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1          ;***COPYRIGHT 1969, DIGITAL EQUIPMENT CORP., MAYNARD, MASS.***
2
3
4          ;THIS SUB-PROGRAM ASSEMBLED WITH SYSTEM PARAMETER FILE - S.MAC(V414)
5          XLIST
6          LIST
7          TITLE PTPSER - PAPER TAPE PUNCH SERVICE ROUTINE
8          SURTTL /RCC TS 15 APR 69 V401 (FROM 002)
9          XP      VPTPSR,401*
10         ;PUT VERSION NUMBER IN GLOB LISTING AND LOADER STORAGE MAP
11
12         EXTERNAL PTPCHN, PTPSAV, ADVRFE, ITMCT1, SETIOD, SETBYT, IOSET, CKS12
13         EXTERNAL ILLINP, OUT, WAIT1,PTPCHL,PIOMOD
14         EXTERNAL SETACT,STOIOS
15         INTERNAL PTPINT,PTPDSP
16
17         ;PTP DEVICE DATA BLOCK LINKAGE
18
19         ENTRY PTPSER
20 200000    PTPSER:
```

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21
22           , PARAMETER ASSIGNMENTS
23
24
25           , PTP CONTROL REGISTER
26           000010 PTPCON=10
27
28           , FORMAT CONTROL
29           000200 PTFCON=200
30
31           , SPECIAL IO STATUS WORD ASSIGNMENTS
32           400200 IODISC=400000
33           200000 PTFEED=200000
34           020000 PTFEOL=200000
35           004000 PTPBIN=4000          ;CHECKSUM BINARY
36           002000 PTPIR=2000          ;IMAGE BINARY
37
38           ; SPECIAL ASCII CHARACTERS
39           ; DEFINED WITH THE CORRECT PARITY
40
41           000377 RORCNT=377
42           000011 HORTAB=11
43           000213 VERTAB=213
44           000014 FORMFD=14
45
46
47           IFN FTCHECK+FTMONP,<
48           EXTERNAL PTPDBR,PTPIOS,PTPPTP,PTPADR,PTPCTR,PTPCNT,PTPCHA,PTPSIO,PTPCON
49           >
50           IFE FTCHECK+FTMONP,<
51           ;PTP DEVICE DATA BLOCK
52
53           INTERN PTPDBR
54           PTPDBR: 000000 606460 000000 SIXBIT /PTP/
55           000001 000012 000041 XWD +D10*HUNGST,41
56           000002 000000 000000 PTPIOS: 0
57           000003 000000 000000 EXP PTPDSP
58           000004 000401 014403 XWD DVPTP+DVOUT,14403
59           000005 000000 000000 *
60           000006 000000 000000 *
61           000007 000000 000000 PTPPTR: 0
62           000010 000007 000000 PTPADR: XWD PROG,0
63           000011 000000 000000 PTPCTR: 0
64           000012 000000 000000 PTPCNT: 0
65           000013 000000 000000 PTPCHA: 0
66           000014 000000 000000 PTPSIO: 0
67           000015 000000 000000 PTPCON: 0
68           >

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69

70

71

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,PTP SERVICE DISPATCH TABLE
72 000016 254000 000024' JRST PTPINI ;INITILIZE
73 000017 254000 000024' JRST PTPREL ;HUNG DEVICE TIME-OUT ERROR.
74 000020 254000 000024' PTPDSP: JRST PTPREL ;RELEASE
75 000021 254000 000027' JRST PTPCLS ;CLOSE
76 000022 254000 000043' JRST PTPOUT ;OUTPUT
77 000023 254000 000000 JRST ILLINP ;INPUT
```

78	000024			PTPINI:	
79	000024	710200	000070	PTPREL: CONC PTP,0	
80	000025	513000	000015	HLLZS PTPCON	
81	000026	263140	000020	POPJ PDP,	ICLEAR CONSO FLAG BITS
82					IRETURN
83					
84					
85					
86	000027	260140	000020	PTPCLS: PUSHJ PDP,OUT	ICOUTPUT REMAINING BUFFERS
87	000028	260140	000020	PUSHJ PDP,WAIT1	IWAIT FOR IOACT=0.
88	000031	200000	000021	MOVE IOS,PTPIOS	IC(IOS)=C(PTPIOS)
89	000032	661000	600011	TLO IOS,I0DISC+PTPFED+IO	IIOBISCI=IOI=PTPFED=1
90	000033	260140	000020	PUSHJ PDP,SETACT	ISFT ACTIVE FLAG,STORE IOS,AND
91					IRESET HUNG DEVICE TIMEOUT COUNT
92	000034	201040	000020	MOVEI TAC,200	
93	000035	202040	000010	MOVEI TAC,PTPCNT	IPTPCNT=200
94	000036	201040	000010	MOVEI TAC,PTPCON	ISET CONSO FLAG
95	000037	542040	000015	HRRM TAC,PTPCON	
96	000040	201040	000020	MOVEI TAC,PTPCHN	ITAC=PTPCHN,PI CHANNEL ASSIGNMENT
97	000041	710200	000010	CONC PTP,PTPCON(TAC)	IDONE FLAG=1, ASSIGN PI CHANNEL
98	000042	254000	000030	JRET WAIT1	IWAIT FOR IOACT=0, ALL BUFFERS FINISHED

```

99
100 000043 623000 000002 PTPOUT: TLZE IOS,IOBFG ;VIRGIN DEVICE? (IOBEG:=0)
101 000044 254000 000057 JRST PTPIN? ;YES
102
103 000045 ;PTPIN1:
104 000045 621000 400000 TLZ IOS,IODISC ;CLEAR DISCONNECT BIT
105 000046 260140 000033 PUSHJ PDP,SETACT ;SET ACTIVE FLAG,STORE IOS, AND
106 ;RESET HUNG DEVICE TIMEOUT COUNT
107 000047 505040 000010 HRLI TAC,PTP0N ;CONSO FLAG
108 000050 541040 000040 HRRI TAC,PTPCHN ;CONO FLAGS
109 000051 660040 000010 TRQ TAC,PTP0N
110 ;STARTDV PTP,EXTERNAL PIOFF,PION
111 000052 700000 000000 CONO PI,PIOFF
112 000053 710201 000000 CONO PTP,(TAC)
113 000054 546040 000015 HLRM TAC,PTPCON
114 000055 700000 000000 CONO PI,PION
115 000056 263140 000000 POPJ PDP, ;RETURN
116
117 000057 135040 000000 PTPIN2: LDR TAC,PIOMOD
118 000060 661000 200024 TLO IOS, IOFST+PTPFED+IO ;IOFST:=PTPFED:=IO:=1
119 000061 621000 006000 TLZ IOS,PTPBIN+PTP1B ;CLEAR BINARY AND IMAGE BINARY BITS
120 000062 306040 000013 CAIN TAC,IB ;IMAGE BINARY?
121 000063 661000 002000 TLO IOS,PTPIR ;YES
122 000064 306040 000014 CAIN TAC,B ;MODE=BINARY?
123 000065 661000 004000 TLO IOS,PTPBIN ;YES, PTPBIN:=1
124 000066 201040 000200 MOVEI TAC,PTPFDN ;PTPCNT:=PTPFDN
125 000067 202040 000012 MOVEI TAC,PTPCNT
126 000070 260140 000000 PUSHJ PDP,SETBYT ;SETRYT
127 000071 502040 000007 HLLM TAC,PTP1R ;PTP1R0-5:=PTP1R12-13:=0,PTP1R6-11:=BYTE
128 ;SIZE: PTP1R14-17:=PROG
129 000072 254000 000045 JRST PTPIN1
  
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130
131
132
133
134 000073 710360 000015' PTPINT: CONSO PTP,@PTPCON
135 000074 254000 000073' JRST PTPINT
136 000075 202000 000014' MOVEM IOS,PTPSIO ;PTPSIO:=C(IOS) SAVE IOS
137 000076 200000 000022' MOVE IOS,PTPIOS ;IOS:=C(PTPIOS)
138 000077 603000 200020' TLNE IOS,PTPFED ;FEED REQUEST? (PTPFED=1?)
139 000100 254000 000172' JRST PTPS2 ;YES
140 000101 200000 000014' MOVE IOS,PTPSIO ;RESTORE IOS
141 000102 264000 000200' JSR PTPSAV ;SAVE ACS AND ESTABLISH PDP
142 000103 201300 000000' MOVEI DEVDAT,PTPDDR
143 000104 260140 000000' PUSHJ PDP,IOSET ;IPROG:=(JBTAOR 18-35),ITEM:=C(DEVCTR)
144
145 000105 623000 400000' TLZE IOS,IODISC ;IOS:=C(PTPIOS)
146 000106 254000 000210' JRST PTPADV ;DISCONNECT? (IODISC=1?)
147 000107 623000 000004' TLZE IOS,IOFST ;YES
148 000110 254000 000214' JRST PTP9 ;IOFST=1? IOFST:=0
149 000111 607000 006000' TLMN IOS,PTPBIN+PTPIR ;YES
150 000112 254000 000141' JRST PTP3 ;BINARY PUNCH MODE?
151
152 000113 200040 000013' MOVE TAC,PTPCHA ;BINARY OUTPUT BYTE SIZE=36
153 000114 241040 000006' ROT TAC,6
154 000115 202040 000013' MOVEM TAC,PTPCHA
155 000116 405040 000077' ANDI TAC,77 ;TAC:=XX, SIXBIT SUB-BYTE
156 000117 271040 000200' ADDI TAC,200
157 000120 710140 000001' DATA PTP,TAC ;PUNCH 2XX
158 000121 371000 000012' SOSL PTPCNT ;IC(PTPCNT):=C(PTPCNT)-1, WORD DONE?
159 000122 254000 000246' JRST PTPXIT ;NO
160 000123 371000 000011' SOSL PTPCTR ;IC(PTPCTR):=C(PTPCTR)-1, ITEM COUNT < 0?
161 000124 254000 000133' JRST PTPR1 ;NO
162 000125 603000 202000' TLNE IOS,PTPIB ;IMAGE BINARY?
163 000126 665000 400000' TLOA IOS,IODISC ;YES, SUPPRESS TAPE FEED.
164 000127 661000 600000' TLO IOS,IODISC+PTPFED ;IODISC:=PTPFED=1
165 000130 201040 000010' MOVEI TAC,10
166 000131 202040 000012' MOVEM TAC,PTPCNT ;IPTCNT:=10
167 000132 254000 000246' JRST PTPXIT
168
169 000133 201040 000005 PTPB1: MOVEI TAC,5 ;IPTCNT:=5
170 000134 202040 000012' MOVEM TAC,PTPCNT
171 000135 200260 000007' MOVE DAT,@PTPPTR ;PTPCHA:=OUTPUT DATA WORD
172 000136 350000 000007' AOS PTPPTR ;PTPPTR:=C(PTPPTR)+1, ADVANCE ITEM POINTER.
173 000137 202240 000213' MOVEM DAT,PTPCHA
174 000140 254000 000246' JRST PTPXIT
175

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176	000141	710140	000013'	PTP3:	DATAO PTP,PTPCHA	;PUNCH CHARACTER
177	000142	602000	000014		TRNE IOS,14	;IS MODE AN ALPHA MODE
178	000143	254000	000156'		JRST PTP1	INO
179	000144	200240	000013'		MOVE DAT,PTPCHA	
180	000145	302240	000011		CAIE DAT,HORTAR	;HORIZONTAL OR VERTICAL TAB?
181	000146	306240	000213		CAIN DAT,VERTAR	
182	000147	254000	000235'		JRST PTPP1	;YES
183	000150	302240	000014		CAIE DAT,FORMFD	;FORM FEED?
184	000151	254000	000156'		JRST PTP1	INO
185	000152	661000	220000		TLO IOS,PTPFED+PTPEOL	;PTPFED:=PTPEOL:=1
186	000153	201240	000020		MOVEI DAT,20	
187	000154	202240	000012'		MOVEM DAT,PTPCNT	;PTPCNT:=20
188	000155	254000	000246'		JRST PTPXIT	

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189                                     EXTERNAL PEVEN8           ;IN IOCSS, FOR PARITY IN ASCII
190
191 000156 375000 000011' PTP1:  SOSGE  PTPCTR           ;C(PTPCTR):=C(PTPCTR)-1, IS C(PTPCTR)<0?
192 000157 254000 000201'        JRST PTP5             ;YES
193 000160 134400 000007'        ILDB TEM,PTPCTR       ;ITEM=OUTPUT ITEM
194 000161 135040 000057'        LDR TAC,PIOMOD
195 000162 306040 000010'        CAIN TAC,I           ;MODE=IMAGE?
196 000163 254000 000170'        JRST PTP6             ;YES
197 000164 435400 000200'        IORI TEM,200        ;NO, INSERT EIGHTH HOLE
198 000165 606040 000014'        TRNN TAC,14        ;AN ASCII MODE?
199 000166 260140 000000'        PUSHJ PDP,PEVEN8   ;YES, TURN EIGHTH HOLE OFF IF
200                                     ; APPROPRIATE TO GET EVEN PARITY
201 000167 322400 000156'        JUMPE TEM,PTP1     ; IF AN ASCII NULL, IGNORE IT,
202                                     ; THEY ARE PUT IN BY PTPFED STUFF
203                                     ; ELSE FALL INTO PTP6
204
205 000170 202400 000013' PTP6:  MOVEM TEM,PTPCHA       ;PTPCHA=OUTPUT ITEM
206 000171 254000 000246'        JRST PTPXIT
207
208 000172 402000 000013' PTPS2:  CLEARM PTPCHA       ;PUNCH FEED
209 000173 710140 000013'        DATA PTP,PTPCHA
210 000174 377000 000012'        SOSG PTPCNT        ;COUNT FEED LINES
211 000175 621000 200000'        TLZ IOS,PTPFED    ;PTPFED:=0
212 000176 202000 000002'        MOVEM IOS,PTPIOS  ;PTPIOS:=C(IOS)
213 000177 200000 000014'        MOVE IOS,PTPSIO   ;RESTORE IOS
214 000200 254500 000000'        JEN @PTPCHL       ;DISMISS
215
216
217 000201 661000 400000' PTP5:  TLO IOS,IODISC        ;IODISC=1
218 000202 254000 000246'        JRST PTPXIT
219
220 000203 550100 000010' PTPBN:  HRRZ TAC1,PTPADR       ;TAC1:=BUFFER ADDRESS
221 000204 260140 000000'        PUSHJ PDP,CKS12   ;TAC1=CALCULATE CHECKSUM
222 000205 270100 000010'        ADD TAC1,PTPADR
223                                     ;STORE CHECKSUM IN LEFT HALF OF FIRST BUFFER DATA WORD,
224 000206 502060 000002'
225 000207 254000 000133'        JRST PTPR1

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226
227 000210 260140 000000 PTPADV: PUSHJ PDP,ADVBF  IADVANCE BUFFER
228 000211 254000 000241' JRST PTPDSC IEXIT1, NEXT BUFFER EMPTY
229 000212 623000 000001 TLZE IOS,IOW IIN A WAIT? IOW:=0
230 000213 260140 000000 PUSHJ PDP,SETIOD IYES, IOWS:=1
231 000214 621000 000004 PTP9: TLZ IOS,IOFST IOFST:=0
232 000215 200040 000010' MOVE TAC,PTPADR
233 000216 350000 000001 AOS TAC
234 000217 542040 000007' HRRM TAC,PTPTR I;PTPTR18-351=C(PTPADR18-35)+1
235 000220 550220 000001 HRRZ ITEM,@TAC IITEM:=WORD COUNT
236 000221 135100 000234' LDR TAC1,PTP91 IPICK UP BYTE SIZE
237 000222 260140 000000 PUSHJ PDP,ITMCT1 IITEM:=WORD COUNT*(36/BYTE SIZE)
238 000223 202200 000011' MOVEM ITEM,PTPCTR IPTPCTR:=C(ITEM)
239 000224 322200 000210' JUMPF ITEM,PTPADV IIS ITEM COUNT=0?
240 000225 603000 004000 TLNE IOS,PTPRIN IBINARY PUNCH MODE?
241 000226 254000 000203' JRST PTPRN IYES
242 000227 607000 002000 TLNN IOS,PTPIB IIMAGE BINARY?
243 000230 254000 000156' JRST PTP1 IYES
244 000231 350000 000007' AOS PTPPTR IYES

245 000232 370000 000011' SOS PTPCTR
246 000233 254000 000133' JRST PTPR1
247
248 000234 300600 000007' PTP91: POINT 6,PTPTR,11
249
250 000235 201240 000377 PTPP1: MOVEI DAT,RUBOUT IPTPCHA:=RUBOUT
251 000236 202240 000013' MOVEM DAT,PTPCHA
252 000237 661000 020000 TLO IOS,PTPEOL IPTPEOL:=1
253 000240 254000 000246' JRST PTPXIT
254
255 000241 260140 000024' PTPDSC: PUSHJ PDP,PTPREL ICLEAR PTP CONTROL REG AND CONSO BITS
256 000242 620000 010000 TRZ IOS,IOACT IOACT:=0
257 000243 661000 000004 TLO IOS,IOFST IOFST:=1
258 000244 623000 000001 TLZE IOS,IOW IIN A WAIT? IOW:=0
259 000245 260140 000213' PUSHJ PDP,SETIOD IYES, IOWS:=1
260
261 000246 254000 000000 PTPXIT: JRST STOIOS ISTORE IOS, RESET HUNG TIMEOUT COUNT AND
262 IOISSMIS INTERRUPT
263
264 END
```

NO ERRORS DETECTED

PROGRAM BREAK IS 000247

ADVBFE	000210' EXT	R	000014 INT	CKS12	000204' FXT
DAT	000005 INT	DEV DAT	000006 INT	DVOUT	000001' INT
DVPTP	000400 INT	FORMFD	000014	FTCHEC	000000
FTMONP	000000	HORTAB	000011	HUNGST	000001 INT
I	000010 INT	IE	000013 INT	ILLINP	000023' FXT
IO	000020 INT	IOACT	010000 INT	IOBEG	000002 INT
IODISC	400000	IOFST	000004 INT	IOS	000000 INT
IOSET	000104' EXT	IOW	000001 INT	ITEM	000004 INT
ITMCT1	000222' EXT	OUT	000027' EXT	PDP	000003 INT
PEVENB	000166' EXT	PIOFF	000052' EXT	PIOMOD	000161' FXT
PION	000055' EXT	PROG	000007 INT	PTP1	000156'
PTP3	000141'	PTP5	000201'	PTP6	000170'
PTP9	000214'	PTP91	000234'	PTPADR	000010'
PTPADV	000210'	PTPB1	000133'	PTPBIN	004000
PTPBN	000203'	PTPCHA	000013'	PTPCHL	000200' FXT
PTPCHN	000050' EXT	PTPCLS	000027'	PTPCNT	000012'
PTPCON	000015'	PTPCTR	000011'	PTPDOB	000000' INT
PTPCON	000010'	PTPDSC	000241'	PTPDSP	000020' INT
PTPDEL	020000	PTPFDN	000200	PTPFED	200000
PTPIR	020000	PTPIN1	000045'	PTPIN2	000057'
PTPIN1	000024'	PTPIN2	000073' INT	PTPIOS	000002'
PTPOUT	000043'	PTPP1	000235'	PTPPTR	000027'
PTPREF	000024'	PTPS2	000172'	PTPSAV	000102' FXT
PTPSER	000000' INT	PTPSIO	000014'	PTPXIT	000246'
RUBOUT	000377	SETACT	000046' EXT	SETHYT	000070' FXT
SETIOD	000245' EXT	SETIOS	000246' EXT	TAC	000001 INT
TAC1	000002 INT	TEM	000010 INT	VERTAB	000213
VTPSR	000401 INT	WAIT1	000042' EXT		

DRN	6#	6	
DSFR	6#	6	
DSI	6#	6	
DSKRLB	6#	6	
DSO	6#	6	
DVAVAL	6#	6	
DVCDR	6#	6	
DVDIR	6#	6	
DVDIRI	6#	6	
DVDIS	6#	6	
DVDSK	6#	6	
DVDTA	6#	6	
DVIN	6#	6	
DVLNG	6#	6	
DVLPT	6#	6	
DVMTA	6#	6	
DVOUT	6#	6	58
DVPTP	6#	6	58
DVPTR	6#	6	
DVTTY	6#	6	
ENTRR	6#	6	
FBMERR	6#	6	
FNERR	6#	6	
FORMFD	43#	183	
FRGSFG	6#	6	
FT2REL	6#		
FTATTA	6#		
FTCHEC	6#	46	49
FTEXAM	6#		
FTFINI	6#		
FTGETT	6#		
FTHALT	6#		
FTKCT	6#		
FTMONP	6#	46	49
FTPRV	6#		
FTRA10	6#		
FTCHK	6#		
FTREAS	6#		
FTSLFE	6#		
FTTALK	6#		
FTTIME	6#		
FTTRAC	6#		
FTTRPS	6#		
FTTYS	6#		
HORTAB	41#	180	
HSAMSK	6#	6	
HSAPQS	6#	6	
HSASIZ	6#	6	
HUNGCT	6#	6	
HUNGST	6#	6	55
I	6#	6	195
IB	6#	6	120
IBUFR	6#	6	

CODES	6#		
DISARL	6#		
ENABLE	6#		
NOSCHE	6#		
NOSHIF	6#		
QUEUES	6#		
SCHEDU	6#		
SHUFFL	6#		
STARTD	6#	110	
XP	6#	6	9