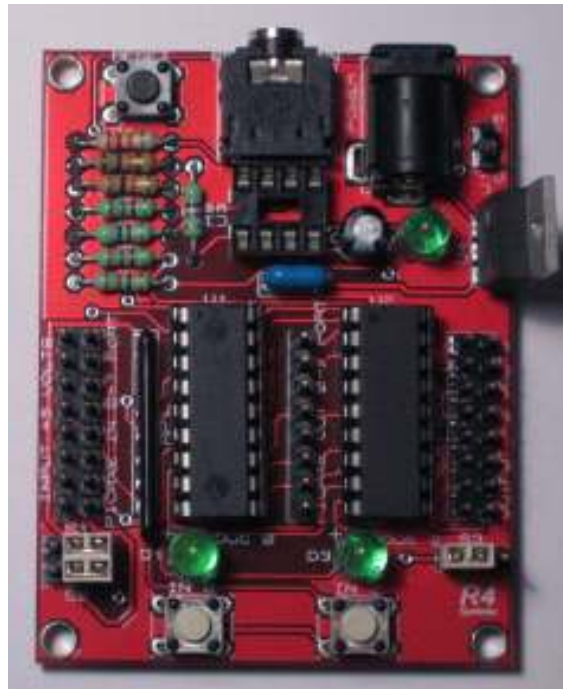


# ***R4 Systems Inc.***

## 18X Board Documentation

2007.07.26

Version 2.0



# **R4 Systems Inc.**

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# ***R4 Systems Inc.***

## **Introduction**

R4 Systems Inc. is pleased to provide you with our 18X board. This board can be populated with an 18 pin PICAXE microprocessor and some support components.

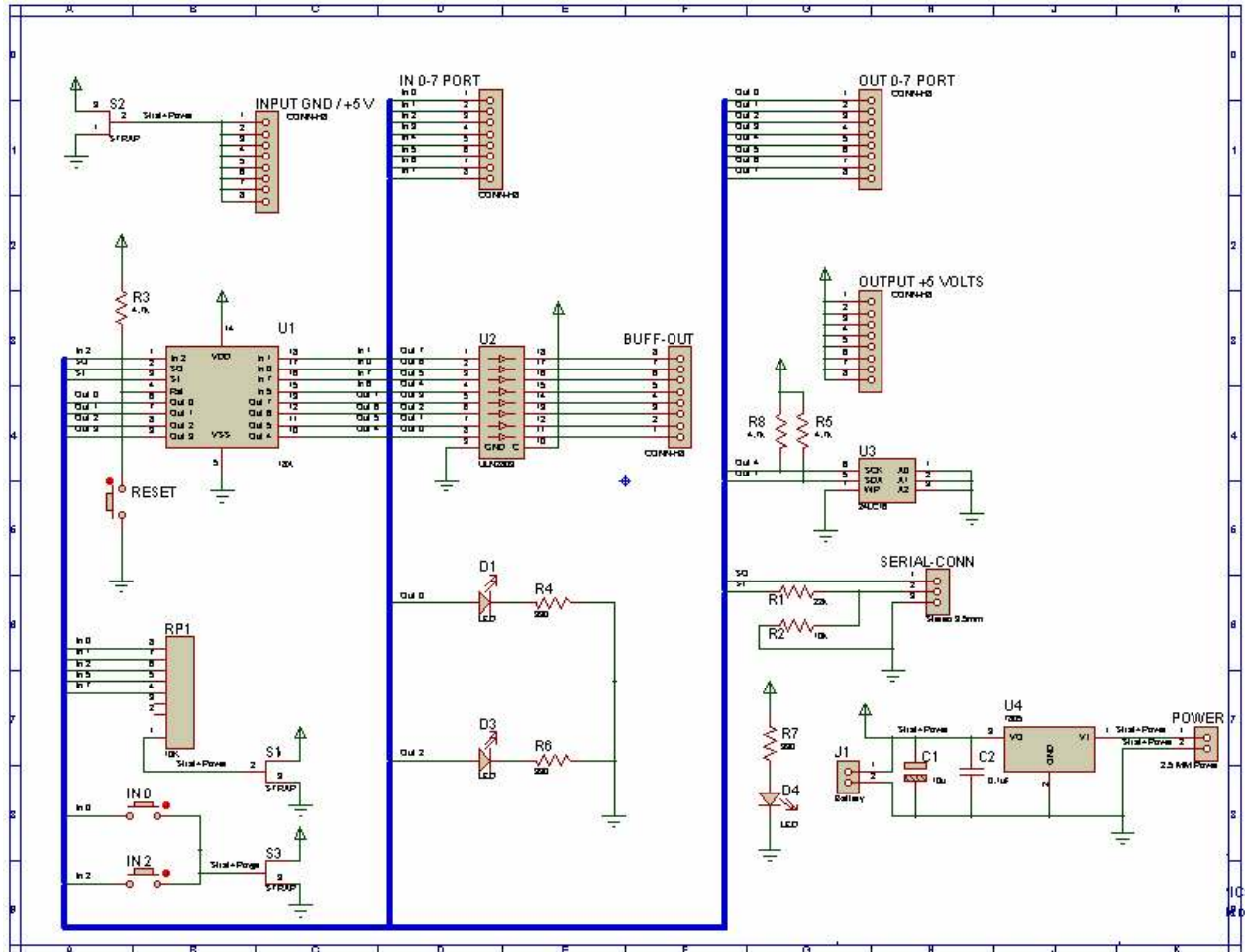
The Board has been designed and built to the highest standards, however R4 Systems Inc. offers no warranty or accepts any responsibility for problems arising from a user defined project.

This board is not intended to be used in any Life Support Device.

PICAXE® is a registered trademark licensed by Microchip Technology Inc.

## Circuit Schematic

**The following is the Circuit Schematic:**



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## View Schematic Using Proteus

The 18X Board CD includes the following:

- Proteus Demo (You can use the Proteus Demo to view the schematic)
- 18X Board Manual
- 18X Board Schematic

To view the schematic you will need to load Proteus on your PC.

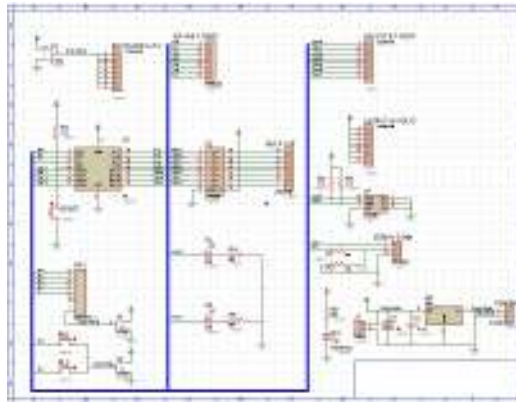
- To load Proteus place the CD in the CD drive and follow the prompts.

To Open the Schematic

- From the Windows Start menu start Proteus Demonstration ISIS.
- Proteus ISIS will start with the following screen.



- From the Proteus File menu select Open Design and navigate to the CD drive.
- On the CD select the file 18X
- The following is a screen capture of Proteus with the schematic open.



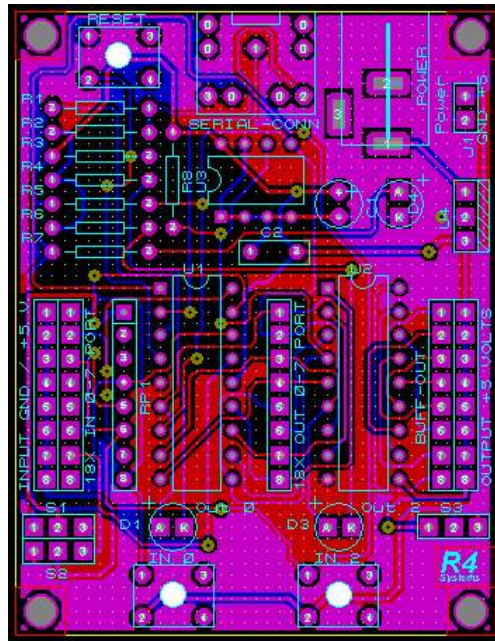
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## The Following is the parts list

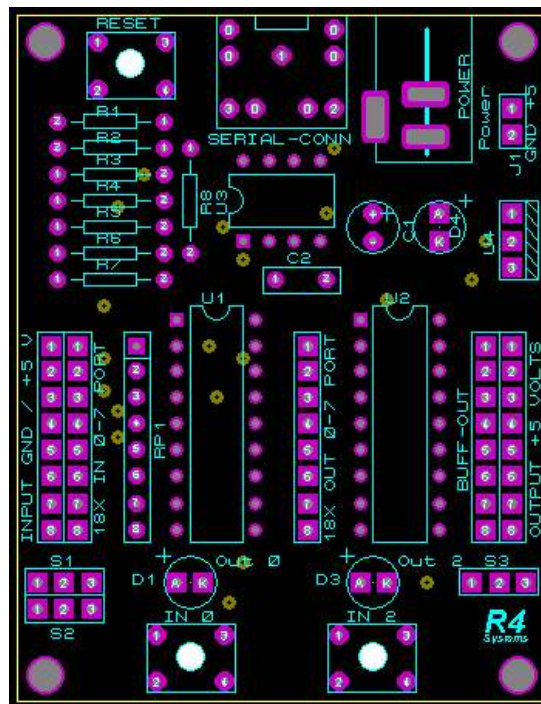
QTY	PART-REFS	VALUE	PACKAGE
---	-----	-----	-----
Resistors			
-----			
1	R1	22k	RES40
1	R2	10k	RES40
3	R3,R5,R8	4.7k	RES40
3	R4,R6,R7	330	RES40
Capacitors			
-----			
1	C1	10u	ELEC-RAD10
1	C2	0.1uF	CAP20-SQ
Integrated Circuits			
-----			
1	U1	18X	DIL18
1	U2	ULN2803	DIL18
1	U3	24LC16	DIL08
1	U4	7805	P1
Diodes			
-----			
3	D1,D3,D4	LED	LED
Miscellaneous			
-----			
5	BUFF-OUT, IN 0-7 PORT, INPUT GND / +5 V, OUT 0-7 PORT, OUTPUT +5 VOLTS	CONN-H8	CONN-SIL8
3	IN 0, IN 2, RESET		PCB-SW-SPST
1	J1	Battery	CONN-SIL2
1	POWER	2.5 MM Power	2.5 MM CONN
1	RP1	10K	RESPACK-7
3	S1-S3	STRAP	CONN-SIL3
1	SERIAL-CONN	Stereo 3.5mm	PICAXE SERIAL

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## Board Overview

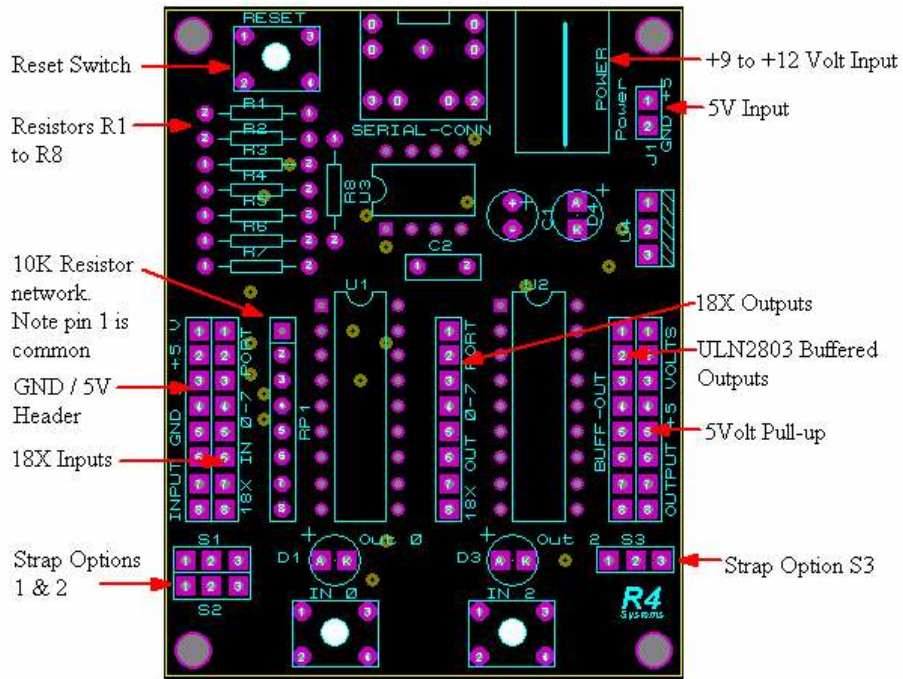


Board overview with Top & Bottom Copper and Silkscreen



Board overview Parts Placement

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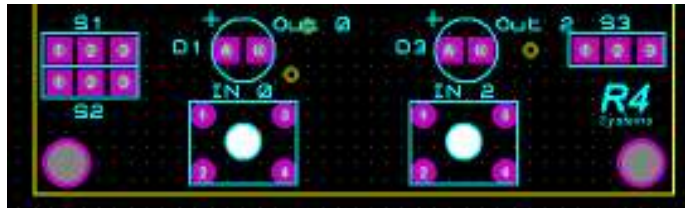


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## Option Straps Overview

There are three option straps on the board.

These are S1, S2 and S3.



For Standard PICAXE operation set the Straps as follows.



More information regarding the function of the straps, please see the schematic.

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## Header Layout

There are four 8 pin headers on the board. There are:

### Input GND / 5 Volts

This header provides a connection to Ground or to the + 5 Volts depending on the setting of S1

Set S1 to connect Pins 2 & 3 to provide + 5 Volts (Standard PICAXE Operation)

Set S1 to connect Pins 1 & 2 to provide + Ground

### 18X IN 0-7 Port

This header provides a connection to the 18X Input Port, Bits 0 to 5.

### 18X Out 0-7 Port

This header provides a connection to the 18X Output Port, Bits 0 to 7 (this is the un-buffered port pins).

### Buff OUT

This header provides a connection to the ULN2803 Output Pins. The ULN2803 inputs are connected to the 18X Outputs.

### Output +5 Volts

This header provides a connection to the + 5 Volts.

## Straps

There are three, 3 pin straps on the board. There are:

### S1

Strap S1 connects the INPUT GND / +5 V to Ground or to the + 5 Volts.

Set S1 to connect Pins 2 & 3 to provide + 5 Volts (Standard PICAXE Operation)

Set S1 to connect Pins 1 & 2 to provide + Ground

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## S2

Strap S2 connects the RP1 (10K Pull Up/Down) to the +5 V or Ground.

Set S2 to connect Pins 2 & 3 to provide Pull Down on RP1 (Standard PICAXE Operation)

Set S2 to connect Pins 1 & 2 to provide Pull Up on RP1.

## S3

Strap S3 connects the two user input switches to the +5 V or Ground.

Set S2 to connect Pins 1 & 2 to provide Pull Up. (Standard PICAXE Operation)

Set S2 to connect Pins 2 & 3 to provide Pull Down.

For Standard PICAXE operation set the Straps as follows.



More information regarding the function of the straps, please see the schematic.

## **Connection to PC**

The connection to the PC is via the Serial Connector.

Connect the 9 Pin DB9 to the PC Com port and connect the Stereo connector to the Serial Connector on the board.

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## Sample 18X Test Programs

To check the operation of the completed board, the following two programs can be used.

The following is a simple test program to flash the LEDs. Load the following into the PICAXE editor. Connect the PC to the board. On the PICAXE Editor select Run. This will load the Program into the PICAXE on the board. If all is OK the LEDs will alternately flash for 0.1 second each.

```
main:
    pause 10
start:
    high 0
    pause 100
    low 0
    pause 100

    high 2
    pause 100
    low 2
    pause 100

    goto start
```

The following is a simple test program to verify the operation of the two Switches. . Load the following into the PICAXE editor. Connect the PC to the board. On the PICAXE Editor select Run. This will load the Program into the PICAXE on the board. If all is OK the LEDs will light when the switch below them is pressed.

```
main:
    pause 100
start:
    Let pins = pins
    goto start
```

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## Completed Board

Your completed board should look like this:



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## 5-Volt Power Option

If you have a 5-Volt Power supply available, you can leave out the 7805 (U4). Power can be applied to the board using the 5-Volt connection. See photo below:

