# KIT 96. SERIAL PIC PROGRAMMER

This is a kit of parts and a PCB to use the software of Bojan Dobaj to program all 8, 18, 28 & 40 pin DIP serial programmed PIC's. For a full list of these PIC chips go to **picallw.com** The older parallel programmed PIC's - 16C5x - are not supported by this programmer. (Get my Kit117 or Kit 144 to program these PICs.)

Do not confuse these programming **methods** with the serial port and parallel **ports** of a PC. A serial programmed PIC refers to the programming algorithm by which data enters the PIC. In this method the data bits are entered serially onto 1 pin (like a shift register) and the 13V programming voltage is toggled onto a programming pin to latch and burn the word (12 or 14 bits.) In the parallel programming method the whole word (12 or 14 bits) is presented on the PICs 8-pin port B and 4-pin port A simultaneously then the programming voltage is toggled. Timing is critical. On-board firmware is usually, but not always needed to do this.

Originally, the program to use with Kit 96 was **P16PRO** software. However, with the rapid introduction of new PICs and the evolution of software the program to use with Kit 96 now is **picallw.exe**. This is where the software author, Bojan Dobaj, is putting all his effort. Download it from

**picallw.com**
**kitsrus.com**
**dontronics.com**

Get the latest **picallw.exe** version from **picallw.exe.** It runs under all Microsoft operating systems. It will program the PIC16X8xx and 16F62x PICs for free. For other PICs there is a 256 word code limitation on the unregistered version. Register it at **dontronics.com** **QuasarElectronics.com** or **electronics123.com** to remove the limitation.

New PIC's can be added as they are released by entering them in the **device.ini** file of the software. The software shows you where to place your PIC chip on the board for programming. The hardware & power need to be connected for this to happen. Note that with the latest picallw.exe software you can also program the new 18Fxxx PIC chips. No hardware modification is required.

**Other Software Sources.** You can get free software for Kits 96/119 from

http://www.ic-prog.com/
http://www.winpicprog.co.uk/

**Schematic.** See the schematics on the next page. The power supply is in the top schematic. We have made space on the board for C5/330pF from pin 6 of the 74LS06 to ground since there has been some reports that it may be required. We have not supplied this component but the position is there if have programming problems (unlikely.)

**Construction**. There are 4 links to add to the board. Use the zero ohm resistors. The short leg on the LED's is the cathode which corresponds to the bar on the LED overlay. Use the green LED for L2. We have supplied 8 18 & 40 pin IC sockets. By cutting the end off the 40 pin IC socket and a little filing and pushing you can solder all 3 IC sockets into the PCB. However, for maximum ease and flexibility you may wish to supply your own 40 pin **wide-slot** ZIF (3M, Aries) socket.

**NOTE:** to program the new 16F873 you will need a 40-pin wide-slot ZIF socket. K96 was designed before this chip came out and you will need the ZIF socket.

Use the 14 pin IC socket to mount the inverter buffer IC. You will need to connect the programmer to the parallel port of a PC using a straight-through male/female cable from the on-board 25 pin PCB-mounted sub-D connector.

## COMPONENTS

| | | |
|---|---|---|
| Resistors, 5% 1/4W: | | |
| 680R blue grey brown | R11 | 1 |
| 1K brown black red | R1 | 1 |
| 4K7 yellow violet red | R2 3 4 5 9 10 | 6 |
| 10K brown black orange | R6 R7 R8 | 3 |
| Zero ohm resistors for links | | 4 |
| | | |
| SN74LS06 inverter buffer | IC3 | 1 |
| 78L05 | IC1 | 1 |
| 78L08 | IC2 | 1 |
| 100nF 104 monoblok | C1 2 | 2 |
| 330pF ceramic | C4 | 1 |
| 470uF/35V ecap | C3 | 1 |
| 40 pin IC socket | | 1 |
| 8 pin IC socket | | 1 |
| 14 pin IC socket | | 1 |
| 18 pin IC socket | | 1 |
| BC557B | T1 T2 T3 | 3 |
| Bridge rectifier WO2M | | 1 |
| 5mm red LED | L1 L3 (use red LEDs) | 2 |
| 5mm green LED | L2 (use the green for L2) | 1 |
| 25 pin male R/A subd connector | 1 | |
| DC power jack 2.5mm | | 1 |
| Kit 96 PCB | | 1 |

**PCB Hardware Error.** Please note **R1 should be 1K** ohm as in this Documentation. We printed 10K by mistake on the overlay of the PCB. IC labeling has been corrected between the schematic and PCB overlay (12/2001.)

If you have trouble getting a power supply of 17VDC as input to Kit 96 then you can buy out Kit 135 which takes the input from a 12V plugpack and steps it up to 17VDC.

For a comprehensive list of PIC tools & websites go to **dontronics.com**

# KIT 96. SERIAL PIC PROGRAMMER

**TESTING K96 WITH picallw.exe**
Connect the assembled Kit 96 to a PC with a straight-through parallel cable. Connect at least 17VDC to the Kit. On your PC you have probably made a desktop icon for picallw.exe. Click on it. First, in the top left dropdown box change **PICALL** to **P16PRO**.

Next go to Settings/LPT Port and set 'Auto'.

After that go to Settings/Hardware Setup-Test. If the message 'Can't find the P16PRO or compatible hardware' comes up then check component placement and soldering. Is the power connected? If you are sure the cable is a straight through cable then maybe play with the parallel port settings on your PC.

If all is OK the first thing to do, obviously, is click on the programmer you are using in the lower left box: 'P16PRO, 74LS05,06, kit 96'.

Do not play with any settings in the first two columns which were set automatically when you pressed 'kit 96'. Now look at the six 'Set/Clear' boxes in the third column on the right hand side. This is the only place where we will click things.

Each 'Set/Clear' box relates to the hardware connection written in the center column: Data Out, Clock … Reset

In kit 96 looking at the schematic:

- pin 3 is Clock
- pin 4 is VDD,
- pins 2 and 10 are Data Out and Dataln,
- pins 5 and 6 are the VPP and VPP40 resp. which turn on each of the two LEDs.

First click Set/Clear on VPP and on VPP1. The red programming voltage LEDs should turn on/off.

Now use a multimeter set to the 20V range. Connect to ground lead tp ground somewhere on the board. Connect the red lead to pin 3 of the DB25 connector. Clicking on the Set/Clear will turn on 5V to pin 3 then turn it off. Similarly with pins 4 and 2 & 10. These tests can be used to trace the 0V/5V at other places on the target board. They show that the cable connection is working to the target board. If all these tests are OK then the programmer is ready to go.

(Documentation march 9, 2003.)

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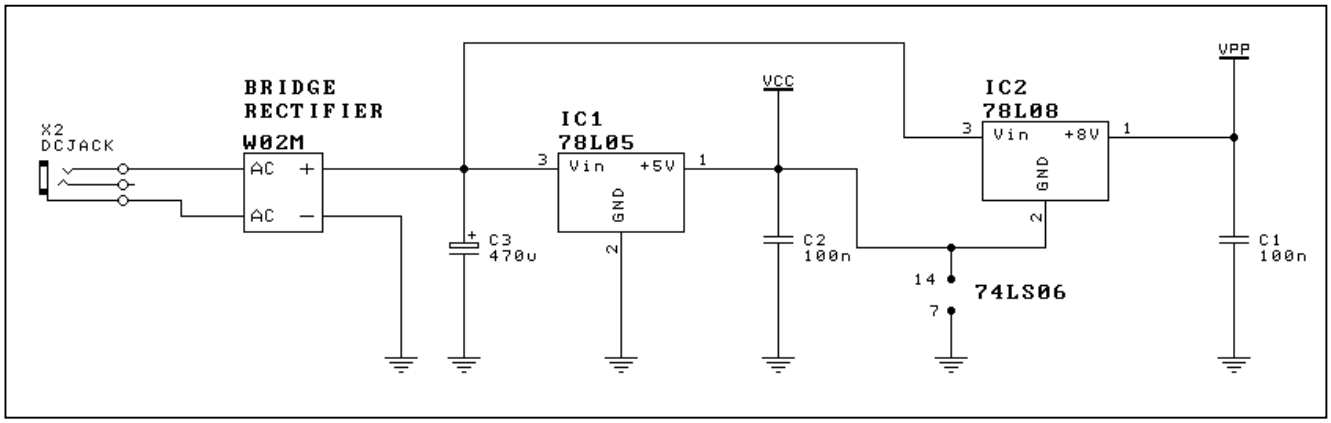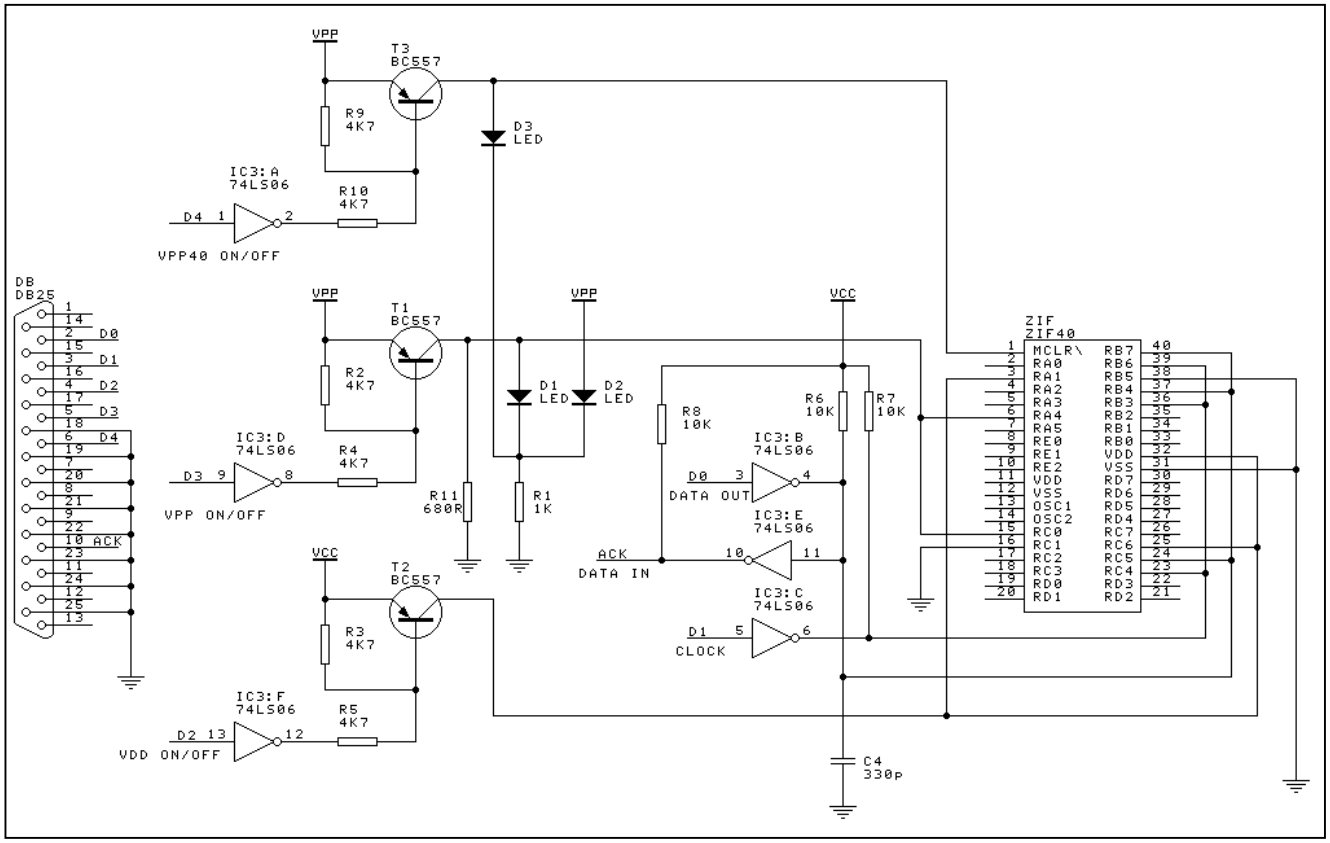
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