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DECUS NO.	8-753
TITLE	OS/8 SYSTEM OUTPUT HANDLERS,V4
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COMPANY	Portsmouth Abbey School Portsmouth, Rhode Island
DATE	February 1976
SOURCE LANGUAGE	PAL8

ATTENTION

A. GENERAL INFORMATION

Object Computer(s) **PDP-8**   Source Computer (if different) _____

Original File Name and Title   **OS/8 System Output Handlers**   DECUS or DEC No. **8-753**

New File Name and Title (if different) _____

Original Author   **G. Chase**

Revising Author   **G. Chase**

Affiliation   **Portsmouth Abbey School**

Address   **Portsmouth, Rhode Island**

_____

Country _____

Category   **Utility**   Source Language **PAL8**

Monitor/Operating System   **OS/8**   DEC No. _____

Core Storage Required _____   Starting Address _____

Peripherals Required _____

Other Software Required _____   DEC or DECUS No. _____

Restrictions, Deficiencies, Problems _____

B. REASON(s) FOR REVISION

1. Debug, correct known problem ☐   4. Increased operational efficiency ☒
2. Extend to handle new or different configurations ☐   5. Operate on different processor ☐ Specify _____
3. Operate under different monitor or new system ☐   6. Other (please specify) _____

C. TAPES AVAILABLE

Paper Tapes   Object Binary ☒   Binary Patch ☐   Object ASCII ☐   Source ☐   Other _____

DECtape ☒ LINCtape ☐ Format _____   Magtape: 7 Track ☐ 9 Track ☐ BPI _____

Object Files ☒ Source Files ☒ Documentation Files ☐ Other SAV _____

D. ABSTRACT

These handlers simulate (LT, T4) line-printer output an a teletype or equivalent terminal. LPT was written to handle an actual line-printer, or -- especially -- matrix printers such as the Centronics LS8E.

"LT" Output Handlers (version 4) for OS-8

These handlers simulate (LT, T4) line-printer output on a Teletype or equivalent terminal. LPT was written to handle an actual line printer, or -- especially -- matrix printers such as the Centronics LS8-E.

Common to all handlers in this group:

1. The attempt to print a character beyond the specified margin width generates CR/LF/Tab, and then the character.

2. The attempt to print more than 60 lines on one page, without any form feed, causes an automatic Form (page ejection) to 11 inches length.

3. Form is also generated by (a) code 14 or 214 (b) initialization of the handler (Block 0 write) (c) Ctrl/Z (end of file). The user may also cause a 0-record write to be interpreted as end-of-file, as explained later.

4. After Form, programmed or internally generated, Line Feed and Form become null until some printing character (240-372) has been read.

5. Escape (233) is converted to $. So is true Alt Mode (375), but the user can change this.

6. Codes 373,374,376,377 are null (this can be changed); also all control codes that are not specially handled. The "specials" are:

7. CR: echoed literally; LF: produces one line feed unless inhibited (see #4.) or unless it is the 60th line feed (see #2.). Horizontal Tab is expanded (up to 8 spaces). Vertical Tab inserts 2 blank lines. Form is discussed above; likewise Escape.

8. The handlers listen for Ctrl/C, Ctrl/O, Ctrl/S, and Ctrl/Q or any other "bland" character. Ctrl/S (stop, let me read the output) is undone by typing anything other than the first 3 mentioned above.

9. LT: and LPT: listen to the console keyboard. T4: listens to the console keyboard for Ctrl/C, to its own keyboard (device 40) for Ctrl/C, /O, /S, and /Q or equivalent. T4: prints on device 41, the usual code for a second terminal. LPT: prints on device 66.

10. Initial margin (paper width) values, ALTERable by BUILD.SV, are LT: 72 decimal, T4: 72, LPT: 80. LT: and T4: keep minus margin in location MWIDTH, LPT: keeps plus margin in MARGIN.

11. Special coding (removable) handles the Ctrl/N double-width option of Centronics printers (LPT: handler only).

12. Files: LTV4.PA and .BN; T4V4.PA and .BN; LPTV4.PA and .BN. Assembling T4V4.PA and LPTV4.PA will give "RD" messages from PAL8 (non-fatal).

13. Ctrl/O skips to the next output buffer load. I use it to move down
    a listing until the part I want is printed. The 11" page size is
    not disturbed.

re: TYP441.SV. This is not a handler, just a simple program with no
    particular merit. It accepts one input file and passes it on to
    printer 04 (console) and 41 simultaneously. If /F is included in
    the Command Decoder input, Form codes are expanded; otherwise they
    are null. SAVE options are ;200=2401. Use: multiple copies of
    notices, calendars, Snoopys, etc.

User Alterations and Options

1. Undo the conversion of Alt Mode to $ sign.
2. Enable printing of other codes above 372 (172).
3. Treat a 0-record write as end-of-file.
4. Change margin (paper) width value.
5. Change default ejection (Form) from decimal 60 lines to..
6. Restrict first ejection to 3", not 11" [roll-paper users only].
✓7. Take out the Ctrl/N coding for LS8E double-width chars. [LPT: only].
8. Add a null to every carriage return, either
            (a) to help "bounce" or dashpot problems, or
            (b) to handle "raw" CR's not followed by a line feed.

How to Make Them

Consult the enclosed symbol tables. See note on "relative" addresses
and "generic" names. Example: convert LT: margin to decimal 80,

```
.R BUILD                            [decimal 72 = + 110 = -7670
$AL TT8E,351                          "      80 = + 120 = -7660
7670/ 7660      (return)              "     120 = + 170 = -7610]
$BO
.
```

1.	ALter ALTMOD from 53xx	to 7000	(NOP)
2.	ALter ALTMOD+4 from 53yy	to 7000	
3.	ALter NULL from 52zz	to 7410	(SKP)
4a.	ALter MWIDTH from 7670	to minus octal margin (see above)	LT:,T4:
4b.	ALter MARGIN from 0120	to plus octal margin LPT: only	
5.	ALter VEJECT from 7704	to minus no. of printed lines per page	
6.	ALter LINCTR from 7704	to 7764	
✓7.	ALter CTRLN from 7440	to 7000 LPT: only	
8.	ALter TIMING from 7000	to JMS TYPE = 4326 or 4333	

    (Location TIMING-1 contains JMS TYPE for the particular handler.
     You can look at this code with the EXamine command in BUILD.)

Changes from earlier versions include Ctrl/S & Q, the handling of Escape,
Alt Mode and Ctrl/N in the text, recoding and reformatting of listing,
explicit symbol table and ALter instructions in write-up.

COMBINED SYMBOL TABLES:

"LT:"		"T4:"		"LPT:"	
ALTMOD	0275	ALTMOD	0276	ALTMOD	0275
BUFADR	0201	BUFADR	0201	BUFADR	0201
CR	0446	CR	0446	CR	0457
				CTRLN	0402
CTR2	0550	CTR2	0552	CTR2	0555
DCB	0005	DCB	0005	DCB	0005
DOLLAR	0340	DOLLAR	0337	DOLLAR	0340
ENTRY	0203	ENTRY	0203	ENTRY	0203
EXIT	0263	EXIT	0264	EXIT	0263
EXITF	0266	EXITF	0267	EXITF	0266
EXITO	0346	EXITO	0345	EXITO	0346
EXITR	0342	EXITR	0341	EXITR	0342
EXIT0	0343	EXIT0	0342	EXIT0	0343
FORM	0470	FORM	0470	FORM	0504
FORMFL	0546	FORMFL	0550	FORMFL	0553
LF	0454	LF	0454	LF	0470
LINCTR	0545	LINCTR	0547	LINCTR	0552
LOOPR	0241	LOOPR	0242	LOOPR	0241
MARGIN	0110 (*P)	MARGIN	0110 (*P)	MARGIN	0557 = ADRS.
MWIDTH	0551	MWIDTH	0553	MWIDTH	0556
NOFORM	0510	NOFORM	0510	NOFORM	0515
				NOTUPN	0412
NPRINT	0444	NPRINT	0444	NPRINT	0455
NULL	0345	NULL	0344	NULL	0345
OUTPTR	0205	OUTPTR	0206	OUTPTR	0205
OUTPUT	0400	OUTPUT	0400	OUTPUT	0400
PRINT	0271	PRINT	0272	PRINT	0271
RECCTR	0200	RECCTR	0200	RECCTR	0200
RECFLD	0240	RECFLD	0241	RECFLD	0240
RETFLD	0264	RETFLD	0265	RETFLD	0264
SKIPIT	0313	SKIPIT	0314	SKIPIT	0313
STASH	0547	STASH	0551	STASH	0554
TAB	0513	TAB	0513	TAB	0520
TABCTR	0544	TABCTR	0546	TABCTR	0551
THIRD	0202	THIRD	0202	THIRD	0202
TIMING	0451	TIMING	0451	TIMING	0462
TYPE	0526	TYPE	0526	TYPE	0533
VEJECT	0553	VEJECT	0555	VEJECT	0560
VPAGEL	0552	VPAGEL	0554		

(*P) = PARAMETER VALUE, N O T AN ADDRESS.

ALL R E L A T I V E ADDRESSES = THE ABOVE VALUES - 200 (OCTAL)

'ALTER' & 'EXAMINE' (BUILD.SV) WANT (1.) RELATIVE ADDRESSES, AND
        (2.) GENERIC NAMES: "TT8E", "TT41", "LS8E" RESPECTIVELY.

`°BUILD.SV°` USED TO CHANGE FROM OLD TO NEW HANDLER VERSION:

```
.R BUILD        the newer BUILD moves its own core control block, thus
                            ".R BUILD" acts like ".RUN SYS BUILD".

$UNLOAD LS8E

$LOAD SYS:LPTV4.BN

$INSERT LS8E,LPT                      the $ signs are prompts from BUILD

$OL
DTA0 RK8E:SYS RKB0 TTY PTP PTR LT T4 LPT

DSK=RK8E:RKB0
$

$BOOTSTRAP
SYS BUILT
.SAVE SYS BUILD

.COPY SYS:*.*=SYS:BUILD.SV/N        move new BUILD into predecessor's slot
FILES COPIED:
BUILD.SV

.R BUILD

$EXAMINE LS8E,357                      357 = relative adrs. of MARGIN in LPT:
6120
$
.RESORC/E

111 FILES IN 2031 BLOCKS USING 3 SEGMENTS
1161 FREE BLOCKS

J   NAME  TYPE MODE SIZ BLK KIND U V ENT USER
01  SYS   RK8E RWF 3248 SYS       0 C  07
02  DSK   RK8E RWF 3248 SYS       1 B  21
03  DTA0  TD8E RWF  737 16+ TD8A 0 C  10
04  RKB0  RK8E RWF 3248 SYS       1 B  21
05  TTY   TTY  RW       17+ KL8E   C 176
06  PTP   PTP  W        20  PT8E   A  00
07  PTR   PTR  R        20  PT8E   A 112
10  LT    LPTR W        21+        D  03
11  T4    LPTR W        22+        D  03      system takes 'em all as LPT's
12  LPT   LPTR W        23+        D  03      ( or equivalent )

FREE DEVICE SLOTS: 05,  FREE BLOCK SLOTS: 02
OS/8 V3
```

To change DVC — from 66 to 15
RUN SYS Build
  # AL LS8E, 334
    6666/6156
  # AL LS8E, 335
    6661/6151
  # Bootstrap