

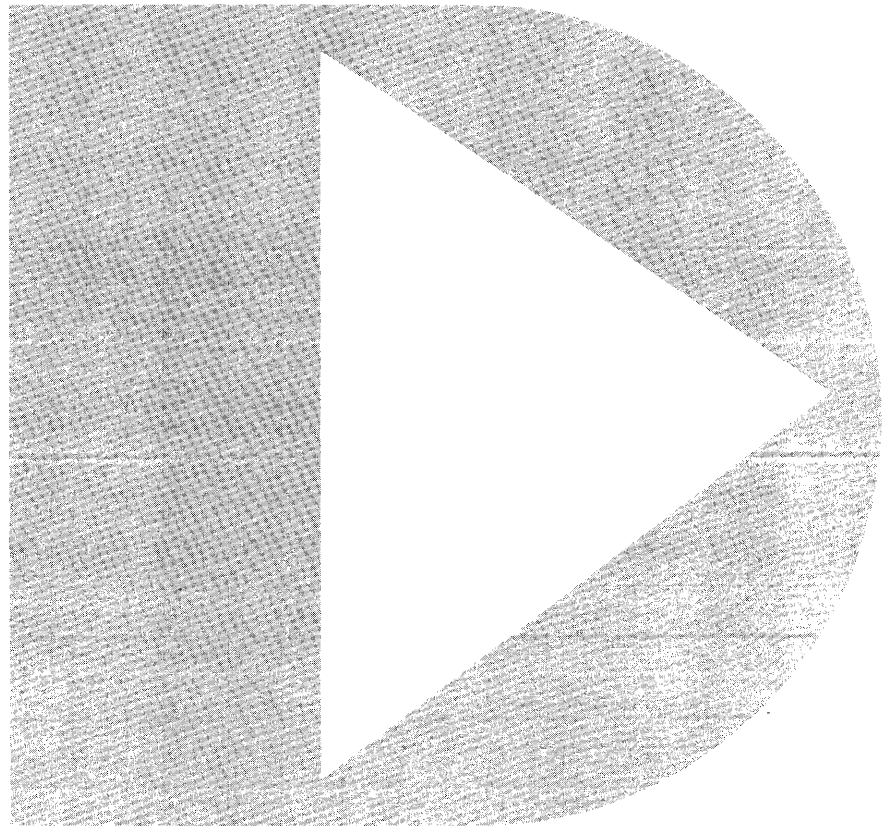
SERVO PRINTER DRIVER ROUTINES (VERSION 1)

V1SERVO 1.1

SEPTEMBER 25, 1973

Program Users Guide

Datapoint



DATAPOINT 2200

VISERVO

USER'S GUIDE

SEPTEMBER 1973

1. General Description

V1SERVO is a set of driver routines for the Servo Printer (2200-250 Series). The routines are written for a version 1 2200 but are upward compatible. The size of the 2200 required is determined by the user's calling program.

2. Operating Instructions

The user may use V1SERVO to print an entire string by setting the H and L registers to the address of the string to be printed and calling PRINT\$. PRINT\$ returns when either a 003 (which has no effect on the printing) or an 015 (which causes a carriage return and line feed) is encountered. The following control characters have special meanings to the string printing routine:

<u>Character</u>	<u>Function</u>
003	Terminate string
011	Next character horizontal position
012	Line feed
014	Form feed
015	Carriage return/Line feed
023	Line feed

V1SERVO may also be used to print a character by calling the routine SPRINT with a character to be printed in the B-register. Every ASCII character found on the Datapoint 2200 keyboard is a legal printing character on the Servo Printer. The following control characters have the specified functions in the character printing routine:

<u>Character</u>	<u>Function</u>
012	Line feed
014	Form feed
015	Carriage return

The user's routine must initialize the printer (by calling PRINTP which restores the printer and resets position counters) prior to the first call to V1SERVO.

The following is a sample program using the string and character printing facilities of V1SERVO:

. PRINTS LINES INPUT FROM THE KEYBOARD

.
PRINTS EQU 010024 STRING PRINTING ROUTINE
PRINTP EQU 010000 PRINTER INITIALIZATION ROUTINE
SPRINT EQU 010251 SINGLE CHARACTER PRINT ROUTINE
KEYIN\$ EQU 01157 DOS INTERRUPTABLE KEYIN ROUTINE
LINE SK 70 LINE BUFFER
LINPTR DC LINE LINE BUFFER POINTER

.
START CALL PRINTP PREP THE PRINTER
LB 014 FORM FEED
CALL SPRINT
LOOP HL LINE
LC 70
CALL KEYIN\$ KEYIN A LINE
HL LINE
CALL PRINT\$ PRINT A LINE
JMP LOOP

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DOS ASSEMBLER 5.1 663 LABELS

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UNUSED LABELS:

PRINTP

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55.	10055	140	070	020		JTC	PRNXT		SKIP 021,022
56.	10060	110	065	020		JFZ	PRINTS		
57.	10063	010	012			LB	012		CONVERT ROLLUP TO LINE FEED
58.	10065	106	251	020		PRINTS	CALL	SPRINT	PRINT ONE CHARACTER
59.	10070	106	111	020		PRNXT	CALL	PRSHL	RESTORE HL
60.	10073	301				LAB			
61.	10074	074	003			CP	3		
62.	10076	053				RTZ			
63.	10077	074	015			CP	015		
64.	10101	110	024	020		JFZ	PRINTS		
65.	10104	010	012			LB	012		
66.	10106	106	251	020		CALL	SPRINT		DO A LINE FEED AFTER CARRIAGE RETURN
67.						.			
68.						.	RESTORE M AND L		
69.						.			
70.	10111	066	250	056	020	307	PRSHL	MLA	*PH
71.	10116	066	247	367			MLL	PL	
72.	10121	350					LHA		
73.	10122	007					RET		
74.							.		
75.							.	SAVE M AND L	
76.							.		
77.	10123	335					PSVHL	LDH	
78.	10124	306					LAL		
79.	10125	066	250	056	020	373	MSD	*PH	
80.	10132	066	247	370			MSA	PL	
81.	10135	007					RET		
82.							.		
83.	10136	106	111	020			PBUMP	CALL	PRSHL
84.	10141	327					LCM		GET HORIZONTAL POSITION
85.	10142	010	000				LB	0	BC=POSITION
86.	10144	106	236	020			CALL	INCHL	
87.	10147	106	123	020			CALL	PSVHL	
88.							.		
89.	10152	302					LAC		
90.	10153	200					ADA		
91.	10154	360					LLA		HL=X*2
92.	10155	301					LAB		
93.	10156	211					ACB		
94.	10157	350					LHA		
95.							.		
96.	10160	302					LAC		
97.	10161	206					ADL		
98.	10162	320					LCA		
99.	10163	301					LAB		
100.	10164	215					ACH		BC=X*3
101.	10165	310					LBA		
102.							.		
103.	10166	302					LAC		BC=X*6
104.	10167	200					ADA		
105.	10170	320					LCA		
106.	10171	301					LAB		
107.	10172	211					ACH		
108.	10173	310					LHA		


```

140,
141,
142,
143,
144,
145,
146,
147,
148,
149,
150,
151,
152,
153,
154, 10251 006 132
155, 10253 121
156, 10254 301
157, 10255 074 012
158, 10257 150 014 021
159, 10262 074 014
160, 10264 100 030 021
161, 10267 074 015
162, 10271 150 043 021
163, 10274 074 040
164, 10276 066 131 056 021 307
165, 10303 110 320 020
166, 10306 004 006
167, 10310 370
168, 10311 066 130 307
169, 10314 014 000
170, 10316 370
171, 10317 007
172,
173, 10320 066 130
174, 10322 267
175, 10323 110 351 020
176, 10326 301
177, 10327 064 200
178, 10331 127
179, 10332 006 007
180, 10334 131
181, 10335 026 001
182, 10337 106 070 021
183, 10342 133
184, 10343 066 131 307
185, 10346 104 306 020
    
```

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+
. VERSION 1 SERVO DRIVER
.
. THIS ROUTINE SHOULD BE CALLED WITH
. A CHARACTER TO BE PRINTED IN THE B-REG
. ANY PRINTABLE ASCII CHARACTER IS OK
. SPECIAL CHARACTERS
. 012 -- LINE FEED
. 014 -- FORM FEED
. 015 -- CARRIAGE RETURN
.
. ENTRY CONDITION FOR SPRINT B = CHARACTER
. EXIT CONDITION FOR SPRINT B = CHARACTER (NOTE: HL NOT SAVED)
.
SPRINT LA SRVADR
EX ADR
LAB GET CHARACTER
CP 012 LINE FEED
JTZ PRLF
CP 014 FORM FEED
CP 015 CARRIAGE RETURN
CP 040 CHECK FOR SPACE
MLA *BMPCNT+1
JFZ CHKTAB
INCBMP AD 6 INCREMENT TAB COUNT
LMA
MLA BMPCNT
AC 0
LMA
RET
.
CHKTAB LL BMPCNT SEE IF CARRIAGE TO BE MOVED HORIZONTALLY
ORH
JFZ BMPHDR
SPRTCH LAB
OR 0200
EX WRITE WRITE THE LOW ORDER PORTION OF THE CHARACTER
LA 7
EX COM1 WRITE THE HIGH ORDER PORTION(12 BITS ARE REQUIRED)
LC 1
CALL SERVOS WAIT FOR CHARACTER READY
EX COM2
MLA BMPCNT+1
JMP INCBMP
    
```

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186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228.

10351 066 130 337
10354 250
10355 370
10356 066 131 347
10361 370
10362 066 133 307
10365 204
10366 370
10367 066 132 307
10372 213
10373 370
10374 006 132
10376 121
10377 304
10400 127
10401 303
10402 131
10403 026 002
10405 106 070 021
10410 135
10411 104 326 020
10414 006 010
10416 127
10417 250
10420 131
10421 026 004
10423 106 070 021
10426 137
10427 007
10430 026 004
10432 106 070 021
10435 125
10436 026 001
10440 104 070 021

```

*
. BUMP HORIZONTAL POSITION
.
BMPHOR MLD  BMPCNT      GET THE TAB COUNT IN DE
        XRA
        LMA
        MLE  BMPCNT+1
        LMA
        MLA  HORPOS+1    INCREMENT HORIZONTAL CARRIAGE POSITION
        ADE
        LMA
        MLA  HORPOS
        ACD
        LMA
        LA   SRVADR
        EX   ADR
        LAE
        EX   WRITE      WRITE THE TAB COUNT
        LAD
        EX   COM1      WRITE THE HIGH ORDER PORTION
        LC   2
        CALL SERVOS    WAIT FOR CARRIAGE MOTION READY
        EX   COM3
        JMP  SPRTCH    GO TO PRINT CHARACTER
*
. LINE FEED
.
PRLF   LA   8          INDEX EIGHT INCREMENTS
        EX   WRITE
        XRA
        EX   COM1
        LC   4
        CALL SERVOS    WAIT FOR PAPER FEED READY
        EX   COM4
        RET
*
. FORM FEED
.
PRFF   LC   4          WAIT FOR PAPER FEED READY
        CALL SERVOS
        EX   DATA
        LC   1
        JMP  SERVOS
    
```

```

229.
230.      *
231.      , CARRIAGE RETURN
232. 10443 066 133 056 021 307 PRCR  MLA  *HORPOS+1  WRITE THE HORIZONTAL POSITION COUNT
233. 10450 127                      EX  WRITE      THIS IS THE DISTANCE TO BE MOVED
234. 10451 066 132 307          MLA  HORPOS
235. 10454 064 004              OR   4          SET DIRECTION LEFT
236. 10456 131                  EX  COM1
237. 10457 026 002              LC   2
238. 10461 106 070 021          CALL SERVO  WAIT FOR CARRIAGE MOTION READY
239. 10464 130                  EX  COM3
240. 10465 104 110 021          JMP  REINIT
241.      *
242.      , SERVO STATUS ROUTINE
243.      ,
244. 10470 006 132          SERVO  LA   SRVADR
245. 10472 121              EX   ADR
246. 10473 101          SERVWT  IN
247. 10474 044 020          ND   020      CHECK ERROR?
248. 10476 112 107 021      CFZ  RESTOR
249. 10501 101              IN
250. 10502 242              NDC
251. 10503 150 073 021      JTZ  SERVWT
252. 10506 007              RET
253.      ,
254. 10507 123          RESTOR  EX   STATUS      RESTORE ON PRINTER
255. 10510 250          REINIT  XRA          INITIALIZE BUMP COUNT AND HORIZONTAL POSITION
256. 10511 066 130 056 021 370 MSA  *BMPCNT
257. 10516 066 131 370      MSA  BMPCNT+1
258. 10521 066 132 370      MSA  HORPOS
259. 10524 066 133 370      MSA  HORPOS+1
260. 10527 007              RET
261.      *
262.      , DATA  -- MUST BE IN ONE PAGE
263.      ,
264. 10530          TM   4
265. 10530 000 000      BMPCNT  DA   0          BUMP COUNT
266. 10532 000 000      HORPOS  DA   0          HORIZONTAL POSITION
267. 00132          SRVADR  EQU  0132      SERVO PRINTER ADDRESS
268.
10000

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| | | | | | | | | | | | |
|-------|--------|------------|-----------|------------|------------|-------------|-----|------|-----|-----|-----|
| 10530 | BMPCNT | 36
189 | 37
192 | 109
256 | 112
257 | 124
*265 | 125 | 164 | 168 | 173 | 184 |
| 10351 | BMPHOR | 175 | *189 | | | | | | | | |
| 10320 | CHKTAB | 165 | *173 | | | | | | | | |
| 10532 | HORPOS | 38
*266 | 39 | 116 | 120 | 194 | 197 | 232 | 234 | 258 | 259 |
| 10306 | INCBMP | *166 | 185 | | | | | | | | |
| 10236 | INCHL | 45 | 86 | *128 | | | | | | | |
| 10136 | PBUMP | 51 | *83 | | | | | | | | |
| 10250 | PH | 70 | 79 | *138 | | | | | | | |
| 10247 | PL | 71 | 80 | *137 | | | | | | | |
| 10443 | PRCR | 162 | *232 | | | | | | | | |
| 10430 | PRFF | 160 | *224 | | | | | | | | |
| 10024 | PRINTS | *44 | 64 | | | | | | | | |
| 10000 | PRINTP | *32 | | | | | | | | | |
| 10065 | PRINTS | 53 | 56 | *58 | | | | | | | |
| 10414 | PRLF | 158 | *213 | | | | | | | | |
| 10111 | PRSHL | 59 | *70 | 83 | | | | | | | |
| 10070 | PRTNXT | 49 | 55 | *59 | 122 | 126 | | | | | |
| 10123 | PSVHL | 46 | *77 | 87 | | | | | | | |
| 10510 | REINIT | 240 | *255 | | | | | | | | |
| 10507 | RESTOR | 248 | *254 | | | | | | | | |
| 10470 | SERVOS | 182 | 207 | 218 | 225 | 228 | 238 | *244 | | | |
| 10473 | SERVWT | *246 | 251 | | | | | | | | |
| 10251 | SPRINT | 58 | 66 | *154 | | | | | | | |
| 10326 | SPRTCH | *176 | 209 | | | | | | | | |
| 00132 | SRVADR | 32 | 154 | 200 | 244 | *267 | | | | | |

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25 LABELS USED