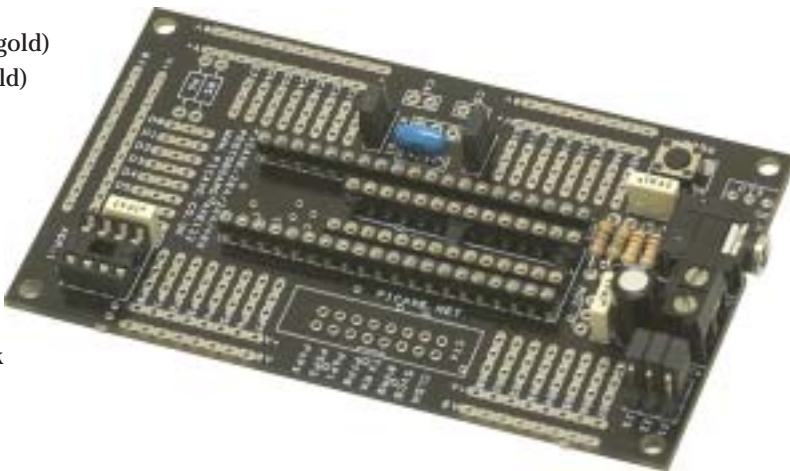


# PICAXE-28/28X/40X PROTO BOARD KIT

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## Contents:

- PCB Proto board PCB
- R1 10k resistor (brown black orange gold)
- R2 22k resistor (red red orange gold)
- R3 180R resistor (brown grey browngold)
- R4 4k7 resistor (yellow violet red gold)
- D1 BAT85 shottky diode
- X1 4MHZ 3 pin ceramic resonator
- D1 miniature 6mm push switch
- C1-3 100nF polyester capacitor
- C4 100uF 16V electrolytic capacitor
- J1-5 3 pin header and jumper link
- CT1 stereo download socket
- CT2 5mm 2 pole screw terminal block
- H1-2 20 pin turned pin socket
- CT1 stereo download socket
- IC1 28 pin IC socket
- IC2 8 pin IC socket



## Optional Components (not supplied):

- CT3 Molex style download connector (see download section)
- RG1 78L05 5V Voltage regulator (see power section)
- X2 8 or 16MHz resonator/crystal (see resonator section)
- C5-6 Crystal loading capacitors (see resonator section)
- R5-6 i2c 4k7 pull-up resistors (see i2c section)
- CT4 16 pin header (see PICAXE.net section)

## Description:

The proto board provides a rapid development system for all PICAXE 28 and 40 pin devices. It provides the basic download circuit beside a small proto typing area for connection of input / output circuits to the PICAXE input/output pins. A socket to use a 24LCxx series EEPROM is also provided.

The protoboard is also designed to be used within the PICAXE.net system. See the PICAXE.net documentation for further details.

## Instructions:

1. Solder the components in place. The default position for the jumper headers is (viewed from front with download socket at top of board):
  - J1 left hand side
  - J2 left hand side
  - J3 left hand side
  - J4 right hand side
  - J5 right hand side
2. Insert a PICAXE microcontroller (purchased separately).
3. Use the prototyping area to develop your test circuit. Note the pads are joined in sets of pads (and power rails) as marked in ink on the top of the board.

## Input / Output Connection Pads

Each PICAXE input/output pin is connected to 3 solder pads for connection of external circuits. V+ and 0V power rails are also provided by each set of pads. The input/output pads are labelled as follows:

### Label PICAXE-28A/28X

RST reset  
A0 ADC0  
A1 ADC1  
A2 ADC2  
A3 ADC3  
E0 -  
E1 -  
E2 -  
B0 output 0  
B1 output 1  
B2 output 2  
B3 output 3  
B4 output 4  
B5 output 5  
B6 output 6  
B7 output 7  
C0 input 0  
C1 input 1  
C2 input 2  
C3 input 3  
C4 input 4  
C5 input 5  
C6 input 6  
C7 input 7  
D0 -  
D1 -  
D2 -  
D3 -  
D4 -  
D5 -  
D6 -  
D7 -

### PICAXE-40X

reset  
ADC0  
ADC1  
ADC2  
ADC3  
ADC5  
ADC6  
ADC7  
output 0  
output 1  
output 2  
output 3  
output 4  
output 5  
output 6  
output 7  
input c0  
input c1  
input c2  
input c3  
input c4  
input c5  
input c6  
input c7  
input 0  
input 1  
input 2  
input 3  
input 4  
input 5  
input 6  
input 7

### PICAXE-28X

Reset	1	28	Output 7
ADC 0 / In a0	2	27	Output 6
ADC 1 / In a1	3	26	Output 5
ADC 2 / In a2	4	25	Output 4
ADC 3 / In a3	5	24	Output 3
Serial In	6	23	Output 2
Serial Out	7	22	Output 1
0V	8	21	Output 0
Resonator	9	20	+V
Resonator	10	19	0V
In0 / Out c0 / Infrain	11	18	In7 / Out c7 / keyboard data
In 1 / Out c1 / pwm 1	12	17	In6 / Out c6 / keyboard clock
In 2 / Out c2 / pwm 2	13	16	In 5 / Out c5
In 3 / Out c3 / i2c scl	14	15	In 4 / Out c4 / i2c sda

### PICAXE-40X

Reset	1	40	Output 7
ADC 0 / In a0	2	39	Output 6
ADC 1 / In a1	3	38	Output 5
ADC 2 / In a2	4	37	Output 4
ADC 3 / In a3	5	36	Output 3
Serial In	6	35	Output 2
Serial Out	7	34	Output 1
ADC 5	8	33	Output 0
ADC 6	9	32	+V
ADC 7	10	31	0V
+V	11	30	Input 7 / keyboard data
0V	12	29	Input 6 / keyboard clock
Resonator	13	28	Input 5
Resonator	14	27	Input 4
In c0 / Out c0	15	26	In c7 / Out c7
In c1 / Out c1 / pwm 1	16	25	In c6 / Out c6
In c2 / Out c2 / pwm 2	17	24	In c5 / Out c5
In c3 / Out c3 / i2c scl	18	23	In c4 / Out c4 / i2c sda
Input 0 / Infrain	19	22	Input 3
Input 1	20	21	Input 2

Note: the output holes marked P0 to P7 are reserved for use with the PICAXE.net input/output pins. Please see the PICAXE.net documentation for further details.

## Power Supply

The protoboard can be powered in three ways.

- 1) External 4.5V battery or 5V regulated DC supply
- 2) 9V DC regulated supply with added on-board regulator RG1
- 3) PICAXE.net

When used with an external battery or regulated 5V supply, jumper J3 must be in the left hand position. In this case the supply voltage (connected to connector CT2) is applied directly to all components on the protoboard.

When used with an external 9V DC regulated supply (connected to connector CT2), a 78L05 regulator must be soldered in position RG1 and the jumper link J3 completely removed. The 78L05 provides a regulated 5V supply to the components on the board (maximum current capacity 100mA).

When used with the PICAXE.net board, the power supply to the protoboard is sourced from the PICAXE.net board (7805 5V 1A regulator from 9V supply). In this case Jumper J3 must be in the right hand position and no external supply should be connected to connector CT2.

## Download Cable

The standard PICAXE download cable (part AXE026) can be connected to the 3.5mm download socket CT1. If desired the older style 'molex' cable (part AXE025) can be connected to the optional header CT3. When either of these two cables is used, jumpers J1 and J2 must both be in the left hand position.

When programs are downloaded via the PICAXE.net board, jumpers J1 and J2 must both be in the right hand position.

## Resonator

The protoboard is designed to be used with a 4Mz 3 pin ceramic resonator, soldered in position X1. When using this resonator jumper links J4 and J5 must be fitted in the right hand position.

If desired a second resonator (8 or 16MHz) can be fitted in position X2. A crystal, with support capacitors, could also be used in positions X2, C5, C6. When using this alternate resonator/crystal jumper links J4 and J5 must be moved to the left hand position.

## i2c EEPROM

The protoboard can be fitted with a 24LCxx series EEPROM in position IC2. The address of this EEPROM is hard wired to 001. If using the i2c bus, two 4k7 pull up resistors may be required in position R5 and R6 (add only if no pull-ups are already supplied elsewhere on the i2c bus). Please see the i2c tutorial (download from [www.picaxe.co.uk](http://www.picaxe.co.uk)) for further information on how to use the i2c bus.

## PICAXE.net

The PICAXE.net connector CT4, and the output holes marked P0 to P7, are reserved for use with the PICAXE.net board. Please see the PICAXE.net documentation for further details.

The circuit diagram is shown for the 28 pin PICAXE chips. The circuit for 40 pin PICAXE chips is identical, but with additional active input/output pins.

