: A0EB 0BE8'    A @DVTB2(11),R3 ;Y, ADD DEVICE BASE
33 088E: 0453          B *R3        ;GOTO ROUTINE
34          *
35 0890: 0200 0064      ER100 LI R0,100 ;ILLEGAL UNIT
36          *
37 0894: C740      XRSE10 MOV R0,*R13 ;ERROR CALL
38 0896: 04E0 2FE8      CLR @L3LOCK ;CLEAR LEVEL 3 LOCK
39 089A: 0380      RTWP

```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 13

15:17 09/27/82

PDOS ASM R2.4

FILE: BOOT:SR,WINC #4

```
1 *****
2 *      AUTO BAUD MAIN PORT
3 *****
4 *
5 * AUTO BAUD MAIN PORT.  INIT TMS9902 TO
6 * 7 BITS/CHARACTER, EVEN PARITY, 2 STOP BITS
7 *
8      089C'      BAUD      EQU $
9 089C: 0720 7020      #      SET0 @ABFLG      ;SET AUTO BOOT FLAG
10 08A0: 020C 0000      #      LI R12,SCRU      #      LI RO,-1*FLGAB ;GET POINTER TO SWITCHES
11 08A4: 1F24      #      TB ABTB      #      MOV RO,@ABFLG ;AUTO BOOT?
12 08A6: 164A      #      JNE MAIN04      #      JLT MAIN04 ;Y
13 08A8: 04E0 7020      #      CLR @ABFLG      ;N, CLEAR AUTO BOOT FLAG
14 08AC: 020C 0080      #      LI R12,CRU1      ;SET 9902 CRU BASE
15 08B0: 1D1F      #      SBO 31      ;RESET TMS9902
16 08B2: 04C3      #      CLR R3      ;CLEAR COUNTER
17 08B4: 3220 0C2C'      #      LDCR @B62,8      ;INITIALIZE CONTROL REGISTER
18 08B8: 1E0D      #      SBZ 13      ;DO NOT INIT INTERVAL REG
19 *
20 08BA: 1F0F      BAUD02 TB 15      ;WAIT FOR TIC
21 08BC: 13FE      #      JEQ BAUD02
22 *
23 08BE: 0583      BAUD04 INC R3      ;TIME START BIT
24 08C0: 1F0F      #      TB 15      ;FALL OUT ON A MARK
25 08C2: 16FD      #      JNE BAUD04
26 08C4: 0204 0C0E'      #      LI R4,BAUDT-2 ;SET POINTER TO TABLE
27 *
28 08C8: 05C4      BAUD06 INCT R4      ;MOVE TO NEXT
29 08CA: 8D03      #      C R3,*R4+      ;DO WE HAVE A MATCH?
30 08CC: 18FD      #      JH BAUD06      ;N, KEEP GOING
31 08CE: 3314      #      LDCR *R4,12      ;INIT REC/XMT DATA RATE
32 *
33 08D0: 1F15      BAUD08 TB 21      ;WAIT FOR CHARACTER COMPLETION
34 08D2: 16FE      #      JNE BAUD08
35 08D4: 1E12      #      SBZ 18      ;CLEAR
36 08D6: 1F18      #      TB 27      ;DSR HIGH ON MAIN PORT?
37 08D8: 1303      #      JEQ BAUD10      ;Y
38 08DA: 06A0 0B3C'      #      BL @BTPM      ;N, OUTPUT ERROR MESSAGE
39 08DE: 0CB7'      #      DATA ERM02
40 *
41 08E0: C020 0BFC'      BAUD10 MOV @INSYS,RO ;SPECIAL INITIALIZATION ROUTINE
42 08E4: 0690      #      BL *RO      ;GOTO ROUTINE
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PDOS ASM R2.4

PAGE: 14

15:17 09/27/82

FILE: BOOT:SR,HINC #4

```

1      ****
2      *      CHECKSUM BOOT EPROMS & ASK FOR DEVICES
3      *
4 08E6: 04C0      CKSM   CLR R0          ;CLEAR CHECKSUM
5 08E8: 0201 0800'      LI R1,BOOTV      ;POINT TO BEGINNING OF EPROMS
6      *
7 08EC: A031      CKSM02 A *R1+,R0      ;SUM MEMORY
8 08EE: 0281 0FFA'      CI R1,BOOTV+>7FA ;DONE?
9 08F2: 1AFC              JL CKSM02      ;N
10 08F4: C000          MOV R0,R0        ;Y, CHECKSUM ERROR?
11 08F6: 1303          JEQ CKSM04       ;N
12 08F8: 06A0 0B3C'      BL @BTPM      ;Y, OUTPUT ERROR MESSAGE
13 08FC: 0CC1'          DATA ERM03
14      *
15      0001      CKSM04 IFN FLGSH,CKSM10
16              CLR @DRSEL      ;CLEAR DRIVE SELECTION
17              LI R6,DVTB2      ;POINT TO DRIVE TABLE
18              LI R7,>0001      ;GET MASK
19      *
20      CKSM06 MOV *R6+,R8      ;GET TABLE ADDRESS
21              CI R8,ERRTB      ;ENTERED?
22              JEQ CKSM08       ;N
23              BL @BTPM        ;'SELECT '
24              DATA BTM05
25              MOV R8,R1        ;GET STRING
26              AI R1,16         ;POINT TO STRING
27              BL @BTPM02       ;OUTPUT DEVICE NAME
28              BL @BBTTO        ;OUTPUT ' ? '
29              DATA ' ? '
30              BL @BTGC         ;GET REPLY
31              CI R0,'Y'*256    ;Y?
32              JNE CKSM08       ;N
33              SOC R7,@DRSEL    ;Y, SET DRIVE SELECT
34      *
35      CKSM08 SLA R7,1          ;SHIFT MASK
36              CI R6,DVTB2E     ;DONE?
37              JL CKSM06        ;N
38      *
39      08FE'      CKSM10 EQU $

```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 15

15:17 09/27/82

PDOS ASH R2.4

FILE: BOOT:SR,WINC #4

```
1 *****
2 *      MAIN PROMPTS
3 *
4 08FE: 02E0 7000   MAIN   LHPI BMS      ;GET BOOT WORKSPACE
5 0902: 06A0 0862'   BL @BTGN      ;GET NUMBER
6 0906: 0C30'        DATA BTMO1
7 0908: 08FE'        DATA MAIN
8 090A: 1018         JMP MAIN04
9 090C: C060 7024     MOV @PARMS,R1   ;SAVE UNIT #
10 0910: 0281 0064    CI R1,100       ;Y, BOOT?
11 0914: 1A1F        JL MAIN06       ;Y
12 0916: 0A11        SLA R1,1        ;N, GET INDEX
13 0918: C061 0828'   MOV @BOOTB(1),R1
14 091C: 020D 08DC'   LI R13,BBT0    ;POINT TO OUTPUT ROUTINE
15 0920: 020E 09EC'   LI R14,BBGH    ;POINT TO GET HEX ROUTINE
16 0924: 020F 084A'   LI R15,BOUTH   ;POINT TO OUTPUT HEX ROUTINE
17 0928: 0451        B *R1
18 *
19 *****
20 *      BOOT ERROR
21 *
22 092A: C0C0   MAIN02  MOV R0,R3      ;SAVE ERROR #
23 092C: 06A0 083C'   BL @BTPM      ;OUTPUT MESSAGE
24 0930: 0C80'        DATA ERMO1
25 0932: 06A0 084A'   BL @BOUTH     ;OUTPUT ERROR R3
26 0936: C020 7020     MOV @ABFLG,R0 ;AUTO BOOTING?
27 093A: 13E1        JEQ MAIN       ;N
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 16

15:17 09/27/82

PDOS ASM R2.4

FILE: BOOT:SR,MINC #4

```
1 *****
2 *      SYSTEM BOOT
3 *
4 093C: 04C1      MAIN04 CLR R1      ;START WITH UNIT 0
5 093E: 020C 0000  #      LI R12,SCRU  #      MOV @DRSEL,R12 ;GET SELECT
6 0942: 1F23      #      TB D1TB   #      SRL R12,1      ;DEVICE #1?
7 0944: 1607      #      JNE MAIN06 #      JOC MAIN06      ;Y
8 0946: 8C71      #      C *R1+,*R1+ ;N, TRY UNIT 4
9 0948: 1F22      #      TB D2TB   #      SRL R12,1      ;DEVICE #2?
10 094A: 1604      #      JNE MAIN06 #      JOC MAIN06      ;Y
11 094C: 8C71      #      C *R1+,*R1+ ;N, TRY UNIT 8
12 094E: 1F21      #      TB D3TB   #      SRL R12,1      ;DEVICE #3?
13 0950: 1601      #      JNE MAIN06 #      JOC MAIN06      ;Y
14 0952: 8C71      #      C *R1+,*R1+ ;N, TRY UNIT 12
15 *
16 0954: C801 7024 MAIN06 MOV R1,@PARMS ;SAVE UNIT #
17 0958: C081      MOV R1,R2
18 095A: 0AE2      SLA R2,14      ;MASK TO 0-3
19 095C: 09D2      SRL R2,13      ;X 2
20 095E: 0911      SRL R1,1
21 0960: A0A1 0BE8' A @DVTB2(1),R2 ;ADD BASE
22 0964: C822 0008 7026 MOV @8(2),@PARMS+2
23 *
24 096A: 06A0 0B3C' MAIN10 BL @BTPM      ;'.....BOOT'
25 096E: 0C8D'      DATA BTM02
26 0970: 06A0 0B18' BL @XDITB      ;INIT DRIVES
27 0974: 06A0 09C0' BL @BOOT      ;READ BOOT
28 0978: 7040 0B5C' DATA IBWS,XRSE0
29 097C: D020 0070      MOV @PSFLG,R0 ;GET CURRENT AUTO-START FLAG
30 0980: F020 7020      SOCB @ABFLG,R0 ;CHANGE TO AUTO BOOT FLAG+BOOT DISK #
31 0984: C800 0070      MOV R0,@PSFLG ;SET AUTO-START & DEFAULT DISK #
32 0988: D000      MOV R0,R0 ;AUTO START?
33 098A: 1607      JNE G000      ;Y
34 098C: 020C 0080      LI R12,CRU1 ;N, POINT TO MAIN PORT
35 0990: 1F15      TB 21 ;CHARACTER?
36 0992: 13B5      JEQ MAIN ;Y
37 0994: 06A0 0B3C' BL @BTPM      ;N, 'HIT RETURN'
38 0998: 0C94'      DATA BTM03
39 *
40 099A: 04C1      G000 CLR R1
41 0000      IFZ FLG95,G000Z
42      MOV *R1,@>FFFC ;MOVE RESET VECTOR TO LOAD VECTOR
43      MOV @2(1),@>FFFE
44      IFZ FLG95V,G000Z
45      LI R12,MCRU ;POINT AT MOTOR
46      SBZ 6 ;TURN OFF MOTOR
47 *
48 099C: 0411      G000Z BLWP *R1 ;GO!!!!!!
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 17

15:17 09/27/82

PDOS ASM R2.4

FILE: BOOT:SR,MINC #4

```
1      *****
2      *      MAKE BOOT
3      *
4 099E: 070E      MKBT      SET0 R14      ;SET FLAG
5 09A0: 1001      JMP BTBT02
6      *
7      *****
8      *      OTHER BOOT SECTOR
9      *
10 09A2: 04CE      BTBT      CLR R14      ;RESET FLAG
11      *
12 09A4: 06A0 0862' BTBT02 BL @BTGN      ;ASK FOR UNIT
13 09A8: 0CA5'      DATA BTM04      ;'UNT,SEC='
14 09AA: 08FE'      DATA MAIN
15 09AC: 10A8      JMP MAIN      ;CR
16 09AE: 074E      ABS R14      ;READ BOOT?
17 09B0: 13DC      JEQ MAIN10      ;Y
18 09B2: 06A0 0818' BL @XDITB      ;N, INIT DRIVES
19 09B6: 06A0 09C0' BL @BOOT      ;WRITE BOOT
20 09BA: 7040 0840' DATA IBWS,XHSEO
21      *
22 09BE: 109F      BTBT04 JMP MAIN
23      *
24      *****
25      *      READ/WRITE BOOT
26      *
27 09C0: C020 7024      BOOT      MOV @PARMS,R0      ;GET DISK #
28 09C4: C060 7026      MOV @PARMS+2,R1      ;GET SECTOR #
29 09C8: 04C2      CLR R2      ;START AT ADDRESS >0000
30 09CA: C0C0      MOV R0,R3
31 09CC: 0243 0003      ANDI R3,>0003      ;MASK UNIT
32      *
33 09D0: 04E3 2FD4      BOOT02 CLR @DDFLG(3)      ;INSURE SINGLE SIDEDNESS
34 09D4: 04E3 2FD0      CLR @DSFLG(3)      ;      SINGLE DENSITY
35      09D8'      #      EQU $      #      MOV @DSEL,@DSEL
36 09D8: 041B      BLWP *R11      ;READ OR WRITE SECTOR
37 09DA: 10A7      JMP MAIN02      ;ERROR
38 09DC: 0581      INC R1      ;NEXT SECTOR
39 09DE: 0222 0100      AI R2,BPS
40 09E2: 0282 6000      CI R2,EBRAM      ;DONE?
41 09E6: 1AF4      JL BOOT02      ;N
42 09E8: 046B 0004      B @4(11)      ;Y
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 18

15:17 09/27/82

PDOS ASM R2.4

FILE: BOOT:SR, WINC #4

```
1          *****
2          * GET HEX NUMBER
3          *
4 09EC: C10B      BBGH  MOV R11,R4      ;GET HEX #
5 09EE: 04C1          CLR R1
6 09F0: 04C2          CLR R2
7 09F2: 0703          SET0 R3          ;RESET NUMBER FLAG
8          *
9 09F4: 0583      BBGH02 INC R3          ;SET NUMBER FLAG
10 09F6: 0A41          SLA R1,4        ;ADD NEW DIGIT
11 09F8: A042          A R2,R1
12 09FA: 06A0 0BAA'    BL @BTGC        ;GET NEXT CHARACTER, CR?
13 09FE: 1601          JNE BBGH04      ;N
14 0A00: 04C0          CLR R0          ;Y, CLEAR DELIMITER
15          *
16 0A02: 0280 1B00      BBGH04 CI R0,>1B00 ;ESC?
17 0A06: 130B          JEQ BTBT04      ;Y
18 0A08: 04C2          CLR R2          ;N, CLEAR COUNTER
19 0A0A: 020B 0C00'    LI R11,BHTB
20          *
21 0A0E: 903B      BBGH06 CB *R11+,R0 ;LOOK FOR DIGIT, FOUND?
22 0A10: 13F1          JEQ BBGH02      ;Y
23 0A12: 0582          INC R2          ;N, COUNT
24 0A14: 0282 0010      CI R2,16      ;DONE?
25 0A18: 11FA          JLT BBGH06      ;N
26 0A1A: 0743          ABS R3          ;Y, NUMBER?
27 0A1C: 1302          JEQ BBGH08      ;N
28 0A1E: CD41          MOV R1,*R5+     ;Y, STORE
29 0A20: 05C4          INCT R4
30          *
31 0A22: C0C0      BBGH08 MOV R0,R3      ;SET STATUS
32 0A24: 0454          B *R4            ;RETURN
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PDOS ASM R2.4

PAGE: 19

15:17 09/27/82

FILE: BOOT:SR, HINC #4

```
1 *****
2 *      MEMORY INSPECT/CHANGE
3 *****
4 *
5 *      [ADR1]          MEMORY INSPECT/CHANGE
6 *      [ <CR> ]      = SAME
7 *      [ - ]         = PREVIOUS
8 *      [ + ]         = NEXT
9 *      [ADR1] [ADR2]   MEMORY DUMP
10 *      [ADR1] [ADR2] [ADR3] MEMORY COPY
11 *
12 *****
13 *
14 0A26: 06A0 0B3C'  BBUGER BL @BTPM      ;ERROR
15 0A2A: 0CB0'      DATA ERMO1
16 *
17 0A2C: 0B9D      BBUG  BL *R13      ;OUTPUT CRLF
18 0A2E: 0A0D      DATA >0A0D
19 0A30: 0205 700C  LI R5,BWS+12    ;POINT TO R6
20 0A34: 069E      BL *R14          ;GET HEX NUMBER
21 0A36: 1019      JMP BBUG07
22 0A38: 130E      JEQ BBUG06      ;SINGLE LOCATION
23 0A3A: 069E      BL *R14          ;GET HEX
24 0A3C: 10F4      JMP BBUGER
25 0A3E: 131C      JEQ BBUG10      ;DOUBLE, MEMORY DUMP
26 0A40: 069E      BL *R14          ;GET 3RD HEX NUMBER
27 0A42: 10F1      JMP BBUGER
28 0A44: 16F0      JNE BBUGER
29 *
30 *****
31 * COPY COMMAND - (R6) TO (R7) INTO (R8)
32 *****
33 *
34 0A46: DE36      BBUG02 MOVB *R6+,*R8+ ;MOVE DATA
35 0A48: 81C6      C R6,R7          ;DONE?
36 0A4A: 12FD      JLE BBUG02      ;N
37 0A4C: 10EF      JMP BBUG        ;Y
```


(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 20

15:17 09/27/82

PDOS ASM R2.4

FILE: BOOT:SR,HINC #4

```
1 *****
2 * MEMORY INSPECT/CHANGE
3 *****
4 *
5 * OUTPUT ADDRESS
6 *
7 0A4E: 069D      BBUG04 BL *R13      ;OUTPUT CRLF
8 0A50: 0A0D      DATA >0A0D
9 0A52: C0C6      MOV R6,R3      ;OUTPUT ADDRESS
10 0A54: 069F      BL *R15
11 *
12 * OPEN LOCATION (R6)
13 *
14 0A56: 069D      BBUG06 BL *R13
15 0A58: 3A20      DATA ' : '
16 0A5A: C0D6      MOV *R6,R3      ;GET DATA
17 0A5C: 069F      BL *R15      ;PRINT
18 0A5E: 069D      BL *R13
19 0A60: 2000      DATA ' '*256
20 0A62: C146      MOV R6,R5      ;SET STORE ADDRESS
21 0A64: 069E      BL *R14      ;GET DATA, CR?
22 0A66: 13E2      JEQ BBUG      ;NO NUMBER
23 0A68: 13F2      JEQ BBUG04     ;<CR>
24 *
25 0A6A: 0280 2000 BBUG07 CI R0,'-'*256 ;BACKUP?
26 0A6E: 1602      JNE BBUG08     ;N
27 0A70: 0646      DECT R6      ;Y, BACKUP
28 0A72: 10ED      JMP BBUG04
29 *
30 0A74: 05C6      BBUG08 INCT R6      ;FORWARD
31 0A76: 10EB      JMP BBUG04
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PDOS ASH R2.4

PAGE: 21

15:17 09/27/82

FILE: BOOT:SR,MINC #4

```
1 *****
2 * MEMORY DUMP FROM (R6) TO (R7)
3 *****
4 *
5 0A78: 069D   BBUG10 BL *R13      ;OUT CRLF
6 0A7A: 0A0D           DATA >0A0D
7 0A7C: 00C6           MOV R6,R3
8 0A7E: 069F           BL *R15
9 0A80: 069D           BL *R13
10 0A82: 3A20           DATA ': '
11 0A84: 0708           SET0 R8      ;OUTPUT 8/LINE
12 *
13 0A86: 069D   BBUG12 BL *R13
14 0A88: 2000           DATA ' '*256
15 0A8A: 00F6           MOV *R6+,R3   ;GET DATA
16 0A8C: 069F           BL *R15
17 0A8E: 0928           SRL R8,2      ;DONE WITH LINE?
18 0A90: 16FA           JNE BBUG12   ;N
19 0A92: 069D           BL *R13      ;Y
20 0A94: 2020           DATA ' '
21 0A96: C206           MOV R6,R8      ;Y, OUT ASCII
22 0A98: 0228 FFF0       AI R8,-16
23 *
24 0A9C: 0038   BBUG14 MOVB *R8+,R0   ;GET CHARACTER
25 0A9E: 0240 7F00       ANDI R0,>7F00 ;MASK
26 0AA2: 0280 2000       CI R0,' '*256 ;PRINTABLE?
27 0AA6: 1402           JHE BBUG18   ;Y
28 *
29 0AA8: 0200 2E00   BBUG16 LI R0,' '*256 ;N, OUTPUT PERIOD
30 *
31 0AAC: 0280 7F00   BBUG18 CI R0,>7F00 ;RUBOUT?
32 0AB0: 13FB           JEQ BBUG16   ;Y
33 0AB2: 06A0 0BBE'       BL @BTTO   ;N, OUTPUT
34 0AB6: 8188           C R8,R6      ;DONE?
35 0AB8: 1AF1           JL BBUG14    ;N
36 0ABA: 81C6           C R6,R7      ;DONE?
37 0ABC: 1BB7           JH BBUG      ;Y
38 0ABE: 020C 0080       LI R12,CRU1 ;N, GET CRU BASE
39 0AC2: 1F15           TB 21        ;CHARACTER?
40 0AC4: 16D9           JNE BBUG10   ;N
41 0AC6: 0703           SET0 R3      ;Y, SET FLAG
42 *
43 0AC8: 06A0 0BAA'   BBUG20 BL @BTGC   ;GET CHARACTER
44 0ACC: 0280 0300       CI R0,>0300 ;^C?
45 0AD0: 13AD           JEQ BBUG      ;Y
46 0AD2: 0743           ABS R3      ;N, GET 2ND CHARACTER?
47 0AD4: 11F9           JLT BBUG20   ;Y
48 0AD6: 10D0           JMP BBUG10   ;N
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 22

15:17 09/27/82

PDOS ASM R2.4

FILE: BOOT:SR, WINC #4

```

1          *****
2          *      MEMORY TEST
3          *
4          *      ?100,57312      (>E000-32)
5          *
6          *****
7          *
8 0AD8: C020 7026  MENT  MOV @PARMS+2,R0 ;GET END OF MEMORY, 0?
9 0ADC: 1601          JNE MENT02      ;N
10 0ADE: 02A0          STMP R0          ;Y, TEST UP TO WORKSPACE
11          *
12 0AE0: 0201 0AE6'  MENT02 LI R1,MENT04 ;POINT TO TEST ROUTINE
13 0AE4: 0400          BLMP R0          ;MOVE TO NEW WORKSPACE
14          *
15 0AE6: C10D          MENT04 MOV *R13,R7 ;GET LIMIT
16          *
17 0AE8: 04C6          MENT06 CLR R6      ;GET BEGINNING OF MEMORY
18      0000          DUP FLG102
19          AI R6,>00A0 ;SKIP MAPPER REGISTERS
20 0AEA: C248          MOV R8,R9 ;SAVE SEED
21          *
22 0AEC: 06A0 0B2C'  MENT08 BL @RANDS ;GET RANDOM #
23 0AF0: CD88          MOV R8,*R6+ ;STORE DATA
24 0AF2: 81C6          C R6,R7 ;DONE?
25 0AF4: 1AFB          JL MENT08 ;N
26 0AF6: 04C6          CLR R6 ;Y, CHECK DATA
27      0000          DUP FLG102
28          AI R6,>00A0 ;SKIP MAPPER REGISTERS
29 0AF8: C209          MOV R9,R8 ;RESTORE SEED
30          *
31 0AFA: 06A0 0B2C'  MENT10 BL @RANDS ;GET RANDOM #
32 0AFE: 8236          C *R6+,R8 ;MEMORY SAME?
33 0B00: 130F          JEQ MENT12 ;Y
34 0B02: 06A0 0B3C'  BL @BTPM ;N, ERROR
35 0B06: DCB0'          DATA ERM01
36 0B08: C0C6          MOV R6,R3
37 0B0A: 0643          DECT R3
38 0B0C: 06A0 0B4A'  BL @BOUTH ;OUTPUT HEX ADDRESS
39 0B10: 06A0 0BDC'  BL @BBTTO ;", "
40 0B14: 3A0D          DATA ': '*256
41 0B16: C0C8          MOV R8,R3
42 0B18: 28E6 FFFE          XOR @-2(6),R3 ;GET ERROR BITS
43 0B1C: 06A0 0B4A'  BL @BOUTH ;OUTPUT HEX ERROR MASK
44          *
45 0B20: 81C6          MENT12 C R6,R7 ;DONE?
46 0B22: 1AEB          JL MENT10 ;N
47 0B24: 06A0 0BDC'  BL @BBTTO ;Y
48 0B28: 2E00          BYTE '. ',0
49 0B2A: 10DE          JMP MENT06 ;CONTINUE

```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PDOS ASM R2.4

PAGE: 23

15:17 09/27/82

FILE: BOOT:SR,WINC #4

```
1 *****
2 *      GENERATE PSEUDO RANDOM SEQUENCE OF INTEGERS
3 *
4 *      LINEAR CONGRUENTIAL SEQUENCE:
5 *      X[N+1] = (X[N] * A + C) MOD 2^16
6 *
7 0B2C: C008      RANDS  MOV R8,R0      ;GET RANDOM SEED
8 0B2E: 0AB0      SLA R0,11      ;N*2^11
9 0B30: A008      A R8,R0      ;N*2^11+N
10 0B32: 0A20      SLA R0,2
11 0B34: A200      A R0,R8      ;N*2^11+5N
12 0B36: 0228 3619  AI R8,13849    ;(N*A+13849.) MOD 2^16
13 0B3A: 045B      RT
14 *
15 *****
16 *      BL @BTPM
17 *      DATA MESSAGE
18 *
19 0B3C: C07B      BTPM  MOV *R11+,R1    ;GET POINTER
20 *
21 0B3E: C14B      BTPM02 MOV R11,R5    ;SAVE RETURN
22 *
23 0B40: D031      BTPM04 MOVB *R1+,R0    ;GET CHARACTER, DONE?
24 0B42: 130E      JEQ BOUTH4    ;Y
25 0B44: 06A0 0BBE' BL @BTT0      ;N, OUTPUT
26 0B48: 10FB      JMP BTPM04
27 *
28 *****
29 *      OUTPUT HEX NUMBER
30 *
31 0B4A: C14B      BOUTH  MOV R11,R5    ;SAVE RETURN
32 0B4C: 0702      SET0 R2
33 *
34 0B4E: C103      BOUTH2 MOV R3,R4      ;OUTPUT R3
35 0B50: 0A43      SLA R3,4
36 0B52: 09C4      SRL R4,12
37 0B54: D024 0C00' MOVB @BHTB(4),R0
38 0B58: 06A0 0BBE' BL @BTT0
39 0B5C: 0942      SRL R2,4      ;DONE?
40 0B5E: 16F7      JNE BOUTH2    ;N
41 *
42 0B60: 0455      BOUTH4 B *R5      ;Y, RETURN
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PDOS ASM R2.4

PAGE: 24

15:17 09/27/82

FILE: BOOT:SR,WINC #4

```
1          ****
2          *      GET NUMBER
3          *
4          *      BL @BTGN
5          *      DATA PROMPT
6          *      DATA PROBLEM ADDRESS
7          *      <CR>
8          *      NORMAL
9          *
10 0B62: C28B      BTGN      MOV R11,R10      ;SAVE RETURN
11 0B64: C07A      MOV *R10+,R1      ;GET PROMPT
12 0B66: 06A0 0B3E'  BL @BTPM02      ;OUTPUT MESSAGE
13 0B6A: 0203 7022      LI R3,PARMS-2      ;POINT TO SAVE AREA
14 0B6E: 0702      SET0 R2      ;SET <CR> FLAG
15          *
16 0B70: 04C1      BTGN02  CLR R1      ;CLEAR RESULT
17 0B72: 05C3      INCT R3      ;MOVE TO NEXT STORAGE CELL
18 0B74: 04E3 0002      CLR @2(3)      ;CLEAR NEXT PARAMETER AS WELL
19          *
20 0B78: 06A0 0BAA'  BTGN04  BL @BTGC      ;GET CHARACTER
21 0B7C: C4C1      MOV R1,*R3      ;STORE RESULT
22 0B7E: 020B 0BFE'  LI R11,B0TB      ;GET DECIMAL TABLE
23 0B82: 9EC0      CB R0,*R11+      ;CR?
24 0B84: 130D      JEQ BTGN08      ;Y, RETURN
25 0B86: 9EC0      CB R0,*R11+      ;",?
26 0B88: 13F3      JEQ BTGN02      ;Y
27 0B8A: 3860 0B06'  MPY @C10,R1      ;N, READY FOR DIGIT
28 0B8E: C042      MOV R2,R1
29          *
30 0B90: 9EC0      BTGN06  CB R0,*R11+      ;DIGIT?
31 0B92: 13F2      JEQ BTGN04      ;Y
32 0B94: 0581      INC R1      ;N, COUNT
33 0B96: 028B 0C0A'  CI R11,B0TBE      ;ANY MORE?
34 0B9A: 1AFA      JL BTGN06      ;Y
35 0B9C: C2DA      MOV *R10,R11      ;N, ABNORMAL
36 0B9E: 045B      RT
37          *
38 0BA0: 0582      BTGN08  INC R2      ;1ST CHARACTER?
39 0BA2: 1301      JEQ BTGN10      ;Y
40 0BA4: 05CA      INCT R10      ;N, NORMAL RETURN
41          *
42 0BA6: 046A 0002      BTGN10 B @2(10)      ;DEFAULT RETURN
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PDOS ASM R2.4

PAGE: 25

15:17 09/27/82

FILE: BOOT:SR,HINC #4

```
1          *****
2          *          GET CHARACTER FROM MAIN PORT
3          *
4 0BAA: 020C 0080  BTGC  LI R12,CRU1      ;GET CRU BASE
5 0BAE: 04C0          CLR R0          ;CLEAR R0
6          *
7 0BB0: 1F15  BTGC2 TB 21          ;CHARACTER?
8 0BB2: 16FE          JNE BTGC2      ;N
9 0BB4: 35C0          STCR R0,7      ;Y, GET CHARACTER
10 0BB6: 1E12          SBZ 16        ;ACKNOWLEDGE
11 0BB8: 0280 2000    CI R0,>2000    ;CONTROL CHARACTER?
12 0BBC: 1A0C          JL BTT06      ;Y, RETURN
13          *
14          *****
15          * OUTPUT CHARACTER(S) IN R0
16          *
17 0BBE: 0240 7F00  BTTO  ANDI R0,>7F00 ;MASK R0
18          *
19 0BC2: C240  BTTO2  MOV R0,R9        ;SAVE CHARACTERS
20 0BC4: 020C 0080  LI R12,CRU1
21 0BC8: 1D10          SBO 16        ;SET RTSON
22          *
23 0BCA: 1F16  BTTO4  TB 22          ;BUSY?
24 0BCC: 16FE          JNE BTT04      ;Y
25 0BCE: 3209          LDCR R9,8      ;N, OUTPUT CHARACTER
26 0BD0: 0A89          SLA R9,8      ;2ND CHARACTER?
27 0BD2: 16FB          JNE BTT04      ;Y
28 0BD4: 1E10          SBZ 16        ;N, RESET RTSON
29          *
30 0BD6: 0280 0000  BTT06 CI R0,>0000 ;SET STATUS
31 0BDA: 045B          RT
32          *
33          *****
34          * OUTPUT CHARACTER(S)
35          *
36          *      BL 0BBTTO
37          *      DATA CHARACTERS
38          *
39 0BDC: C03B  BBTTO  MOV *R11+,R0    ;GET CHARACTER(S)
40 0BDE: 10F1          JMP BTT02      ;OUTPUT
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PDOS ASM R2.4

PAGE: 26

15:17 09/27/82

FILE: BOOT:SR,HINC #4

```

1 *****
2 *      DATA STORAGE
3 *
4      OBE0'      DVTB1 EQU $
5 OBE0: 1F23      #      TB D1TB      #      SRL R12,1      ;UNITS 0-3
6 OBE2: 1F22      #      TB D2TB      #      SRL R12,2      ;UNITS 4-7
7 OBE4: 1F21      #      TB D3TB      #      SRL R12,3      ;UNITS 8-11
8 OBE6: 1F20      #      TB D4TB      #      SRL R12,4      ;UNITS 12-99
9 *
10 OBE8: 8992+    DVTB2 DATA XDLT01      ;UNITS 0-3
11 OBEA: 899A+    DATA XDLT02      ;UNITS 4-7
12 OBEC: 89A2+    DATA XDLT03      ;UNITS 8-11
13 OBEE: 89AA+    DATA XDLT04      ;UNITS 12-99
14      OBFO'      DVTB2E EQU $      ;END-OF-DEVICE-TABLE
15 *
16      OBFO' OBE8'      RORG $-8
17 OBE8: 0838'      DATA ERRTB      ;OVERLAY WITH ERROR TABLE
18 OBEA: 0838'      DATA ERRTB
19 OBEC: 0838'      DATA ERRTB
20 OBEE: 0838'      DATA ERRTB
21 *
22      0828'      BOOTB EQU $-200      ;DISPATCH TABLE
23 OBFO: 0AD8'      DATA MEMT      ;100=MEMORY TEST
24 OBF2: 0A2C'      DATA BBUG      ;101=IAC
25 OBF4: 09A2'      DATA BTBT      ;102=BOOT
26 OBF6: 099E'      DATA MKBT      ;103=MAKE BOOT
27 OBF8: 895A+    DATA USER$      ;104=AUX ROMS
28 OBFA: 099A'      DATA G000      ;105=BLWP @0000
29 *
30 OBFC: 879A+    INSYS DATA ISYS$      ;SYSTEM INITIALIZATION
31      OBFE' OBFC'      RORG $-2
32 OBFC: 08E6'      DATA CKSM      ;DEFAULT TO CKSM
33 *
34 OBFE: 002C      BOTB  BYTE >0D,>2C      ;CR,"
35 OC00: 3031 3233 3435 BHTB TEXT '0123456789'
   OC06: 3637 3839
36 OC0A: 4142 4344 4546 BOTBE TEXT 'ABCDEF'
37 *
38 OC10: 0007 001A      BAUDT DATA 7,>01A      ;BAUD = 19200
39 OC14: 000E 0034      DATA 14,>034      ;BAUD = 9600
40 OC18: 001D 0068      DATA 29,>068      ;BAUD = 4800
41 OC1C: 0038 00D0      DATA 59,>0D0      ;BAUD = 2400
42 OC20: 0075 01A1      DATA 117,>1A1      ;BAUD = 1200
43 OC24: 00EA 0341      DATA 234,>341      ;BAUD = 600
44 OC28: 0246 04D0      DATA 582,>4D0      ;BAUD = 300
45 OC2C: 62FF 0638      B62  DATA >62FF,>638 ;BAUD = 110

```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PDOS ASM R2.4

PAGE: 27

16:17 09/27/82

FILE: BOOT:SR,HINC #4

```
1 *****
2 * TEXT STORAGE
3 *
4 OC30: 0A0D BTM01 BYTE >0A,>0D
5 OC32: 2A50 444F 5320 TEXT '*PDOS BOOT R'
   OC38: 424F 4F54 2052
6 OC3E: 322E 3420 BYTE RL1,'.',RL2,RL3
7 OC42: 0A0D BYTE >0A,>0D
8 OC44: 302D 3939 3D42 TEXT '0-99=BOOT'
   OC4A: 4F4F 5400
9 OC4D: 0A0D BYTE >0A,>0D
10 OC4F: 3130 303D 4D45 TEXT '100=MEMORY TEST'
   OC55: 4D4F 5259 2054
   OC5B: 4553 5400
11 OC5E: 0A0D BYTE >0A,>0D
12 OC60: 3130 313D 4941 TEXT '101=IAC'
   OC66: 4300
13 OC67: 0A0D BYTE >0A,>0D
14 OC69: 3130 323D 424F TEXT '102=BOOT'
   OC6F: 4F54
15 OC71: 0A0D BYTE >0A,>0D
16 OC73: 3130 333D 4D41 TEXT '103=MAKE BOOT'
   OC79: 4B45 2D42 4F4F
   OC7F: 5400
17 OC80: 0A0D BYTE >0A,>0D
18 OC82: 3130 343D 4155 TEXT '104=AUX'
   OC88: 5800
19 OC89: 0A0D BYTE >0A,>0D
20 OC8B: 3F00 TEXT '?'
21 OC8C: 0000 BYTE 0
22 *
23 OC8D: 0A0D BTM02 BYTE >0A,>0D
24 OC8F: 424F 4F54 TEXT 'BOOT'
25 OC93: 0000 BYTE 0
26 *
27 OC94: 4544 2100 BTM03 TEXT 'ED!'
28 OC97: 0A0D BYTE >0A,>0D
29 OC99: 4B49 542D 5245 TEXT 'HIT RETURN'
   OC9F: 5455 524E 2000
30 OCA4: 0000 BYTE 0
31 *
32 OCA5: 0A0D BTM04 BYTE >0A,>0D
33 OCA7: 554E 542C 5343 TEXT 'UNT,SCT='
   OCA9: 543D
34 OCAF: 0000 BYTE 0
```


(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 28

15:17 09/27/82

PDOS ASM R2.4

FILE: BOOT:SR,HINC #4

```
1      0001      IFN FLGSM,ERM01
2      BTN05     BYTE >0A,>0D
3      TEXT 'SELECT '
4      BYTE 0
5      *
6  OCB0: 0A0D     ERM01  BYTE >0A,>0D
7  OCB2: 4552 5220 TEXT 'ERR '
8  OCB6: 0000     BYTE 0
9      *
10 OCB7: 0A0D     ERM02  BYTE >0A,>0D
11 OCB9: 4453 5220 4C4F TEXT 'DSR LOW'
    OCBF: 5700
12 OCC0: 0000     BYTE 0
13      *
14 OCC1: 0A0D     ERM03  BYTE >0A,>0D
15 OCC3: 4348 4543 4853 TEXT 'CHECKSUM ERROR'
    OCC9: 554D 2045 5252
    OCCF: 4F52
16 OCD1: 0000     BYTE 0
17      OCD2'     EVEN
18 OCD2: 0800'     END BOOTV
```

(APPENDIX H BOOT:SR LISTING continued)

PDOS BOOT EPROM R2.4

PAGE: 29

15:17 09/27/82

PDOS ASH R2.4

FILE: BOOT:SR,MINC #4

183 SYMBOLS

ABFLG A 7020	ABTB A 0024	AXROM A 0000	BAUD R 089C
BAUDT R 0C10	BAUD02 R 08BA	BAUD04 R 08BE	BAUD06 R 08C8
BAUD08 R 08D0	BAUD10 R 08E0	BBGH R 09EC	BBGH02 R 09F4
BBGH04 R 0A02	BBGH06 R 0A0E	BBGH08 R 0A22	BBROM A 0800
BBTTO R 0BDC	BBUG R 0A2C	BBUGER R 0A26	BBUG02 R 0A46
BBUG04 R 0A4E	BBUG06 R 0A56	BBUG07 R 0A6A	BBUG08 R 0A74
BBUG10 R 0A78	BBUG12 R 0A86	BBUG14 R 0A9C	BBUG16 R 0AA8
BBUG18 R 0AAC	BBUG20 R 0AC8	BDTB R 0BFE	BDTBE R 0C0A
BHTB R 0C00	BOOT R 09C0	BOOTB R 0B28	BOOTV R 0800
BOOT02 R 09D0	BOUTH R 0B4A	BOUTH2 R 0B4E	BOUTH4 R 0B60
BPS A 0100	BTBT R 09A2	BTBT02 R 09A4	BTBT04 R 09BE
BTGC R 0BAA	BTGC2 R 0B80	BTGN R 0B62	BTGN02 R 0B70
BTGN04 R 0B78	BTGN06 R 0B90	BTGN08 R 0BA0	BTGN10 R 0BA6
BTM01 R 0C30	BTM02 R 0C8D	BTM03 R 0C94	BTM04 R 0CA5
BTPM R 0B3C	BTPM02 R 0B3E	BTPM04 R 0B40	BTT0 R 0B8E
BTT02 R 0BC2	BTT04 R 0BCA	BTT06 R 0BD6	BUFF A 7060
BHS A 7000	B62 R 0C2C	CKSM R 08E6	CKSM02 R 08EC
CKSM04 R 08FE	CKSM10 R 08FE	CKSUM R 0812	CRU1 A 0080
C10 R 0806	C4 R 0802	DDFLG A 2FD4	DRSEL A 7022
DSEL A 2FFE	DSFLG A 2FD0	DVSEL A 0003	DVTB1 R 08E0
DVTB2 R 08E8	DVTB2E R 0BF0	D1TB A 0023	D2TB A 0022
D3TB A 0021	D303C A 2FBC	D4TB A 0020	EBRAM A 6000
ERM01 R 0CB0	ERM02 R 0CB7	ERM03 R 0CC1	ERRTB R 0838
ER100 R 0890	FLGAB A 0000	FLGROM A 0000	FLGSH A 0001
FLG101 A 0001	FLG102 A 0000	FLG95 A 0000	FLG95S A 0000
FLG95V A 0000	G000 R 099A	G0002 R 099C	IBWS A 7040
INSYS R 0BFC	ISYS\$ E 0000	LB01% R 0000	LB02% R 0000
LB03% R 0000	LB04% R 0000	LB05% R 0000	LDV1 A 0001
LDV2 A 0001	LDV3 A 0000	LDV4 A 0000	L3LOCK A 2FE8
MAIN R 0BFE	MAIN02 R 092A	MAIN04 R 093C	MAIN06 R 0954
MAIN10 R 096A	MENT R 0AD8	MENT02 R 0AE0	MENT04 R 0AE6
MENT06 R 0AE8	MENT08 R 0AEC	MENT10 R 0AFA	MENT12 R 0B20
MKBT R 099E	MOFLG A 2FD8	NOFF A 0000	PARMS A 7024
PSFLG A 0070	RANDS R 0B2C	RB A 0000	RL1 A 0032
RL2 A 0034	RL3 A 0020	R0 A 0000	R1 A 0001
R10 A 000A	R11 A 000B	R12 A 000C	R13 A 0000
R14 A 000E	R15 A 000F	R2 A 0002	R3 A 0003
R4 A 0004	R5 A 0005	R6 A 0006	R7 A 0007
R8 A 0008	R9 A 0009	SCRU A 0000	SWADR A 6000
SMLOCK A 2FEA	TICS2 A 2F88	TIME A 2FEC	TNOFF A FFFE
TPS A 007D	USER\$ E 0000	XDIT R 0B18	XDITB R 0B18
XDIT02 R 0B28	XDIT04 R 0B36	XDIT06 R 0B36	XDIT10 R 0B36
XDLT01 E 0000	XDLT02 E 0000	XDLT03 E 0000	XDLT04 E 0000
XDOF R 0B38	XDOF02 R 0B38	XISE0 R 0B56	XPID R 0B0E
XRSE0 R 0B5C	XRSE02 R 0B60	XRSE04 R 0B6E	XRSE06 R 0B74
XRSE08 R 0B80	XRSE10 R 0B94	XHSE0 R 0B40	

APPENDIX I

BT303:SR SOURCE LISTING

PDOS ASM R2.4

PAGE: 1

15:35 09/27/82

FILE: BT303:SR,HINC #4

```
1      *      BT303:SR      09/13/82
2      *****
3      *
4      *      TM990/303A READ/WRITE DISC ROUTINES      *
5      *      DEVICE #1      *
6      *      PROGRAMMED BY PAUL ROPER      *
7      *
8      *****
9      *
10     IDT 'B3032.4 '
11
12     *
13     DEF XDLT01      ;303 LINK TABLE
14     REF TICS2,TIME,TPS
15     REF D303C,DSFLG,L3LOCK
16
17     *
18     COPY BTFLG:SR      ;GET FLAGS
19     *      BTFLG:SR      09/17/82
20     *****
21     *      SYSTEM CONFIGURATION FLAGS
22     *****
23     0001      FLG101 EQU 1      ;TM990/101M
24     0000      FLG102 EQU 0      ;TM990/102
25     0000      FLG95S EQU 0      ;STD TMS9995
26     0000      FLG95V EQU 0      ;VIDEO GAMES TMS9995
27     *
28     0000      FLGROM EQU 0      ;0=RAM, 1=EPROM
29     0000      FLGAB EQU 0      ;0=AUTO-BAUD, 1=AUTO-BOOT
30     0001      FLGSH EQU 1      ;0=NO SWITCHES, 1=SWITCHES
31     0001      LDV1 EQU 1      ;LOGICAL DEVICE #1 (XDLT01)
32     0001      LDV2 EQU 1      ;LOGICAL DEVICE #2 (XDLT02)
33     0000      LDV3 EQU 0      ;LOGICAL DEVICE #3 (XDLT03)
34     0000      LDV4 EQU 0      ;LOGICAL DEVICE #4 (XDLT04)
35     *
36     0000      NOFF EQU 0      ;DISK OFF DEVICE #
37     *
38     0000      FLG95 EQU FLG95S!FLG95V
39     0003      DVSEL EQU LDV4*2+LDV3*2+LDV2*2+LDV1
```

(APPENDIX I BT303:SR SOURCE LISTING continued)

```
40      *
41      *****
42      * TM990/303A FLOPPY CONTROLLER CONFIGURATION
43      *****
44      *
45      0100      BPS      EQU 256      ;256 BYTES/SECTOR
46      0210      DCRU      EQU >0210      ;CRU BASE ADDRESS
47      0034      XBIAS      EQU 52      ;BIAS TO TRACK 1
48      000A      STEP      EQU 10      ;HEAD STEP RATE (ms)
49      1003      XDEN      EQU >1003      ;DENSITY/IBM/INTERLACE
50      6900      XBPS      EQU 26*1024+8PS ;SECTORS/SECTOR SIZE
51      0736      BS303      EQU 72*26-26 ;LOGICAL BOOT SECTOR = TRACK 72
```

(APPENDIX I BT303:SR SOURCE LISTING continued)

TM990/303A R/W DISC ROUTINES R2.4

PDOS ASM R2.4

PAGE: 2

15:35 09/27/82

FILE: BT303:SR,MINC #4

```
1
2      * LINKAGE TABLE
3
4      *
5 0000: 100F      XDLT01  JMP XI303      ;INITIALIZE DRIVE ENTRY
6 0002: 1021      JMP XR303      ;READ SECTOR ENTRY
7 0004: 1023      JMP XW303      ;WRITE SECTOR ENTRY
8 0006: 045B      RT              ;DISC OFF ENTRY
9 0008: 0736      DATA BS303    ;DISK #0 BOOT SECTOR
10 000A: 0736     DATA BS303    ;DISK #1 " "
11 000C: 0736     DATA BS303    ;DISK #2 " "
12 000E: 0736     DATA BS303    ;DISK #3 " "
13      0001      IFN FLGSH,XDLTE
14      TEXT 'TM990/303A' ;DRIVE NAME
15      BYTE 0
16
17      0010'      XDLTE  EVEN
18
19
20      * TM990/303 CONFIGURATION TABLE
21
22 0010: 0102      XDITB  DATA >0102 ;DISK SIZE/SURFACES
23 0012: 0040      DATA 77        ;TRACKS
24 0014: 03E8      DATA STEP*100  ;HEAD STEP RATE
25 0016: 050C      DATA 1500      ;HEAD SETTling TIME
26 0018: 00AC      DATA 3500      ;HEAD LOAD TIME
27 001A: 0700      DATA 2000      ;HEAD UNLOAD TIME
28 001C: 1003      DATA XDEN      ;DENSITY/IBM/INTERLACE
29 001E: 6900      DATA XDPS      ;SECTORS/SIZE
30
31
32      * TM990/303A INITIALIZATION ENTRY
33
34      *
35 0020: C34B      XI303  MOV R11,R13 ;SAVE RETURN
36 0022: 020C 0210 LI R12,DCRU  ;POINT TO CONTROLLER
37 0026: 100E      SBO 14        ;RESET
38 0028: 1E0E      SBZ 14
39 002A: 0202 1000 LI R2,>1000  ;SEND DEFINE DRIVES 0-3
40
41 002E: 04C3      XI303A CLR R3
42 0030: 04C4      CLR R4
43 0032: 0207 0010' LI R7,XDITB  ;GET FORMAT ADDRESS
44 0036: 06A0 00B8' BL @BTSN    ;SEND COMMAND
45 003A: 1004      JMP XI303B    ;ERROR
46 003C: 0582      INC R2
47 003E: 0282 1003 CI R2,>1003  ;DONE?
48 0042: 12F5      JLE XI303A    ;N
49
50 0044: 045D      XI303B B *R13   ;RETURN
```

(APPENDIX I BT303:SR SOURCE LISTING continued)

TM990/303A R/H DISC ROUTINES R2.4

PDOS ASM R2.4

PAGE: 3

15:36 09/27/82

FILE: BT303:SR,MINC #4

```
1 *****
2 *      READ SECTOR ENTRY
3 *
4 0046: 0202 0300  XR303  LI R2,>0300    ;GET READ COMMAND
5 004A: 1002      JMP XRME
6 *
7 *****
8 *      WRITE SECTOR
9 *
10 004C: 0202 0400  XH303  LI R2,>0400    ;GET WRITE COMMAND
11 *
12 0050: C1CD      XRME   MOV R13,R7      ;POINT TO PARAMETERS
13 0052: C077      MOV *R7+,R1      ;GET UNIT #
14 0054: 0241 0003  ANDI R1,>0003    ;MOD(UNIT,4)
15 0058: A081      A R1,R2          ;ADD TO COMMAND
16 005A: C0F7      MOV *R7+,R3      ;GET SECTOR NUMBER
17 005C: D021 8512+  MOVB @DSFL6(1),R0 ;DOUBLE SIDED?
18 0060: 1609      JNE XRME02      ;Y
19 0062: C142      MOV R2,R5        ;N, SAVE CHND
20 0064: 04C2      CLR R2
21 0066: 3CA0 01AE'  DIV @C26,R2      ;/26
22 006A: C042      MOV R2,R1
23 006C: 3860 01B0'  MPY @C52,R1      ;*52
24 0070: A0C2      A R2,R3          ;SKIP HOLES
25 0072: C085      MOV R5,R2        ;RESTORE CHND
26 *
27 0074: 0223 0034  XRME02  AI R3,XBIAS  ;BIAS BY TRACK 0
28 0078: C103      MOV R3,R4        ;X 256
29 007A: 0983      SRL R3,8
30 007C: 0A84      SLA R4,8
31 007E: C1D7      MOV *R7,R7      ;GET MEMORY ADDRESS
32 0080: 06A0 00B8'  BL @BTSN      ;SEND COMMAND, ERROR?
33 0084: 1017      JMP XRME12      ;Y
34 0086: 0A62      SLA R2,6        ;N, READ COMMAND?
35 0088: 1704      JNC XRME10      ;Y
36 *
37 008A: 05CE      XRME04  INCT R14   ;OK
38 *
39 008C: 04E0 8592+  XRME06  CLR @L3LOCK  ;CLEAR LOCK FLAG
40 0090: 0380      RTHP
```

(APPENDIX I BT303:SR SOURCE LISTING continued)

TM990/303A R/W DISC ROUTINES R2.4

PDOS ASM R2.4

PAGE: 4

15:36 09/27/82

FILE: BT303:SR,WINC #4

```
1          *****
2          *      CHECK AND SET DOUBLE SIDED FLAG
3          *
4 0092: C10D      XRME10  MOV R13,R4      ;POINT AT UNIT
5 0094: C174      MOV *R4+,R5      ;SAVE UNIT #
6 0096: C184      MOV *R4+,R6      ;SECTOR 0?
7 0098: 16F8      JNE XRME04      ;N
8 009A: C114      MOV *R4,R4      ;Y, GET BUFFER
9 009C: 0245 0003  ANDI R5,>0003    ;MOD(UNIT,4)
10 00A0: 0964 001E 8512+  MOVB @30(4),@DSFLG(5) ;SET SIDES FLAG
11 00A6: 02C0      STST R0        ;GET EQ BIT
12 00A8: 0831      SRC R1,3       ;__S__
13 00AA: 2840      XOR R0,R1
14 00AC: 0200 008E      LI R0,110    ;GET 'INCOMPATIBLE DRIVE/MEDIA ERROR'
15 00B0: 0A31      SLA R1,3       ;MATCH?
16 00B2: 18EB      JOC XRME04      ;Y
17          *
18 00B4: C740      XRME12  MOV R0,*R13   ;N, RETURN ERROR #
19 00B6: 10EA      JMP XRME06
```

(APPENDIX I BT303:SR SOURCE LISTING continued)

TH990/303A R/M DISC ROUTINES R2.4

PDOS ASH R2.4

PAGE: 5

15:36 09/27/82

FILE: BT303:SR,WINC #4

```
1 *****
2 *      SEND COMMAND TO 303
3 *
4 *      BL @BTSN
5 *      ERROR
6 *
7 00B8: C28B      BTSN  MOV R11,R10      ;SAVE RETURN
8 00BA: 73CF      SB R15,R15      ;CLEAR RETRY FLAG
9      0001      DUP 1-FLG102
10 00BC: 0206 000F  LI R6,>000F      ;SET EXTENDED ADDRESS TO >Fxxxx
11      0000      IFZ FLG102,BTSN02
12      MOV R7,R6      ;COMPUTE MAPPED PHYSICAL ADDRESS
13      SRL R6,11
14      MOV @>0080(6),R6 ;_____XXXX PPPP
15      MOV R6,R11
16      SRL R6,4
17      SLA R11,12
18      ANDI R7,>OFFF
19      LI R0,109      ;GET 'BOUNDARY ERROR'
20      CI R7,>0F00      ;BOUNDARY PROBLEM?
21      JH BTSN12      ;Y
22      A R11,R7      ;N
23 *
24 * RETRY ENTRY
25 *
26 00C0: 020C 0210  BTSN02 LI R12,DCRU      ;POINT TO 303
27 00C4: 04C0      CLR R0      ;CLEAR ERRORS
28 00C6: 04C1      CLR R1
29 00C8: 0205 0100  LI R5,BPS      ;BYTE COUNT
30 00CC: 06A0 0196'  BL @BTSNT      ;WAIT FOR ACCEPT
31 00D0: 1F0B      TB 11
32 00D2: 06A0 0196'  BL @BTSNT      ;WAIT FOR BUSY
33 00D6: 1F0C      TB 12
34 00D8: 1D0B      SBO 8      ;SET COMMAND BIT
35 00DA: 04C8      CLR R8      ;SET TO NO CHAIN
36      0D01      DUP 1-FLG102
37 00DC: 0209 000F  LI R9,>000F      ;SET EXTENDED ADDRESS TO >Fxxxx
38      0000      IFZ FLG102,BTSN04
39      STMP R9      ;GENERATE & SEND 1st BYTE
40      SRL R9,12
41      SLA R9,1
42      MOVB @>0081(9),R9
43      SRL R9,4
44      00E0'      BTSN04 EQU $      ;END 102 SECTION
```


(APPENDIX I BT303:SR SOURCE LISTING continued)

TM990/303A R/W DISC ROUTINES R2.4

PDOS ASM R2.4

PAGE: 6

15:36 09/27/82

FILE: BT303:SR,HINC #4

```
1 *****
2 * (BTSN continued)
3 *
4 00E0: 06A0 017A'    BL @BTSNS
5 00E4: 1E08          SBZ 8          ;INDICATE 2nd & 3rd BYTES
6 00E6: 02A9          STWP R9        ;GENERATE 2nd BYTE
7 0000              IFN FLG102,BTSN06
8 00E8: 02CB          STST R11       ;READ STATUS
9 00EA: 0ACB          SLA R11,12     ;SWAP COMMAND?
10 00EC: 1628          JNE BTSN20    ;Y
11 *
12 0000              BTSN06 IFZ FLG102,BTSN08
13                  SRL R9,11
14                  MOV @0080(9),R9
15                  SLA R9,12
16                  STWP R11
17                  ANDI R11,>0F00
18                  A R11,R9
19 *
20 00EE: 06A0 017A'    BTSN08 BL @BTSNS
21 00F2: 02A9          STWP R9        ;GENERATE 3rd BYTE
22 00F4: 06C9          SHPB R9
23 00F6: 06A0 017A'    BL @BTSNS
24 00FA: 06A0 0196'    BL @BTSNT     ;LOOK FOR COMPLETION
25 00FE: C300          MOV R0,R12
26 *
27 0100: 0240 405B     BTSN10 ANDI R0,>405B ;ERROR?
28 0104: 130B          JEQ BTSN14    ;N
29 0106: 022F 8000     AI R15,>8000  ;Y, RETRY?
30 010A: 170B          JNC BTSN16    ;Y
31 010C: D001          MOVB R1,R0    ;N, USE PART OF 2ND ERROR WORD
32 010E: 0260 4000     ORI R0,>4000  ;SET ERROR BIT AGAIN
33 0112: 0A31          SLA R1,3      ;WRITE PROTECT?
34 0114: 1702          JNC BTSN12    ;N
35 0116: 0200 0067     LI R0,103     ;Y, RETURN WRITE PROTECT ERROR
36 *
37 011A: 064A          BTSN12 DECT R10 ;N
38 *
39 011C: 73CF          BTSN14 SB R15,R15 ;CLEAR LEFT BYTE AGAIN
40 011E: 046A 0002     B @2(10)     ;RETURN
```

(APPENDIX I BT303:SR SOURCE LISTING continued)

TH990/303A R/W DISC ROUTINES R2.4

PDOS ASM R2.4

PAGE: 7

15:36 09/27/82

FILE: BT303:SR,HINC #4

```
1          *****
2          * RETRYS
3          *
4 0122: 0A11      BTSN16 SLA R1,1      ;NOT READY?
5 0124: 17CD              JNC BTSN02    ;N, JUST TRY AGAIN
6 0126: C260 862A+      MOV @TICS2,R9   ;Y
7 012A: 04CC              CLR R12       ;CLEAR TIMEOUT
8          *
9 012C: C020 862A+      BTSN18 MOV @TICS2,R0 ;GET TIME
10 0130: 6009              S R9,R0      ;GET DELTA TIME
11 0132: 0280 863A+      CI R0,TPS      ;1 SECOND?
12 0136: 18C4              JH BTSN02    ;Y
13 0138: 060C              DEC R12      ;N, TIMEOUT?
14 013A: 16F8              JNE BTSN18   ;N
15 013C: 10C1              JMP BTSN02   ;Y, GO AHEAD
16          *
17          0000          IFN FL6102,ER102
18          *****
19          * PROCESS ALLOWS SHAPS
20          *
21 013E: 0208 8522+      BTSN20 LI R11,D303C ;POINT TO COMMAND TABLE
22 0142: 0708              SETD R8
23          *
24 0144: CEF9          BTSN22 MOV *R9+,*R11+ ;BUILD COMMAND
25 0146: 0928              SRL R8,2      ;DONE?
26 0148: 16FD              JNE BTSN22    ;N
27 014A: 0408              CLR *R11     ;Y, CLEAR R8
28 014C: 0209 8522+      LI R9,D303C    ;POINT TO COMMAND
29 0150: 06A0 017A'      BL @BTSNS     ;SEND 2ND
30 0154: 0209 8522+      LI R9,D303C
31 0158: 0A89              SLA R9,8      ;GET RIGHT BYTE
32 015A: 06A0 017A'      BL @BTSNS     ;SEND 3RD
33 015E: 0708              SETD R8       ;SET TIMEOUT
34          *
35 0160: 0201 8522+      BTSN24 LI R1,D303C ;POINT TO COMMAND TABLE
36 0164: C031              MOV *R1+,R0   ;GET ERROR REGISTERS
37 0166: C051              MOV *R1,R1
38 0168: C000              MOV R0,R0     ;DONE?
39 016A: 16CA              JNE BTSN10    ;Y
40 016C: 04E0 8632+      CLR @TIME      ;N
41 0170: 0608              DEC R8        ;TIMEOUT?
42 0172: 16F6              JNE BTSN24    ;N
43          *
44 0174: 0200 0066      ER102 LI R0,102   ;Y, ERROR ERROR #
45 0178: 10D0              JMP BTSN12
```

(APPENDIX I BT303:SR SOURCE LISTING continued)

TM990/303A R/W DISC ROUTINES R2.4

PDOS ASM R2.4

PAGE: 8.

15:36 09/27/82

FILE: BT303:SR,MINC #4

```
1          *****
2          *      OUTPUT BYTE R9
3          *
4 017A: 3209    BTSNS  LDCR R9,8      ;OUTPUT COMMAND BYTE
5 017C: 100A          SBO 10        ;CAUSE INTERRUPT
6 017E: 04C9          CLR R9        ;CLEAR TIMEOUT
7          *
8 0180: 0609    BTSNS2 DEC R9        ;TIMEOUT?
9 0182: 13F8          JEQ ER102     ;Y
10 0184: 1F0B          TB 11         ;N, ACCEPTED?
11 0186: 16FC          JNE BTSNS2   ;N
12 0188: 1E0A          SBZ 10        ;ACKNOWLEDGE
13 018A: 04C9          CLR R9        ;CLEAR TIMEOUT
14          *
15 018C: 0609    BTSNS4 DEC R9        ;TIMEOUT?
16 018E: 13F2          JEQ ER102     ;Y
17 0190: 1F0B          TB 11         ;N, DONE?
18 0192: 13FC          JEQ BTSNS4   ;N
19 0194: 045B          RT            ;Y
20          *
21          *****
22          * TEST & TIMEOUT
23          *
24 0196: 0208 0014    BTSNT  LI R8,20      ;GET TIMEOUT CONSTANT
25          *
26 019A: 04E0 8632+    BTSNT2 CLR @TIME   ;CLEAR TASK TIME
27 019E: 0609          DEC R9        ;SHORT PROGRAM TIMEOUT?
28 01A0: 1602          JNE BTSNT4   ;N
29 01A2: 0608          DEC R8        ;Y, TIMEOUT?
30 01A4: 13E7          JEQ ER102     ;Y
31          *
32 01A6: 049B    BTSNT4 X *R11        ;N, CONDITION OK?
33 01A8: 13F8          JEQ BTSNT2   ;N
34 01AA: 046B 0002          B @2(11)   ;Y, RETURN
35          *
36 01AE: 001A    C26    DATA 26
37 01B0: 0034    C52    DATA 52
38 01B2: 0000'      END XDLT01
```

(APPENDIX I BT303:SR SOURCE LISTING continued)

TK990/303A R/W DISC ROUTINES R2.4

PDOS ASM R2.4

PAGE: 9

15:36 09/27/82

FILE: BT303:SR,MINC #4

73 SYMBOLS

BPS	A 0100	B5303	A 0736	BTSN	R 00B8	BTSNS	R 017A
BTSNS2	R 0180	BTSNS4	R 018C	BTSNT	R 0196	BTSNT2	R 019A
BTSNT4	R 01A6	BTSN02	R 00C0	BTSN04	R 00E0	BTSN06	R 00EE
BTSN08	R 00EE	BTSN10	R 0100	BTSN12	R 011A	BTSN14	R 011C
BTSN16	R 0122	BTSN18	R 012C	BTSN20	R 013E	BTSN22	R 0144
BTSN24	R 0160	C26	R 01AE	C52	R 01B0	DCRU	A 0210
DSFLG	E 0000	DVSEL	A 0003	D303C	E 0000	ER102	R 0174
FLGAB	A 0000	FLGROM	A 0000	FLGSH	A 0001	FLG101	A 0001
FLG102	A 0000	FLG95	A 0000	FLG95S	A 0000	FLG95V	A 0000
LDV1	A 0001	LDV2	A 0001	LDV3	A 0000	LDV4	A 0000
L3LOCK	E 0000	NOFF	A 0000	R0	A 0000	R1	A 0001
R10	A 000A	R11	A 000B	R12	A 000C	R13	A 0000
R14	A 000E	R15	A 000F	R2	A 0002	R3	A 0003
R4	A 0004	R5	A 0005	R6	A 0006	R7	A 0007
R8	A 0008	R9	A 0009	STEP	A 000A	TICS2	E 0000
TIME	E 0000	TPS	E 0000	XBIAS	A 0034	XBPS	A 6900
XDEN	A 1003	XDITB	R 0010	XDLTE	R 0010	XDLT01	R 0000
XI303	R 0020	XI303A	R 002E	XI303B	R 0044	XRNE	R 0050
XRNE02	R 0074	XRNE04	R 008A	XRNE06	R 008C	XRNE10	R 0092
XRNE12	R 00B4	XR303	R 0046	XN303	R 004C		