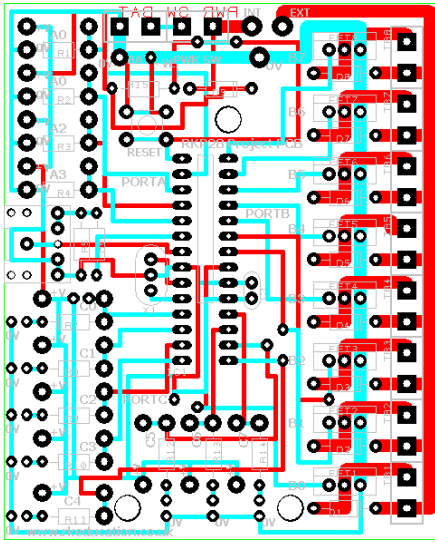
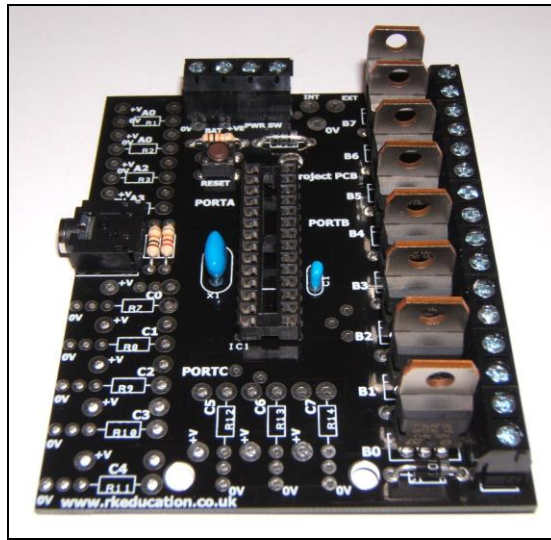


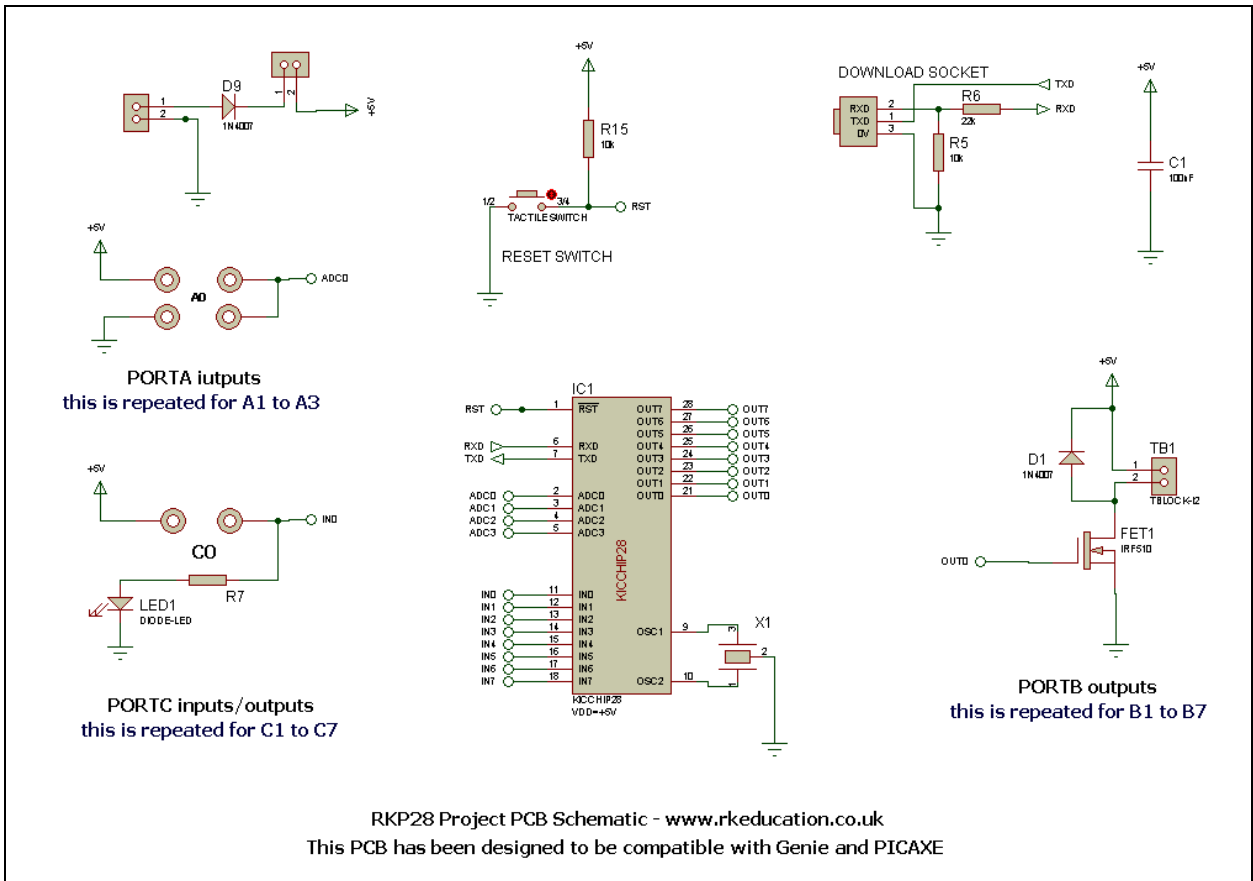
RKP28 Component List and Instructions



PCB layout



Constructed PCB



Schematic

Description

The RKP28 project PCB has been designed to use microcontrollers such as the Genie or PICAXE

- Software is downloaded from a PC into the microcontroller via a 3.5mm stereo socket
- The clock reference is from a 3 pin ceramic resonator
- 8 outputs are connected to high power IRF510 FETs
- Power to the FETs can either be from the main power supply or from an external source
- 4 potential divider analogue inputs
- 8 I/O ports that can be used as either potential divider inputs or low power outputs

Component List

C1 – 100nF multilayer ceramic capacitor 2.5mm pitch
D1 ~ D9 – 1N4007 diodes
FET1 ~ FET8 – IRF510 FETs
IC1 – 28 pin 0.3" DIP socket with microcontroller, e.g. Genie
R5 – 10k brown black orange
R6 – 22k red red orange
R15 – 10k brown black orange
RESET – PCB mounting tactile switch
Software download socket – PCB mount 3.5mm stereo connector
TB1 ~ TB8 – 2 way 5mm pitch terminal blocks
BAT & PWR SW - 2 way 5mm pitch terminal blocks
X1 – 4MHz ceramic resonator

Instructions

For instructions on using your chosen microcontroller, for example Genie, please see the appropriate website

Connecting Power

The power is connecting the terminal block marked BAT, the 0V input, usually black is put in the left hand terminal and the +VE, usually red, is put in the right hand terminal, a regulated 6VDC power supply should be used.

A power switch can be used and should be inserted into the terminal block marked PWR SW, if a power switch is not required short the terminals together

Power to the FET outputs can either be internal or external, if you want to use the internal supply, that is the +6VDC on the BAT terminal block, then short the pads marked INT and EXT together. If you want to use an external power supply connect the 0VDC to the 0V pad and the +VDC to the EXT pad, alternatively the 0VDC from the external power supply could be inserted into the 0V of the BAT terminal block.

PORTA Inputs A0 ~ A3

These are used as inputs and can be used as either digital or analogue inputs. They are arranged as potential dividers with the +V and 0V parts clearly marked, the centre of the potential divider or output are the 2 pads to the right hand side of the potential divider.

They are connected to the microcontroller as follows,

A0 – pin2

A1 – pin3

A2 – pin4

A3 – pin5

PORTB FET outputs

The FETs can be turned on by sending a +VE output from the microcontroller, by sending a logic 1 from the software to the appropriate output pin.

Each of the FET outputs has a back EMF protection diode and as such a DC motor can easily be added, simply insert the cables from the motor into the appropriate terminal block, please note a capacitor will need to be used on the motor terminals.

They are connected to the microcontroller as follows,

B0 – FET1 – pin21

B1 – FET2 – pin22

B2 – FET3 – pin23

B3 – FET4 – pin24

B4 – FET5 – pin25

B5 – FET6 – pin26

B6 – FET7 – pin27

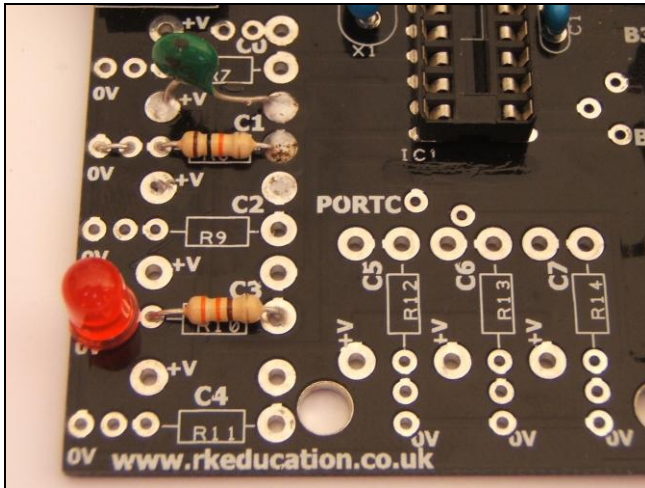
B7 – FET8 – pin28

To use an output simply attach flying leads to the appropriate output terminal block.

PORTC bi-directional I/O

PORTC I/O can be used as either digital inputs or low power outputs, they will be configured in software.

Please see below for an example of port C being used as an input and an output



C1 is being used as a temperature sensor input with a thermistor and resistor used as a potential divider. It is important to use the wire link when using PORTC as an input.

C3 is being used as a low power output with an LED. The resistor above R10 is deliberately left out.

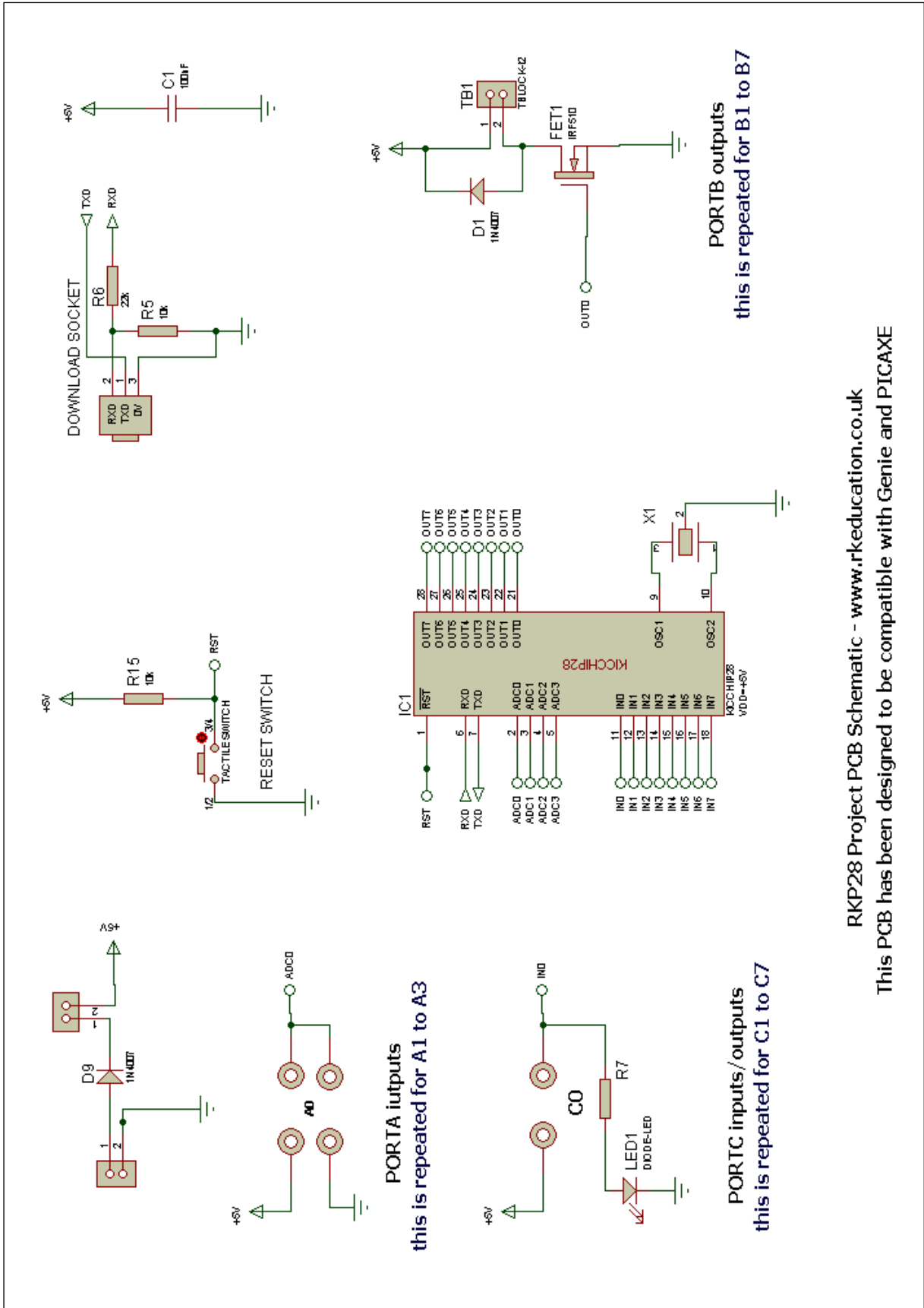
How you use PORTC will depend on how your chosen microcontroller works.

Please visit our website

www.rkeducation.co.uk

If you have any comments or queries please email us at

technical@rkeducation.co.uk



PORTA inputs
this is repeated for A1 to A3

PORTB outputs
this is repeated for B1 to B7

PORTC inputs/outputs
this is repeated for C1 to C7

RKP28 Project PCB Schematic - www.rkeducation.co.uk

This PCB has been designed to be compatible with Genie and PICAXE