

RESET



COPY-ON



TEST

DATA
LED

PAUSE



COPY-OFF

PBUFF PRINTER BUFFER

by Don McKENZIE

★★ PBUFF Version 3.2 ★★ by Don McKENZIE. Jan 86(C)
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256K RAM INSTALLED

(TEST MESSAGE PRINTOUT)

OPERATOR INSTRUCTIONS..... (Versions 2.2 and 3.2)

Any time the PBUFF is powered up, with COPY OFF, it is ready to accept data from the computer system. Set to COPY OFF, power up and press TEST. A sign on message complete with buffer memory size is printed. If there is a ROM checksum error, this will be reported on the printout.

Pressing the RESET with COPY OFF will light up the DATA LED very brightly.

Release the RESET and the LED will go out.

Pressing RESET will abort any current printout, clear the buffer, and set to ASCII (normal) output mode. PBUFF does a RESET on power up.

To use the PBUFF, print your file in the normal manner as per the computer system's operating instructions. The DATA LED will flash as data is accepted by PBUFF, and the printer will start operating. If the file to print is smaller than the PBUFF memory size then the PBUFF will get all DATA from the computer system, release the computer system for normal operation, and finish the printing job under its own control. If the file to print is larger than the PBUFF memory size then the DATA LED will light up brightly until 256 bytes (100hex.) are free, then PBUFF accepts another 256 bytes from the computer system. This pause can be seen on the DATA LED. When all data is finally loaded into the PBUFF, the LED will stay off and the computer system will be released for normal operation.

COPY.... PBUFF will only copy a file that is the same size or less than the total memory size of the buffer. EG:- A 64K buffer will only allow you to copy a 64K file or less, a 256K buffer will only allow you to copy a 256K file or less. In reality, a 64K buffer will store 65,280 bytes before a buffer overflow occurs and a 256K buffer will store 261,120 bytes. The start of the file to be copied is from the point data was loaded from the last RESET, or power up. If the TEST function was used after power up, this printout will be stored at the start of the buffer to be copied. A RESET can be used to clear this data from the buffer to be copied. To copy a file, set PBUFF to COPY OFF, press reset, load the file into PBUFF, and allow it to print. When finished, throw the copy switch to ON, then to OFF. An exact copy of the printed file will be produced. If multiple copies are required, leave the copy switch in the ON position. This will print the same file over and over until your printer runs out of paper, RESET is pressed, or COPY is set OFF.

COPY ON Test function... Press RESET, set to COPY ON, press RESET. The LED will flash at approx. 3 cycles per second. This indicates a pass of system diagnostics. If at any time the LED flashes at approx. 1 CPS. then you have a RAM error. Setting COPY OFF will stop this test and ready the buffer.

Hexadecimal Output... Press RESET, set COPY ON, press TEST. LED will flash at approx. 3 CPS. Set to COPY OFF. PBUFF will now output all data in HEX format as follows :- MSB, LSB, space. As this requires three times the memory overhead to store, you can divide your buffer size by three. To abort printout or set back to ASCII (normal) mode, press RESET. BEWARE of internal printer buffer confusion in the HEX mode. As all output including control characters are converted to printable characters, the internal printer buffer is never "FORCED" to empty its contents. A known dummy file may need to be loaded into PBUFF in order to "FORCE PRINT" any remaining characters in the original file. Setting COPY ON then OFF will print the same file again, which will also "FORCE PRINT" the remaining characters.

SOFTWARE PAUSE using a double backslash, "\\" string.....

This pause string is two bytes of 5C HEX (92 DECIMAL) together. When the pause string is detected all output to the printer is halted, and input continues until the buffer is full. Switching the COPY switch to ON, then OFF will allow output to continue until the next pause string is detected. Don't leave the COPY switch in the ON position, as this will be the "COPY ON" condition when the buffer is empty.

On power up, the pause function is active. An override is available just in case you need to print the pause string, and you are not using the pause function. Read the OPERATOR INSTRUCTIONS and put PBUFF into the Hexadecimal Output mode, then press RESET. The pause function is now ignored. To re-install the pause function at this stage, you have to power the unit down, or print the TEST message.

HARDWARE PAUSE SWITCH (IF FITTED)..... Setting pause on (switch contacts open) will stop all output to the printer. Input will continue as normal. Setting pause off allows the printer to continue. Can be used in conjunction with the printer shaver switch as follows:- During printout, select pause, swap printers then release pause. No characters will be lost, and no "lock-up" conditions will occur.

Please Note.. !!!!!!!

(1) The I.C.'s on my boards are tightly packed. Make sure that your sockets fit into the board before soldering them in. Chunky sockets will not match up with the .1 inch centres between chips.

(2) The BPIO board is easily ruined by soldering the components onto the board the wrong way. Side "A" is the component side. The 26 pin header and the resistors mount on the component side. The DB23F will only mate with the edge connector one way, that is with the widest part of the connector down. The CENT36F mounts the same way, widest edge of the connector down when looking at the component side of the board. This is only a repeat of what I have stated in the BPIO assembly instructions, but some kit builders still get it wrong.

(3) It has recently been brought to my attention by Mr Franc Zabkar that the Data LED loads it's output buffer excessively, and although this area appears to be problem free, I feel it is wise to reduce the current that this buffer is trying to sink. (Approx 20ma) The value of Resistor R4 is now 330 ohms instead of 150 ohms. This halves the sink current required, (Approx 10ma) and still allows the Data LED to light up brightly enough. This new value is shown in my instructions. If you feel that further problems exist in this circuit, two further fixes can be employed. BUT you only need carry out steps 3A or 3B if you have computer to buffer loading problems !!!

(A) Double the buffering power of the existing 74LS04 as follows:-
Use the spare gate of E13 by connecting E13/1 to E13/13, and E13/2 to E13/12. This connects the two gates in parallel and produces a sink current of around 16ma.

(B) Install a 74S04 instead of a 74LS04. The 74S04 can sink 20ma.

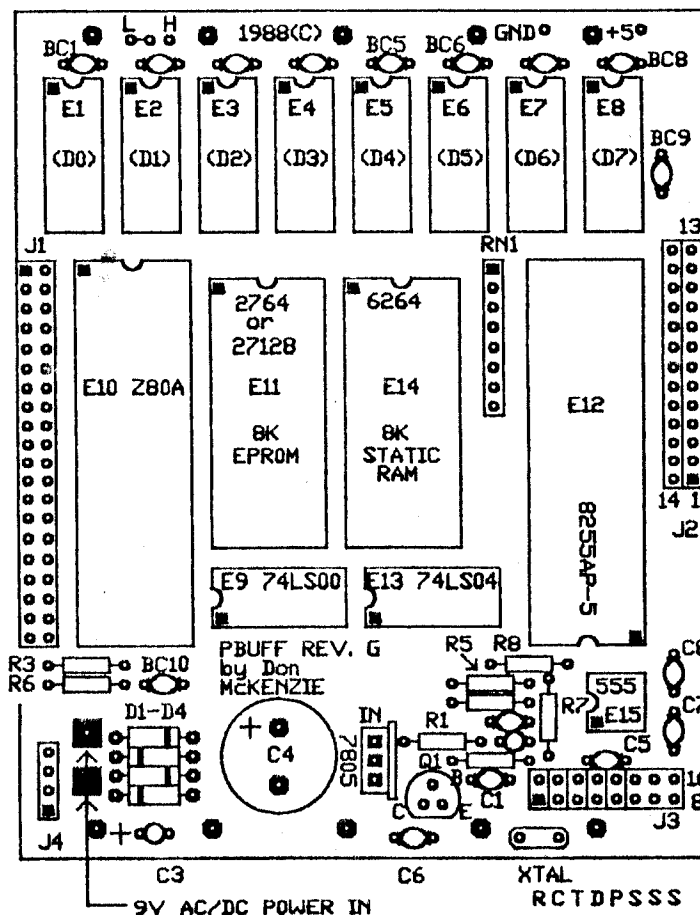
BC1-BC11 .01uf Ceramic (11)
C1 220pf Ceramic
C2 22uf Tantalum (16V)
C3 10uf Tantalum (16V)
C4 2200uf Electro (16V)
C5 150pf Ceramic
C6 680pf Ceramic
C7 .01uf Ceramic
C8 .01uf Ceramic
R1 100K
R2 270 OHMS
R3 10K
R4 150 OHMS 330 OHMS
R5 1K
R6 4K7
R7 100K
R8 1K

CRYSTAL 3.58MHZ (3.579545)
Q1 BC548
D1-D4 1N4002 (4)
7805 +5V REG (TO-220)

DYNAMIC RAMS
4164's or 41256's

RN1 Resistor network
Single in line package with
7 by 4K7 resistors with one
common pin. (8 pin device)
NOTE PIN 1 NEAR DRAMS

BOARD LAYOUT
BETWEEN R5 & C1
R5
R4
BC11
C2 (+ END NEAR R1)
R2
C1



All chips and connectors have pin 1 marked with a square. ■

Connector pinouts.

J1 Z80 BUS
STANDARD PINOUT OF
Z80 FOR FUTURE EXPANSION

J2 INPUT	J2 OUTPUT
14 STROBE	1 STROBE
15 D0	2 D0
16 D1	3 D1
17 D2	4 D2
18 D3	5 D3
19 D4	6 D4
20 D5	7 D5
21 D6	8 D6
22 D7	9 D7
23 ACK	10 ACK
24 BUSY	11 BUSY
25 GROUND	12 GROUND
26 +5 VOLTS	13 +5 VOLTS

J3 CONTROL

1 & 9 RESET
2 & 10 COPY
3 & 11 TEST
4 DATA LED -
12 DATA LED +
5 & 13 HARDWARE PAUSE
6, 7, 8, 14, 15, & 16 SPARE

J4 SERIAL BOARD POWER OUT

1 AC
2 +12VOLTS
3 +5VOLTS
4 SPARE

