Support Group Application Note
Number: 002
Issue: 1
Author:

Using the Olivetti JP101 printer

Applicable Hardware :

- Electron
- BBC B
- BBC B+
- Master 128
- Master Compact

Related Application Notes:

Support Group
Acorn Computers Limited
Acorn House
Vision Park
Histon
Cambridge CB4 4AE

Using the Acorn JP101 Spark Jet Printer

Apart from being a remarkably quiet and fast home computer printer, the JP101 Spark Jet Printer has many special features which are simple to use and can improve the presentation of your printouts. Among these features are nine different national character sets, double width printing, double height printing, and horizontal and vertical tabulation functions.

The printer may be controlled from either a program or from the keyboard using VDU commands, or by typing control characters on the keyboard. For example, we can turn the printer on or off from the keyboard or from a BASIC program by typing VDU or VDU3. This may also be done from the keyboard by typing CTRL-B or CTRL-C, which is easier to type!!

When we wish the printer to perform a more complicated task, such as printing characters double width, or automatically tabulating data as it prints it out, then a sequence of commands must be sent to the printer to tell it how it must print any future characters the computer sends it. We wish to send these characters to the printer only and this may be done using VDU1 which sends the next character to the printer only.

In order that the printer should recognise characters sent to it by the computer as part of a command sequence rather than as characters to be printed they are preceded by an ESC character. This has the ASCII code number 27, so to send the ESC character to the printer only we use the command VDU1,27.

VDU commands may be strung together so we may send sequences of characters more easily. For example, to tell the printer that we wish it to print any further characters we send it as double width characters, we must send it the sequence ESC 3. To do this we use VDU1,27,1,51. 51 is the ASCII code for the character 3.

For more information about ASCII codes or VDU commands, see your computer's user guide. For more information about the operating commands of the JP101 printer, see the printer manual chapter 6.

Given below is a summary of the VDU commands you should use to obtain various effects on the JP101 printer. Note that before sending any VDU commands to the printer is possible, the printer must be enabled using a VDU2 (see example programs in 12) and 14) below).

1) Double Width Characters On

VDU1, 27, 1, 51 This command turns double width printing on until it is turned off again.

2) Double Width Characters Off

VDU1, 27, 1, 52 This command turns off double width printing.

3) Double Height Characters On

VDU1, 27, 1, 39

This command turns on double height printing. It may also be used in conjunction with 1) to obtain double height, double width characters.

4) Double Height Characters Off

VDU1, 27, 1, 37 This command turns off double height printing.

5) Underlining

VDU1, 27, 1, 42, 1, 48 (normal underlining)
VDU1, 27, 1, 42, 1, 49 (double underlining)
VDU1, 27, 1, 42, 1, 50 (dotted underlining)

These commands turn on the appropriate style of underlining, which remains in operation until cancelled.

6) Underlining Off

VDU1, 27, 1, 43 Turns underlining off.

7) Horizontal Character Spacing

VDU1, 27, 1, 60 (10 characters per inch)
VDU1, 27, 1, 61 (12 characters per inch)
VDU1, 27, 1, 62 (18 characters per inch)

These commands select the number of characters printed per inch horizontally. The default value on power-up or general reset is 10 cpi.

8) Vertical Line Spacing

VDU1, 27, 1, 69 (6 lines per inch)
VDU1, 27, 1, 70 (8 lines per inch)

These commands set the number of line feeds per inch to the chosen value.

9) Variable Vertical Line Spacing

VDU1, 27, 1, 38, 1, n

Sets line spacing to a value between 1/12 inch and 9/12 inch, in increments of 1/12 inch. The value n is 48+ (the number of increments). For example, if the desired line spacing was 5/12 inch, then n would be (48+5) = 53, and the complete command would be VDU1, 27, 1, 38, 1, 53.

10) General Reset

VDU1, 27, 1, 48

Clears the print buffer, the horizontal and vertical program settings, the pitch and line spacings, etc.

11) Alternative National Character Sets

VDU1, 27, 1, 91, 1, 48, 1, 51, 1, 48 (German)
VDU1, 27, 1, 91, 1, 48, 1, 52, 1, 48 (Spanish)
VDU1, 27, 1, 91, 1, 48, 1, 53, 1, 48 (Danish)
VDU1, 27, 1, 91, 1, 48, 1, 54, 1, 48 (French)
VDU1, 27, 1, 91, 1, 48, 1, 55, 1, 48 (Italian)
VDU1, 27, 1, 91, 1, 48, 1, 56, 1, 48 (Swedish/Finnish)
VDU1, 27, 1, 91, 1, 48, 1, 57, 1, 48 (British)
VDU1, 27, 1, 91, 1, 48, 1, 58, 1, 48 (USA-ASCII)
VDU1, 27, 1, 91, 1, 48, 1, 59, 1, 48 (Norwegian)

Selects one of the alternative national character sets. The default is that set on the DIP switches on the PCB. Details of the special characters are given in the printer manual on page 5.12.

12) Programmed Horizontal Tabulation

VDU1, 27, 1, 80
(Format Information)
VDU1, 27, 1, 90

This is a complicated command to use. The program below demonstrates the use of this command to print numbers 0 to 100 in a field width of 60 characters at tab stops of 0, 10, 15, 40, 47 characters.

10 @%+0	Turn off screen formatting
20 VDU2	Turn on output to printer
30 VDU1, 27, 1, 80	Tell printer horizontal tabulation program starts here
40 PRINT"60;10;15;40;47";	Send format information, line width followed by positions of tab stops
50 VDU1, 27, 1, 90	Tell printer horizontal tabulation program stops here
60 Z=0	
70 REPEAT	
80 PRINT Z;	For Z=0 to 100 print Z
90 VDU1, 9	Horizontal tab to next tab stop
100 Z=Z+1	
110 UNTIL Z-101	
120 VDU1, 12	Page eject
130 VDU3	Turn off output to printer

13) Horizontal Tab

VDU1, 9

Automatically inserts enough spaces as needed to reach the next horizontal tab stop as set by 12) above. If no Horizontal Tabulation Program is set then one space is inserted.

14) Programmed Vertical Tabulation

VDU1, 27, 1, 81
(format information)
VDU1, 27, 1, 90

This is the vertical version of 12) above. See 12) for more information. The following program demonstrates printing as programmed vertical tab stops.

```
10  @%=0
20  VDU2
30  VDU1, 27, 1, 81'
40  PRINT"60;10;15;40;47";
50  VDU1, 27, 1, 90
60  Z=0
70  REPEAT
80  PRINT Z;
90  VDU1, 11
100  Z=Z+1
110  UNTIL Z=6
120  VDU1, 12
130  VDU3
```

15) Vertical Tab

VDU1,11

Prints contents of buffer up to tab code, then performs paper skip to next vertical tab stop as defined by a Vertical Tabulation Program. If there is no vertical tab stop defined, then the printer performs one line feed.

16) Paper Skip

VDU1, 12 Performs paper feed to first print line of next page.

17) Relative Vertical Form Skip

VDU1, 27, 1, 73, 1, i, l, j, l, k (where i=48+x, j=48+y, k=48+z)

Performs a paper skip of xyz line feeds, where xyz is less than 255. For example to obtain 100 line feeds use VDU1, 27, 1, 73, 1, 49, 1, 28, 1, 48

18) Line Feed

VDU1, 10 Performs a single line feed

19) Carriage Return

VDU1, 13	Performs a single line feed

20) Audible Alarm

VDU1, 7	Activates audible alarm lasting about 300msec.

21) Clear Printer Buffer

VDU1, 127	Clears print buffer and resets print head. Does not affect tab programs etc.

22) Plotter Programming

Although it is possible to program graphics dump routines in BASIC the result would be very slow due to the large amount of information that must be processed. Any routine of this type should therefore be written in machine code. Such a "Printer Dump Routine" is available from Acorn for the JP101.