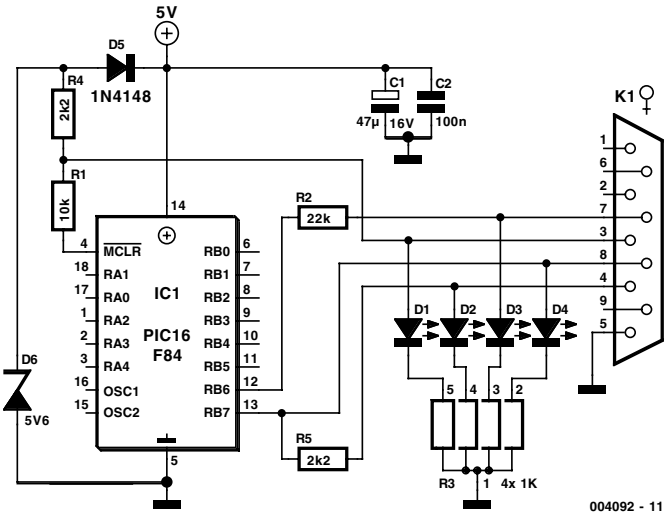
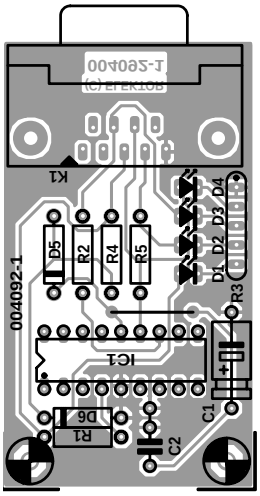
019 PIC16F84/16C84 Mini Programmer

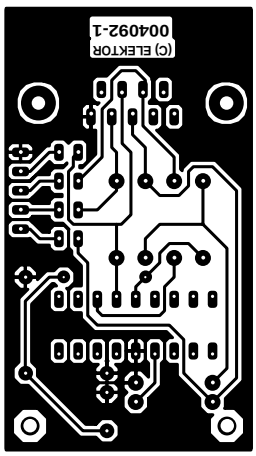
J. Klein

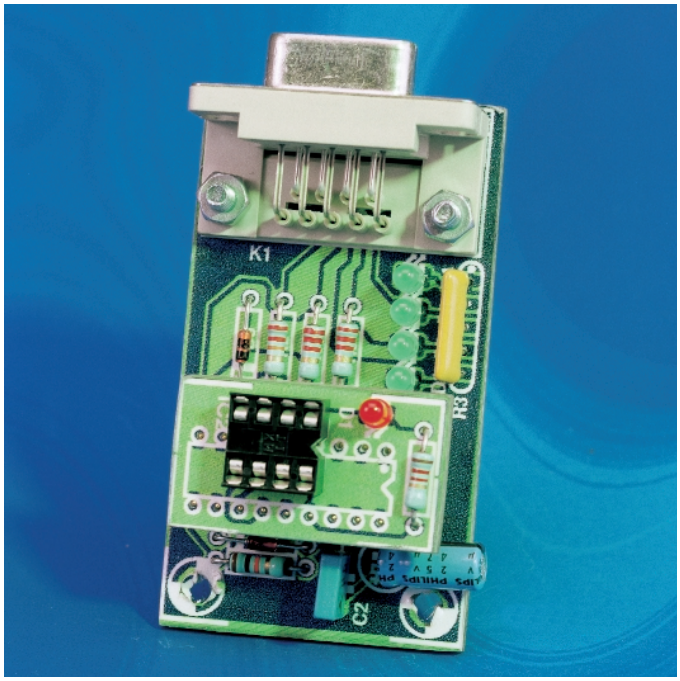
As new microcontroller chips appear on the market, today's microcontroller programming tools are becoming more and more 'universal' to cope with different programming conventions. It is also sadly the case that the more 'universal' the programmer, the more you need to pay. In practice, most people will only use a fraction of the capabilities of such a programmer, making it difficult to justify such an expense.
The project here describes a minimal solution to the programming problem for one of the most popular types of controller. The PIC16F84 (1k-Flash-memory) and the PIC16C84 (1k-ROM)



with 13 I/O-lines. Using a PC together with this relatively simple interface and some software it is possible to build a low-cost programmer
The design for the programmer is described on the author's website. The programmer connects to the serial port of a PC. Pin 3 of the port supplies the power and zener diode D6 along with D5 regulates the supply to the chip at 5 V. C1 and C2 smooth the regulated supply. The unregulated supply is fed to pin MCLR of the PIC to configure it in programming mode. R1







limits current into this pin and an internal regulator ensures the correct programming voltage on chip. A high on this pin switches the PIC into programming mode. Data exchange between the PC and the PIC occurs over the lines TxD (Pin 3), DTR (Pin 4) and CTS (Pin 8) and can be viewed on the LEDs D2, D3 and D4.
A control software package comprising NTPICPROG, PIX and Euro13 for Windows and DOS (altogether 198 kB) can be downloaded free from the 'Elektro' page of the authors website at http://jump.to/gate
Also available from the website is the Eagle and PDF data for the author's circuit board, along with the circuit diagram and some pictures. The circuit board shown is an *Elektor Electronics* design, the layout can also be downloaded from the Free Downloads section on the *Elektor Electronics* web site: http://www.elektor-electronics.co.uk
The board is unfortunately not available ready-made through the Publishers' Readers Services.

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Elsewhere in this edition is an EEPROM Adapter that can be used with this PIC programmer.

COMPONENTS LIST

Resistors:
R1 = 10kΩ
R2 = 22kΩ
R3 = 4-way SIL array 1kΩ
R4,R5 = 2kΩ2

Capacitors:
C1 = 47µF 16V
C2 = 100nF

Semiconductors:
D1-D4 = LED
D5 = 1N4148
D6 = zener diode 5V6, 100 mW
IC1 = PIC16F84

Miscellaneous:
9-pin sub-D socket (female), angled pins, PCB-mount version